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# **Science & Technology**

***Central Eurasia:  
Life Sciences***

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# Science & Technology

## Central Eurasia: Life Sciences

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**Biological Characteristics of New Cotton Variety  
INEBR-1**

927C0109B Tashkent UZBEKSKIY  
BIOLOGICHESKIY ZHURNAL in Russian No 4,  
Jul-Aug 91 (manuscript received 10 Dec 89) pp 51-54

[Article by R. N. Nurmatov, O. I. Kuznetsova, D. A. Akkuzhin and K. D. Madzhitova, "Biolog" Scientific Industrial Association, Uzbek SSR Academy of Sciences]

UDC 633.511:631.52

[Abstract] Biological description and optimum cultivation and harvesting times are described for a new strain of cotton, INEBR-1, developed from crossing Tashkent-2 with 153-F. INEBR-1 has a growing phase of 130-133 days, producing pyramidal plants 100-120 cm high with 1-1.5 type of branching pattern. Extensive field trials and cultivation at various farms has shown that harvests of 41.2 quintals/ha can reasonably be anticipated in Uzbekistan if crop management recommendations are followed. Tables 2; references 5: Russian.

**Molybdenum Leaching by Acidophilic and Heterotrophic Bacteria**

927C0109A Tashkent UZBEKSKIY  
BIOLOGICHESKIY ZHURNAL in Russian No 4,  
Jul-Aug 91 (manuscript received 19 Mar 90) pp 12-15

[Article by P. T. Malakhova, E. V. Kovalenko and S. I. Mukhamedova, Institute of Microbiology, Uzbek SSR Academy of Sciences; Central Asian Scientific Research Institute of Nonferrous Metallurgy]

UDC 576.66:550.72

[Abstract] Trials were conducted with Mo-rich and Mo-poor ores to assess the efficiency of acidophilic and heterotrophic bacteria in promoting Mo leaching. The studies involved the use of Thiobacillus ferrooxidans, Bacillus pumilis, Bacillus sp. 101 KhR, Mycobacterium sp. IZh, Pseudomonas putrefaciens KV<sub>2</sub>, and Pseudomonas sp. A<sub>2</sub>V<sub>1</sub>. Depending on the buffer solutions, pH, temperature and other factors, Mo recovery was enhanced by bacteria presumably through oxidation of Mo into more soluble forms. In addition, in certain cases leaching efficiency was further enhanced two-fold or better by introduction of EDTA, Na<sub>2</sub>O<sub>2</sub> or diphenylamine into the incubate. Tables 1; references 12: 6 Russian, 6 Western.

**Construction of RecA 441-Superproducing Escherichia Coli**

927C0139A Moscow BIOTEKHNOLOGIYA in Russian  
No 1, Jan-Feb 91 (manuscript received 16 Nov 88)  
pp 30-31

[Article by Ye. N. Zaytsev, A. A. Alekseyev and Ye. M. Zaytseva, Leningrad Institute of Nuclear Physics imeni B. P. Konstantinova, USSR Academy of Sciences]

UDC 577.151.52

[Abstract] In view of the increasing appreciation of the utility of the rec A protein in genetic engineering, a superproducing E. coli strain was engineered for production of the thermoinducible recA 441 protein encoded by the mutant recA 441 gene. The chromosomal DNA bearing the recA 441 gene was isolated from E. coli JM12, cloned into BamHI site in plasmid pBE322, recloned into pMOB48 and used for transformation and amplification in E. coli Z905. Induction of recA 441 gene starts at 37°C; the superproducing Z905 strain has now been used for three years for production of 98 percent pure recA 441 protein in grams/10 L quantities. Figures 1; references 13: Russian.

**Insulin-Cellulose: Preparation and Use in Isolation of Monoclonal Insulin Antibodies by Affinity Chromatography**

927C0139B Moscow BIOTEKHNOLOGIYA in Russian  
No 1, Jan-Feb 91 (manuscript received 06 Mar 89)  
pp 47-48

[Article by A. Y. Sheris, A. A. Zhvirblene and R. K. Noreyka\*, Kaunas Polytechnical Institute; \*\*"Ferment" Scientific Industrial Association, Vilnius]

UDC 577.175.722.086.83

[Abstract] Sodium periodate activation of cellulose was employed for coupling porcine insulin to different grades of cellulose for eventual isolation of anti-insulin monoclonal antibodies by affinity chromatography. The results showed that best results were obtained with granocel-8 cellulose after treatment with 0.1 M sodium periodate for 300 min, washing, and incubation with insulin in 0.1 M carbonate buffer, pH 9.5, for 15-17 h at 4°C, and treatment with sodium borohydride. The resultant product contained 8.9 mg of insulin per 1 ml of the sorbent and was shown to be effective in recovery of monoclonal antibodies. Tables 1; references 6: 2 Russian, 4 Western.

**Cost Reduction of Hybridoma Nutrient Media**

927C0139C Moscow BIOTEKHNOLOGIYA in Russian  
No 1, Jan-Feb 91 (manuscript received 20 Apr 89)  
pp 53-56

[Article by A. N. Kolganov, S. M. Ambrosova, A. V. Kulyavtsev, Ye. A. Sukhacheva, A. V. Kirillov and T. N. Plechko, Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow]

UDC 57.083.13

[Abstract] Substitution studies were conducted with nutrient media DMEM and RPMI-1640 used for hybridoma cultures to determine whether less expensive cattle serum could replace embryonal serum (Flow Laboratories) in the formulation. The results showed that substitution of 10 percent cattle serum had no adverse impact on the growth and monoclonal antibody production by hybridomas specific for cucumber mosaic virus, curly potato dwarf virus, potato A virus and rock cress mosaic virus. Pretreatment of the cattle serum with polyethylene glycol-6000 reduced the serum protein concentration 2-fold and facilitated antibody recovery. Figures 9; references 13: 8 Russian, 5 Western.

**Melamine Resin Filters for Purification and Concentration of Influenza Viruses**

927C0139D Moscow BIOTEKHNOLOGIYA in Russian  
No 1, Jan-Feb 91 (manuscript received 07 Dec 88)  
pp 57-60

[Article by A. B. Oreshkov\*, N. V. Katushkina\*, V. M. Kalikov\*, G. K. Imangaziyeva\*\* and N. Ya.

Lyubman\*\*. \*Leningrad Polytechnical Institute imeni M.I. Kalinin; \*\*"Kazmekhanobr" Scientific Research Institute, Alma-Ata]

UDC 543.544.576

[Abstract] Extensive trials were conducted with melamine resin (PFEL-15) filters to ascertain their utility and efficiency in purification and concentration of influenza A and B viruses. The studies involved assessment of tablet (17 mm diam., 12 mm height, 2.7 ml vol.) and cylindrical (18 mm ext. diam., 8 mm int. diam., 120 mm height, 25 ml vol.) filters with pore diameters of 4-5  $\mu$ m. The results showed that optimum desorption was obtained with 0.5 M sodium chloride, ensuring 5- to 20-fold concentration of 90 percent pure viruses depending on initial titers, etc. Electron micrographs indicated that viral structure was not affected by the adsorption/desorption cycle. The viral suspension were nonpyrogenic, indicating that melamin resin filters may be used in the production of influenza vaccines, shortening the process by 2-3 h. Figures 7; tables 1; references 9: Russian.

**Induced Autolysis of *Aspergillus Terreus* At-490 Grown on Agricultural and Food Industry Byproducts**

927C0139E Moscow BIOTEKHNOLOGIYA in Russian No 1, Jan-Feb 91 (manuscript received 05 Mar 90) pp 65-68

[Article by N. V. Aladashvili, M. Ya. Tkeshelashvili, V. Sh. Berikashvili, T. L. Babayan\*, V. K. Latov\*, V. M. Belikov\* and G. I. Kvesitadze, Institute of Plant Biochemistry, Georgian SSR Academy of Sciences, Tbilisi; \*Institute of Heteroorganic Compounds imeni A. N. Nesmyanova, USSR Academy of Sciences, Moscow]

[Abstract] Lignocellulosic byproducts of the agricultural and food industries were assessed for their suitability in supporting production of *Aspergillus terreus* AT-490

biomass. Detailed studies with tomato residues and citrus meal showed that at 40°C they supported the growth of *Aspergillus terreus* biomass that consisting of 27-42 percent amino acids/peptides, 27-30 percent carbohydrates (incl. 14 percent reducing sugars), and 20-24 percent nucleic acids. Biomass recovery involved initial centrifugation, five min ultrasonication and treatment of the suspension (50 g/L) with 3 percent ethanol at 55°C for at least 23 h to effect 32 percent lysis. Figures 3; tables 6; references 13: 9 Russian, 4 Western.

**Simultaneous Production of Monoclonal Antibodies Against Recombinant Human Interleukin-2 (rIL-2) and *E. Coli* Membrane Protein and Lipopolysaccharide (LPS)**

927C0139F Moscow BIOTEKHNOLOGIYA in Russian No 1, Jan-Feb 91 (manuscript received 19 May 88) pp 71-74

[Article by A. V. Panyutich, N. N. Voytenok, A. Yu. Tsimanis\*, Yu. P. Bundulis\* and V. A. Skrivelis\*, Belorussian Scientific Research Institute of Blood Transfusion, Belorussian SSR Ministry of Health, Minsk; \*Institute of Fine Organic Synthesis, Latvian SSR Academy of Sciences, Riga]

UDC 579.222:579.842.11

[Abstract] Conventional hybridoma technology was utilized for the production of monoclonal antibodies against rIL-2 produced in an *E. coli* system, commencing with immunization of Balb/c mice and subsequent fusion of the immune splenocytes with X63-Ag 8-653 murine myeloma cells. The rIL-2 preparation used for immunization consisted of 80 percent rIL-2 and a 20 percent admixture of *E. coli* antigens. Preliminary immunoblotting studies and immunoenzyme assays on the supernatant fluids of the uncloned hybridomas detected monoclonal antibodies against rIL-2 as well as against a 4 kD *E. coli* membrane protein and LPS. A hybridoma clone was isolated producing anti-rIL-2 antibodies and suitable for specific immunoassays. Figures 3; tables 1; references 8: Western.

### **Picea Abies Endosperm as Indicator of Radiation Mutagenesis**

927C0090A Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 35 No 4, Apr 91 (manuscript received 23 Nov 90) pp 365-369

[Article by G. G. Goncharenko, V. G. Krivko, V. V. Potenko and L. V. Khotyleva, academician, Belorussian SSR Academy of Science, Belorussian Scientific Research Institute of Forestry; Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences]

UDC 575.174.2:633.936

[Abstract] Isoenzyme patterns of haploid endosperm of Norway spruce (*Picea abies*) were analyzed for their indicator value in assessing environmental radiation pollution. The samples were collected in Latvia and the Vitebsk Oblast of Belorussia, representing clean areas, and in the Gomel and Mogilev oblasts of Belorussia which received radioactive fallout from the Chernobyl accident in Ukraine. Analysis of the isoenzyme patterns of 16 enzymes, reflecting 16 gene-enzyme systems, by starch block electrophoresis led to detection of 68 alleles. Examination of homozygotic loci showed that most of the mutations affecting structural genes involve changes in electrophoretic mobility or function of the corresponding isoenzyme band. Functional changes (null mutations) preclude electrophoretic detection. Both types of mutation were observed in the radiation polluted areas, pointing to the utility of this indicator system. Figures 2; references 6: 5 Russian, 1 Western.

### **New Substance Ensures Radionuclide-Free Milk**

927C0115A Kiev RADYANSKA UKRAYINA in Ukrainian 22 Aug 91 p 2

[Article by Ukrinform]

[Text] A promising new drug called "Bolyus" acts to remove radionuclides from cattle. This was the conclusion of a team of Ukrainian and Norwegian scientists after studies done at the Chapayev Collective Farm in the Dubrovitsky Ryon of Rivne Oblast. When introduced into the stomach of dairy cows Bolyus has been shown to absorb and promote elimination of cesium

from the body to ensure radionuclide-free milk. Testing has also been conducted on privately owned cattle. The scientists advocate using Bolyus at all farms affected by fallout from the Chernobyl Nuclear Power Plant.

### **Former Defense Plant Produces Medical Lasers**

927C0115B Kiev RADYANSKA UKRAYINA in Ukrainian 2 Aug 91 p 4

[Article by A. Rudenko, RADYANSKA UKRAYINA correspondent]

[Text] Lviv, 1. For a long time no mention was made in the mass media of the "Polyaron" production association in Lviv since it was part of the defense establishment. Now, as a result of reforms, Polyaron's products are seen at foreign trade exhibitions and where they frequently garner awards.

Polyaron's helium-neon lasers have attracted the attention of specialists since these are devices with virtually universal applications because of their sharply-focused light. They are in demand by reclamation experts and construction engineers, geodesicists and metrologists, tool-and-die makers and workers in the optical industry, as well as agriculturalists and physicians.

The Ministry of Health holds the Lviv lasers in high regard, particularly those used in wound healing and resolution of surgical sutures.

Presently, lasers have found extensive applications in stomatology, traumatology, and orthopedics. With the support of the Ministry of Health, Polyaron has made plans for mass production of new compact lasers using fiber optics, which makes it possible to reach any lesion in the human body.

In addition to medical applications, atmospheric studies and data recording and retrieval, lasers are also used by artists and fashion designers as demonstrated at the recent Duesseldorf-91 International Exhibition in Germany. The Lviv scenic light effects were used for an allegorical depiction of the growth and development of flowers in unison with a beating human heart in response to love songs.

In August Polyaron's products will be on display at the Medbiofarm-91 Exhibition in Kiev, accessible to the capital's residents and visitors.



**Immunostimulat Activity of Bacillus  
Mucilaginosus Polysaccharide**

927C0109C Tashkent UZBEKSKIY  
BIOLOGICHESKIY ZHURNAL in Russian No 4,  
Jul-Aug 91 (manuscript received 24 Oct 90) pp 63

[Article by V.N. Bochkarev, All-Union Scientific  
Rsearch Institute of Hunting and Animal Husbandry  
imeni Prof. B.M. Zhitkov]

UDC 632.938.231.52

[Abstract] *Bacillus mucilaginosus* produces an  
exopolysaccharide (95 percent carbohydrate, 5 percent

protein) which has been shown to act as an immunos-  
timulant in Karakul sheep in a dose-dependent fashion.  
Administration of 5-20 mg/kg of the polysaccharide  
intramuscularly results in a marked increase—in 12 to  
23 h depending on the dose—in red cell counts, hemo-  
globin concentration, T and B cells, blood nucleic acid  
concentration and total serum protein. These changes  
generally peak in 24 h but remain above baseline for  
several days. A 20-fold increase in the dose had an  
immunosuppressive effect. Veterinary trials on piglets  
with hemorrhagic gastroenteritis (5 mg/kg/day for five  
days) in conjunction with conventional chemotherapy  
increased the survival rate to 90 percent, versus 56  
percent in polysaccharide-untreated animals. Accord-  
ingly, *B. mucilaginosus* polysaccharide appears to be a  
promising veterinary immunostimulant.

### Laser Treatment for Semipalatinsk Cancer Patients

927C0231A Alma-Ata KAZAKHSTANSKAYA PRAVDA  
in Russian 31 Dec 91 p 4

[Article by O. Rotaru: "Laser Heals"]

[Text] The Semipalatinsk test range is closed. Time to begin the work of ecological rehabilitation of the region contiguous with it. The first thing needed is a clear, scientifically grounded program for improving the health of the population. The Ministry of Nuclear Power and Industry has already released 380,000 rubles for this purpose.

On his part Doctor of Medical Sciences Orumbert Mefodyevich Kim, director of the radiation diagnosis and radiation therapy course at Semipalatinsk Medical Institute, has specific proposals regarding treatment of oncological diseases and their prevention. One would think that these proposals could have been included in the "Zdorovye" ["Health"] program.

This doctor has a great deal of experience in working with patients at the hospital of the Semipalatinsk Oncological Clinic. He uses nontraditional treatment methods—laser therapy—in his practice.

As we know, even small doses of radiation evoke profound biological changes at the intracellular level. The first to suffer are the hemopoietic and lymphatic systems—that is, tissues that reproduce quickly. A person may not even feel right away the deleterious effect of doses of radiation energy he has absorbed, but the effect will make itself known in his grandchildren and great-grandchildren.

"A unique situation evolved here over the 40 years of the test range's operation," said Orumbert Mefodyevich. "We can say that our patients undergoing treatment at the hospital of the cancer clinic are unusual because their blood leukocyte count was reduced by the action of radiation. And yet, their treatment includes radiation therapy. By exposing the patients to additional radiation we worsen their condition, nor are we always able to rectify the situation by the commonly accepted methods of hemostimulation (infusion of blood, and its substitutes and components). So this is where laser therapy comes to the rescue. It has already been used both for preventive purposes and for treatment of leukopenia,

and it has been used successfully. As a result the leukocyte count of patients rises to normal, making it possible to complete treatment successfully. The method is also good in that exposure to laser radiation is painless and harmless."

The doctor believes the medical personnel could benefit considerably from a mobile team (a physician and nurse equipped with a microbus) necessarily staffed by highly qualified specialists from departments of Semipalatinsk Medical Institute, on one hand as consultants and on the other with the purpose of applying the methods they have developed for improving the health of people. It would be good to have a laser device in such a bus, because there are many chronic patients (suffering leukemia, immunodeficiency) among residents of our region, especially in regions contiguous with the test range, whom we consider to be conditionally healthy.

This of course requires a great deal of money. It is no secret that no health improvement efforts were made precisely due to its lack. But now the money has appeared, and we must not delay, we must begin work.

"It would also be good to attract the assets of charities, peace organizations, and cooperatives existing in Semipalatinsk Oblast for this purpose, for example the cooperative under the name of 'Aid to Nuclear Test Victims'," O. Kim said.

### Electronic Disinfection Device

927C0231B Moscow ROSSIYSKAYA GAZETA  
in Russian 29 Jan 92 p 1

[Article: "Electrons Against Microbes"]

[Text] Scientists of the Institute of High-Current Electronics of the Tomsk Affiliate of the Siberian Department of the Russian Academy of Sciences developed an instrument that kills microbes on any surface. Essentially, an electron beam of relatively low energy penetrates to micron thickness within the surface treated by the instrument, killing harmful bacteria. There is a unique exposure dose for every species of bacteria. Scientists have determined these doses.

The instrument will enjoy application in the treatment of surgical instruments and of dairy equipment, which will avert fast souring of the product even in a hot environment. It will also be used in other places requiring ideal decontamination. The instrument was tested at the Tomsk Oblast Clinical Hospital, and the results were approved by the Russian Ministry of Health.

**Enterosorption: Advances, Problems and Perspectives**

927C0107A Kiev VRACHEBNOYE DELO in Russian  
No 9, Sep 91 (manuscript received 03 Mar 90) pp 12-19

[Article by M. A. Andreychin and V. V. Gebesh, professors, M. S. Gnatyuk, S. F. Kovalchuk, O. L. Ivakhiv and N. Ye. Soroka, Chair of Infectious Diseases, Ternopol Medical Institute; Chair of Infectious Diseases, Kiev Institute for Advanced Training of Physicians]

UDC 615.246.2

[Abstract] A survey is presented of Soviet experience with enterosorption as a means of detoxication and as a promising therapeutic adjunct in other cases. Although a variety of absorbents have been proposed, to date Soviet practice relies largely on SKN-grade activated charcoal, which in many cases has been found to give results equivalent to those obtained with hemosorption. Administration is usually per os and has been found beneficial in jaundice, chronic hepatitis, acute gastrointestinal infections, acute pancreatitis, chronic colitis, and various forms of intoxication. More recent findings suggest that immunosorbents may be employed in the management of allergies, ischemic heart disease and arrhythmia. Enterosorption has been beneficial in reduction of blood concentrations of cholesterol, triglycerides and  $\beta$ -lipoproteins. All indications are that enterosorption is a safe procedure lacking absolute contraindications. However, prolonged use (two weeks) in patients with rheumatoid arthritis has been reported to lead to exacerbation, presumably due to elimination of natural antioxidants. Also, in some patients with chronic renal insufficiency, urinary excretion of creatinine has been reduced. Another facet of enterosorption is that enterosorbents may be used for drug delivery and the procedure itself has been shown to enhance the pharmacodynamics of subsequently administered drugs. References 48: 1 Ukrainian, 47 Russian.

**Antioxidants in Experimental Clinical Hepatology**

927C0129A Kiev VRACHEBNOYE DELO in Russian  
No 7, Jul 91 (manuscript received 20 Jul 89) pp 17-22

[Article by V. N. Khorostinka, professor, and T. A. Moiseyenko, Chair of Internal Diseases, Second Therapeutic Faculty, Kharkov Medical Institute]

UDC 615.356:577.161.3:616.36-009.7

[Abstract] Largely Soviet literature is reviewed on the use of antioxidants in hepatology. The antioxidants encompass a wide spectrum of chemical entities, including vitamins, flavonoids, natural products (propolis) and synthetic substances. Both animal studies and clinical trials have shown that in many cases efficacy of antioxidant therapy can be enhanced by using a combination of drugs. Although the indications to date are that antioxidants have a definite place in the management of

hepatobiliary pathology, much remains to be done to define optimum therapeutic regimens and indications in every specific condition. References 44: 35 Russian, 9 Western.

**Biological Effects of Low-Dose Ionizing Radiation**

927C0129A Kiev VRACHEBNOYE DELO in Russian  
No 7, Jul 91 (manuscript received 07 Feb 91)  
pp 111-112

[Article by V. A. Baraboy, Kiev Scientific Research Institute of Oncology]

UDC 614.876:612.014.482

[Abstract] A. N. Kovalenko's hypothesis [Vrachebnoye Delo, No 7, July 1990] on what constitutes low-dose ionizing radiation, his seeming unfamiliarity with the fundamentals of radiobiology and his pretensions to an "authoritative" presentation of his concepts should be a matter of great concern. Kovalenko refers to doses of 25 to 50 rads and higher as being in the low-dose range, although low-dose in radiobiology refers to five to six rads, i.e., doses which exceed natural background radiation by one order of magnitude. Furthermore, he ignores the fact that genomic damage is caused by a dose continuum, asserting instead that a fairly high threshold dose of ionizing radiation has to be exceeded for lasting genetic damage. Low-dose damage, Kovalenko states, disappears by itself as a result of DNA repair mechanisms. He then glibly asserts that the tragic consequences for the clean-up crews at Chernobyl, who had received 25 to 50 rads or more, are simply due to "radiophobia" and have nothing to do with radiation injuries. Playing fast-and-loose with well established radiobiologic facts, Kovalenko's intention is an unconscionable and hopefully last attempt at resuscitation of "radiophobia" as an explanation of the human toll resulting from the disaster at the Chernobyl Nuclear Power Plant.

**Novel Antimicrobial Absorbable Sutures for Gastrointestinal Surgery: Experimental Trials**

927C0180A Tbilisi SOOBSHCHENIYA AKADEMII  
NAUK GRUZINSKOY SSSR in Russian Vol 131 No 2,  
Feb 91 (manuscript received 05 Feb 91) pp 417-420

[Article by T. F. Chkhikvadze, D. N. Kokhodze and D. T. Dzhikiya, Tbilisi State Medical Institute]

UDC 617.55:617.089+61:678.004

[Abstract] No. 1 sutures prepared from monocarboxylulose and impregnated with an antimicrobial agent (s) were subjected to extensive testing to ascertain their suitability for gastrointestinal surgery. The high tensile strength sutures were most bacteriostatic for Klebsiella pneumoniae, Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli and Proteus mirabilis. Testing on male and female rats demonstrated that they

were nontoxic on intraperitoneal implantation, and non-pathogenic or carcinogenic in rabbits on implantation into abdominal muscles. Resorption studies on dogs and rabbits using gastric resection and gastrointestinal and intestine-to-intestine anastomoses showed complete absorption of the sutures in 180 days. Accordingly, the initial impressions on the suitability of this suture for gastrointestinal surgery are positive. Figures 1; tables 2; references 7: 1 Georgian, 5 Russian, 1 Western.

#### **Successful Management of Breast Cancer With Rotational Magnetic Field**

927C0187F Moscow *SOVETSKAYA MEDITSINA*  
in Russian No 8, Aug 91 (manuscript received 11 Jun  
90) pp 86-87

[Article by N. G. Bakhmutskiy, V. I. Golubtsov, T. A. Pyleva, D. A. Sinitskiy and V. Ye. Frolov, PNIL [expansion

unknown] on Use of Magnetic Fields in Oncology, Kuban Medical Institute imeni Krasnaya Armiya, Krasnodar]

UDC 618.19-006.6-085.847.8-036.8-07

[Abstract] The case is presented of a 48 year old woman first seen in May, 1976, with metastatic carcinoma of the right breast. The patient was managed with a radical mastectomy followed by radio- and chemotherapy. In January, 1978, the cancer had spread to the left breast. The patient was then treated with a total of 110 rotational magnetic field procedures (0-3 mTesla induction variance/2 min; 60 min/procedure). Resolution of some of the lesions was observed and the patient has been doing well with no further progression of malignancy for the last 12 years. Figures 2; references 5: Russian.

**Degradation of Synthetic Nitron Fibers by Microycetes**

927C0111A Leningrad MIKOLOGIYA I  
FITOPATOLOGIYA in Russian Vol 25 No 2, Feb 91  
(manuscript received 08 Aug 90) pp 141-146

[Article by Ye. V. Zhiryayeva, I. A. Yermilova, T. I. Komarova and I. G. Kanevskaya, Leningrad Institute of Soviet Trade imeni F. Engels; Institute of Botany imeni V. L. Komarov, USSR Academy of Sciences, Leningrad]

UDC 620.193.82:582.288:677.499

[Abstract] Electron microscopy and dynamic light scattering techniques were employed in studies on the susceptibility of nitron fibers (acrylonitrile:methyl acrylate:itaconic acid copolymer) to micromycetes. Incubation of 5 percent nitron samples with four-day-old micromycete cultures for 28 days in Czapek's medium without a C source at 26°C resulted in breakdown of fiber structure into small MW components. Nitron surface underwent the greatest degree of deterioration when attacked by *Aspergillus terreus* BIN, *A. terreus* 4V, *A. fumigatus*, *A. flavus* 3C, *Penicillium notatum* and *Cladosporium herbarum*. Significantly less damage was done by *A. oryzae*. Figures 5; tables 3; references 10: 1 Serbo-Croatian, 7 Russian, 2 Western.

**Mycotic Conversion of Grain Fodder Into Protein-Carbohydrate Product**

927C0111B Leningrad MIKOLOGIYA I  
FITOPATOLOGIYA in Russian Vol 25 No 1, Jan 91  
(manuscript received 22 Mar 90) pp 39-42

[Article by M. M. Afanasyeva and V. A. Vysloukh, All-Union Scientific Research Institute of Nature Protection and Conservation]

UDC 582.28:636.086.25

[Abstract] An analysis was conducted on the efficiency fungal associations in processing grain fodder into single-cell protein-carbohydrate products, using a straw-grain (1:1) mixture containing 6-7 percent protein. Trials with different associations showed that best yield (78.1 percent) and maximum protein content (29.3 percent) was obtained on submerged cultivation with the mycelial fungi *Aspergillus fumigatus*, *Polyporus squamosus* and the yeast *Candida scotii*. Higher yields prevailed when the introduction of the fungi was successive rather than simultaneous. In addition, both yield and protein content were improved by grinding the grain fodder to 5-50 mm size rather than finer milling to 0.1-0.5 mm. Finally, surface cultivation produced less protein and required five days for completion while submerged cultivation was completed in 1.5 days. Tables 3; references 4: Russian.

**Cellulolytic Activity of Wood-Degrading Basidiomycete Bjerkandera in Submerged and Solid-Phase Fermentation**

927C0111C Leningrad MIKOLOGIYA I  
FITOPATOLOGIYA in Russian Vol 25 No 1, Jan 91  
(manuscript received 13 May 88) pp 48-52

[Article by Kh. G. Ganbarov and M. Z. Muradov, Microbiology Section, Azerbaijan SSR Academy of Sciences, Baku]

UDC 582.287.237:154.33

[Abstract] Trials were conducted with several strains of *Bjerkandera adusta* and *B. fumosa* to determine their cellulolytic potentials in submerged and surface (solid-phase) decomposition of wheat stalks, straw and grapevine sawdust with several different nitrogen sources. The results demonstrated that specific cellulase and  $\beta$ -glucosidase activities of both species were 2.4- to 8.5-fold higher in surface decomposition than in submerged cultures, since the former approximates more closely natural conditions of woody substance decomposition. In addition, activity was much higher on wheat stalk than on straw or grapevine sawdust. The difference was attributed to enzyme adsorption and inactivation on the lignocellulose of the latter substrates. Optimum cellulase activity was observed after three to four days at pH 4.5, 0.04 percent ammonium nitrate, 57-60 percent moisture content and 26-28°C. Beta-glucosidase optimum required pH 5.5 and 0.06 percent ammonium nitrate. Figures 2; tables 2; references 12: 6 Russian, 6 Western.

**Lyophilization of Cholera Vibrio O1 and Non-O1 Phages**

927C0126A Kiev PROBLEMY KRIOBIOLOGII in Russian No 2, Feb 91 (manuscript received 04 Jul 88) pp 34-40

[Article by L. D. Makedonova, T. A. Kudryakova, V. V. Kadetov and L. A. Natalich, Rostov-on-Don Scientific Research Antiplague Institute]

UDC 579.843.1:616.078.075

[Abstract] Optimum conditions of lyophilization were determined for the labile phages of *Vibrio cholerae* serogroups O1 and non-O1. The results showed that maximum viability was retained under the following conditions: 1) freezing of phage-bearing ampules to -60°C at a rate of 12°C/min, and 2) lyophilization for 27 h with temperature increasing to -40°C over 3 h, to 25°C over the next 14 h, and 10 h at 25°C. h. Best retention of viability on subsequent storage at 4-10°C was shown by phages lyophilized from 10 percent sucrose + 1.5 percent gelatin + either 0.75 percent calcium chloride or 0.75 percent magnesium chloride. Figures 1; tables 4; references 8.

**Clinical Efficacy of Erythrocytes After Two Year Storage at -40°C**

927C0126B Kiev *PROBLEMY KRIOBIOLOGII* in Russian No 2, Feb 91 (manuscript received 05 Jul 89) pp 27-31

[Article by V. V. Orlik, B. V. Kachorovskiy, R. A. Krivoruchko, M. I. Vinarchik, M. V. Mindyuk, L. G. Doroshenko and G. P. Zubarev, Lviv Branch, Kiev Scientific Research Institute of Hematology and Blood Transfusion]

UDC 615.387.014.41.038

[Abstract] Clinical trials were conducted with red cell concentrates preserved by the high glycerol (39.6 percent) and slow-freeze (-40°C) method. After storage for up to two years, the erythrocytes were reconstituted with a plasma substituent and used after one to seven days at 4C in 116 anemic patients ranging in age from 16 to 68 years. Blood chemistries and hemodynamic monitoring of the patients demonstrated that the therapy was clinically beneficial and the erythrocytes were areactogenic. These observations confirmed the safety and clinical utility of red cells preserved by the high glycerol-slow freeze method, demonstrating that they can be stored for up to two years at ordinary refrigerator temperatures (-40°C). Tables 3; references 10: 7 Russian, 3 Western.

**Household Electromagnetic Fields and Breast Cancer in Rats**

927C0180B Tbilisi SOOBShCHENIYA AKADEMII  
NAUK GRUZINSKOY SSSR in Russian  
Vol 131 No 2, Feb 91 (manuscript received  
18 Jan 91 pp 411-412)

[Article by V. G. Bilanishvili, O. V. Tatishvili, M. M. Sichinava, D. A. Akhalkatsi, K. I. Bardadze, M. Z. Menabde, M. S.

Sartaniya, A. O. Sepiashvili, Ts. A. Kokrashvili, V. A. Osmanova, R. V. Khomeriki and D. Sh. Beniashvili]

[Abstract] The Russian abstract of the Georgian article indicates that exposure to household-type electromagnetic fields facilitates onset and development of mammary carcinoma in female rats treated intravenously with 50 mg/kg of nitrosomethylurea. Electromagnetic exposure lasted from 0.5 to 3 h/day; oncogenesis was more pronounced with alternating magnetic fields than with constant fields. Tables 2; references 3: 1 Russian, 2 Western.

**Pharmacology, Toxicology**

**Stimulation of Wound Healing and Prevention of Surgical Wound Infection by Xymedon**

927C0106E Moscow KHIRURGIYA in Russian No 5,  
May 91 (manuscript received 03 Mar 90) pp 27-30

[Article by O. S. Kochnev, professor, and S. G. Izmaylov, candidate medical science, Chair of Emergency Surgery, Kazan State Institute for Advanced Training of Physicians imeni V. I. Lenin]

UDC 617-089.168-06:617-001.4-002.3-084

[Abstract] Xymedon, a congener of pyrimidine, underwent testing on outbred male rats for its efficacy in accelerating wound healing. Intra-gastric administration of 500 mg/kg of the drug to 150-170 g outbred male rats resulted in surgical scar formation that, five days post-operatively, had a tensile strength that was 57 percent greater than scars in control animals and exceeded the elasticity of control scars by 42.4 percent. In addition, scars in the xymedon group exceeded the tensile strength of scars in rats treated with 100 mg/kg of methyluracil by 21.5 percent. Clinical trials on 92 male and female appendectomy patients, 15 to 54 years old, treated with 0.5 g of xymedon 4 q.i.d (commencing on first postoperative day) showed accelerated wound healing and earlier alleviation of pain and inflammation. Consequently, suture removal was possible one to two days earlier than in control patients and the hospital stay was reduced by 1.2 days. Finally, the incidence of pyogenic complications was four-fold lower in the patients treated

with xymedon. These observations indicate that xymedon has definite therapeutic utility in clinical surgery. Tables 2; references 12: Russian.

**Comparative Effects of Zootoxins on Isolated Heart Preparations**

927C0106F Moscow BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 91 (manuscript received 10 Feb 89) pp 47-53

[Article by I. A. Valtseva, V. N. Krylov, V. V. Yegorov and N. P. Sheshina, Moscow Medical Academy imeni I. M. Sechenov]

UDC 615.919:591.145.2

[Abstract] Isolated rat, cat and guinea pig heart preparations were utilized for testing a variety of zootoxins for cardiotropic action. Studies with reptilian, amphibian and arachnid venoms showed the both chrono- and inotropic effect regardless of the origin. More detailed analysis demonstrated that frog venom, which enhanced both the amplitude of contraction and the heart rate, acted by increasing intracellular calcium. Scorpion venom exerted an analogous effect on the heart by altering cyclic nucleotides, promoting an increase in cAMP and reducing cGMP. The frog and scorpion venoms may merit further investigation as precursors of cardiotoxic agents, whereas venom from other species that depress heart activity may find use in studies on pathogenetic mechanisms. Figures 1; tables 2; references 10: Russian.

### Fundamentals of Occupational Selection

927C0184A Kiev FIZIOLOGICHESKIY ZHURNAL  
in Russian Vol 37 No 4, Sep-Oct 91 (manuscript  
received) pp 126-128

[Review by A. G. Zadorozhnyy of book *Psikhofiziologicheskiye funktsii cheloveka i operatorskiy trud* (Psychophysiological Functions in Man and Operator Occupations) by N. V. Makarenko, Nauk. dumka, Kiev, 1991]

[Text] Research of the physiology of higher nervous activity, which has a glorious history in Soviet science, has been noticeably curtailed in recent years, which negatively affects the development of theoretical and applied neurobiology disciplines. We currently feel a distinct need for serious, thorough research on the physiology of higher nervous activity, which includes determining the role of typological aspects of higher nervous activity in man in the manifestation of individual differences between people. In connection with this, it is appropriate to note a statement made by academician Simonov at a meeting of the USA Biological Psychiatry Society (1989) on a report by well-known English scientist Hans Ayzenk "Biological fundamentals of personality": "In summary, you come to the somber conclusion that in the homeland of scientist I. P. Pavlov, with respect to the types of the nervous system, the scope of research of neurophysiological, genetic, and neurochemical fundamentals of individual aspects of behavior and psychiatry in no way measures up to the significance of this problem and the intensity of its development abroad... Urgent effort in the development of the physiology of the types of higher nervous activity and the neurobiological fundamentals of personality present an urgent assignment to Soviet researchers."<sup>1</sup>

Makarenko's monograph is devoted to the role of the properties of the fundamental nerve processes in the expression of electrophysiological, somatovegetative, and psychophysiological functions and their importance to occupational activity. It essentially fills this gap and thus meets the demands of time. In like manner the work may be viewed as an original perspective direction of research that lays the foundation for occupational selection and orientation, with the objective of improving the quality of training a number of specialists for the economy. The monograph consists of two sections. The first section outlines the theoretical aspect of the problem. This section consists of four chapters. The second section, which reports the results of research and their implementation, includes two chapters. The work clearly traces the grounds for the directions of research that are outlined in the introduction about the leading role of the central nervous system in determining personality traits as proposed by I. P. Pavlov and receiving further development and experimental confirmation in the works of the school of Teplov, Nebylitsyn, and their students, as well as in the works of the author of this monograph.

The first chapter introduces the reader to the world of modern concepts of neurodynamic fundamentals of personality differences between people. After having performed a great creative work on the analysis, systematization, and summarization of abundant and diverse material, the author draws the conclusion that in spite of the importance of individual aspects of higher nervous activity of people in their education, formation, and development of occupational skills, our knowledge about the connection between individual aspects of the entire complex of physiological, psychophysiological, and personality characteristics has hardly been enriched, and we do not see any progress in this.

The second chapter provides an understanding of the mobility of fundamental nerve processes and presents technical methods for its determination. The author's concept of a property that he calls "functional mobility" is the mobility of nerve processes in the Pavlov understanding and does not contradict the lability of Vvedenskiy-Ukhtomskiy, and although it is distinct from the latter, it is a speed reaction of the operating functional system, rather than a specific nerve substrate (nerve, nerve center, etc.), that is, it reflects the ability of the nervous system to fulfill a certain number of operating cycles per unit of time with the action of positive and inhibitory signals, rather than excitation cycles alone. These aspects differentiate functional mobility from lability in the understanding of B. M. Teplov. This functional mobility is determined by the critical frequency of flashes of phosphene, etc. This chapter describes methods proposed by the author for assessing the functional mobility and occupational fitness of the brain. It should be noted that N. V. Makarenko thoroughly elucidates these problems in subsequent works<sup>2</sup>, which are not included in the material of this monograph. In them he proves that the functional mobility of the nerve processes is an independent property of higher nervous activity.

The third chapter says that data on the genetic determination of some neurodynamic and psychomotor functions as well as the personality aspects of man are extremely original. The most important aspect of this research is that the indexes of functional mobility, which are determined by the method proposed by the author, are highly genetically determined, which confirms the possibility of using them as objective criteria for assessing the typological property of higher nervous activity.

The fourth chapter is the largest in terms of the amount of material as well as its diversity. It discusses the typological conditionality of cerebral, somatovegetative, and psychomotor functions in man. As a result of analyzing a great deal of experimental material (more than 1,500 people), it was concluded that the physiological basis of individual psychophysiological differences between people is composed of genetically determined typological properties of higher nervous activity which determine many important facets of the entire pattern of individual behavior. In addition, among the properties



of higher nervous activity investigated, the property of functional mobility of nerve processes holds a special place. The property is most clearly expressed in the nature of vegetative, neurodynamic, and electrophysiological reactions in the properties of memory, attention, perception, and thought and especially in those cases where the body is given loads that are not too difficult or light for higher sections of the central nervous system. However, according to some indexes of separate functions, statistically reliable differences are found even at rest. There is formidable proof for believing that the functional mobility of nerve processes are a property of higher nervous activity that is most responsible for the individual aspects of the pattern of complex neurodynamic and psychomotor activity. This is extremely significant if you consider that the dynamic parameters (speed, rate, volume of information processed) generally characterizes the effectiveness of goal-oriented actions in man.

In order to increase the reliability of the human factor in different spheres of occupational activity, a significant role belongs, in the author's opinion, to assessing and predicting current and long-term occupational fitness with consideration of individual functional aspects, conditions, and the nature of work. The practical solution of these problems dictates the creation of a scientifically-based system of controlling labor resources, including efficient training, selection, and arrangement of personnel, and measures for supporting daily activity and occupational longevity.

The second section of the book also allocates attention to the possibility of scientifically based proof of the role of personality in occupational activity; chapters five and six are devoted to this. The basis is comprised of the results of examining operators with skills of occupational activity both developed and strongly in place and examining people trained in operator activity for managing mobile objects. It was demonstrated that by using the entire complex of electrophysiological, physiological, and psychological techniques and comparing the results with the effectiveness of occupational activity, we can obtain rather weighty responses to many questions of the applied direction. Having used the method of multiple regression, the author concludes that the physiological-psychological basis of success in learning and mastering the operator occupation for managing a mobile object is made up of complex sensorimotor and psychomotor functions, along with the properties of basic nerve processes and that indexes of these functions may be recommended in the complex of tests for psychophysiological selection.

This section also contains specific practical developments of the author: a device for automatically processing motor reactions of a person for determining suitability for operator activity, a method for assessing the level of neuropsychic stress in a person (invention), the PNN-3 instrument and a method for the rapid diagnosis of neurodynamic aspects. These developments

have been tested in a large number of experimental studies and contain standard data and recommendations.

Thus, this book is an undoubted creative success of the author, who has a great deal of experience in the practical physiology of higher nervous activity and the use of it in a number of branches. The reader will find valuable information in it that is necessary for enhancing his knowledge of the laws of relationships of physiological and psychophysiological functions and on the significance in them of the properties of basic nerve processes, as well as their role in controlling behavioral reactions. We cannot doubt that the work will be of use to a very wide range of readers. Attesting to this are facts of the broad use of a number of the monograph author's developments in many research institutes, teaching institutions, and departmental organizations in the country for solving theoretical and applied problems.

#### Footnotes

<sup>1</sup>P. V. Simonov, 44th Annual Meeting of the USA Biological Psychiatry Society (4-7 May 1989, San Francisco, USA), Zhurn. Vyssh. Nervn. Deyatelnosti, Vol 32, No 5, 1989, 987 pp.

<sup>2</sup>N. V. Makarenko, Liability of nervous system in individuals with different levels of functional mobility of nerve processes, FIZIOLOGIYA CHELOVEKA, Vol 16, No 2, 1990, pp 51-57. N. V. Makarenko, Adaptation of motor reactions and functional mobility of nerve processes, Ibid., No 5, 1990, pp 50-55. COPYRIGHT: Izdatelstvo "Naukova dumka", "Fiziologicheskii zhurnal", 1991

#### Circadian Rhythmicity of Hypothalamo-Pituitary-Adrenocortical Axis in Mature Rats With Disordered Serotonin Metabolism as Juveniles

927C0187A Novosibirsk SIBIRSKIY BIOLOGICHESKIY ZHURNAL in Russian Vyp 3, May-Jun 91 (manuscript received 22 May 90) pp 16-21

[Article by L. N. Maslova, S. B. Lurye, A. M. Reshenin, T. A. Lukina and Ye. V. Naumenko, Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk]

UDC 591.35+612.453

[Abstract] Studies on three month old outbred rats showed that intraperitoneal administration of prednisolone (0.5 mg/day) when the animals were 15, 18 and 19 days old attenuated circadian fluctuations in plasma corticosterone levels in the adults. Control animals displayed a characteristic maximum at 2100 hours and a minimum at 0900 hours. Similar attenuation was seen in the mature rats treated with p-chlorophenylalanine (3 mg/10 g) when 15 and 17 days old. Injection of serotonin into lateral ventricles of mature rats in the morning and evening resulted in a greater elevation in corticosterone

in the morning than in the evening in control animals, a difference not seen in experimental animals. These observations clearly implicate serotonergic mechanisms in modulation of basal corticosterone levels. Figures 2; references 24: 8 Russian, 16 Western.

**Administration of 5,7-Dihydroxytryptamine Into Middle Forebrain Bundle and Specific Binding of <sup>3</sup>H-Serotonin in Rat Brain During Passive Avoidance Response**

927C0187B Novosibirsk SIBIRSKIY BIOLOGICHESKIY ZHURNAL in Russian Vyp 3, May-Jun 91 (manuscript received 22 May 90) pp 16-21

[Article by G. F. Molodtsova, N. V. Filipyeva, and R. Yu. Ilyuchenok, Institute of Physiology, Siberian Department, USSR Academy of Sciences, Novosibirsk]

UDC 612.815:577.175.823+612.821.2

[Abstract] Male Wistar rats, 180-200 g, were used in an assessment on the involvement of serotonergic mechanisms in passive avoidance responses. The essential findings were that administration of the neurotoxic agent 5,7-dihydroxytryptamine into the left middle forebrain bundle at the level of the lateral hypothalamus had no impact on ipsilateral and contralateral binding of tritiated serotonin in the frontal cortex and hippocampus, indicating postsynaptic binding. Passive avoidance behavior was accompanied by diminished binding of tritiated serotonin in the amygdala in control rats, a change that was not evident in 5,7-dihydroxytryptamine pretreated rats. These observations demonstrate that 5,7-dihydroxytryptamine alters the serotonergic mechanisms involved in conditioned avoidance without, however, affecting postsynaptic serotonin receptors. Tables 2; references 13: 1 Russian, 12 Western.

**Acquisition and Retention of Cardiac Stress-Alleviating Mechanisms During Adaptation to Ongoing Stress**

927C0187C Moscow KARDIOLOGIYA in Russian Vol 31 No 5, May 91 (manuscript received 24 Oct 90) pp 71-75

[Article by V. I. Kuznetsov, V. A. Saltykova and F. Z. Meyerson, Laboratory of Heart Pathophysiology, Institute of General Pathology and Pathophysiology, USSR Academy of Medical Sciences, Moscow]

UDC 616.12-02:613.863]-092.19-092.9-07

[Abstract] Trials were conducted on isolated hearts obtained from 180-240 g male Wistar rats to determine retention of "adaptive cardiac protection" following one to 15 days of immobilization. The data showed that hearts from animals immobilized for 15 days were at least twice as tolerant of ischemia, reperfusion, and toxic concentrations of calcium ions and catecholamines as

hearts from control animals. The mechanisms of "adaptive cardiac protection" were observed to persist for 15 days when assessed in terms of contractility and prevented of arrhythmia and cytopathology and, furthermore, were reinforced with short-term restressing. Figures 1; tables 4; references 12: 4 Russian, 8 Western.

**Lipid Peroxidation in Vasopressin-Induced Pulmonary Edema and Hyperbaric Oxygen Therapy**

927C0187D Moscow KARDIOLOGIYA in Russian Vol 31 No 5, May 91 (manuscript received 17 Apr 90) pp 75-77

[Article by M. L. Fafurina, Chair of Pathophysiology, Yaroslavl Medical Institute]

UDC 616.24-005.98-085.835.12.07:616.153.915-39

[Abstract] Experimental studies were performed on mature, outbred rats to assess the impact of hyperbaric oxygenation [HO] (HO; 3 atm; 40-50 min) on pulmonary lipid peroxidation in conjunction with vasopressin-induced (20 U/kg; i.v.) pulmonary edema. The results demonstrated that HO did not alter the extent of pulmonary edema or affect blood supply to the lungs. However, pulmonary levels of diene conjugates actually increased as a result of HO. In addition, treatment with  $\alpha$ -tocopherol or urea did not influence onset of pulmonary edema. Although pulmonary pathology was not affected by these modalities, these observations do not gainsay the use of antioxidants or HO in protecting other tissue from lipid peroxidation. Tables 3; references 20: 16 Russian, 4 Western.

**Effects of Dietary Organic Selenium on Resistance to Ionizing Radiation, Aflatoxin-B<sub>1</sub> and Infections**

927C0187E Moscow VOPROSY PITANIYA in Russian No 4, Jul-Aug 91 (manuscript received 17 Apr 90) pp 52-55

[Article by V. A. Knizhnikova, V. A. Komleva, V. A. Tutelyan, G. P. Novoselova, N. A. Golubkina, E. N. Trushina, Y. Kumpulaynen and K. Edelman, Institute of Biophysics, USSR Ministry of Health; Institute of Nutrition, USSR Academy of Medical Sciences, Moscow; Agroicultural Research Center and 'Alko', Finland]

UDC 613.2:546.23]-07

[Abstract] Outbred male rats, 170 g in weight, were employed in testing the efficacy of dietary organic selenium on alleviating a multifactor insult posed by exposure to I-131, gamma irradiation, aflatoxin-B<sub>1</sub> and superimposed viral infection, i.e., conditions simulating the fate of Chernobyl victims. The net results demonstrated that control rats subjected to a cumulative thyroid load of 1700 rad from I-131 and a cumulative whole-body 675 rad gamma dose had a six month mortality rate of 30 percent. The mortality rate for an

analogous group on a diet including 0.03 mg/day of organic selenium was 7 percent; in addition, the average body weight of these animals was greater by 120 g. In the case of animals challenged with aflatoxin-B<sub>1</sub> the mortality rate was reduced from 10 to 6 percent by dietary selenium, which also reduced mortality in rats with superimposed viral infections. Higher and lower levels of selenium intake were ineffective. The fact that human serum levels of selenium in some regions from the Baltics to Sakhalin are below normal (40-130 rather than 150-250 µg) suggests prevalence of subclinical selenium deficiency and possibly undue susceptibility to adverse environmental factors. Tables 3; references 5: 1 Russian, 4 Western.

**Enhancement of Potential-Dependent Inhibition of Calcium Channels of Snail Neurons by Tolbutamide**

927C0195A Kiev NEYROFIZIOLOGIYA in Russian  
Vol 23 No 5, Sep-Oct 91 (manuscript received  
17 Jan 91) pp 515-519

[Article by Ye. I. Solntseva, Scientific Research Institute of the Brain, USSR Academy of Medical Sciences, Moscow]

UDC 615.212.4:577.352+577.352.4

[Abstract] Analysis of the impact of tolbutamide and H-8, inhibitors of kinase A, on calcium channels of snail neurons revealed the presence of two phosphorylation sites. Calcium current measurements showed that in the presence of 1-5 mM/L of tolbutamide peak amplitude was depressed 30-80 percent, while the T<sub>1/2</sub> for the fast decay component decreased from 76 to 65 msec and that of the slow decay component from 108 to 79 msec. H-8 (1-30 mM/L) led to a < 20 percent amplitude depression, changing the T<sub>1/2</sub> for the rapid decay from 67 to 50 msec and of the slow decay from 87 to 79 msec. Additional studies demonstrated that tobutamide enhances the inhibitory effects of depolarization prestimuli on calcium currents, and that the inhibitory efficacy of tolbutamide is directly related to prestimulus potential. Accordingly, these findings support the interpretation that dephosphorylation of a specific site in the calcium channel underlies potential-dependent channel inhibition. Figures 3; references 9: 2 Russian, 7 Western.

**Kinetics of Suberyldicholine-Induced Ion Channels in Planorbis Neurons**

927C0195B Kiev NEYROFIZIOLOGIYA in Russian  
Vol 23 No 5, Sep-Oct 91 (manuscript received  
29 Mar 91) pp 588-595

[Article by A. N. Kachman, Ye. V. Frolova and S. A. Gapon, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad]

UDC 577.352.5:612.829

[Abstract] The patch-clamp technique in cell-attached configuration was used in assessing suberyldicholine-induced Cl current kinetics in planorbis (*Planorbis corneus*) neurons. The data demonstrated that the kinetic data on the effects of the nicotinic mimetic can be described by the equations previously derived for the effects of acetylcholine on chromaffin cells [Clapham et al., *J. Physiol.*, 347: 255, 1984]. Applicability of this kinetic model suggests it may be useful in studies on the mechanisms of action of other cholinergics and anticholinergics. Figures 2; references 11: 4 Russian, 7 Western.

**Tocopherol Modulation of Acetylcholine-Induced Currents in Garden Snail**

927C0195C Kiev NEYROFIZIOLOGIYA in Russian  
Vol 23 No 5, Sep-Oct 91 (manuscript received  
02 Apr 91) pp 628-631

[Article by V. A. Dyatlov, P. V. Belan, E. A. Bakay, V. P. Makovetskiy and V. V. Makovetskaya, Institute of Physiology imeni A. A. Bogomolets and Engineering Center of Biotechnical Systems, Ukrainian SSR Academy of Sciences, Kiev]

UDC 577.352.5

[Abstract] Patch-clamp technique on neurons isolated from garden snail ganglia was used to study the mechanism of the action of tocopherol on acetylcholine-induced currents. The quantitative evaluation consisted of determining intracellular Ca<sup>2+</sup> levels and impact of arachidonic acid on acetylcholine-induced Cl currents in neurons differing in susceptibility to tocopherol. The results indicated that certain neurons exhibit special subtypes of cholinergic receptors subject to modulation by intracellular concentrations of Ca<sup>2+</sup> and possibly arachidonic acid metabolites. Interplay of these factors can be assumed to underlie the antagonism between tocopherol and arachidonic acid vis-a-vis acetylcholine-based Cl currents. The putative mechanism may involve inhibition of arachidonic acid release from membrane phospholipids by tocopherol or interference with its action. Figures 2; references 12: 7 Russian, 5 Western.

**Traditional Chinese Medicine and Sino-Soviet Cooperation**

927C0106A *Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 2, Mar 91 pp 56-59*

[Article by A. P. Sivakov and V. S. Ulashchik, Belorussian Institute for Advanced Training of Physicians, Minsk]

UDC 615.89(150)

[Abstract] A review is presented of the history and development of traditional medicine in China and the integration of traditional practices with Western medical knowledge. A signal development has been the successful incorporation of modern diagnostic procedures with traditional therapeutics. In addition, and here Soviet contribution has been significant, Western medicine has also contributed many nontraditional modalities for stimulation of vital points. Such stimulants have included UV and infrared light, electric currents, ultrasound, laser light, microwaves, and so forth. The Chinese medical establishment has always been most cordial to its Soviet counterpart, and Soviet failure to reciprocate and engender medical cooperation would represent a very shortsighted attitude.

**Liver Function in Burn Cases After Extracorporeal Hemoperfusion Via Porcine Spleen**

927C0106C *Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 4, Apr 91 (manuscript received 28 May 90) pp 19-21*

[Article by Ye. Ye. Yarugskiy, A. A. Saidov, V. A. Karev, Z. B. Zufarova and A. N. Usmanov, First Tashkent State Medical Institute; Uzbek Burn Center]

UDC 616.36-085.38.617-001.17

[Abstract] Clinical trials were performed with 120 patients with III AB to IVth degree burns (25-95 percent of body surface) to assess the impact of hemoperfusion via a porcine spleen on liver function. The one to 55 year-old patients underwent one to six hemosorptions via arteriovenous or venovenous shunts. Hemosorption was performed for 25-60 min at a rate of 30-40 ml/min to clear 700-1800 ml of blood. Objective and subjective clinical improvements were reflected in laboratory results indicative of selective removal of endogenous toxic products and recovery of liver function. The mortality rate for the cohort undergoing extracorporeal hemoperfusion via the porcine spleen was 26.6 percent (32 patients), almost three-fold lower than the 75 percent rate (143 patients) in an analogous group of 191 patients in whom perfusion via the xenobiotic spleen was not part of the treatment strategy.

**Permanent and Temporary Incapacity in 30 to 35 Year-Old Villagers**

927C0106D *Kishinev ZDRAVOOKHRANENIYE in Russian No 1, Jan-Feb 91 pp 30-33*

[Article by L. L. Kishlar and V. I. Botnar, Scientific Research Institute of Preventive and Clinical Medicine, Moldovan SSR Ministry of Health]

UDC 616.12-008-331.1-057-084.4.003.1

[Abstract] As part of a hypertension monitoring program in 1985 a questionnaire study was conducted in two Moldovan villages on incapacity during the preceding 12 months. The study encompassed 1157 male and female villagers ranging in age from 30-55 years. Comparison of the responses with actual medical histories showed that the accuracy and specificity of the questionnaires were 73.5 and 83.2 percent, respectively. The questionnaires revealed that 39.1 percent of the cohort had been temporarily incapacitated, with cardiovascular pathology responsible for 44.4 percent of the cases. Permanent incapacity was reported by 3.9 percent of the respondents. In general, cardiovascular pathology afflicted 9 percent of the total number of villagers and accounted for 6.8 percent of sick days. In that category hypertension afflicted 3.1 percent of the respondents and ischemic heart disease 0.5 percent. Tables 2; references 4: Russian.

**Cardiovascular Diseases in Deep-Shaft Coal Miners**

927C0142A *Kiev VRACHEBNOYE DELO in Russian No 6, Jun 91 (manuscript received 03 Jan 91) pp 37-39*

[Article by I. F. Peftiyev, A. I. Kiva and S. I. Konovalova, Donetsk Center of Labor Hygiene and Trauma Prevention]

UDC 616.1:622.33/34

[Abstract] A health survey conducted on 1,345 deep-shaft coal miners revealed that 22.5 percent presented with cardiovascular pathology and 11.4 percent suffered from chronic bronchitis. Hypertension was diagnosed in 13.5 percent, vascular dystonia in 3.7 percent, ischemic heart disease in 3.9 percent and stress-induced angina pectoris in 1.3 percent of the miners. In general, the severity and type of cardiovascular pathology was related to the actual working conditions as determined by shaft declivity, ambient temperature and duration of occupational exposure to these conditions. References 10: Russian.

### First Soviet Plant for Production of Artificial Kidneys

927C0163A Moscow IZVESTIYA in Russian 29 Nov 91  
Union Edition p 2

[Article by M. Shimanskiy, "Do Not Let Hope Die". First paragraph is IZVESTIYA introduction in bold-face.]

[Text] It would seem that the event was a joyful one: with the participation of a German firm the first production of an artificial kidney was developed in Belarus. But how long will the many thousands of patients wait?

A joint venture is being developed in the Belorussian city of Borisov together with the Germans. An exclusive role is being given to Soviet public health in this. Patients suffering from chronic renal failure, as asserted by the World Health Organization, number as many as those suffering from heart disease. In the Soviet Union approximately 60,000 people die annually as a result of chronic renal failure. The specialists believe that these numbers are very low.

The artificial kidney may help a patient by assuming the function of cleansing the blood. Abroad, they say, this is not news. In the USSR there is a catastrophic shortage of artificial kidneys. They simply are not manufactured in the Soviet Union. The German firm Frezenius agreed to help the Soviets solve this extremely urgent problem, one which could not even endure the smallest postponement. This firm is giving the USSR the technology and designing the production of the artificial kidney dialysis machines at the Borisov Factory of Medical Preparations.

The joint venture will manufacture two million dialysis machines in Borisov each year. It is true that the annual demand by Soviet public health is greater than six million. But in any case many thousands of patients will not have to wait for months for an available place for an artificial kidney in a given ward.

When will the Soviet dialysis machines arrive at the hospitals?

I went on assignment from the editor to the Borisov Factory. Here I happened to find Mr. Vinfried Shtefan, the director of the project for the Farmaplan Company, the daughter venture of Frezenius.

"Our firm has many joint ventures throughout the world," says V. Shtefan, "but this is the first time we have conducted such business in your country. Our further cooperation depends on how the project goes in Borisov. Of course, there is a certain anxiety because of the difficulties in your economy. But the exceptional importance of this installation necessitates a preparedness for risk on the part of our firm. We are planning on long-term cooperation in such important work and are hoping to directly participate in the development of the

Soviet market. We have friendly relations with our Soviet colleagues on this note. I think that the work can be completed on time."

"Farmaplan," says V. Dranits, director of the Borisov Factory, "has already shipped 115 million rubles' worth of unique equipment to us. It has all been set up, and now the final assembly and adjustments are proceeding. We have representatives of the firm and specialists with higher qualifications working here constantly. The firm gave us the technology to produce polysulfone fibers, the chief element in the artificial kidney dialysis machine, for the first time in its history. A group of our workers has already been trained in the German firm."

"There is one more extremely important thing," continues V. Dranits. "We have an understanding: all innovations in the field of artificial kidney dialysis machines that the German firm develops in coming years will be immediately given to us. On account of this we will have the opportunity to manufacture equipment that meets world standards for a long time."

Thus, the unique installation in Borisov will begin operation by the end of 1991. There have not been and will not be any delays on the part of the German firm; they are even surpassing the schedule, and the collective at the factory is doing everything possible in order to meet the deadline precisely. The Belarus government is giving all possible aid to the construction. As V. Dranits said, not one of his requests has been denied by the Soviet Ministry of the Republic.

I write these lines, but a distressing thought will not let me rest. It is sad but true: For many years our government could not solve the most important problem of the production of dialysis machines, and now, when business had begun to move, the union agencies stopped funding the construction of the joint venture in Borisov as of July. The debt to the factory for work already performed is currently 68 million rubles. But whose debt is it? Because of an administrative muddle in the highest spheres of power it is even unclear which government agency should be held accountable. The last time at the beginning of this November, the Committee for Operative Management of the USSR Economy affirmed with its resolution the need to put this installation into operation in 1991. However, even this structure has already become non-existent. But should the endless bureaucratic confusion affect the sick?

### Joint Production of New Ulcer Medicine

927C0163B Moscow ROSSIYSKAYA GAZETA  
in Russian 29 Nov 91 p 4

[Article by V. Romanchin: "Saytotek Beats Ulcer"]

[Text] So, we may say that the ice has broken. Ulcer sufferers may breathe easy. In the near future a miracle drug will appear in Russian pharmacies, Saytotek, a preparation that literally beats the ulcer. It is the first

fruit of a joint venture between the U.S. company, Searle, and the Moscow Production Association Moskhimfarmpreparaty.

We do not need to remind you that the situation in the country with respect to drugs is disastrous. We do not have the basic essentials: mustard plasters, analgesics, cotton wadding, bandages, and cough and cold tablets. Complex drug preparations need not even be discussed; the acute shortage of them is felt even in the hospitals. In view of this depressing news, reports on the organization of a joint venture in the area of drug manufacturing and foreign shipments sounds especially hopeful.

What is Saytotek? According to specialists, it is one of the best drugs in pharmaceutical production in the United States. Under conditions of rigid competition with other novel drugs, which number more than 100, that are presented to the pharmacology committee in the United States each year, Saytotek received the highest grade, A-1. A single package of this preparation is sufficient for a four-week course of treatment for stomach or duodenal ulcer. The effectiveness of treatment is astonishing. According to specialists, 90 percent of patients are cured after the first course of treatment. The value of this preparation also lies in the fact that it not only cures, but also prevents the disease.

"I must confess that beginning the manufacture of novel drugs," says Anatoliy Grigoryev, chief engineer at the Moskhimfarmpreparaty Production Association, "under our conditions is no simple affair, but we took the risk. In weighing all the pros and cons and assessing the disastrous situation in the field of public medical service, we concluded that it was time to begin manufacturing complex, highly effective preparations such as Saytotek. There is an enormous need for this drug. Unfortunately there are too many people in this country suffering from stomach or duodenal ulcers. The appearance of Saytotek in our meager market will undoubtedly help thousands of ulcer sufferers. Everything is ready for manufacturing the drug here. The first batch will be small, only 250,000 packages. We will see what the demand will be for the preparation. The cost of a single preparation will be 130 rubles (for comparison it costs 35 dollars abroad). If our hopes are justified, we are ready to infinitely expand the manufacture of Saytotek. We have the capacity for this. The support of our partner in the joint venture, the American firm Searle, also raises our hopes."

So we will hope that the initiative of Searle and Moskhimfarmpreparaty will prompt other well known foreign firms that specialize in the field of manufacturing medical preparations towards joint ventures. The time has long since come to move from words to action. Conversations and good intentions alone can hardly fill the empty pharmacy shelves with drugs, and after all, the health of our citizens depends on this in many ways.

### Assessment of Experience With the Utilization and Route of Development of "AGIS-Zdorovye"

927C0173A Moscow VESTNIK AKADEMII  
MEDITSINSKIKH NAUK SSSR in Russian  
No 1, Jan 1991 pp 13-14

UDC 614.4/.7:002.6/:681.3.068

[Article by V. I. Chiburayev and M. F. Glazkova, Main Sanitary-Prophylactic Administration of the USSR Ministry of Health (Minzdrav SSSR)]

[Text] The sanitary epidemiological service, created in 1922 mainly for the campaign against infectious diseases, has dealt with a large number of problems in the field of environmental protection, including questions of a technological character; however, for all practical purposes, it has not known how the discharges of enterprises that it requires to observe sanitary standards and regulations influence the state of health of the population.

A study begun in 1981 by the sanitary service of the Soviet Union to investigate the state of health of the population living under the conditions of various sanitary-hygienic situations that have come about in industrial cities and in particular territories of the country has been carried out on the basis of a uniform methodology, which has been named the "AGIS-Zdorove" ("Zdorove" Automated State Information System ["Zdorove" ASIS]).

Instructional and methodological materials were developed in order to carry out this program, and additional staff units were introduced into the staffs of the sanitary-epidemiological stations of the cities selected to carry out this program, and "Zdorove" groups were organized. There are more than 150 such municipal sanitary-epidemiological stations at the present time, and requests continue to arrive to include them in the operation of AGIS-Zdorove.

The most difficult stage in the activity of the AGIS-Zdorove system was its establishment, the preparation of personnel, the assurance of the quality of the primary information, as well as the working out of possible interactions of various levels of the administration of the sanitary-epidemiological service (city-oblast-republic-center). Working meetings, cycles for the upgrading of qualifications, as well as training at the work sites of the union division of the ASIS were organized by the USSR Ministry of Health [Minzdrav SSSR] in order to prepare the cadres for participation in this study.

The service's activity along these lines exerted an influence on the formation of new thinking in the sanitary physician, made it possible to shift from the mere control function to the assessment of the degree of the influence of the environment on the state of health of the population.

Restructuring of the activity of the service is going on at the present time. The USSR Ministry of Health has moved the problem of the prevention of unfavorable effects of environmental factors on the state of the population's health to the foreground, and the study carried out within the framework of the ASIS is playing a large role in this process.

The data obtained as a result of the activity of the ASIS are being actively used by the sanitary-epidemiological service in its performance of state sanitary oversight. These data are of special significance in pre-surveillance. Decisions have been made on the basis of these data regarding the location of new facilities, and facilities which are the sources of significant pollution of the environment have been closed and respecialized; questions of planning and the process of the building of population sites have been resolved.

The sanitary-epidemiological stations of Berezniki, Dnepropetrovsk, Dneprodzerzhinsk, Kemerovo, Chelyabinsk, Magnitogorsk, Gorkiy, and other cities are actively using these data in their activities.

The system which was set up is functioning at the present time at several levels: the city, republic (in three republics), and central levels. The processing of information may be carried out each of these levels. In order to correlate these results across the country, information arrives at the union division of AGIS-Zdorove which is located in the All-Union Scientific Institute of the Center of Prophylactic Medicine of the USSR Ministry of Health.

The volume of information arriving at the union division has required the development of programs for the creation and running of databases, involving specialists in the development of specialized mathematical programs. The All-Union Scientific Investigatory Institute of the Automation of Administration in the Non-Industrial Sphere, along with the USSR Ministry of Health, has been recruited on economic contract conditions to carry out this work.

The program which was developed and implemented for the creation and operation of the database, which at the present time includes information from more than 120 cities, makes it possible to accomplish 165 tasks, to obtain a range of tabulations broken down by areas (city, economic region, republic), as well as in relation to the time course across years.

A system for tracking the level of morbidity of the population on the basis of selected nosologies and environmental factors with respect to individual cities has been set up for practical purposes at the present time. A feedback loop has been worked out by the union division of AGIS-Zdorove since 1986; this represents material, set up in the form of tables that correlated information presented by the municipal sanitary-epidemiological stations; data regarding deviations in morbidity from the

average for the cities included in the system; as well rank positions of a city with respect to pollution and morbidity.

However, at the present time there has been little of this, since the objective of determining the contribution of different factors of the environment to change in the state of health of the population has not been realized. The use of different mathematical models in the database has not offered the possibility of identifying reliable associations between pollution and the morbidity of the population as a whole across the system. The association established between the indices of morbidity and pollution of the atmosphere with formaldehyde (50 cities), by sulfuric acid aerosol and chlorine (18 cities), as well as the association established of specific contamination of the atmosphere and drinking water with certain diseases on the basis of the data of 20 cities, constitute an exception.

The incomplete primary information regarding the levels of atmospheric pollution presented by the laboratories of the USSR State Committee on Hydrometeorology [Goskomgidromet SSSR], which does not reflect the real situation, is one of the principal causes of the negative result obtained with respect to the identification of relationships between environmental factors and morbidity. This is caused by the fact that daily pollution of the atmosphere is calculated on the basis of the collection of three or sometimes two samples in the daytime. As experience has shown, the taking of samples at night or over the course of 24 hours, as stipulated by the global monitoring of the WHO/UNEP, substantially changes the results. Changing the methods of the detection of substances (in particular, carbon monoxide, sulfuric anhydride) also has an effect, as does the fact that a limited number of constituents are monitored (in a number of cities, four).

It must be stated that, despite the available data, the indices of the quality of drinking water are used in a limited fashion, and data regarding meteorological factors as a complex of meteorological conditions is not being analyzed.

Along with the absence of a reliable mechanism for the analysis of data across the system as a whole, the presence of scientific developments which permit the recommendation of methods of mathematical analysis of the association of pollution and morbidity at the city level should be noted; this opens up prospects for the development of this level of AGIS-Zdorove.

The realization of this prospect is governed by the fact that in the last year a number of municipal sanitary-epidemiological have been equipped with personal computers, and an effort to adapt programs for this type of computer technology has been started. The isolation of the union division of AGIS-Zdorove from the specialty institutes and collectives has had an effect on the scientific development of the system, on its improvement,

and on the search for other factors of the environment that exert a substantial influence on the state of health of the population.

A number of important hygienically significant questions have not been answered on the basis of the databases: questions concerning the contribution of four principal substances to change in the state of health of the population (dust, carbon monoxide, sulfuric anhydride, nitrous oxide); regarding substances which are subject to obligatory monitoring on a high priority basis, which are characteristic of a sector or a complex of industrial enterprises; and concerning the correlational relationships with comprehensive indices of atmospheric pollution (R, K tot., K).

Taking into account that the establishment of cause and effect relationships between the morbidity of the population and environmental pollution was a principal objective of a study begun within the framework of the AGIS-Zdorove system, the absence of this information, fed back to the localities, sometimes leads to unjustified conclusions and to the impossibility of taking concrete decisions. In this connection, the results obtained of the activity of AGIS-Zdorove require objective analysis and correct interpretation.

When this analysis is carried out it is necessary to take into account not only data of ASIS, but other data from medical statistical reporting as well. The comparison of data obtained will permit the drawing of a specific conclusion and the development of prophylactic measures.

In analyzing the possible reasons for an increase in morbidity, it is necessary to take into account the fact that lifestyle, state of medical assistance, and biological factors exert a significant influence on the health of the population, along with environmental pollution.

The practical work experience accumulated both by the sanitary-epidemiological service as well as by scientific research institutions has demonstrated the necessity of further perfection of the AGIS-Zdorove system in organizational and scientific terms.

In this connection a great deal of attention is presently being devoted to the development of the city level of the AGIS system and to the possibility of carrying out an independent analysis and efficient use of the data obtained, for which purpose a program on personal computers at the city level has been developed and is being introduced.

The computerization of the sanitary-epidemiological service requires a great deal of organizational work with respect to the training of physicians and mid-level personnel engaged in this work. At the same time, the republic and oblast divisions which have been created should provide a great deal of assistance in the organization of the work with the cadres. The union division of the ASIS will carry out generalized analytical investigations, develop methodological aspects of the problem

associated with the functioning of the system, as well as supervise the republic (oblast) divisions.

Despite the fact that AGIS-Zdorove has not provided answers to a number of problems posed to it, the study, which has commenced with its appearance, regarding the assessment of the degree of influence of the environment on the state of health of the population, has become an inseparable part of the activity of the sanitary-epidemiological stations and requires further development and perfection; the Main Sanitary-Prophylactic Administration of the USSR Ministry of Health, along with the scientific research institutions and with the participation of the practicing sanitary service, is indeed engaged in this at the present time. COPYRIGHT: Izdatelstvo "Meditsina", 1991

### **Siberian Immunologists Call for More Funds, Administrative Reforms**

*927C0257A Moscow MEDITSINSKAYA GAZETA in English 22 Nov 91 p 11*

[Article by Y. Tokarenko, correspondent, Novosibirsk]

[Text] The full-page article records comments of Vadim Lozovoy, member of the Academy of Medical Sciences and director of the Institute of Clinical Immunology of the academy's Siberian Branch (SO AMN); and Candidate of Medical Sciences Arkadiy Cherepanov, senior science associate of the Novosibirsk Scientific Research Institute of Orthopedics and Traumatology, regarding financial and administrative troubles of medical research in Siberia.

Lozovoy relates that ineffective management and shortages of funds, personnel and materials are creating uncertainty about the future of high-priority research and developments in the field of immunology. He cites the examples of a discovery, which was made recently at the immunology institute and registered with the USSR State Committee on Inventions and Discoveries, and a R&D project which was proposed in line with a program, "Health of the Population of Russia." Doctor of Medical Sciences V. Kozlov and his colleagues are credited with the discovery, which is entitled "the phenomenon of regulation of humoral immune response by cells of an erythroid nature." Two years were spent on preparation of a feasibility study of the R&D project which is aimed at development of medicinal forms of recombinant human lymphokines, immunosorbents for hemosorption and lymphosorption, and new methods for diagnosing immunopathological states with different etiologies and at introduction and clinical employment of preparations and test systems. In other countries, such preparations and systems have proved informative in cases of postradiation sickness and AIDS but the USSR still have no facilities for producing them, it is explained. Inaction on the part of SO AMN's presidium and the Russian government has delayed production of these items at the scientific production association "Vektor."



Lozovoy complains that local authorities have failed to support the creation in Novosibirsk of biotechnological facilities for obtaining other preparations in which foreign firms are interested, including an immunostimulator called inprol which protects truncl cells of the brain against radiation injury; a preparation called "tilong" whose action is five to ten times as prolonged as that of T-aktivin; and a unique substance obtained from the thymus of reindeer which inhibits the rejection reaction in transplantation of organs.

For three years, the immunology institute has received no noncurrency rubles to finance promising research, and contracts with foreign countries have fallen through, Lozovoy relates. The cost of reagents has increased by almost 10 times, which has forced scientists to prepare their own reagents. The creation of bone-marrow and organ transplantation centers has essentially been frozen, although specialists have already been trained for these centers. Construction of a clinic for the immunology institute began in 1986 and still has not been finished. The institute is threatened with losing scientific potential which will be difficult to replace. Bureaucratic rigidity and the overconservatism of expert councils and academy structures have been an obstacle to acceptance of views which are new in principle. (Lozovoy mentions that he was forced to resign from the presidium of SO AMN for disagreeing with certain policies.) Lozovoy reports that the immunology institute's scientific council has complained to scientific divisions of the Siberian Branch about bureaucratic practices and ineffective management of Siberian science, and the council has called for a whole new charter and set of operating principles to be drafted for SO AMN.

It is reported in an appendix that the bureaucratic style of management and its adverse effects on "dynamic intellectuals" were criticized recently by V. P. Kaznachejev, director of the Institute of Clinical and Experimental Medicine, at an all-Union symposium on intellect systems in Novosibirsk. A number of constructive proposals have been made for reforming and integrating science organization in Siberia, and an association of institutes is being created on the basis of new positions.

### **Belorussian Studies of Chernobyl Accident's Mental Consequences**

*927C0257B Moscow MEDITSINSKAYA GAZETA  
in English 11 Oct 91 p 6*

[Article by F. Gayduk, professor, head of chair of psychiatry of the medical institute, Minsk]

[Text] The phenomenon of mass radiophobia gripped almost the entire population of areas stricken by the Chernobyl accident.

This very radiophobia was the first signal of the occurrence of still another medical problem—the problem of mass mental affliction. Under the direction of Professor Yu. Aleksandrovskiy and Doctor of Medical Sciences G.

Rumyantseva, a group of scientists of the All-Union Scientific Research Institute of General and Forensic Psychiatry imeni Serbskiy conducted studies in the zone of rigid radiation monitoring for many years. According to data from this institute, up to 95 percent of the population of these areas has subclinical or clinical forms of borderline nervous and mental disorders.

At the end of 1990, the Belorussian Ministry of Health created, at the Minsk Medical Institute, a special laboratory with seven science associates and an annual budget of 100,000 rubles, for the purpose of coordinating operations for the study of this problem and rendering practical assistance. Financing for this laboratory has in fact been cut in half, and funds are allotted on a monthly basis and with no guarantee for the future. The laboratory is not fully staffed. And if our Moscow colleagues will pardon me for saying so, 25,000 rubles which were supposed to be set aside for the All-Union Scientific Research Institute of General and Forensic Psychiatry out of the overall amount still have not been allocated for the purpose of carrying on work that was begun and for rendering the republic methodological assistance.

The laboratory nevertheless was able to organize a republic scientific-and-practical conference, "Mental Consequences of the Accident at the Chernobyl Nuclear Power Station," and hold the conference this summer. The work of Belorussian psychiatrists was analyzed, their positions were reconciled, and tasks and tactics for the future were defined.

The problem is that for five whole years before the laboratory was created, only one science associate on the permanent staff of the Belorussian Scientific Research Institute of Radiation Medicine (BelNIIRM) studied this problem in the republic in an official capacity. Professor V. Kondrashenko's group has done a tremendous amount of work on mental screening of patients at a clinic of BelNIIRM. Kondrashenko heads a course on psychotherapy at the Institute for Advanced Training of Physicians and is a chief specialist of the republic Ministry of Health. Physicians of the republic, Gomel and Mogilev psychiatric hospitals and associates of a specialized chair of instruction at the Minsk Medical Institute also have actively studied Chernobyl topics. It must be confessed, however, that their efforts have not been coordinated and have not received proper material and technical support.

The scientific-and-practical conference helped to summarize results that have been obtained, and it indicated the tremendous importance of work which has begun. It was concluded in particular that 60 to 90 percent of the population residing in stricken territories really has symptoms of mental dysadaptation, while about half of this population has clinically defined forms of nervous and mental disorders. An increase of borderline mental impairments and psychosomatic illnesses has been noted.

**New Moscow Medical University Plans To Update Specialist Training**

927C0269A Moscow PRAVDA in Russian 22 Jan 92 p 2

[Interview with V.N. Yarygin, corresponding member of the Academy of Medical Sciences, by L. Rudskiy, interviewer]

[Abstract] The rank of university was recently conferred upon Moscow Medical Institute No. 2, which was named in honor of N.I. Pirogov. Professor Vladimir Nikitich Yarygin, corresponding member of the Academy of Medical Sciences, told about the essence of changes which have been achieved or are anticipated.

"Since the time when we were a part of Moscow University No. 2, we have not only preserved, but even multiplied our traditions of firm basic education. Moreover, it was at our institute that a medical-biological school which was absolutely singular for both Soviet and European higher education came into being and earned recognition, so that last year we were already prepared to provide our students with knowledge of a whole range of basic subjects.

"Integration of the research and training processes is another mandatory axiom of the university. We are rearing not only physicians with various specialties but also medical biochemists, biophysicists, immunologists and geneticists.

"Both health protection and methods of healing have become more and more technicalized, chemicalized and

computerized all over the world. Middle-level medical personnel with higher educations have even appeared in many countries. This has not happened in our country as yet. But we now intend to graduate such specialists, too.

"We have developed three main levels of medical-specialist training. The first four years of training are the level of basic medical-biological and medical education. The second level is a two-year program of general higher medical education. The third level is higher medical education with special practical training.

"An assessment of the qualifications of our staff of professors and instructors and research personnel is now being completed with the participation of independent experts. Not all of the faculty who were accustomed to being employed at the institute will be able to work at the university, I regret to say. It has nevertheless been decided to try out a contract form of mutual relations so that problems can be solved with greater mobility, taking conditions of the moment into account.

"As for the students, of which we now have approximately 7,500, their number will decrease. After all, the republics of the former Union have become independent, and their relations in the field of higher education are taking on a different aspect.

"The principle for job placement of graduates also is changing radically. We are carrying out a state plan. But when the capacity of the market for physicians is foreseen, reduction of the number of physicians by raising standards for their qualifications probably should be expected."

**Neurochemical Correlates of Radiosusceptibility in Aggressive and Nonaggressive Rats**

927C0106B Tbilisi IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR: SERIYA BIOLOGICHESKAYA in Russian Vol 17 No 4, Jul-Aug 91 (manuscript received 05 Jul 90) pp 279-583

[Article by K. Sh. Nadareyshvili, G. S. Iordanishvili, M. I. Nikolayshvili and N. N. Melitauri, Institute of Physiology imeni I. S. Beritashvili, Georgian SSR Academy of Sciences, Tbilisi]

UDC 611.821.7:612.822.2+577.15

[Abstract] Studies were conducted on aggressive (A) and nonaggressive (N) rats (mouse-killing test) to further define neurochemical correlates of radiosusceptibility.

Whole-body x-ray irradiation showed that with a 5.5 Gy dose the survival of A rats was reduced to 80.20 days and that of N rats to 109.30 days. With a dose of 12.0 Gy the reductions were to 3.70 and 6.70 days, respectively. These differences are statistically significant, yielding  $LD_{50/30} = 6.5$  Gy for N rats and 6.1 Gy for A rats. Furthermore, brain tissue serotonin levels are significantly lower in A rats than in N rats and, as a result, the norepinephrine/serotonin ratios in the olfactory bulbs, hippocampus and amygdala in A rats are 41-65 percent higher than in N rats. Finally, brain concentrations of total and protein sulhydryl groups—known to be involved in radioprotection—in N rats are significantly higher than in A rats. These findings provide additional evidence of biochemical differences between A and N rats which entail greater radiosusceptibility of the former. Tables 3; references 18: 13 Russian, 5 Western.

### 'Animaferon' Treatment of Veterinary Diseases Increases Meat Production in Ukraine

927C0119A Kiev RADYANSKA UKRAYINA  
in Ukrainian 2 Aug 91 p 2

[Article by Press Center, Ukrainian SSR Academy of Sciences]

[Text] Economists attribute current meat shortages to farm animal illnesses. Infectious diseases, particularly those affecting young pig and cattle stock, significantly impair productivity and profitability of farms specializing in young stock.

Scientists at the Institute of Microbiology and Virology of the Ukrainian Academy of Sciences in cooperation with the Ukrainian Scientific Research Veterinary Institute headed by Ya. H. Kyshko, who holds a doctorate in biological sciences, have developed a novel drug—animaferon—for combating infectious diseases. Animaferon is a small protein from the interferon family and physiologically can be regarded as a component of natural immunity which protects against viral and bacterial infections. Treatment of pigs and cattle with animaferon enhances their resistance to infection and may cut it short, making animaferon a highly effective therapeutic and prophylactic agent.

The use of animaferon at a number of collective and state farms in Ukraine, Belorussia and in the Moscow Oblast has significantly improved ham and veal production, to say nothing of profit margins.

### Control of Veterinary Preparation Manufacture Is Objective Need

927C0172A Moscow VETERINARIYA in Russian  
No 3, Mar 91 pp 3-5

[Article by P. P. Dostoyevskiy and L. K. Volynets, Chief Directorate of Veterinary Science, Gosagroprom, Ukrainian SSR; Ukrainian Zonal Scientific-Control Laboratory, VGNKI [as published] of Veterinary Preparations]

[Text] The industrial technology of manufacturing stock breeding products entails the widespread use of various veterinary preparations and biologically active substances for the prevention and treatment of disease and enhancement of animal growth and productivity. At the same time we must not forget that the unskilled use of preparations, especially low quality preparations, may negatively affect animal productivity and product quality.

The rising demand for preparations necessitates the expansion of their production and increasing quality control. This problem is at present an acute one, and the manufacture of preparations involves the production departments of veterinary laboratories, biofactories, and commercial factories of various ministries and departments in increasing numbers. There are currently

approximately 4,000 factories that manufacture preparations for the needs of stock breeding and veterinary science.

The checks show that not all of the factories have been able to achieve high quality production. Veterinarians often receive preparations that do not meet the requirements of standard documentation for their manufacture. We could present a number of examples where the quality of the preparations was second-rate, and often technological discipline was sacrificed in the name of fulfilling the plan.

Such a phenomenon is exacerbated by the shortage of raw materials and equipment and the substitution of one type of raw material or equipment for another that was not approved by the standard documentation. Also noteworthy is the low skill level of the specialists working in the production departments and at the factories, where vacant positions for veterinary specialists are often filled by zootechnicians, biologists, and others. Thus, at the Novosanzhar Vetsanutil Factory in Poltava Oblast, the chief veterinarian position, the director of the OTK [quality control] with a salary of 220 rubles, was given to a senior veterinarian with a salary of 180 rubles, and the position of OTK is filled by a specialist with a zootechnician education. The colleagues at the Ukrainian ZNKL randomly checked 51 batches of 14 different preparations between 1985 and 1990 at 18 production departments and biofactories of the Ukrainian SSR Gosagroprom. Eleven batches, or 21.5 percent, did not meet standard documentation requirements. This is explained by the poor supply of the production departments with equipment, area, storage space, packaging, and the necessary reagents as outlined by the standard documentation. Thus, the economy pays for poor quality products without receiving the desired effect.

Because of the lack of appropriate conditions for the production of preparations, their manufacture was banned in different years at the Kirovograd and Sumy Oblast Branch Laboratories and the Krivorozhsk Rayon Branch Laboratory. We drew the conclusion that such extreme measures are not always justified or advisable. We know that product quality improves from correctly developed and introduced methods of monitoring. An example of this is the Sumy Oblast Production Cost-Accounting Laboratory of Veterinary Preparations, which in recent years began to improve quality and expand the assortment of preparations manufactured. Here the standard documentation and monitoring methods were set up using the indexes outlined by State Standard Specifications, and the morale improved in the collective.

Incidences of the manufacture of poor quality products were noted in the factories of the Ministry of the Medical Industry, where there was a trend towards lax observation of the Industrial Specifications or State Standard Specifications in the manufacture of preparations for animals. Thus, at the Kiev Vitamin Factory, santoquin (a vitamin D<sub>3</sub> stabilizer) was not added for a long time.

As a result, the active ingredient began to decompose within the first days after manufacture, and the poultry plant received too little of its planned production. Only after the intervention of laboratory specialists and the imposing of economic sanctions on the factory did it begin to manufacture a preparation that met standard requirements.

As analysis of state monitoring checks of laboratories for the past 10 years shows that violations in technological discipline were found often. Thus, 40 percent of the product batches checked at the factories of various ministries and departments did not meet standard documentation requirements. Violations in the standards were frequently observed at the factories of Ministry of Forestry (57 percent), the Meat Processing Industry (50 percent), and the Chief Directorate of the Microbiology Industry (33 percent).

In some factories interdepartmental government monitoring causes dissatisfaction. Where production is smooth, the employees treat the state controllers like skilled consultants. We believe that their basic functions at the factories should be to provide technological assistance and to search for the cardinal means of affecting quality. Under conditions of economic independence, we need to develop a system of material claims of the consumer against the manufacturer and to strictly punish him for the manufacture and sale of poor quality products.

Currently the USSR Ministry of Health and the State Commission of the USSR Council of Ministers on Products and Purchases and the USSR Ministry of Justice are jointly developing a law on product quality in which they plan to clearly define the rights and duties of the consumer and the monitoring agencies. They ought to examine problems of the quality of products that arise in stock breeding and veterinary science and define the rights and duties of the state controllers.

We sometimes hear reproaches addressed to the state controllers: Why do we need this control which costs the state so much? Consider that the Ukrainian ZNKL has paid the government 500,000 rubles in the past 10 years alone for illegally obtained profits due to the sale of poor quality products. The sale of preparations worth 2.3 million rubles that did not meet standards was banned, while all the expenses of running the laboratory are approximately 400,000 rubles. In this case we cannot precisely calculate the effect on the consumer or how much of the excess expenses on the manufacture and use of unnecessary products could have been averted.

The quality of biological preparations manufactured by the biofactories is worrisome, since cases of negative indications from their use are becoming more frequent. In all probability, the monitoring system by the representatives of the VGNKI of veterinary preparations at the biofactories is outdated, and we need to think about

a new responsibility of the department of biological monitoring of biofactories for the quality of the products that they manufacture.

Problems of the transportation and storage of veterinary preparations have not yet been completely worked out. Monitoring checks showed that the preparations frequently freeze when shipped by airplanes. Such an incidence was observed at the Sumy Airport, where they attempted to deliver the biopreparations to the Zoovet-snab (zoo veterinary supply) after thawing. Instances of not observing the temperature environment during storage of preparations in pharmacies, veterinary hospitals, and homes are frequent. There is often no control of the physical status of the biopreparations, and at the warehouses you cannot always find the instruments for measuring temperature and humidity.

The use of veterinary preparations should be scientifically based. In this country many recommendations, exhortations, and instructions are given for the use of drugs, but they often do not reach the practicing specialists, or they are not complied with in a satisfactory manner.

Special attention should be given to the efficient use of antibiotics, sulfanilamide, nitrofurans preparations, and drugs, the shortage of which is currently felt.

Under present conditions we are relying on self-monitoring, but often no one plans to demand this of himself. Consequently, the state controllers, veterinary specialists with high qualifications, need to take the initiative.

There are often instances where the production is loaded with the manufacture of several preparations against a single disease. Wastes on their manufacture are enormous, and the effect is slight. Thus, more than six products are manufactured for treating mastitis in cows, while the production of one or two effective preparations would be adequate. The assortment of them is rising; therefore, it is necessary to constantly select the new and review the old for recommendations for the manufacture of low-toxic, inexpensive, and effective medicines.

Assessing the quality of new preparations and those being developed is an important matter. Hundreds of preparations pass through the stage of development and production tests annually. Their effectiveness depends on objective assessment of the effect on the animals' body. Often practical specialists perform this work without adhering to scientific methods or considering the use of accompanying therapeutic and prophylactic measures, as well as the amount of feed and the maintaining the animals in the economy. As a result, the practice produces imperfect preparations, about which we learn only after large-scale use. At the same time, hundreds of thousands of rubles are wasted on their manufacture and use.

It is advisable to increase control of the efficient use of means for meeting state programs for research in veterinary science. A check of a number of scientific research developers showed that scientific research is not performed at an adequately high level and does not meet world standards.

Specialized scientific collectives need to review and develop new maximum acceptable standards in balanced rations and additives of radionuclides, heavy metal salts, nitrates, and nitrites with consideration of the changes in the ecology with respect to different regions of the country. This will help set up feed control.

The fact that in a number of rayons of the country cooperatives are organized without the approval of the state veterinary service is cause for concern. These cooperatives add stimulants, preservatives, and chemical additives to the feed of the stock breeding farms. They can upset metabolic processes in the animals' bodies and make them sick.

Some cooperatives violate the resolution of the USSR Council of Ministers dated 29 December 1988 "Regulating individual forms of activity of cooperatives in accordance with the USSR Law of Cooperation", which outlines that the cooperatives do not have the right to manufacture and sell drugs.

It has been found that individual workers manufacture larger experimental batches of preparations, instead of the one to two that are allowed, without state quality control and use them in the farms without the involvement of state veterinary service specialists and make agreements for pay for the work performed.

The cooperative Mysl-1 registered by the Shevchekov Rayon Executive Committee in Kiev at the Kiev Medical Institute for the Advanced Training of Physicians sold the collective farm-factory imeni 60th Anniversary of the Soviet Ukraine in the Apostolov Rayon in Dnepropetrovsk Oblast the anti-stress preparation antisystemonin [as published] for 20,000 rubles, which was manufactured without standard documentation and used without the approval of the state veterinary service. Generally the new cooperatives lack the skilled veterinary specialists and research base for effective developments and discoveries. They are only interested in profit.

We believe that such cooperatives should be found and their work ceased. In this manner we will prevent unnecessary waste on the manufacture and use of preparations of dubious efficacy. Order No.2 of the Chief State Veterinary Inspector of the Ukrainian SSR sent letters to the presidents of the oblast and municipal executive committees for making the activity of the cooperatives in 1990 more orderly. With actions such as these we are striving to develop in each director a feeling of responsibility to the veterinary service for manufacturing quality preparations for animals.

The above-listed problems are of important practical significance, since the effectiveness of the veterinary measures implemented and the productivity of the animals will depend on their solution. With the introduction of a market economy the agencies of the state veterinary control will check the advisability and effectiveness of expenses for the resources allocated to scientific establishments for development and to factories for the manufacture of preparations. Supplying the public with high quality products of animal origin in many ways depends on the reliability of the preparations used in stock breeding and veterinary science. COPYRIGHT: Izdatelstvo "Kolos", "Veterinariya", 1991

### Relocation of BW Laboratory Denied

927C0170A Moscow IZVESTIYA in Russian 06 Dec 91  
p 7

[Article by V. Sbitnev: "Looking for Anthrax in Siberia"]

[Text] The mention in Izvestiya (No 279) of a secret laboratory for the development of bacteriological weapons being relocated near Irkutsk disturbed Siberians.

Immediately after publication in our paper of the report "I Know How Anthrax Appeared in Sverdlovsk" the people's deputy of the Irkutsk Municipal and Oblast Council Yu. Shevelev requested the oblast directorate of the AFB [as published] to explain this matter to him.

After several days he received an exhaustive response which stated that "any data on the relocation of the laboratory near Irkutsk or its location within the oblast could not be found." It is true that a stipulation is made in this response that in the first place, the AFB does not have the information on the oblast in question, and in the second place Yu. Shevelev was advised to send his inquiry to the USSR and RSFSR Ministries of Defense, as well as the government of Russia "to clear up this important matter."

Such stipulations elicited many doubts about the sincerity of the response in the city's leaders. At the last session of the Irkutsk Municipal Executive Committee an authorized commission was created to check the reports of our newspaper. The commission included deputies as well as representatives of the executive committee. M. Savchekov, vice president of the Eastern Siberia Branch of the Siberian Department, USSR Academy of Medical Sciences, was requested to head the study. The authorities assume that medics will be more successful Chekists.

### Illness Affects Sverdlovsk Harvesters

927C0170B Moscow IZVESTIYA in Russian 24 Jul 91  
p 8

[Article by A. Tarasov: "Cause of Illness Again Unclear". First paragraph is IZVESTIYA introduction in boldface.]

[Text] Another case of illness among Sverdlovsk harvesters has been recorded. It is the third case in the past three years.

Izvestiya reported the previous emergency. I will remind you that in 1989 there was a mass poisoning of the students of Ural University during harvesting of potatoes at the Krasnoufimskiy Collective Farm. Last year schoolchildren became ill after weeding the carrot field at the Khramtsovo Collective Farm. The location of the last disaster is the Brusyanskiy Collective Farm in Beloyarsk Rayon. Workers at the Sverdlovsk Union "Vektor" were assigned to work at its beet and carrot fields this summer, but after only one day of collective farm

work six citizens were hospitalized. The symptoms of the illness are about the same as those of last year's, as well as that of the year before that. The most obvious of them is that the victims' feet give way. The diagnosis: toxic polyneuropathy.

And so, as of today 222 Sverdlovsk residents have been afflicted in the past three years with this serious illness.

The oblast department of sanitation and epidemiology and an oblast executive committee on emergency ecological situations are investigating the matter in detail, but it is not known whether they will make any sense of it. Why? After the students were poisoned the sanitation and epidemiology department banned the use of a number of toxic chemicals in agriculture in the oblast, since the opinion has formed that they are at fault for the tragedy, and chemical preparations were used ten-fold less in 1990 than previously. However, after the emergency at Khramtsovo, it was revealed that the field where the schoolchildren had worked had not been treated with chemicals for many years.

The oblast sanitation and epidemiology department was not the only one to analyze soil, water, and plant samples from the contaminated fields. Chemists from Moscow, Kiev, and Leningrad, army medics, the oblast plant protection station, and the Chemistry Institute, Urals Department, USSR Academy of Sciences, were involved in the research, but the causes of the disaster remain unclear. The specialists did not find any concentrations of pesticides toxic to people. The USSR Ministry of Health commission and the Ministry of Defense could not find the root of the evil either. Incidentally, it was decided to ban the use of all pesticides at a session of the oblast council of people's deputies.

And now there has been another tragedy. The president of the oblast sanitation and epidemiology department claimed that chemical preparations were not used in the oblast this year on the potato and vegetable fields, including the Brusyanskiy field.

It is obvious we cannot reveal the secret of the "Sverdlovsk Syndrome" without highly skilled specialists and very accurate instruments, and as long as these studies are financed by a local budget, the hope for a comprehensive, exhaustive investigation will be low.

### Local Commission Finds No Evidence of BW Research

927C0170C Moscow IZVESTIYA in Russian 11 Dec 91  
p 8

[Article by A. Pashkov: "End to Legend of Anthrax in Urals". First paragraph is IZVESTIYA introduction in boldface.]

[Text] Anthrax is no longer produced in Yekaterinburg claims the man assigned by Andropov to be responsible for "cleaning" the military laboratory.

Previous publications of Izvestiya (Nos. 268, 279, 289) reported that anthrax bacteria that had escaped from the bacteria laboratory of the 19th military garrison had affected several human lives. Former general of counter reconnaissance, A. Mironyuk, proved this unambiguously.

However, along with Mironyuk and Pirozhkov, Andropov's deputy (who staunchly adheres to his "meat" version at present), there is one more person who reported daily to the president of the KGB, to Suslov, secretary of the central committee, and to Defense Minister Ustinov about the "anthrax" situation in Sverdlovsk.

"When it became clear where the wind was blowing from, we stopped sending codes and telegrams to Moscow," says General Yu. Kornilov, former director of the Sverdlovsk Directorate of the KGB. "It is unlikely that you will find any documentation on this subject in Moscow. Everything was thoroughly erased. I can tell you frankly that prior to 1979 I knew very little about this garrison and its objective. It was subordinate to general headquarters. In reality, colossal efforts were spent before we found the true cause for the outbreaks of disease."

I was able to chat with those who operatively searched for the source of infection 12 years ago in Sverdlovsk. Naturally, at that time the first thought was to find the saboteurs. (Incidentally, G. Arkhangelskiy, deputy director of the 19th military garrison, insists even today that it would not have happened without enemy involvement.)

Thus, all efforts were spent searching for enemy spies. Two Americans, a husband and wife, were performing a good work in Sverdlovsk at that time. They came to the Urals on a scientific exchange and probably could have brought something to undermine the industrial potential of the "defensive edge". Trains came to Sverdlovsk with foreign equipment. The wagons often carried suspicious bags. Later analysis showed that they carried insecticides.

"Along with the saboteurs," recalls Kornilov, "the KGB became occupied with its "meat" version. We found a lot of curious things here. A number of graves in which animals infected with anthrax were buried had not been attended and had been disturbed. Incidentally, the specialists claimed that the disease did not come from the depths of the planet, or even the oblast, but from Sverdlovsk.

It is hard to say why "competent agencies" wandered near the military garrison for so long, almost two weeks and did not immediately take this version seriously. Apparently, a totalitarian government is built so that numerous "competent agencies" each know their precise areas and without a command from above do not stick their noses into others' business. In any case, everyone in town was talking about the military laboratory, but the

searches were first performed outside its walls. Incidentally, there was concrete proof from people that were not silent even then.

V. Perlin, the chief epidemiologist in Chkalovskiy Rayon at that time, had access to the military garrison when they stopped letting people in, and informed the leadership. Vladimir Nikolayevich hypothesized that the infection came from there. They were educated guesses, but subsequent analyses taken from the grass, pavement, etc., confirmed that the anthrax was of aerosol origin. This was at variance with the "meat" version.

V. Perlin told me that it was possible that the military "wanted to confirm the results of their 'work'" in this manner. At first glance it is a blasphemous thought, but on the other hand, if you recall what happened in Hitler's and Stalin's camps with the blessing of the government system, you need not hurry in your conviction of the absurdity of such a hypothesis.

In any case several letters were sent to the editor without signatures in which they, employees of the 19th garrison, asked the journalists to stop the ridiculous investigations; after all, we are working with not only anthrax, but also the plague, which is necessary to strengthen the defense capabilities of the country—and accidents? There are all kinds.

Having expressed his opinion, V. Perlin explained that one more circumstance forced him to believe this: it was apparent that there was not one release, but two, since the anthrax outbreak lasted almost two months.

Vladimir Nikolayevich was right. The first outbreak occurred as a result of the negligence of the staff: the pressure in the sleeve of the ventilation system rose sharply and the filter broke, setting free the anthrax spores. They were carried by the wind throughout the area in which people began to die. A Mironyuk diagram and then a respective aerial photograph confirmed this.

The second outbreak, which took 18 more lives, occurred later, when prophylactic work for washing and purifying the rayon began. A thick layer of dust had accumulated on the roofs of ceramic manufacturing factories. This layer trapped the deadly hazard. If people had worn the usual respirators many would still be living.

The director of the 19th garrison, Mikhaylov, then committed suicide. His supervisor, Smirnov, who spent his career in the general headquarters of the installation said in a conversation with one of the chief officials of this matter that he would kill himself if the true reasons for the disease became known. He died of natural causes; God will be his judge. However, we have to tell the hard truth. By hiding the real cause of the anthrax outbreak from physicians and specialists, the soldiers, whether they wanted to or not, performed the awful experiment on their own people.



In trying to unearth the more probable version so late, the "competent agencies" also to some degree facilitated the continuation of the inhumane experiment, and today, since our chat with Yu, this fact is of fundamental importance. Kornilov has taken an unexpected turn in the end.

The point is that three deputies of Russia, General Kornilov, Skripchenko, the vice-president of the Yekaterinburg Municipal Executive Committee, and Lakhov, the advisor to the president have sought to ensure that the soldiers at the 19th garrison laboratory are engaged in the production of antibiotics, blood substitutes, and cardiovascular preparations. A document for this has already been signed by Defense Minister Shaposhnikov.

There is no doubt that we have a catastrophic shortage of drugs, especially those named above. In reality, highly skilled personnel and first class equipment are gathered behind a barbed wire. But after this event, who can guarantee that a threat to the city will not arise again from the military laboratory, whose activity even "competent agencies" in essence knew nothing about?

"Andropov instructed me to personally monitor the 'cleaning' of the garrison and the shipment of equipment from it," says Yu. Kornilov. "I remember, they tried to keep me out of one of the sectors, although I precisely knew that strains of anthrax had been found on the equipment... They have been cleaning the laboratory for five years: changing floors and taking down plaster. I swear that it is now a clean factory. It would be unacceptable for it to simply disappear.

G. Arkhangelskiy, deputy director of the scientific work, assured me that those responsible for the outbreaks are no longer working there. After all, there are enough

civilian controllers here, and the rayon physicians check the ventilation channels and the discharge channels. As one of the most weighty arguments, my companions presented the reason that soon Americans will be coming here; negotiations are proceeding with them for the shipment of the necessary equipment.

I agree that we cannot thoughtlessly and barbarously destroy what it took years to develop: neither atomic stations nor defense installations. Moreover, we would be driving away highly skilled personnel. But I am deeply convinced that without restoring the trust of the people and providing for the most rigid safety measures, they will never begin the next production, which could be a potential threat to a city of a million people. The government has still not dealt in any way with those that suffered in 1979 and is already beginning to build new projects. As before, the interests of a specific person lie on the verge of grandiose projects....

"There is no information that would directly or indirectly indicate the location near Irkutsk of a secret military laboratory, which was at fault in 1979 for an anthrax outbreak," announced Mikhail Savchenkov, vice-president of the Eastern Siberian Branch of the Academy of Medical Sciences, to the TASS correspondent. He directs a commission specially created by the local administration to check the reports that appeared at the end of November saying that this laboratory was moved from Sverdlovsk to the Baikal area.

The check was performed along military and civilian lines. The lack here in the past and present of a scientific subunit for developing bacteriological weapons was confirmed, said the commission leader. However, it did not rule out the need for an official request to the Ministry of Defense and the government of Russia to investigate the subsequent fate of the super-secret laboratory.

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