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Performance of Fibrous Ion-Exchange Materials as Plant Nutrient Media

927C0069D Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 6, Nov-Dec 90 (manuscript received 16 Feb 90) pp 78-83

[Article by N. R. Peryshkina, L. I. Lukashevich, I. F. Khirsanova, G. D. Batmanova and N. A. Yakovleva, Institute of Physicoorganic Chemistry, Belorussian SSR Academy of Sciences]

UDC 631.589.2

[Abstract] Fibrous ion-exchange materials were tested for their efficiency in supporting growth of several plant species in terms of ion requirements. The end-objective is the design of a compact system suitable for spacecraft use. Studies with cabbage, pea, horseradish and wheat plants showed that the Biona B-2 system was the best soil-substitute under the test conditions. The Biona B-2 substrate consists of an anion exchanger coupled to nitron fibers. Tables 7; references 3: 2 Belorussian, 1 Russian.

Novel Plant Growth Inhibitor 2,3,-Dichloroisobutyrate (DCIB): Uptake, Intracellular Distribution and Effect on Water Metabolism

927C0030A Moscow FIZIOLOGIYA RASTENIY in Russian Vol 38 No 2, Mar-Apr 91 (manuscript received 06 Apr 89; in final form 04 Mar 90) pp 365-370

[Article by G. S. Erdeli, G. N. Khozhainova, G. Schilling* and W. Merbach*, Soil Biology Faculty, Voronezh State University; *Martin-Luther-Universitaet, Halle-Wittenberg, Germany]

UDC 57.042.2.58.1.11

[Abstract] In order to better appreciate the entire spectrum of DCIB [2,3,-Dichloroisobutyrate] effects on plants, an analysis was conducted on the fate of this growth inhibitor in peas (Pisum sativum), kidneys beans (Phaseolus vulgaris), mung beans (P. aureus) and wheat (Triticum aestivum). Exposure of shoots to C-14 labeled DCIB demonstrated that this agent was bound preferentially to cell walls and that the major portion of DCIB remained in the supernatant after protein precipitation with TCA. In addition, DCIB inhibited water intake and the intensity of transpiration, favoring water retention in leaves and stems. Consequently, the present evidence suggests that the primary mechanism of action of DCIB involves enhancement of hydrophilicity of biomolecules. Figures 1; tables 4; references 17: 14 Russian, 3 Western.

Wood-Decomposition by Root-Rot Fungi

927C0035C Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 1, Jan-Feb 91 (manuscript received 10 May 90) pp 39-43

[Article by S. V. Horlenko and N. G. Dishuk, Central Botanical Garden, Belorussian SSR Academy of Sciences]

UDC 632.4:582.287.237

[Abstract] Studies were conducted with 14 strains of the root-rot pathogen Heterobasidion annosum isolated from seven conifer varieties to assess their virulence and possible adaptation. Determinations of wood-decomposition efficiencies showed that considerable pathogen-host adaptation had occurred in the evolutionary sense. Certain pathogen varieties preferentially attacked selected conifers and are particularly active in bioconversion of dead trees of those species. Figures 1; tables 2; references 6: 5 Russian, 1 Western.

Intermediate Crops in Harvest Improvement

927C0044A Kishinev IZVESTIYA AKADEMII NAUK SSR MOLDOVA: BIOLOGICHESKIYE I KHIMICHESKIYE in Russian No 2, Feb 91 (manuscript received 17 Jul 90) pp 62-69

[Article by M. F. Lupashku, M. F. Lala, N. I. Bolokan, D. P. Zabriyan and S. N. Kushnir, Department of Microbiology, Moldova SSR Academy of Sciences]

[Abstract] An analysis as presented of factors that may be utilized to improve productivity of arable lands in Moldova, concentrating on enhacing utilization of solar radiation by crops per unit area of land. Field studies in 1980-1985 showed the importance of intermediate crops as a means of harvesting two to three crops per year from a given field, recognizing that in Moldava the most severe limitations are posed by a shortfall in precipitation. An integrated coefficient has been formulated to relate solar radiation to crop production in terms of "photosynthetically active radiation" and the results of several crop combinations are presented in tabular form. Among the most efficient combinations are winter wheat-corn, vetch-oats-corn, and so forth. Tables 5; references 5: Russian.

Telemetric Monitoring of Cotton Crops

927C0058A Moscow ZASHCHITA RASTENIY in Russian No 2, Feb 91 pp 46-48

[Article by G. K. Madaliyeva, Ye. A. Yanovskiy, A. F. Yanovskiy and Ye. V. Bicherov, "Agroresursy" Automated Information Processing System, All-Union Scientific Research Center; Institute of Physics, Belorussian SSR Academy of Sciences; SANIIZR (expansion unknown)]

UDC 632.914

[Abstract] Aerial (100-500 m) and ground level (0.5-0.7 m) telemetric monitoring of the spectra, polarization and angle of reflection of light from cotton crops was used to monitor the spread of cotton wilt. The results confirmed that affliction with cotton wilt altered the parameters of interest in comparison with healthy cotton plants. Near infrared and red wavelenghts were found to provide the most informative data. Meaningful polarization data were derived when measurements were taken at a sighting angle of $> 30°$ in the 180° azimuth relative to the sun and included the phase angle and zenithal angle since cotton leaves show heliotropic movements. Figures 4; tables 1.

Embryoculture in Production of Triple-Species Triticale

927C0069B Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 6, Nov-Dec 90 (manuscript received 14 Jun 90) pp 10-12

[Article by L. V. Khotyleva and S. I. Gordey, Institute of Genetics and Cytology, Belorussian SSR Academy of Sciences]

UDC 633.11:633.14:631.523/527:581.3

[Abstract] Cursory technical details are presented on the use of in vitro embryoculture for the production of triple-species triticale. The results showed that high embryo yields were obtained when hybridization involved hard wheat and rye with soft wheat bearing kr genes responsible for wheat-rye compatibility. The effects of the recessive kr genes were due to abnegation of the effects of the dominant Kr genes on anther growth, fertilization and formation of hybrid embryos in distal crossings. Tables 4; references 7: 4 Russian, 3 Western.

Genotypic Specificity of Androgenesis amd Embryoculture In Vitro in Dihaploid Triticale and Wheat Production

927C0069C Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 6, Nov-Dec 90 (manuscript received 12 Jun 90) pp 12-16

[Article by I. A. Gordey and A. P. Sorokin, Belorussian Scientific Research Institute of Agriculture and Feeds]

UDC 633.112.9+633.11:631.523

[Abstract] An analysis is presented of results obtained in studies designed to assess various genetic factors that impact on in vitro anther and embryo culture of hexaploid winter wheat and triticale. The resultant findings demonstrated that in vitro androgenesis is strongly genotype amd species-dependent. Production of dihaploid triticale was positively affected by recessive kr genes, whereas no such relationship was evident in the production of dihaploid wheat varieties. Tables 4; references 7: 4 Russian, 3 Western.

Genetic Aspects of Cotton Adaptation to Saline Soils

927C0080A Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 2, Jan-Feb 91 (manuscript received 27 Sep 90) pp 22-28

[Article by B. T. Khydyrov, B. V. Roshchupkin, N. N. Borisova, Vl. V. Kuznetsov and B. P. Strogonov, Institute of Plant Physiology imeni K. A. Timiryazev, USSR Academy of Sciences]

[Abstract] Different varieties of two cotton species were tested for their adaptive potential to saline soils, using productivity and fructification criteria. Prior to planting the seed were treated with for two to three min with sulfuric acid solution; subsequently, soil moisture was maintained by irrigation with either 0.3 or 0.6 percent sodium chloride or 1.4 percent sodium sulfate. The resultant data demonstrated that strains Ash-25 and 9871-I of Gossipium barbadensis were far more tolerant of salinity than strains T-61, 149-F and 133 of G. hirsutum. There were no telling differences between the sodium chloride or sodium sulfate groups. Differences between these two species were attributed to greater tolerance of the growth and developmental processes of G. barbadensis to excess salinity. Figures 2; tables 3; references 10: Russian.

Nuclear Polyhedrosis Viruses and National Economy

927C0081A Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 3, May-Jun 91 (manuscript received 21 Mar 91) pp 31-38

[Article by P. K. Kullyyev, G. Kh. Yalkamyshov, N. Agalykov and N. V. Biryukova, Institute of Zoology, Turkmen SSR Academy of Sciences]

[Abstract] Largely Western literature is surveyed on the harnessing of nuclear polyherosis viruses (NPV) for human benefit. In the initial stages, use of NPVs was limited to insecticidal potential. With advances in genetic engineering, NPVs were identified as excellent recombinant vehicles for high rates of expression of recombinant proteins in insect cell systems. To date, such systems have been utilized for production of human α- and β-interferon, human interleukin-2 and other proteins of medical and economic significance. For the most part such endeavours have been limited to the research laboratory, but rapid advances in tissue culture, insect breeding and recombinant techniques indicate that industrial applications will follow shortly. References 44: 12 Russian, 32 Western.

Luminescent Methods in Pesticide and Growth Factor Analysis

927C0083A Moscow AGROKHIMIYA in Russian No 1, Jan 91 pp 139-151

[Article by S. G. Zhemchuzhin and V. A. Momotenko]

UDC 632.95

[Abstract] Largely Western analytical literature is suveyed on the application of luminescent methods to the analysis of pesticides. The technique of primary importance in this category, because of near-universal applicability, is that of fluorescence analysis relying either on the natural compounds or following their derivation with fluorogenic groups. Fluorescent analysis has found wide application in research and environmental monitoring. Its use and refinement is increasing daily for quantitative and qualitative analysis because of the advantages it offers in sensitivity, specificity and reproducibility. References 110: 6 Russian, 94 Western.

Structural Organization of Γ-Subunit Gene of Human Photoreceptor cGMP Phosphodiesterase

927C0007B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 315 No 1, Nov-Dec 90 (manuscript received 27 Aug 90) pp 229-231

[Article by N. I. Piriyev, V. A. Purishko, N. V. Khramtsov and V. M. Lipkin, Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow]

UDC 577.1

[Abstract] Conventional genetic engineering techniques were utilized for cloning and analysis of the structural organization of the γ-subunit gene of human photoreceptor phosphodiesterase responsible for hydrolysis of cGMP. The gene was localized to a 3500 bp fragment and found to include three exons and two introns. The amino acid sequence of the subunit, derived from the nucleotide sequence, was shown to be represented by 87 residues and exhibits 96.55 percent homologies with bovine and mouse γ-subunits. The first exon appears to encode the protein region responsible for binding to transducin and the catalytic moieties, while the third exon encodes the protein which inhibits phosphodiesterase. Figures 2; references 15: 2 Russian, 13 Western.

Pharmacokinetics of Zosterin (Seaweed Zostera Asiatica Pectin)

927C0007C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 315 No 1, Nov-Dec 90 (manuscript received 23 Feb 90) pp 232-235

[Article by A. M. Popov, G. P. Lyamkin, A. A. Artyukov, Yu. N. Loyenko and G. B. Yelyakov, academician, Pacific Institute of Bioorganic Chemistry, Far Eastern Branch, USSR Academy of Sciences, Vladivostok]

UDC 615.322.015+547.458.88

[Abstract] Zosterin, a pectin derived from the seaweed Zostera asiatica, was subjected to a pharmacokinetic analysis in mice in view of its demonstrated antibiotic, antimutagenic, immunomodulating activities and potential therapeutic usefulness in lead poisoning. Per os administration of tritiated zosterin to BDF_1 showed that ca. 20 percent underwent systemic absorption with essentially equivalent distribution between the vascular compartment, liver, kidneys, lungs and spleen. Maximum levels of radioactivity were noted in the blood, lungs and spleen after one h and in the liver and kidneys after two h. Myocardial levels were low and skeletal muscle levels even lower. The extremely low brain levels indicated impermeability of the blood-brain barrier. Maximum urine levels were observed in two h, with 12-15 percent of the label eliminated via this route after 24 h. Fecal radioactivity was at a maximum six h after administration with enteric elimination reaching 73-78 percent after 48 h. Accordingly, there was no tissue accumulation and elimination of zosterin was essentially completed after 48 h. Figures 3; references 15: 9 Russian, 6 Western.

Bradykinin-Potentiating Peptides of Spider Latrodectus Tredecimguttatus Venom: Inhibitors of Carboxycathepsin and Karakurt [as published] Venom Kininase

927C0007D Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 315 No 1, Nov-Dec 90 (manuscript received 25 Dec 89) pp 236-239

[Article by N. A. Sosnina, Z. Golubenko, A. A. Akhunov, Ye. V. Kugayevskaya and Yu. Ye. Yeliseyeva, Institute of Bioorganic Chemistry imeni A. S. Sadykov, Uzbek SSR Academy of Sciences, Tashkent; Institute of Biological and Medical Chemistry, USSR Academy of Medical Sciences, Moscow]

UDC 577.993

[Abstract] Two peptides were identified in the venom of the spider Latrodectus tredecimguttatus which enhance bradykinin activity by inhibiting carboxycathepsin (angiotensin converting enzyme; EC 3.4.15.1). Designated bradykinin potentiating peptides (BPP-1 and BPP-2), these entities have respective pI values of 4.7 and 3.5 and corresponding MWs of 10,000 and 2500 D. Both peptides are thermotolerant and acid stable (20 percent TCA for 10 minutes in water bath). BPP-1 is the stronger enzyme inhibitor with IC_{50} = 10E-7 M (BPP-2 = 10E-4 M). Accordingly, in animal tests in which bradykinin was administered after BPP-1 or BPP-2, BPP-1 was found to be significantly more effective in potentiating the intensity and duration of hypotension. In addition, in this connection it is interesting to note that BPP-1 and BPP-2 also inhibit karakurt [as published] venom kininase. Figures 4; tables 1; refences 15: 6 Russian, 9 Western.

Lipids of Mycelial Fungi in Biotechnology. Part 2. Fungal Lipid Biotechnology

927C0031A Moscow BIOTEKHNOLOGIYA in Russian Vol 1, Jan 91 (manuscript received 09 Jan 89) pp 5-26

[Article by Ye. P. Feofilova, Institute of Microbiology, USSR Academy of Sciences]

UDC 582.282.013.004

[Abstract] A review of Soviet and Western literature is presented on lipids in biotechnology, particularly the merits of eukaryotic microorganisms (algae, yeasts, molds) as a source as opposed to oleogenic plants. The review summarizes the current status of fungal lipids and the approaches used in their production and recovery. Emphasis is placed on the particular advantages that mycelial fungi may offer as source of what has come to be termed SCO (single cell oil). In general, the most promising oleogenic microorganisms have been shown to produce lipids at a rate equivalent to 25 percent of their dry weight. Soviet accomplishents in this respect are noteworthy in that the first pilot plant for the production of lipids from fungi has been constructed in the USSR. The plant technology has been adapted to Candida guillermondii, with one ton of yeast corrently yielding 60-140 kg of lipids consisting of 16-19 percent triglycerides, up to 50 percent phospholipids, and 15-20 percent carbohydrates. With improvements in mutation breeding and selection, it is anticipated that eventually fungal lipids may compete with plant lipids in meeting the economic needs of the country. References 83: 34 Russian, 49 Western.

Biotechnological Research at Belorussian Institute of Experimental Botany imeni V. F. Kuprevich

927C0069A Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 6, Nov-Dec 90 (manuscript received 27 Jun 90) pp 3-5

[Article by V. N. Reshetnikov, Institute of Experimental Botany imeni V. F. Kuprevich, Belorussian SSR Academy of Sciences]

UDC 681.14.143.6:635.21

[Abstract] Research in biotechnology at the institute commenced in 1977 with the opening of biochemistry and molecular biology laboratories. Initial studies concentrated on potato tissue cultures, and since have been expanded to other crops and approaches. Currently, major emphasis is on the application of biotechnology to improvement and propagation of the potato, pea and stevia, as well as recovery of metabolic products. More recent developments have included protoplast manipulations and introduction of immobilized cell technology.

Radionuclide Accumulation in Crops in Southern Belorussia

927C0035A Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 1, Jan-Feb 91 (manuscript received 12 Sep 90) pp 26-31

[Article by V. I. Haponenko, S. M. Shevchuk, N. V. Honcharova, L. K. Sukhaver and A. M. Shpakov, Institutes of Radiobiology and of Geochemistry and Geophysics, Belorussian SSR Academy of Sciences]

UDC 577.34+581.14

[Abstract] Radionuclide (Ru-106, Cs-134, Cs-137) monitoring studies were conducted in 1986 and 1987 in the Gomel and Mogilev oblasts of Belorussia in view of their contamination by the radioactive fallout from the Chernobyl Nuclear Power Plant in Ukraine. Studies in 1986 showed that soil accumulation of beta- and gamma-emitters was largely limited to the top 1 cm layer, with mean beta- and gamma-radiation intensities of 40 and 0.4-4 Bq/g, respectively. Plant cover radioactivity was either at the same level as the soil or an order of magnitude greater, depending on the plants. However, accumulation of radionuclides in the reproductive organs and tissues of crereals and legumes was lower by an order of magnitude than in the stems and leaves, a factor to be considered in the utilization of contaminated crops. Measurements made in 1987 showed almost a 12-fold reduction in the radioactivity of rye and wheat and a three-fold decrease in barley in comparison with 1986 counts. Figures 2; tables 3; references 6: Russian

Bicentric Immunoradiometric Assays of Nerve Growth Factor (7S-BGF) in Mouse Sera Using Affinity-Column Purified Antibodies

927C0035B Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 1, Jan-Feb 91 (manuscript received 04 Apr 90) pp 78-81

[Article by N. B. Gorbunova, Institute of Physiology, Belorussian SSR Academy of Sciences]

UDC 577.175.859:612.89:57.083.3

[Abstract] The solid-phase bicentric immununoradiometric assay [Suda, K., et al., PNAS, 75(8): 4042, 1978] was applied to analysis of 7S-NGF, using antibodies specific for the γ-subunit of the NGF generated in rabbits and purified by affinity chromatography. Under optimal conditions the assay showed a sensitivity of 2 ng/ml. Application of the assay to analysis of serum samples from male mice yielded 7S-NGF levels of 5.75 +/- 0.74 ng/ml. Figures 4; references 12: 2 Belorussian, 2 Russian, 8 Western.

Chromosomal Rearrangements in Three Species of *Chironomidae* (*Diptera, Chironomidae*) from Chernobyl Area

927C0124B Moscow GENETIKA in Russian Vol 27 No 5, May 91 (manuscript received 18 Apr 90) pp 836-848

[Article by N. A. Petrova, Zoology Institute, USSR Academy of Sciences, Leningrad]

UDC 575.224

[Abstract] Polytene chromosomes from the salivary glands of larvae from more than 30 natural populations of *Chironomidae* collected from the 30 km zone surrounding Chernobyl and a cooling tank at Chernobyl were investigated using a high resolution method based on polytene chromosome analysis to identify changes in the nuclear apparatus of these insects and assess the adaptive capabilities of these species. The researchers attributed polymorphism in *Chironomus plumosus* to an increase in the mass of the centromeric chromatin and an increase in the number of individuals with B chromosomes (21 percent) as opposed to 8-12 percent rates for Siberia and Europe. Radiation and the chemicals used in cleaning up the area were also cited as possible causes for the increase in polymorphism. Specimens of *Ch. balatonicus* from Chernobyl exhibited a 43.6 percent rate of increase in telomeric chromatin mass, with the causes for this again attributed to several factors. In conclusion, the results demonstrated that *Ch. plumosus* and *Ch. balatonicus* adapt much more easily to new ecological conditions by means of karyotype rearrangement while maintaining the previous biotope, in contrast to *Glyptotendipes glaucus*, which has the lowest adaptive capabilities of the three and which has lost its ecological niche in a specific biotope. Figures 5; tables 3; references 22: 17 Russian, 5 Western.

Mobility of Radionuclides in Soil-Vegetative Cover of Dead Zone Around Chernobyl Nuclear Power Plant

927C0221A EKOLOGIYA in Russian No 3, Mar 91 (manuscript received 24 Oct 89) pp 89-91

[Article by I. V. Molchanova, L. N. Mikhaylovskaya, Ye. N. Karavayeva, Institute of Plant and Animal Ecology, Ural Department, USSR Academy of Sciences]

UDC 574:577.39

[Abstract] The radioactive fallout from the Chernobyl accident was characterized by a broad range of physicochemical properties. The researchers here studied the forms of ^{90}Sr, ^{134}Cs, and ^{137}Cs in the soils of the natural biogeocenoses of the zone around the plant. Specifically, watershed areas 3, 6, and 18 km from the plant itself were the focus of the study. They are inhabited by sparse stands of pine, and the soil is slightly grassy, consisting of a humus-sand mix (pH of the aqueous extract 4.5-5.2; convertible Ca 1.20-4.09 mg-eq/100 g soil; Mg 0.33-1.48, K 0.15-0.36). For the sake of comparison, they performed similar studies a distance of 5 km from the Beloyarsk Nuclear Electric Power Plant in the Urals. That area is forested by a mix of pine and deciduous trees, beneath which are brown forest soils (pH of aqueous extract 5.5; convertible Ca 6.64 mg-eq/100 g soil; Mg 5.92, K 0.31). The researchers found that, at 3 km from Chernobyl, the 74 percent of the ^{90}Sr is in a fixed form. Its water-soluble compounds represent several tenths of a percent, and its convertible and acid-soluble compounds, 17.7 percent and 7.7 percent, respectively. At 6 km from the plant, the content of convertible compounds grew by a factor of 3.6, and the acid-soluble compounds, by a factor of 2.8. Fixed ^{90}Sr dropped to 13 percent. Farther from the plant, the figures remained roughly the same, although the content of fixed ^{90}Sr did rise somewhat. The mobility of the ^{90}Sr around the Beloyarsk plant was higher that that around Chernobyl, as evidenced by the absence of fixed radioactive strontium and a higher content of its water-soluble forms in the brown soils around the Ural plant. In most cases, there were no statistically reliable differences in ^{134}Cs and ^{137}Cs distributions around either plant. Both isotopes are in fixed or acid-soluble form, regardless of the distance from the production area, and those forms account for 85-90 percent of the total nuclide content. In terms of nuclide mobility, beyond 6 km from Chernobyl, ^{90}Sr is primarily in ion-exchange form and is more mobile than the radioactive cesium. Figures 1, references 3 (Russian).

Radionuclide Content in Water and Suspensions of Dnepr River and Its Reservoirs

927C0221B Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 13 Sep 89) pp 82-87

[Article by V. G. Klenus, M. I. Kuzmenko, L. P. Matviyenko, A. I. Kaglyan, and O. I. Nasvit, Institute of Hydrobiology, UkSSR Academy of Sciences, Kiev]

UDC 577.34:574.63(282.247.32)

[Abstract] With the Chernobyl accident, radionuclides were scattered throughout the environment. The release of the nuclides spanned a period of time and consisted of several stages. The first involved the release of dispersed fuel in which the composition of the radionuclides corresponded to that in the irradiated fuel, but was replete with volatile isotopes of iodine, tellurium, cesium, and noble gases. In the second stage—from 26 April to 2 May 1986—the flows of hot air and products of graphite combustion carried finely dispersed radioactive fuel. The third stage of release was typified by a rapid growth in the rate of exit of fission products from the reactor. The final stage began 6 May, and the leakage of fission products dropped sharply. By that time, the total amount of fission products released (not counting the noble gases) was nearly 50 MCi, roughly 3.5 percent of the total amount of radionuclides in the reactor at the

time of the accident. In the initial period after the accident, the distribution of the radionuclides was a function of the weather conditions and assumed a mosaic pattern. The first measurements made, in the Kiev and Kanev reservoirs, showed widely varying concentrations of radionuclides. After the airborne fallout ceased, rain-driven runoff produced concentrations of 3.7-37.0 Bq/l. In 1987, only the long-lived radionuclides ^{90}Sr, ^{134}Cs, ^{137}Cs were found in the Dnepr chain of reservoirs. Vertical distribution was uniform, and ^{134}Cs and ^{137}Cs concentrations diminished as one descended the chain. Spring flooding did bring ^{144}Ce and $^{106}Ru+^{106}Rh$ to the Kanev and Kiev reservoirs. Concentrations continued to diminish, although spring freshets temporarily raise radionuclide levels. Figures 2, references 5: 4 Russian, 1 Ukrainian.

Change in the Morphological Structure of the Population of *Microcystis Aeruginosa* Kutz. Emend. Elenk. in the Dnepr Chain of Reservoirs After the Chernobyl Accident

927C0221 Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 3 Jul 90) pp 87-91

[Article by L. A. Sirenko, L. Ye. Kostikova, T. F. Shevchenko, and I. Yu. Kostikov, Institute of Hydrobiology, UkSSR Academy of Sciences, Kiev; Kiev University]

UDC [582.232-14+574.63](282.247.32)(477)

[Abstract] *Microcystis aeruginosa*—one of the sources of the "blooming" of the waters of the Dnepr reservoirs—exists there as a complex, perennial population consisting of various subpopulations. The work reported here was a study of the morphological parameters of that population based on alga samples collected in August-September 1987 and 1989 from the Kiev, Kanev, Kremenchuga, and Dneprodzerzhinsk reservoirs. The researchers found that, as compared with data for 1983, considerable changes had taken place in size and habitual spectra when the parameters were measured in 1987. Maximum colony length, for example, had grown, as had modal values and values for median length. The principal type of habitual spectrum in 1983 was characterized by a prevalence of st. simplex, except for the Kiev Reservoir (st. ochraceo-sphaerodictioideus) and the Kanev Reservoir (st. viridis). In 1987, st. sphaerodictioideus predominates in the Kiev and Kanev reservoirs; st. viridis, in the Kremenchuga and Dneprodzerzhinsk reservoirs. In 1989, the parameters measured tended to return to the 1983 values, except for the Kiev Reservoir, in which the sizes of the colonies remained close to those of 1987. The only appreciable change in habitual spectrum occurred in the Kanev Reservoir, which demonstrated a prevalence of st. viridis. Overall, the degree of change in morphological structure diminished moving away from the mouth of the Pripyat River. References 13: 9 Russian, 4 Western.

Mutagenicity Background Monitoring of River Don Delta Water

927C0235G Moscow GENETIKA in Russian Vol 27 No 4, Apr 91 (manuscript received 10 Nov 89; after revision 15 Aug 90) pp 749-752

[Article by V. A. Chistyakov and V. N. Kornilov, Azov Scientific Research Institute of the Fishing Industry, Rostov-on-the-Don]

UDC 573.224.045

[Abstract] The mutagenicity of the River Don delta water was investigated using an Ames test for screening mutagens and a method of counting dominant lethals in *Drosophila* to assess the genotoxic effect of the polluted water in multicellular eukaryotes. The results showed that the sensitivity of tests is sufficient for determining the genotoxicity of River Don waters. Data from the various tests differed in quality and could not be duplicated, thus indicating the presence of a wide range of mutagens with varying effects. In conclusion, these findings indicate that the River Don is heavily polluted; moreover, the effects at the lower-lying delta are less than those at Rostov-on-the-Don. Tables 2; references 8: 5 Russian, 3 Western.

Use of Porphyrins for Assessing Effect of Small Doses of Ionizing Radiation on Human Body

927C0237C Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 63 No 7, Jul 91 (manuscript received 18 Dec 90) pp 47-49

[Article by G. P. Gurinovich, A. Ye. Okeanov, I. F. Gurinovich, M. I. Ivanovskaya, S. I. Shishporenok, Institute of Physics, BSSR Academy of Sciences; Scientific Research Institute of Oncology and Medical Radiology, BSSR Ministry of Health, Minsk]

UDC 616.079.584:547.977.733

[Abstract] Little data exists on the effect of small doses of ionizing radiation on porphyrin metabolism. Such data would be valuable in organizing a nontraditional approach to assessing risk associated with radiation exposure. The paper reported here presents data from the determination of coproporphyrin levels in the urine of 281 individuals, 166 of whom live in the radioactively contaminated oblasts of Gomel and Mogilev. Coproporphyrin excretion levels were generally lower than in control, with the level ranging from 20 percent to 70 percent lower than control in among the individuals from the Krasnopolskiy, Vetkovskiy, Narovlyanskiy, and Khoynikskiy rayons (which are in Mogilev and Gomel oblasts). The lowest levels were found among individuals with chronic atrophic gastritis or hyperplastic gastritis in the remission stage, with various degrees of dysplasia and pronounced proliferation and restructuring of cellular elements of the gastric mucosa. The coproporphyrin excretion index holds promise for

determining risk groups among those exposed to ionizing radiation. Figures 1, references 9: 6 Russian, 3 Western.

Conference Examines Health Effects of Semipalatinsk Tests

927C0253A Moscow SOVETSKAYA ROSSIYA in Russian 3 Jan 92 p 4

[TASS report, author unattributed, under the title: "An Echo of Long-Ago Explosions"]

[Text] "Yellow" and "blue" children have appeared in Altay. The number of cases of cancer, tuberculosis, and other severe ailments has risen. Child mortality has increased and the birth rate has decreased. All of these are consequences of the testing of nuclear weapons in 1949-1963 at the Semipalatinsk testing grounds in Kazakhstan. Participants in a republic conference on the problems of maternal and child health protection held at Barnaul have reached this conclusion.

More than 500 million rubles for Altay alone are required in the upcoming year to implement a program of rehabilitation for the affected population. The conference participants reached the conclusion that, despite the difficulties with the budget and food supply, this question should be placed before the Russian Government.

Emergency Commission for Rabies Control in Kyrgyzstan

927C0165A Moscow TRUD in Russian 6 Sep 91 p 4

[Interview with B. M. Shapiro by E. Baybakpayev: "Emergency Commission for Rabies Control". First paragraph is TRUD introduction in boldface.]

[Text] **A resolution by the Kyrgyzstan Cabinet of Ministers established the position of a Kyrgyzstan Emergency Rabies Control Commission, currently the only one in the country. What is the reason for this? The Kyrgyzstan Chief State Sanitation Physician and the First Deputy Minister of Public Health B. M. Shapiro tells us about it.**

[Shapiro] For starters I will present the figures. Kyrgyzstan, alas, leads in morbidity with rabies and brucellosis. For example, in Russia the index for brucellosis is 1.86 percent (per 100,000 people), but here in Kyrgyzstan it is 12.78... We hold second place in the country for morbidity with anthrax and viral hepatitis infections. We are third for typhoid and tuberculosis of the respiratory organs.

For many years the Kyrgyzstan Emergency Epidemic Control Commission was virtually without any rights. We are in this situation as a result.

[Baybakpayev] What rights have you now been given?

[Shapiro] According to the resolution by the Kyrgyzstan Cabinet of Ministers we now have the right to impose or lift a quarantine, for which we previously needed the permission of the government and local powers. In essence we wasted precious time on this. All without exception are obligated upon our request to undertake sanitation and prophylactic and anti-epidemic measures. In case of refusal, the commission has the right to submit the matter to the president of Kyrgyzstan for his review.

The commission also has the power to remove officials from their work, impose fines of up to three months' wages, and send data to the public prosecutor's office for bringing criminal charges upon them.

Marburg Virus: First Determinations of Two Genes Sequences

927C0014B Moscow MOLEKULARNAYA GENETIKA, MIKROBIOLOGIYA I VIRUSOLOGIYA in Russian No 3, Mar 91 (manuscript received 25 May 90) pp 24-30

[Article by A. A. Bukreyev, A. A. Kolykhalova, V. Ye. Volchkov, V. M. Blinov, S. V. Netesov and L. S. Sandakhchiyev, All-Union Scientific Research Institute of Molecular Biology; "Vektor" Scientific Industrial Association, USSR Ministry of Medical Industry, Koltsovo, Novosibirsk Oblast]

UDC 578.833.29:578.5:577.212.3

[Abstract] Large quantities (20 mg/100 ml) of Marburg virus were recovered from the plasma of infected guinea pigs five to six days after infection, which were sufficient to permit genetic sequencing. Following a conventional approach involving preparation of cDNA by reverse transcriptase, plasmid insertion and amplification in E. coli, four overlapping clones were obtained which represented a 5012 bp long sequence. The nucleotide sequence encoded three polypeptides designated pOR1, pOR2, and pOR3 represented by 200, 559, and 649 amino acid chains. This communication presents the first sequencing study on the Marburg virus and may have application in the construction of genetically engineered vaccines. Figures 4; references 11: 4 Russian, 7 Western.

Diagnosis of Skin Basal Cell Melanoma Using Monoclonal Antibodies to Cytokeratin Peptides

927C0218B Moscow ARKHIV PATOLOGII in Russian Vol 53 No 6, Jun 91 (manuscript received 14 Jun 90) pp 7-11

[Article by S. V. Petrov, N. T. Raykhin, and Dzh. Serre, Kazan Medical Institute; All-Union Cancer Research Center, USSR Academy of Medical Sciences; Cell Biology and Histology Laboratory, University Medical Faculty, Toulouse (France)]

UDC 616.5-006.6-07:616.153.962.4-097-078.3

[Abstract] The expression of various cytokeratins in basal cell melanoma was analyzed immunohistochemically using a number of original monoclonal antibodies. Tissues from 25 basal cell melanomas were obtained directly after tumor removal from both men and women with an average age over 55. The results demonstrated that cytokeratin No. 8 was detected by monoclonal antibody H1 in 24 percent of tumors, and 28 percent of basal cell melanomas were stained by monoclonal antibody f12- 19. Monoclonal antibody G36-19 reacted only with trichobasalioma cells. In addition, there was no correlation found between cytokeratin Nos. 8 and 17 and the prekeratin detected by monoclonal antibody EE 21-06 and the sex and age of the patients, location of tumor, or histological type. Cytokeratin No. 18 was not found in any basal cell melanoma, while cytokeratin No. 17 was found in all basal cell melanomas. The results suggest that basal cell melanoma genesis is associated with appendages of the skin. In conclusion, the findings indicate that basal cell melanomas of varying histogenesis (from cambial elements of the epidermis and appendages of the skin) have common properties. Figures 2; references 19: 5 Russian, 14 Western.

Immunohistochemical Investigation of Monoclonal Antibodies to Membrane Antigen of Lipid Globules in Mother's Milk

927C0218C Moscow ARKHIV PATOLOGII in Russian Vol 53 No 6, Jun 91 (manuscript received 01 Aug 90) pp 11-16

[Article by R. I. Yakubovskaya, A. B. Baryshnikov, T. A. Karmakova, N. I. Kazachkina, G. I. Avdeyev, V. V. Delektorskaya, O. V. Korotkova, Z. G. Kadagidze, V. D. Yermilova, K. I. Zhordaniya, N. N. Volchenko, G. A. Frank, G. V. Vikha, and A. A. Sukhno, Moscow Cancer Science Institute imeni P. A. Gertsen, All-Union Cancer Science Center, USSR Academy of Medical Sciences, Moscow, Scientific Production Association "Biotekhnologiya"]

UDC 618.19-008.839.624-078.33

[Abstract] This study presents an immunohistochemical description of monoclonal antibodies to a lipid globule membrane antigen. The monoclonal antibodies were obtained by somatic hybridization of murine myeloma cells P3x63Ag8.653 and splenocytes from BALB/c mice immunized with a lipid globule membrane fraction bearing the membrane antigen. The antigen detected with monoclonal antibody IKO-25 was found to be specific for the epithelial tissue of various organs with secretory activity. While the reaction of monoclonal antibody IKO-25 with antigens to epithelial tissue from both embryos and adults is similar overall, the pattern of antigen distribution and the intensity of the reaction with monoclonal antibodies differ in a number of organs. Moreover, the spectrum of the reaction with monoclonal antibody IKO-25 is much wider than normal for malignant human tumor tissue. The research showed that the expression of the antigen detected with monoclonal antibody IKO-25 is specific to normal human adult and embryonal epithelial tissue as well as to epithelial tumor tissue. This makes immunohistochemical detection of an antigen an additional method of research for the differential diagnosis of malignant tumors perspective. In addition, the distribution pattern for monoclonal antibody IKO-25-detected antigens in human organs and tissues and the intense interaction of these antibodies with breast, lung, and ovarian cancer cells make possible the use of the respective immunohistochemical reactions for detecting micrometastases and more complete evaluation of processes of cell differentiation in tumoral parenchyma. Figures 3; tables 2; references 11: 4 Russian, 7 Western.

Inheritance and Location of Some Genes Governing Fertility

927C0235A Kiev TSITOLOGIYA I GENETIKA in Russian Vol 25 No 3, May-Jun 91 (manuscript received 23 Apr 90) pp 30-34

[Article by Yu. F. Dzhurayev and A. K. E. Ergashev, Scientific Production Association "Biolog", Tashkent]

UDC 633.511:575.22

[Abstract] This paper presents the results of marker analysis with the use of signal genes from cotton linkage groups I (chromosome 7) and III (chromosome 16). Interspecies hybrids, F_1, F_2, and backcrosses of *Gossypium hirsutum* "Krasnolistnaya Akala" lines A4148, A4149, and VP19 and *G. barbadense* L. C-6030 were employed to analyze the effects of various combinations of genes from linkage groups I and III. The effect of each marker locus on fertility was investigated by separating populations of F_2 hybrids and backcrosses into homozygous dominant, heterozygous, and homozygous recessive groups. The results obtained for each locus showed that the effects of a single locus on fertility are negligible. It is believed that there are several co-adapted blocks of genes in the seventh and 16th chromosomes that are involved in the genetic determination of fertility. These blocks bear genes for sympodial branches and a group of linked genes in the sections between markers. The role of sympodial branch genes in the expression of fertility was evaluated based on the following concepts: 1) Dominant alleles of sympodial genes promote a more scattered habit of the plant that is better suited to mechanized agrotechnology. 2) A homozygous recessive combination of sympodial genes and gene modifiers causes fasciation of the generative organs and forms empty, seedless pods. 3) The simultaneous opening of several blossoms on a single plant increases the chance for heavy pollination and the pollination of adjacent blossoms. In conclusion, the favorable combination of blocks bearing genes for sympodial branches and a group of linked genes in the sections between the markers ensures a relatively high fertility rate. Figures 1; references 11: 10 Russian, 1 Western.

Santoquine's Anti-Mutagenic Activity in Radiation Mutagenesis of Wheat

927C0235B Kiev TSITOLOGIYA I GENETIKA in Russian Vol 25 No 3, May-Jun 91 (manuscript received 15 May 90) pp 62-64

[Article by M. Sh. Babayev, Azerbaijan State University, Baku]

UDC 576.312.36

[Abstract] The radioprotective properties of santoquine, a heterocyclic antioxidant, were investigated on soft wheat, variety Kavkaz. The air-dried seeds were irradiated with 10, 50, or 100 Gy, and then treated with aqueous solutions of santoquine in concentrations ranging from 0.1 to 1.0 percent for 20 hours. The results demonstrated that a concentration of 0.25 to 0.50 percent increases the mitotic index from 9.15 to 11.5 percent. The frequency of chromosomal aberrations also slightly decreased at this concentration. All concentrations were shown to decrease the frequency of all types of chromosomal aberrations in both spontaneous and gamma-induced mutagenesis by two-fold. Accordingly, the findings showed that santoquine indeed exhibits radioprotective properties. Tables 1; references 4: Russian.

Interferon Activates DNA Repair Genes in UV-Irradiated Human Cells

927C0235C Moscow GENETIKA in Russian Vol 27 No 7, Jul 91 (manuscript received 30 Jul 90; after revision 21 Nov 90) pp 1241-1245

[Article by T. A. Sinelshchikova, Ye. G. Gubitskaya, N. B. Akhmatullina, A. A. Tashenova, and G. D. Zasukhina, General Genetics Institute imeni N. I. Vavilov, USSR Academy of Medical Sciences, Moscow]

UDC 575:577.117.559.9

[Abstract] Human embryonal fibroblasts (eight to 14 passages) were employed to investigate the interferon activation of DNA repair genes in UV-irradiated human cells. Native lymphoblastoid interferon α and recombinant interferon α_2 were added on the third day of cell culture to Eagle's medium with 10 percent serum. DNA reparative synthesis was determined using scintillation radiometry by incubating the cells irradiated with UV rays at a dose of 8 J/m^2 with [^{3}H]-thymidine for two hours (2.5 μCi/ml) in a phosphate buffer (pH 7.2). The results demonstrated that incubating the cells with interferon considerably increases the indexes of the reparative synthesis of DNA, which is greatest when the cells are treated with interferon at a concentration of 10 IU/ml for five days. Apparently, interferon prolongs "interferon-induced memory" in cells. The data suggest that interferon is induced by a novel reparation system which may be involved in processes of interferon-induced memory. This phenomenon may also be associated with stress family proteins that are synthesized in the cell in response to stress factors. Figures 2; references 13: 3 Russian, 10 Western.

Homology of Cloned Cyanobacteria *Synechocystis* 6803 DNA Fragments to Chloroplast and Nuclear DNA of Higher Plants

927C0235D Moscow GENETIKA in Russian Vol 27 No 4, Apr 91 (manuscript received 07 May 90) pp 581-588

[Article by Ye. S. Lysenko, T. A. Gapeyeva, S. Yu. Yermakova, I. V. Yelanskaya, O. A. Ogarkova, and V. A. Tarasov, Moscow State University imeni M. V. Lomonosov; General Genetics Institute imeni N. I. Vavilov, USSR Academy of Sciences, Moscow]

UDC 575.113.1:577.113:582.232

[Abstract] This paper describes the isolation of cyanobacteria *Synechocystis* 6803 DNA fragments transformed to photoautotrophic feeding. Blot-hybridization experiments were performed on isolated cyanobacteria DNA fragments with chloroplast (chlDNA) and nuclear (nDNA) DNA from plants in order to study the possibilities of using cloned cyanobacteria genes to isolate homologous genes from higher plants. Previously obtained PS mutants of cyanobacteria *Synechocystis* 6803 are incapable of photoautotrophic growth and are characterized by impairment of photosynthetic electron transport in photosystem II. A gene bank for wild-type *Synechocystis* 6803 was constructed by cleaving wild-type cyanobacteria with BamHI restrictase. The resulting fragments were cloned at the BamHI site on *E. coli* vector plasmid pACYC184. Subfragments of the fragments in question were found in the three recombinant plasmids p744, p1624, and p31 that hybridize with nDNA of *P. sativum* and *A. thaliana* and a subfragment from recombinant plasmid p1624 that hybridized with both nDNA and chlDNA. The reasons for this phenomenon were explored. Figures 6; references 17: 4 Russian, 13 Western.

Cloning of Dehalogenase fcbA Gene From *Arthrobacter globiformis* and Construction of Hybrid Pathway for Degradation of 4-Chlorobenzoate in *Pseudomonas putida*

927C0235E Moscow GENETIKA in Russian Vol 27 No 4, Apr 91 (manuscript received 28 Sep 90) pp 589-597

[Article by Ye. G. Plotnikova, T. V. Tsoy, V. G. Grishchenkov, G. M. Zaytsev, M. V. Nagayeva, and A. M. Voronin, Biochemistry and Physiology of Microorganisms Institute, USSR Academy of Sciences, Pushchino]

UDC 575.224:579.841.11

[Abstract] This paper presents the results of cloning and analysis of *Arthrobacter globiformis* KZT1 gene expression, which governs the dechlorination of 4-chlorobenzoic acid in *Escherichia coli* and *Pseudomonas putida* cells. A clone library of Sau3A fragments of the total DNA from strain KZT1 was constructed in *E. coli* JM109 cells using multicopy vector pUC19 to produce two recombinant plasmids pCA311 and pCA306, which make it possible for *E. coli* cells to dechlorinate 4-chlorobenzoic acid. The new recombinants were then used to clone the fcbA gene that codes for 4-chlorobenzoate-4-hydroxylase. The details are presented for cloning the fcbA gene in *P. putida* cells and constructing a recombinant pathway for 4-chlorobenzoic acid degradation. The results showed that the effectiveness of fcbA gene expression in *P. putida* is higher than in *E. coli* in spite of the fact that Plac in *P. putida* cells was utilized better in *E. coli* and that the copy rate for the pRK415 vector was lower than that for pUC19. These data may find application in environmental pollution clean-up efforts, since most bacteria dechlorinate polychlorinated biphenyls to only chlorinated benzoic acids. Accordingly, the genes governing the dechlorination of chlorobenzoates in the early stages of metabolism of the latter may be perspective for more complete dechlorination of pollutants. Figures 6; tables 1; references 18: 7 Russian, 11 Western.

Cloning of Locus in Calcium-Dependent *Yersinia pestis* Plasmid That Codes for Outer Membrane Protein Synthesis

927C0235F Moscow GENETIKA in Russian Vol 27 No 4, Apr 91 (manuscript received 05 Jul 90) pp 599-608

[Article by A. A. Filippov, N. A. Vidyayeva, V. V. Kutyrev, P. N. Oleynikov, L. M. Kukleva, and O. A. Protsenko, All-Union Scientific Research Anti-Plague Institute "Mikrob", Saratov]

UDC 576.8:575:616.981.452

[Abstract] The 46 kD gene for synthesizing an outer membrane protein (omp2) for *Yersinia pestis*, which is found in the fifth HindIII-fragment of a calcium-dependent plasmid from strain 358, was cloned in vector pBR322. The resultant hybrid replicons, except for omp2, determined the synthesis of two additional polypeptides of the plague agent with molecular masses of 31 and 28 kD in the minicells of *E. coli*. The level of expression did not depend on the orientation of the insertion. The 31 kD product is apparently an analog of the previously described J outer membrane protein. The physical and functional map of the section of the calcium-dependent plasmid that corresponds to the cloned fragment was determined. It was shown that the gene products in this region govern the fundamental level of *Y. pestis* resistance to phagocytosis by peritoneal macrophages in albino mice *in vitro*. At the same time, these products could not give the plague agent the ability to elicit a lethal infection process. Figures 5; tables 1; references 36: 10 Russian, 26 Western.

Management of Osteoarthrosis Deformans (OD) and Rheumatoid Arthritis (RA) by Laser Reflexotherapy (LR)

927C0032A Moscow SOVETSKAYA MEDITSINA in Russian No 5, May 91 (manuscript received 27 Sep 90) pp 86-88

[Article by A. B. Zborovskiy, A. S. Chernov, B. A. Lempert and N. A. Fofanov, No 1 Chair of Internal Diseases, Volgograd Medical Institute]

UDC 616.71/.72-007.248+616.72-002.77-039]-085.849.19-059:615.281.8:547.283.2

[Abstract] Therapeutic trials were conducted with LR [laser reflexotherapy] in combination with DMSO (dimethyl sulfoxide) in the management of 57 patients with RA [rheumatoid arthritis] and 50 with OD [osteoarthrosis deformans]. Analysis of the laboratoy data and clinical findings demonstrated that the combination was of clinical benefit in both cases, with better therapeutic results obtained in patients with OD. In general, LR exerted an analgesic effect and DMSO attenuated inflammatory manifestations. The optimum therapeutic modalities consisted of a five day course of helium-neon laser irradiation (7 Hz, 70 mW/cm^2) of six to eight acupuncture points for 60 sec, 10-12 procedures a day, in combination with application of 50 percent DMSO + 2.5 mg reopirin [as published] for 30-40 minutes a day to afflicted joints. Tables 3; references 9: Russian.

Experimental Trials With Fibrin-Based Surgical Adhesive

927C0015A Kiev KLINICHESKAYA KHIRURGIA in Russian No 5, May 91 (manuscript received 03 Dec 90) pp 23-26

[Article by Yu. A. Furmanov, K. N. Veremeyenko, Yu. G. Moshkovskiy, A. V. Solomko, A. I. Kizim and I. M. Savitskaya, Kiev Scientific Resarch Institute of Clinical and Experimental Surgery, Ukrainian SSR Ministry of Health]

UDC 616.36-089.001.6

[Abstract] Approximations of surgical resections in outbred male rats were used to assess the clinical efficacy of a Soviet fibrin-based adhesive in comparison with the low-toxicity surgical Sulfacrylate glue. Histologic monitoring of the healing process showed that with the fibrin adhesive complete healing occurred within 30 days with only a narrow scar and no tissue reaction. Healing with Sulfacrylate required 50 days and was complicated by inflammation, foci of necrosis, dystrophic changes and giant cell formation, as well as a thick band of scar tissue. The fibrin-based adhesive was designed as a two-component system. The first of which is represented by fibronogen, coagulation factor XIII, fibronectin, and a protease inhibitor to prevent premature fibrin lysis, and the second by thrombin in 0.44 percent calcium chloride. References 4: 2 Russian, 2 Western.

Advances and Trends in Osteosynthesis in RSFSR

927C0073A Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 12, Dec 90 (manuscript received 12 Jun 90) pp 1-6

[Article by N. V. Kornilov, V. I. Karptsov and G. M. Abeleva, Leningrad Institute of Traumatology and Orthopedics imeni R. R. Vreden]

UDC 616.71-089.84:008(470)

[Abstract] A review is provided of advances and trends in osteosynthesis in the RSFSR, in view of the fact that about 10 percent of the population annually sustains hard tissue trauma. Current emphasis in basic and clinical research is directed at improving quality and supply of implants and refinement of surgical techniques in order to reduce hospital stays and duration of incapacitation. Specialized research objectives include creation of biocompatible and absorbable implants and improved designs that are more compatible with biomechanical requirements. In addition, post-graduate training programs are being enlarged to introduce new developments into clinical practice. Special efforts under way to expand production facilities and alleviate existing shortages. References 4: Russian.

Synthetic Sea Buckthorn Oil 'Ayekol' in Comprehensive Open-Wound Management

927C0073B Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 12, Dec 90 (manuscript received 20 Jun 90) pp 42-46

[Article by E. V. Kostrikova, L. D. Goridova and I. V. Gusak, Kharkov Institute of Orthopedics and Traumatology imeni M. I. Sitenko]

UDC 617-001.4-085.322:582.866]:615.454.142

[Abstract] Clinical trials were conducted with Ayekol, a synthetic analog of sea buckthorn oil, in the treatment of open wounds. The study involved 41 patients, 2.5 to 75 years old, with trophic ulcers, compound fractures, and infected wounds surgical wounds refractory to treatment. Topical Ayekol applications were employed after debridement in conjunction with conventional management modalities. The results demonstrated that Ayekol was as effective as natural sea buckthorn oil in accelerating wound healing, enhancing scar elasticity, attenuation of inflammaton and prevention of keloids. Clinical, cytologic and laboratory monitoring demonstrated that Ayekol was without side effects, except for a burning sensation experienced by two patients which made it necessary to discontinue its use. In general, Ayekol's beneficial effects appear to be due to metabolic activation. Tables 1; references 14: Russian.

Toxin Elimination From Body by Electrochemical Oxidation

927C0074D Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 37 No 2, Mar-Apr 91 (manuscript received 10 Sep 89) pp 74-78

[Article by Yu. B. Vasilyev, V. I. Sergiyenko, V. A. Grinberg and A. K. Martynov, Institute of electrochemistry imeni A. N. Frumkin, USSR Academy of Sciences; Scientific Research Institute of Physicochemical Medicine, RSFSR Ministry of Health, Moscow]

UDC 616-008.6-089.816:[616.36-008.8:541.138]-78

[Abstract] An electrochemical device has been designed to facilitate removal of toxins from the body via its inclusion into femoral arteriovenous shunt. The device, utilizing a platinum electrode as the anode and a nickel cathode electrode, was tested on outbred 6-13 kg dogs with experimental hyperbilirubinemia. The results showed that after two h of operation blood bilirubin was reduced by 50 percent in comparison with control animals. The optimum results with the device were obtained under the following conditions: electrode vibration adjusted to ca. 22 Hz with ca. 2 mm amplitude, 14 mA current, 8.6 mA/cm^2 anodal current density, 54 ml/min perfusion rate, and pretreatment of the animals

with 5 ml/kg heparin (i.v.). There were no contraindicatory side effects with coagulation parameters remaining within the norm. Figures 5; references 19: 14 Russian, 5 Western.

Biochemical Viability Mechanisms of Highly Resistant Animals

927C0097B Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 2, Mar-Apr 91 (manuscript received 14 Jul 89) pp 28-29

[Article by M. F. Timochko, Ya. I. Alekseyevich and Yu. G. Bobkov, Central Scientific Research Laboratory, Lvov Medical Institute; Laboratory of Novel Drug Substances, Center for Biomedical Technology, USSR Ministry of Health, Moscow]

UDC 616.152.21-092:[612.273.2+612.592

[Abstract] Conventional 190 g albino rats were subjected to an "altitude" of 12,000 m in a pressure chamber, on the basis of which they were divided into groups highly (30 percent), moderately (20 percent) and poorly (50 percent) tolerant of extreme environmental factors. Subsequent metabolic and polarographic studies on animals subjected to either -5°C until the rectal temperature dropped to 20°C or to an "altitude" of 6000 m for 90 min revealed significant differences among these groups. The signal differences consisted of the fact that the highly tolerant rats, in distinction to poorly tolerant rats, respond with enhanced catalase and superoxide dismutase activities. The latter enzymes act on peroxides to free oxygen and promote a 36-50b percent increase in tissue pO_2 which becomes available for life-supporting oxidative metabolism. In the moderately and poorly tolerant rats tissue pO_2 diminished by 46-54 percent under the impact of stress. Tables 2; references 9: Russian.

Experimental Trials on Effect of Benzofurocain, Ethaden, and Xanthinol Nicotinate on Reparative Regeneration of Bone

927C0217A Moscow ORTOPEDIYA, TRAVMATOLOGIYA I PROTEZIROVANIYE in Russian No 7, Jul 91 (manuscript received 15 Jan 91) pp 36-38

[Article by V. V. Ornostay and G. I. Stepanyuk, Chair of Pharmacology and Course of Clinical Pharmacology, Vinnitskiy Medical Institute imeni N. I. Pirogov]

UDC 616.71-001.5-085-036.8-07:616:71-003.93

[Abstract] The effect of intramuscular injections of benzofurocain (60 mg/kg), ethaden (20 mg/kg), and xanthinol nicotinate (30 mg/kg) given daily on the reparative regeneration of bone tissue following experimental injury (closed fracture of the diaphysis of the right radius) was investigated in 112 mongrel rats (180-200 g) to assess the perspective use of these preparations in traumatology. The results showed that benzofurocain, ethaden, and xanthinol nicotinate all increased the mechanical strength of the bone throughout the experiment by 36, 24, and 22 percent, respectively, in comparison with the control group. The data also indicated that calcium and phosphorus began working to repair the injury in the experimental groups sooner than in the control group. Benzofurocain was shown to facilitate the formation of compact bone at the fracture site rather than the cartilage and spongy bone that is more prevalent with the other two. Of the three preparations, all of which were shown to activate regenerating processes following bone fractures, benzofurocain was demonstrated to be the most effective, since it begins the reorganization of immature bone tissue of the regenerant into mature lamellar bone tissue earlier than the rest. Accordingly, the findings suggest that benzofurocain will be very perspective in traumatology because of its reparation-stimulating and pain-killing properties. References 14: Russian.

Experimental Investigation of Biomaterials Resistant to Calcinosis and Thrombosis

927C0217 Moscow GRUDNAYA I SERDECHNO-SOSUDISTAYA KHIRURGIYA in Russian No 7, Jul 91 (manuscript received 26 Feb 91) pp 41-44

[Article by S. M. Krasovskaya, L. D. Uzhinova, M. Yu. Andrianova, O. Shotolova, Ya. Lukash, A. A. Prishchenko, M. V. Livantsov, L. A. Smirnova, and V. Fiala, VNTsKh [All-Union Scientific Center for Surgery], USSR Academy of Medical Sciences, Moscow; Moscow State University imeni M. V. Lomonosov; Science Center for Investigation of the Biomechanics of Artificial Circulation, University Medical Faculty, Brno, Czechoslovakia; Macromolecular Compounds Institute, Czechoslovakian Academy of Sciences, Prague]

UDC 615.46.03:617.541-089/.015.4.07

[Abstract] Some biochemical and physico-chemical aspects of inhibiting the calcification of biomaterials by decreasing the porosity of the tissue with N-vinyl pyrrolidone and immobilizing synthetic analogs of natural calcification inhibitors—diphosphonates and an anticoagulant—were investigated using porcine aortal valves and bovine pericardium treated with terrilytin and tanned with glutaric aldehyde. These materials were also modified with various agents and lavsan, which is used for covering bioprosthesis frames. The effect of modified surfaces on blood coagulation system activation was investigated *in vitro* using blood and plasma from goats. *In vivo* experiments involved materials implanted into the ascending aorta and left atrium in adult goats. Results of scanning electron microscopy and photoelectronic spectroscopy suggested that plasma proteins differ in their affinity to surfaces bearing anti-coagulants and diphosphonates. The data clearly demonstrated that

biomaterials modified by the anti-coagulant, diphosphonate, and vinyl pyrrolidone system are not only resistant to calcification, but they also exhibit good hemocompatibility in *in vitro* and *in vivo* experiments. Comprehensive research revealed the optimal conditions for the modification of biotissues and lavsan. In addition, investigation of the aspects of copolymerization of modifying agents following radiation exposure to 1 Mrad and the structure of the macromolecule formed help clarify the mechanism of processes occurring during biotissue modification. The authors believe that further progression in the development of new biomaterials will be associated with detailed study of these processes. Figures 3; tables 2; references 5: 1 Russian, 4 Western.

Use of Immunostimulants Levamisole and Dibasol in Pre-Operation Period To Prevent Acute Post-Operative Pyothorax

927C0217C Moscow GRUDNAYA I SERDECHNO-SOSUDISTAYA KHIRURGIYA in Russian No 7, Jul 91 (manuscript received 20 Dec 90) pp 44-46

[Article by L. V. Uspenskiy, D. V. Belokrinitskiy, Yu. V. Pavlov, N. M. Kudryashova, L. G. Sugova, and Ye. G. Rumyantseva; Faculty Surgical Clinic imeni N. N. Burdenko and Interclinic Immunological Laboratory, Moscow Medical Academy imeni I. M. Sechenov]

UDC 616.25-002.31-085.276.4-039.71

[Abstract] The impact of immunostimulants levamisole and dibasol in small doses on T- and B-cell system immunity indexes was investigated in 20 patients with various suppurative diseases of the lungs and central and peripheral lung cancer with the objective of determining their role in preventing pyothorax subsequent to radical operations. In addition to conventional treatment with drug, aerosol, and vitamin therapy given to the control group, the experimental group also received either levamisole (25 mg per day for seven days) or dibasol (0.02 g per day for seven days) both before and after the operation. The results showed that one patient in the control group developed pyothorax while the experimental group experienced no such complications of the pleural cavity. Analysis of cellular and humoral immunity suggested that these immunostimulants exert a selective effect on various links of the immune response. The results showed that levamisole and dibasol both enhance the phagocytic activity of neutrophils and increase the concentration of circulating immune complexes. Levamisole also increases the index of the bactericidal nature of neutrophils and helps reduce the number of unstable cells, thus enhancing the reserve functions of immunity. Figures 4; references 22: 15 Russian, 7 Western.

Polyacrylamide Immobilization of Hydrogen Bacteria: Gas Exchange in Conventional Gels and Cryogels

927C0003A Moscow MIKROBIOLOGIYA in Russian Vol 60 No 1, Jan-Feb 91 (manuscript received 10 Jan 89) pp 23-27

[Article by O. I. Slabova, D. I. Nikitin, V. I. Lozinskiy, Ye. S. Vaynerman and S. V. Rogozhin, Institutes of Microbiology and of Heteroorganic Compounds imeni A. N. Nesmeyanov, USSR Academy of Sciences, Moscow]

UDC 579.83/84.017.7/8

[Abstract] An analysis was conducted on hydrogen oxygenation by hydrogen-oxidizing bacteria in conventional gel (10 percent) and cryogels (three percent) prepared from polyacrylamide. Studies with Renobacter vacuolatum, Blastobacter viscosus and Methylobacterium organophilum demonstrated that the adaptation period in cryogels required three to four days versus 10-12 days in a conventional gel. Maximum dehydrogenase activity—determined at two weeks—of conventional gels exceeded baseline activity of free cells two-fold, and 3.7- to 4.8-fold in the case of cryogels. Metabolic stability of immobilized cells was two- to three-fold longer than of the free cells, with the immobilized cells retaining full activity for up to three years when stored in a refrigerator. With constant use full activity was retained for two years. In all cases cryogel preparations exceeded the performance characteristics of conventional gels. Improved performance of the cryogel system was attributed to its spongiform consistency which favored gas diffusion and required lower concentrations of toxic reagents during polymerization and immobilization at -10°C. Figures 1; tables 2; references 15: 13 Russian, 2 Western.

Correlation Between Lipid Peroxidation and Bioluminescence of Vibrio Harveyi

927C0003B Moscow MIKROBIOLOGIYA in Russian Vol 60 No 1, Jan-Feb 91 (manuscript received 24 Apr 89) pp 77-83

[Article by L. V. Beriya, A. D. Ismailov and V. S. Danilov, Moscow State University]

UDC 579.843.1.017.7:577.115

[Abstract] An analysis was conducted on the correlation between the rate of lipid peroxidation (LP) and bioluminescence (BL) of Vibrio harveyi MAV 392, in order to determine whether LP serves as a source of the aldehyde substrate for BL. The results demonstrated a positive correlation between these two factors with levels of correlation of 0.9-0.97. Consequently, these findings strongly implicate LP as a source of the "aldehyde factor" underlying bioluminescence in V. harveyi and, thus, controlling the intensity of BL. Figures 6; references 20: 2 Russian, 18 Western.

Screening Bacilli for Plasmin- and Plasminogen Activator-Like Activities

927C0003C Moscow MIKROBIOLOGIYA in Russian Vol 60 No 1, Jan-Feb 91 (manuscript received 25 May 89) pp 93-100

[Article by S. N. Vybornykh, N. S. Landau and N. S. Yegorov, Biological Faculty, Moscow State University]

UDC 579.852.11.017:577.152.34

[Abstract] Screening studies were conducted on 40 cultures of Bacilli for plasmin- and plasminogen activator-type activities as part of a pharmaceutical search for novel sources of therapeutically promising agents. Examination of cultures grown on potato-peptone agar led to the identification of the following isolates as exhibiting high levels of both types of activities: Bacillus macerans PI and B. licheniformis 125. In addition, B. macerans P3 and B. firmus produce plasmin-like proteases, and Bacillus sp. 217P-7-1 and 21P-7-2 yield plasminogen activator-type proteases. Preliminary studies also revealed that in some case these activities are attributable to serine proteases and in others to metalloproteases. Tables 5; references 11: 9 Russian, 2 Western.

Induction of Ethanol-Tolerant Clostridium Thermocellum Mutants

927C0003D Moscow MIKROBIOLOGIYA in Russian Vol 60 No 1, Jan-Feb 91 (manuscript received 25 Jul 89) pp 107-115

[Article by N. A. Chuvilskaya, Ya. Yu. Atakishiyeva and V. K. Akimenko, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino]

UDC 579.852.13.04:575.224

[Abstract] Chemical and physical methods were tested for induction of ethanol-tolerance in Clostridium thermocellum, a cellulolytic bacterium showing promise in ethanol production by direct conversion of plant substrate. Ξ-Irradiation in doses ensuring a 0.01-0.1 percent survival rates was shown to be the optimum approach in generating colonies tolerant of 2.5 percent ethanol, whereas trials with UV light and N-methyl-N-nitro-N-nitrosoguanidine were less successful. Under optimal conditions the resultant mutants produced 6 g/L of ethanol from callulose and cellobiose. Figures 3; tables 3; references 22: 6 Russian, 16 Western.

Spectrofluorometric Quantification of Microorganisms in Natural Samples

927C0003E Moscow MIKROBIOLOGIYA in Russian Vol 60 No 1, Jan-Feb 91 (manuscript received 26 Oct 89) pp 176-183

[Article by M. N. Poglazova, V. A. Kuzhinovskiy and I. N. Mitskevich, Institute of Microbiology, USSR Academy of Sciences, Moscow]

UDC 57.018.3:631.46

[Abstract] A method has been developed for rapid quantification of microorganisms in samples representing various natural substrates (fresh and salt water, soil, marine benthic deposits), based on staining the suspensions with 0.02 percent fluorescamine in pH 9 M borate buffer. The samples were then read in a Hitachi MPF-2 spectrofluorimeter at 475 nm following excitation at 400 nm. As required, the samples were ultrasonicated, filtered, diluted or concentrated prior to staining. A linear cell concentration-fluorescence intensity relationship was obtained in the 10E6 to 10E8 cell/ml range, giving good agreement with direct counting in Goryayev's chamber. In addition to simplicity, spectrofluoremetric determinations require only five to ten min, a four- to five-fold improvement over direct counting. Figures 3; tables 3; references 20: 10 Russian, 10 Western.

Impact 6 MD Plasmid (pYP) of Yersinia Pestis EV76 on Outer Membrane Proteins (YOP) of Y. Pseudotuberculosis YPIII

927C0014A Moscow MOLEKULARNAYA GENETIKA, MIKROBIOLOGIYA I VIRUSOLOGIYA in Russian No 3, Mar 91 (manuscript received 30 Apr 90) pp 16-19

[Article by M. I. Zarenkov and Ye. K. Goncharov, Rostov-on-Don Scientific Resarch Institute Antiplague Institute]

UDC 579.842.23:579.259.5].083.1

[Abstract] Transformation studies were conducted to further define the role of pYP in pathogenetic potential of Yersinia sp. via involvement in YOPs [outer membrane proteins] encoded by 42-47 MD plasmids. Yersinia pseudotuberculosis YPIII was selected as the recipient of the pYP76::Tn10 from Y. pestis EV76-7, since the presence of pYP in Y. pestis is one of the factors that differentiates the latter from Y. pseudotuberculosis. Analysis of the YOP patterns by means of SDS-PAGE demonstrated that pYP-bearing Y. pseudotuberculosis lacked certain YOPs characteristics of the parental, pYP-free, strain. Transformation of Y. pseudotuberculosis with pYP defective in the region bearing the pla gene, which encodes a protease known to degrade YOPs, did not affect YOP patterns on SDS-PAGE. Accordingly, in addition to genetic regulation, presence of virulence proteins (YOPs) in Yersinia sp. is also predicated on the expression of a protease encoded by pYP. Figures 2; tables 1; references 10: 1 Russian, 9 Western.

Preparation and Stability of Drug-Loaded Liposomes

927C0071A Kiev FARMATSEVTYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 91 (manuscript received 22 Feb 91) pp 68-71

[Article by V. I. Chuyeshov, M. Yu. Chernov, S. T. Shebanova, O. K. Hulyevskyy, L. K. Koryazova and Ye. V. Hladukh, Kharkov State Pharmaceutical Institute]

UDC 615.014.6:615.451.234:577.352.2]012

[Abstract] Studies were conducted on the stability of liposomes prepared from egg lecithin and cholesterol (7:1) following lyophilization in the presence of various cryoprotectors. The results demonstrated that liposomes loaded with ^{14}C-starch were stable for 12-15 days at 4°C after reconstitution when either one percent sucrose or one percent starch was employed as the cryoprotector during the 10-13 h sublimation. Similarly, liposomes loaded with ^{125}I-insulin were stable for a similar length of time at 20°C with the use of one percent starch for cryoprotection during sublimation. Stability was inferior when two percent polyvinylpyrrolidone was employed for cryoprotection. Figures 4; tables 1; references 6: 5 Russian, 1 Western.

Creation of "Ukrfarmatsiya" Scientific-Production Combine

927C072A Kiev FARMATSEVTYCHNYY ZHURNAL in Ukrainian No 3, May-Jun 91 p 79

[Article by unattributed author]

[Text] By order No 43 (21 Mar 91) issued by the Minister of Health of the Ukrainian SSR, based on Resolution No 578-r (21 Dec 90) of the Council of Ministers of the Ukrainian SSR concerning changes in the structure and function of the Ministry of Health, the Main Pharmaceutical Administration of the Ministry of Health has been abolished and replaced by the "Ukrfarmatsiya" Scientific-Industrial Combine.

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. Intragastric administration of 500 mg/kg of the drug to 150-170 g outbred male rats resulted in surgical scar formation that, five days postoperatively, 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.

Cresacin: Experimental Hepatocyte Stimulant in Partial Hepatectomy

927C0007E Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 315 No 1, Nov-Dec 90 (manuscript received 27 Mar 90) pp 246-248

[Article by M. M. Rasulov, I. G. Kuznetsov, A. A. Belousov and M. G. Voronkov, corresponding member, USSR Academy of Science, Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences; All-Union Scientific Research and Engineering Institute of the Meat Industry, All-Union Agricultural Academy, Moscow]

UDC 547.245:678.048

[Abstract] Cresacin (tris-(2-hydroxyethyl)ammonium-o-cresoxyacetate), a congener of cresatin, was tested for hepatocyte stimulation in outbred male rats subjected to partial (two-thirds) hepatectomy. After surgery the experimental 150-180 g rats were given two intraperitoneal injections of cresacin (25 mg/kg) 48 h apart. In comparison with intact and operated control animals, cresacin was observed to increase hepatocyte cross-area to 660 μ^2 ($P < 0.01$) and to elevate the total number of mitotic cells to 1.28/1000 ($P < 0.05$) and the mitotic index to 22 ($P < 0.01$). Concomitantly, cresacin treatment attenuated hepatic lipid peroxidation and the rate of mitochondrial respiration. The latter were attributed to the antioxidant function of cresacin and a switch from the hexose to the pentose pathway, the latter favoring RNA synthesis in the regenerating hepatocytes. On balance, cresacin was felt to be of interest as an agent deserving further evaluation vis-a-vis liver regeneration. Figures 1; tables 1; references 7: 5 Russian, 2 Western.

Elevation of Brain Temperature by TRH in Rats

927C0031B Moscow BIOTEKHNOLOGIYA in Russian Vol 1, Jan 91 (manuscript received 06 Aug 90) pp 99-102

[Article by S. A. Chepurnov, N. Ye. Chepurnova, V. Yu. Ionidi, Ye. V. Yefimova, V. M. Polyakov and S. V. Marechek, Chair of Human and Animal Physiology, Moscow State University]

UDC 616.89-085.357+615.357.065

[Abstract] In view of the increasing use of intranasal administration of TRH (thyrotropin releasing hormone) in psychiatry and neurology, albino rats were used to further assess the temperature effects on the brain of TRH administered in this manner. Brain temperature was measured with a RT-20 radiothermoscope following intranasal installation of 400 μg of TRH. A single TRH administration to wakeful rats elicited a brain temperature rise that persisted for two h and reached a maximum increment of 0.5°C (P /h 0.01) at 60 min over baseline brain temperature (36.7-36.8°C). A schedule of three TRH administrations (day one i.p; days two and three intranasally) elicited a maximum rise of 0.25°C ($P < 0.02$) after the third administration with duration attenuated to 1.5 h, presumable due to the onset of tolerance. In kallipsol [as published] anesthetized rats a single intranasal administration of TRH resulted in a maximum elevation of brain temperature by 0.9°C in comparison with baseline temperature in kallipsol-treated rats and a 0.6°C rise in comparison with baseline in wakeful rats. The hyperthermic effects of a TRH analog in which L-proline was replaced by D-proline were less pronounced. Figures 1; references 12: 4 Russian, 8 Western.

Peptide Endotoxins and Hemostatic Disorders in Complicated Pregnancies

927C0043A Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 37 No 3, May-Jun 91 (manuscript received 16 Feb 90) pp 53-54

[Article by E. M. Sultanova, Sh. G. Mukhamediyeva, N. Zh. Sagdiyev, O. A. Klyuyev, A. A. Khadzhimetov, S. N. Sultanov, V. Ye. Avakov and Sh. I. Salikhov, Institute of Bioorganic Chemistry imeni A. S. Sadykov, Uzbek SSR Academy of Sciences; Scientific Research Institute of Obstetrics and Gynecology Uzbek SSR Ministry of Health, Tashkent]

UDC 618.3-06-07:[616.151.5+616.153.96

[Abstract] Peptide fractions obtained by chromatography of plasma derived from patients with complicated pregnancies (nephropathy, eclampsia, infections, etc.) were tested for their impact on ADP-mediate thrombocyte aggregation and thromboelastograms. A 2112 D peptide (amino acid compositin given) was isolated by sequential gel chromatography on Sephadex G25 and Toyo Pearl HW-40 from the plasma of patients with nephropathy and infectious processes. An analogous peptide was not present in control plasma. Laboratory testing implicated this peptide as an etiologic factor in coagulopathic complications in pregnancy. Figures 3; tables 1; references 4: 1 Russian, 3 Western.

Involvement of Noradrenegric Mechanisms in Serotonergic Temperature Regulation

927C0045A Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 43 No 10-11, Nov-Dec 90 (manuscript received 03 Jan 90) pp 898-902p

[Article by R. A. Arutyunyan, L. A. Saakova, Dzh. K. Khachatryan, G. Kh. Saakyan and K. R. Arutyunyan, Institute of Physiology imeni L. A. Orbeli, Armenian SSR Academy of Sciences, Yerevan]

UDC 612.53.58

[Abstract] Adrenergic alpha and beta blockers were employed in rabbit studies to further assess the mechanism of action by which serotonin is involved in body temperature regulation. Intravenous administration of

1.7 mg/kg of serotonin elicited a significant ($P<0.01$) temperature drop in the colon, neck muscles and pinna. In animals pretreated with the beta-blocker propranolol (1.0 mg/kg; i.v.) serotonin-mediated hypothermia was further potentiated. Pretreatment with the alpha-blocker phentolamine (3.26 mg/kg; i.v.) resulted in elevation of colonic and neck muscle temperatures by 0.27 and 0.34°C, respectively, and a decrease in pinnal temperature by 3.17°C. The data were interpreted to indicate involvement of noradrenergic mechanisms in mediating serotonin temperature effects either via inhibition (beta-blocker) or activation (alpha-blocker) of the sympathoadrenal axis. The fall in pinnal temperature due to alpha-blocker administration was attributed to peripheral vasoconstriction. Figures 1; tables 3; references 10: 6 Russian, 4 Western.

Screening for Interferon Inducers

927C0052A Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 2, Mar-Apr 91 (manuscript received 19 Jul 90) pp 70-74

[Article by I. S. Haretskaya, A. V. Davydov, L. V. Korobchenko, T. V. Vorontsova and Ye. I. Boreko, Belorussian Scientific Research Institute of Epidemiology and Microbiology, Belorussian SSR Ministry of Health]

UDC 576.858.095+615.326

[Abstract] Extensive screening studies for interferon inducers were conducted on substance of plant and animal origin and products of organic synthesis. Approximately 50 percent of the substances showing direct antiviral activity also behaved as interferon inducers. However, only 14.3 percent of those that lacked direct antiviral activity behaved as interferon inducers. In addition, products of chemical sysnthesis were found to be more potent interferon inducers than biomolecules. Among the synthetic inducers were N- and O-substituted heterocyclic compounds, heterocyclic compounds with several heteroatoms, ammonium salts, and organophosphorus and organosulfur compounds. Tables 2; references 10: 5 Russian, 5 Western.

Age Factors in Response of Splenic Adrenergic Structures to Laser Radiation in Guinea Pigs

927C0052B Minsk in VYESTSI AKADEMII NAVUK BSSR: SYERYYA BIYALAHICHNYKH NAVUK in Belorussian No 2, Mar-Apr 91 (manuscript received 12 Jul 90) pp 74-78

[Article by O. A. Maneyeva, Institute of Physiology, Belorussian SSR Academy of Sciences]

UDC 611.41:591.88:615.849.19

[Abstract] Histochemical and cytofluorometric studies were conducted on splenic tissues of 140 (young) and 800 g (old) female guinea pigs in order to assess the impact of laser stimulation of lumbosacral acupuncture points on splenic APUD mechanisms vis-a-vis age. The points were irradiated with a helium-neon laser with an output of 25 mW/cm^2 for 30 sec/day for five to ten days. The resultant findings demonstrated that maximum stimulation of norepinephrine fluorescence of vascular and paremchymatous adrenergic termini occurred on day five in both age groups. Intensity was much greater in the younger group of animals, and that of the free termini exceeded that of vascular termini. These observations provide further confirmation for the fact that laser action on the immune response exerts its effects via neuroendocrine mechanisms and demonstrate the greater responsiveness of the younger age group. Figures 3; references 10: 1 Belorussian, 8 Russian, 1 Western.

MAO Correlates of Genetic Predisposition to Audiogenic Epilepsy in Rats

927C0074A Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 37 No 2, Mar-Apr 91 (manuscript received 09 Feb 90) pp 46-48

[Article by D. I. Raygorodskaya, A. Ye. Medvedev, V. Z. Gorkin, I. B. Fedotova and A. F. Semiokhina, Institute of Biological and Medicinal Chemistry, USSR Academy of Sciences; Biological Faculty, Moscow State University, Moscow]

UDC 616.853-092:612.858.76]-092.9-07:616-018.1:576.311.347]-008.931:577.152.143

[Abstract] Krushinskiy-Molodkina (KM) rats were employed in an assessment of MAO [monoamino oxidase] status in relation to their genetic predisposition to audiogenic epilepsy. Baseline determinations on brain mitochondrial fractions revealed that deamination of serotonin and benzylamine in KM rats was characterized by V_{max} values ca. 2.5-fold lower than in Wistar rats. Concomitantly, V_{max} for glucosamine deamination was ca. 2-fold higher than in Wistar rats. During an epileptiform seizure V_{max} values in the brain fraction of KM rats fell 2.5- to 5-fold vis-a-vis-their baseline values, as did the V_{max} values of the hepatic mitochondrial fraction. However, studies on the brain preparations showed a 14-fold increase in V_{max}. These findings provide a clear indication that altered metabolism of biogenic amines is involved in the pathogenetic mechanisms underlying genetic predisposition to audiogenic epilepsy in rats. Tables 2; references 10: Russian.

Selective Inhibition of Bovine Brain MAO by Befol and Moklobemid

27C0074B VOPROSY MEDITSINSKOY KHIMII in Russian Vol 37 No 2, Mar-Apr 91 (manuscript received 18 Jul 89) pp 49-51

[Article by T. A. Moskvitina, Ye. M. Gankina, and A. V. Valdman, Institutes of Biological and Medicinal Chemistry and of Pharmacology, USSR Academy of Medical Sciences, Moscow]

UDC 612.882.1.015.1:577.152.143].014.46:615.214.32

[Abstract] Bovine brain mitochondrial preparations were used in assessing the spectrum of MAO [monoamino oxidase] inhibition displayed by befol (p-chloro-N-(2-morpholinopropyl)benzamide) and moklobemid [as published], agents proposed as potential antidepressives since they are congeners of benzamide. In general, inhibition of MAO activity exhibited the following pattern with inhibitor concentrations ranging from 10E-8 to 10E-5 M: serotonin > dopamine > 2-phenylethylamine. The degree of inhibition was directly related to the concentration of the inhibitor; moderate inhibition (seven percent) of tyramine deamination was seen only with 10E-5M befol. Kinetic plots showed that befol and moklobemid acted as reversible noncompetitive MAO inhibitors. Consequently, both agents may be considered as putative antidepressives since tyramine metabolism is not affected at acceptable pharmacodynamic concentrations. Figures 2; tables 1; references 24: 9 Russian, 15 Western.

Novel Bovine Atrial Peptides: Detection, Identification and Activity

927C0074C Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 37 No 2, Mar-Apr 91 (manuscript received 12 May 89) pp 56-58

[Article by T. V. Popova, R. M. Sraponyan and A. A. Galoyan, Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan]

UDC 612.17.015:577.112].019:599.75

[Abstract] Conventional protein methodology was employed in the isolation and identification of atrial peptides from the bovine heart, resulting in the isolation of several fractions that enhanced coronary blood flow in cats. The acidic peptides showed stability over a pH range of 3.5-8.6 and temperatures varying from 0 to 40°C, migrating toward the anode at pH 8.0 on electrophoresis. Intravenous administration of the 1255-3948 D peptides to cats in doses of 2-20 γ enhanced coronary blood flow for up to three-four h and seemed to stabilize blood pressure. Figures 3; tables 1; references 10: 8 Russian, 2 Western.

Temperature-Dependent Serotonin Effects on Heart Rate in Ground Squirrel Citellus Undulatus

927C0089A Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 27 No 2, Mar-Apr 91 (manuscript received 30 Nov 89) pp 206-210

[Article by D. A. Ignatyev, G. S. Sukhova and V. P. Sukhov, Institute of Biological Physics, USSR Academt of Sciences, Pushchino; Moscow University]

UDC 591.412

[Abstract] Ground squirrels captured in Central Yakutia were used in studies on modulation of heart rate by serotonin in relation to ambient temperature. The experiments entailed intraperitoneal administration of 10, 20 or 30 mg/kg of serotonin when the temperatures ranged from 5 to 20°C. The results demonstrated that at low doses of serotonin and 20°C the net effects consisted of an increase in the heart rate and body temperature. Higher serotonin doses and lower temperatures evoked the reverse physiological response, i.e., a reduction in the heart rate and body temperature. These findings were interpreted to indicate that a temperature-dependence of this type facilitates transition of the animals into and from torpidity. Figures 2; references 21: 10 Russian, 11 Western.

Changes in Thermoregulation, Sleep and Blood Levels of Thyroid Hormones in Ground Squirrel Citellus Parryi in Initial 'Critical' Stage of Hibernation

927C0089B Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 27 No 2, Mar-Apr 91 (manuscript received 25 Jan 90) pp 211-217

[Article by Yu. F. Pastukhov and Z. G. Nevretdinova, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Leningrad, and of Biological Problems of the North, Far Eastern Scientific Center, Magadan, USSR Academy of Sciences]

UDC 612.53:612.812.7:599.322.2+591.543.42

[Abstract] Detailed assessment was conducted on the physiological correlates of the initial critical stages of hibernation in the ground squirrel Citellus parryi, using animals captured in the Magadan Oblast. Studies on the 500-700 g animals showed that in the October-January 123 day period there were 12 wakefulness-hibernation cycles. The mean duration of a cycle in the October-November phase was nine days and in the December-Janary phase 12 days. Furthermore, the energy cost of entering hibernation was, on the average, 163.7 kJ/animal in October-November and 87.1 kJ/animal in December-January. Entering itself consisted of three distinct stages readily correlated with brain temperature (medial preoptic hypothalamus). Stage I (superficial torpidity) consisted of a temperature reduction to 27-30°C, stage II (intermediate torpidity) to 20-23°C, and stage III (deep torpidity) to 2-7°C. In addition, microcyclic variations with a periodicity of ca. 1 h further complicated the entire process and found manifestations in changes in oxygen uptake, muscular activity, release of thyroid hormones and T_3/T_4 ratios, and sleep patterns. On balance, the present observations were in agreement with the generally accepted hypothesis that entering hibernation is accompanied by enhanced slow-wave sleep and diminution in the paradoxical sleep component. The dynamics of the various physiological processes showed

their accomodation to new body temperature set points. Figures 3; tables 1; references 18: 12 Russian, 6 Western.

Serotonin Metabolism in Brains of Rats With Two Forms of Hereditary Hypertension

927C0097A Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA in Russian No 2, Mar-Apr 91 (manuscript received 11 Apr 89) pp 15-16

[Article by A. I. Piyanzin, N. N. Voytenko, Ye. Yu. Kozlachkova, A. L. Markel and N. K. Popova, Laboratory of Phenogenetics of Behavior and Genetic Aspects of Neuroendocrine Regulation, Institute of Cytology and Genetics, Siberian Branch, USSR Academy of Sciences, Novosibirsk]

UDC 616.12-008.331.1-055.5/.7-036.1-07:618.831-008.6:577.175.823]-074

[Abstract] A comparative analysis was conducted on the brain serotonin levels in SH (spontaneously hypertensive) HSIH (hereditary stress-induced hypertensive) and Wistar (normotensive) rats in order to assess serotonergic involvement in blood pressure (BP) regulation. Baseline BPs in SH, HSIH and Wistar rats were 184, 186 and 126 mm Hg, respectively. In comparison with Wistar rats, the most significant differences in HSIH rats consisted of significant serotonin elevation in cerebral cortex and depression in the anterior hypothalamus and medulla oblongata. These changes were related to diminished activity of type A MAO in the cerebral cortex of HSIH rats and enhanced activity in the anterior hypothalamus and medulla oblongata, the latter also showing enhanced activity of tryptophan hydroxylase in HSIH rats. Marked differences between SH and Wistar rats consisted of elevation of serotonin in the midbrain, posterior hypothalamus and the medulla oblongata of SH rats. These observation provide further confirmation on the involvement of different serotonin mechanisms in various types of hereditary hypertension. Figures 1; references 19: 4 Russian, 15 Western.

Neurochemical Modulation of Burst Activity of Isolated Endogenous Oscillators of Snail Brain: Effects of Monoamines and Opioids

927C0098A Kiev NEYROFIZIOLOGIYA in Russian Vol 23 No 4, Jul-Aug 91 (manuscript received 26 Feb 91) pp 472-480

[Article by T. L. Dyakonova, Institute of Developmental Biology imeni N. K. Koltsov, USSR Academy of Sciences, Moscow]

UDC 612.822:612.616-003.725

[Abstract] Analysis of bursting activity of isolated brain neursons of the snail Helix lucorum resulted in identification of three bursting neurons, including one that was plateu-generating. The three neurons behaved as endogenous oscillators exhibiting spontaneous changes in discharge patterns in the isolated state: transitions from inactive to nonbursting regular activity to bursting, and so forth. The pattern of activity could be modulated in vitro by endogenous amines and peptides. Combined application of dopamine and enkephalin induced bursting activity, whereas dopamine alone suppressed it. These observations suggest that slow oscillatory activity and bursting of specialized neuron in the snail brain are modulated by identical neurochemical factors acting directly on the neuronal somatic membranes. Presumably, then, such mechanisms account for modulation of rhythmic functions by monoamines. Figures 6; references 19: 5 Russian, 14 Western.

Hemispheric Asymmetry of Norepinephrine and Serotonin in Rat Brain: Influence of Learning and Exogenous Peptides

927C0099A Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I.P. PAVLOV in Russian Vol 41 No 2, Mar-Apr 91 (manuscript received 10 Oct 90; in final form 31 Oct 90) pp 359-363

[Article by R. I. Kruglikov, N. V. Orlova and V. M. Getsova, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow]

UDC 615.78+612.821.6

[Abstract] Hemispheric asymmetry of norepinephrine (NE) and serotonin (ST) in oubred, 15-180 g male rats was assessed in relation to elaboration of a conditioned two-way avoidance response (TWAR) and intraperitoneal administration of des-gly-arg-vasopressin (I), $ACTH_{4-7}$pro-gly-pro (II), or dalargin (III). Control results showed that NE levels in the right cerebral cortex (RCC) significantly ($P < 0.05$) exceeded levels in the left cerebral cortex (LCC) in the absence of any other lateral asymmetry. In animals displaying TWAR, RCC and LCC NE levels increased to an equivalent level with disappearance of lateral asymmetry. The new NE concentration in LCC significantly ($P > 0.05$) exceeded baseline LCC NE levels. ST did not display lateral asymmetry and was not affected by TWAR. Administration of 5-10 μg/animal of I, II, or III had no effect on ST concentrations but led to a general reduction in NE levels and disappearance of interhemispheric differences. These findings demonstrate that involvement of I, II, and III in the acquisition of a conditioned response is mediated via NE mechanisms. Tables 1; references 12: 8 Russian, 4 Western.

Rural Perinatal Mortality Patterns

927C0100A Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 5, May 91 (manuscript received 09 Oct 90) pp 47-48

[Article by D. G. Rozin, Z. A. Turakulov and A. N. Shmagin, Andizhan Medical Institute; Children's Fund imeni V. I. Lenin]

UDC 616-058.1-036.88(575.13)

[Abstract] Analysis of perinatal mortality patterns in the Fergana Valley for 1980-1989 revealed marked functuation from year to year. Mortality was high in 1980-1981, significantly lower in 1982-1983, and again began to increase in 1984. In 1989 perinatal mortality reached the levels reported in the early 1980's. In general, the highest incidence of stillbirths occurred in April and neonatal mortality in May. Women engaged in various stages of cotton culture accounted for 47.7 percent of those whose pregnancies were complicated by perinatal mortality. Levels of hexachlorocyclohexane in the placentas of such women approached 0.3 mg/kg. These findings indicate that work related to cotton growing and harvesting constitutes an avoidable health risk for pregnant women.

Reactive Alterations in Adrenergic Innervation of Cerebral Arteries When Cholinergic Mechanisms Activated

927C0217D Leningrad ARKHIV ANATOMII, GISTOLOGII I EMBRIOLOGII in Russian Vol 100 No 4, Apr 91 (manuscript received 29 Jun 89) pp 24-29

[Article by A. P. Pugovkin and S. G. Lazarev, Chair of Normal Physiology, First Medical Institute imeni Academician I. P. Pavlov and Scientific Research Institute of Army Medicine, Moscow Oblast, Leningrad]

UDC 616.133.33-018.86-02:615.844.032.81

[Abstract] The reaction of the adrenergic nerve apparatus of cerebral arteries to prolonged pharmacologic activation of cerebral cholinergic mechanisms was investigated in 24 adult cats administered 600 μg/kg of phosphacol (paraoxon) intramuscularly. A clinical pattern of moderate poisoning developed 30-45 min later and included hypersalivation, bronchospasms, and fasciculation. The symptoms lasted for three to five hours. Visual examination of the brain revealed plethora of the main veins. The preparations were treated with glyoxylic acid to identify differences in the density of adrenergic innervation of various large arteries and revealed that the distribution of vessels was denser in the experimental animals. Data obtained in this and other experiments suggest that activation of adrenergic mechanisms may be viewed as a compensatory process, the probable outcome of which is enhancement of constricting adrenergic effects on main arteries and arteries of the pia mater. In addition, the findings revealed the high morphofunctional plasticity of the efferent nerve apparatus of cerebral vessels and the presence in it of adrenergic plexi. Moreover, when phosphacol is administered, the activation of an additional number of nerve elements is always accompanied by an increase in the concentration of the mediator in it. In conclusion, phosphacol is a highly toxic organophosphoric compound that is widely used in clinics as well as a number of branches of the economy. These changes in innervation reflect the total activation of adrenergic mechanisms and should be considered when developing methods of pharmacological correction of impairments in the CNS [central nervous system] function during the post-intoxication period. Figures 2; tables 1; references 21: 12 Russian, 9 Western.

Cancer Epidemiology in Kyrgyzstan

927C0218A Bishkek ZDRAVOOKHRANENIYE KYRGYZSTANA in Russian No 3, May-Jun 91 pp 6-7

[Article by Z. P. Kamarli and I. D. Dzhumaliyev, Kyrgyz Scientific Research Institute of Oncology and Radiology]

[Abstract] Cancer morbidity is low in Kyrgyzstan when compared with the USSR as a whole. Thorough analysis of cancer morbidity data was employed to reveal differences in the frequencies of cancer by geographic location, climatic zone, and ethnic group. The highest mortality rate was found in Chuyskaya Dolina, which is in the northern part of the republic and is inhabited mainly by Russians and Ukrainians. Oshsk Oblast had one of the lowest mortality rates. It is in the southern part of the republic and is inhabited by primarily native people. Narynskaya zone is a high-altitude area inhabited chiefly by native stockbreeders. Its extremely low morbidity rate is attributed in part to the high altitude, which has been shown to have a negative impact on the development of malignant tumors. In addition, the results also showed the following: Cancer morbidity is higher in men than in women and two-fold more common in urban than in rural areas. Skin cancer is 10-12 times more common in Russians and Ukrainians than in the native population. Breast cancer is two- to three-fold more common in urban women than in their rural counterparts and five- to six-fold more common in Russians and Ukrainians than in native inhabitants. Tables 2.

Syringes in Short Supply

927C0249A Moscow IZVESTIYA in Russian 23 Nov 91 Union ed. p 4

[Article by E. Andzelevich, under the title: "The Needle Has Been Lost in the Haystack of the Departments"]

[Text] Multi-use needles, designated for special insulin syringes, have disappeared from sale in Cheboksary. Reader Yu. Razumov reports this information. There have always been enough needles, but now they are obtained with difficulty even on prescription. Cheboksary, alas, is no exception. I was told at the All-Union

Association on Sale, Installation and Repair of Medical Equipment [Soyuzmedtekhnika] that not one insulin needle has come to them in the last two years from the Tyumen Medical Equipment Plant, the principal supplier of this product to the country. Appeals to various authorities have thus yielded nothing.

The plant in Tyumen, it must be said, has "bounced around" the ministries. It used to belong to the Ministry of the Medical Industry [Minmedprom]; then to the Ministry of Instrument Engineering, Automation Facilities, and Control Systems [Minpribor]; and after routine reorganization, to the Ministry of General Machine-Building [Minmobshchemash]. The organizers of this reorganization [perestroika] naturally had hoped for the best, but...

In the words of the Deputy Director of the Ministry of General Machine-Building, V. Zhukov, no one is helping to straighten out production either at the Tyumen or other plants. True, it is hoped that the decrease in the production of multi-use insulin needles will be made up by the production of similar needles for one-time use.

The multi-use needles are more popular among patients; they are used many years, by simply exchanging the dulled needles after a month. Then why has production of such needles declined?

Now the plants themselves are determining what they are to produce and in what quantity, and if in 1987 17.8 million insulin needles were produced in Tyumen, this year only 11.5 million were planned. They were sent to Klin to a plant producing syringes for the making up of sets (two needles per set). The Director of the Tyumen plant, G. Toropov, explains that such respecialization had been called for, even when their enterprise was under the jurisdiction of the Ministry of Instrument Engineering, Automation Facilities, and Control Systems. They in fact prefer to carry out its decision, and it is impossible to increase the production of multi-use and disposable needles at the same time; there is not enough space, equipment, etc.

We are again in bondage to extremity. Previously disposable syringes were in acute short supply; now it turns it out that they are being pushed where they are inappropriate. Our Cheboksary author did not pose the question for nothing. What is this? Is every patient supposed to store up 365 disposable packages and store all of this at home? They have been using a single set for five years now and are hoping it stays in good condition for the future. True, disposable syringes are also needed for diabetics; they will be what is needed if they leave home for several days, but to buy a new set every month because of two needles, you will agree, is unprofitable, and the shortage of disposable syringes will only get worse in the bargain.

So far Yu. Razumov is sharpening the dulled insulin needles on a whetstone himself. Of course, this is not as good as factory polishing; the face of the needle will be rough; it is more difficult to sterilize and the puncture is more painful. However, on the other hand, the patient can be sure that he will not pick up AIDS because in the polyclinic, if he has to go there now, there are still not enough disposable syringes for insulin.

In his time a highly-placed representative of the Union Ministry of Health [Minzdrav] came out in favor in our newspaper of not using disposable syringes just in diabetes mellitus "with AIDS in the background". At the same time the patients must be aware of their own responsibility for the quality of sterilization. Moreover, the sterilization of individual syringes can be organized in the same polyclinics.

Perhaps the problem of insulin needles is not of paramount importance at a time when the drugstores do not even have headache tablets? I do not think that is the case. After all there are plenty of diabetics. However, the main thing is the fact that the indifference of officials concerned with the health of the population is retold in this history for the umpteenth time. It turns out that Deputy Director of the Administration of Specialized Medical Assistance of USSR Ministry of Health, G. Volokin, did not even know of the existence of the insulin needle problem until called by the editorial staff.

V. Zhukov recounted that despite their objections G. Agliyev, in his day in the union government, insisted on a reduction in the production of needles which are convenient for patients. The result is that there is still not enough of the one, and the other has already disappeared. It would be necessary to have a coordinating center in the organs responsible for the health of the population, which would be required to be aware of the demand for pharmaceuticals and other materia medica, to be aware of the outlook, and to have an influence on production. Is it not too precipitous, as we carry out a campaign for the sharp reduction of the administrative apparatus, that we refuse to create the necessary new structures?

Also, if we are talking about taking speedy measures, is the Ministry of General Machine-Building, which has survived recent days, up to the task of undertaking them? A Union of Medical Instruments is being created, which the Tyumen plant and other enterprises like it have already joined. I believe that the time of moaning and groaning and wringing of hands is at an end. Russia has its own government at last; may it not consider this problem a trivial or third-rate one for itself.

Corporation Chairman Urges Investment in Pharmaceutical Industry

927C0249C Moscow NEZAVISIMAYA GAZETA in Russian 28 Dec 91 p 6

[Article by Natalya Gorodetskaya, under the title: "A Pharmaceutical Hunger in the Country"; "Chairman of 'Farmindustriya' Corporation Urges Investment in Domestic Industry"; under the rubric: "Medicine"]

[Text] More than 2 billion foreign currency equivalent rubles had been targeted for pharmaceutical purchases for the present year by the USSR Ministry of Health [Minzdrav SSSR]. The medical industry, on the other hand, has received 10 times less for the purchase of raw materials, and at the same time it was able to increase production by 2.5 percent.

As early as July the Chairman of the Corporation for the Production of Pharmaceuticals and Materia Medica, Vladimir Markalyants, appealed to President Mikhail Gorbachev in a letter in which he warned him of a catastrophic situation involving pharmaceuticals and recommended a plan for the reconstruction of the medical industry. Prime Minister Pavlov was charged with the mission of analyzing the situation and taking measures, but Pavlov, as it has become clear, had other plans.

The corporation was created as a Union organization, and its enterprises were located in 14 republics. It is now necessary to create a new structure. The assets of Russia (including Moscow and Petersburg) will be supplied on a priority basis; pharmaceuticals will be sold in the other republics in accordance with agreements within the limits of quotas.

The appropriate documents have been sent to the presidents of all the republics, to the cabinet of ministers, and to the administration [apparat] of the President of Russia. A program of development of the medical industry is now being developed in the Russian government. Potential must be tripled in order to supply the country with pharmaceuticals. Based on the past year's prices, along with expenditures on the development of the related industries of the national economy, 50 billion rubles will be required for this. One billion 250 million rubles was allocated in the past five-year plan for the development of the domestic industry. So that it can readily be calculated how many years it will take us to supply pharmaceuticals by ourselves, if, of course, the government does not change its approach to the needs of the medical industry.

So far the prices for pharmaceuticals in the drugstores are relatively low, despite the significant increase in the cost of their production. The difference between the wholesale and retail prices is being paid by the state out of the state budget [gosbyudzhet].

We are embarking on market relationships, in the opinion of Markarlyants, without knowing how to sell or buy. The corporation proposes that contracts be concluded not for the purchase of pharmaceuticals, but for raw materials, where the technology exists, and in addition, that agreements be worked out for the delivery of equipment for the same monies. Based on the calculations of specialists, this will make it possible to buy 10-15 times more ready-made pharmaceuticals and to improve the quality of preparations and to increase the volume of preparations of an especially important group by 25-30 percent in the following year.

Private Development Fund Started for Medical Industry

927C0261A Moscow KOMSOMOLSKAYA PRAVDA in Russian 19 Dec 91 p 1

[Article by O. Chegodayeva, under the title: "It Is Not Given to Everyone to Taste the Bitter Pill"; under the rubric: "INVESTIGATION OF THE 'CP'"]

[Text] Today a package of analgesic tablets costs 10 rubles, one ampoule of promedol 200 rubles, validol is offered at eight rubles apiece at the Cheremushkinskiy market. They say you can get it cheaper at the hospitals.

For various reasons, of more than three thousand scheduled pharmaceuticals, we are failing to produce almost half, and about about a thousand are being produced at 20-80 percent of the need. For example, 50 percent of the need for analgesics is being met. Given such a shortage and the kopeck prices, all pharmaceuticals are bought up in an instant. Today the pharmacies are operating at a loss: the amount of state subsidies for pharmaceuticals was 7 billion rubles in 1991. That is the idea; they are letting prices go. How much will analgin cost? It is a simple question, but it is not so simple to answer it. According to some forecasts, prices will rise four-fold; according to others, they are not subject to determination since the expenditures for raw material are not determined. Clearly it will not be possible next year to get by without state subsidies. According to preliminary calculations of "Rosfarmatsiya", this will shape up into an extremely large sum. How much money will be allocated in actuality the Russian government will decide by the end of December; what do the producers of pharmaceuticals think about all this?

Prescription I: be born 10 years later

The "Farmindustriya" concern, which combines 80 percent of the enterprises of the sector, has come forward with the idea of creating a Medical Industry Development Fund. Since they do not expect help from the state, the workers of the pharmaceutical industry have donated one day's pay to set up the fund. An appeal which stated, "We are convinced that there is no other way to create a powerful domestic pharmaceutical industry at an accelerated pace, one which will be capable over the course of the next 10 years of meeting the need for highly effective pharmaceuticals" was accepted by the co-founders. Today the state is not in a position to manage such tasks in a short time frame. It is necessary to involve in their solution the capacities of all citizens in order to make this a national endeavor.

It was decided to establish the Medical Industry Development Fund as an extra-governmental, self-administered, self-being structure. The staff of the administration will be minimal. Any citizen, enterprise, or organization may become members of it. The assets will go only toward one purpose, the development of the pharmaceutical industry.

Recently the new fund was a month old, and as I was going over to the "Farmindustriya", I set myself the task of finding out how this seemingly fruitful idea was developing. I also had a converstaion with the President of the Corporation, V. Markaryants, regarding the near future.

Many many people have been supporting the idea. There have already been donations from collectives and from private individuals. Many foreign entrepeneurs have shown a business-like interest. It can be said that the result has exceeded expectations so that there will be a financial base for the reform of the industry, but money alone will not solve everything.

The main cause of the shortage is the undeveloped state of the pharmaceutical industry. This is not surprising: our country has invested resources in the pharmaceutical industry of Poland, Bulgaria, Hungary for many years, and now they are selling us pharmaceuticals for freely convertible currency [SKV]. Poland alone delivers 400 million dollars worth of pharmaceuticals annually. Such a sum would be enough to build a super-modern plant.

But even today's industry could produce more pharmaceuticals; the capacities exist for this. The most acute and painful problem is the shortage of raw materials. Some import lines for the production of pharmaceuticals have come to a halt due to the lack of raw materials. The shortage of raw materials has been aggravated by the delimitation of the republics and the falling apart of the Union, and if the producers of pharmaceuticals cannot operate in a unified economic space and cannot find a common language, the losses are unpredictable. At the present time agreements have not been signed, and the question of raw materials has not been resolved.

Of course, there is always the hope of common sense. After all, no one will be the winner. In addition, the producers of pharmaceuticals do intend to take concrete actions.

The "Farmindustriya" House of Trade will open 1 January. This will be an organization fulfilling the role of intermediary between the consumers of medications, their producers and developers. It is proposed that the first auctions be held in January. Raw materials for pharmaceuticals, pharmaceuticals themselves, medical equipment, and modern technology will be the articles for purchase and sale.

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Backround Γ-Radioactivity and Seed Production by Plantago Lanceolata

927C0063A Moscow RADIOBIOLOGIYA in Russian Vol 31 No 2, Mar-Apr 91 (manuscript received 03 May 90) pp 167-170

[Article by N. P. Frolova, O. N. Popova and A. I. Taskayev, Institute of Biology, Komi scientific Center, UrO, USSR Academy of Sciences, Syktykar]

UDC 577.391.58.039.1

[Abstract] Fertility of Plantago lanceolate was monitored in the 30 km zone of the Chernobyl Nuclear Power Plant—four years after the explosion—at two sites differing in backround levels of γ-radioactivity. The results showed that in the "clean" area with low-level radiation (3-14 pA/kg) 40-50 percent of the runners were sterile. In the "hot" area (60-1434 pA/kg) 60 to 80 percent of the runners were sterile. Concomitantly, seed production in these two areas was 260-396 and 38-71 mg/plant, respectively. These observations provide unequivocal evidence of the adverse effects of long-term γ-irradiation on plant reproductive potential. Figures 1; tables 1; references 4: 3 Russian, 1 Western.

Gametocidal Effects as Indicator of Radioactive Pollution

927C0063B Moscow RADIOBIOLOGIYA in Russian Vol 31 No 2, Mar-Apr 91 (manuscript received 18 Jun 90) pp 171-174

[Article by O. N. Popova, A. I. Taskayeva and N. P. Frolova, Institute of Biology, Komi Scientific Center, UrO, USSR Academy of Sciences, Suktykar]

UDC 577.391.58.039.1

[Abstract] In view of the high susceptibility of pollen fertility to ionizing radiation, the degree of pollen sterility has been proposed as an indicator of radiation exposure. In the present study, violet (Viola matutina) was selected in assesment of backround radiation in the 30 km Chernobyl zone because of its widespread presence in Ukraine. The studies on pollen sterility were conducted in 1987 and 1988 in high- and low-γ-backround. In 1987 the low- and high-backround areas were characterized by respective levels of 0.04 and 15-20 mR/h; in 1988 the corresponding backround were 0.02 and 8-10 mR/h. The analysis revealed that in 1987 in the low- and high-radiation areas pollen sterility was 26 and 40 percent, respectively, with corresponding figures of 17.6 and 41.3 percent in 1988. Single-factor dispersion analysis and assessment of the percentage of anthers with sterile pollen in the various violet populations confirmed the fact that backround radiation was responsible for the differences in pollen sterility. Figures 1; tables 2; references 4: Russian.

Biotic Effects of Low-Dose Nuclear Radiation

927C0063C Moscow RADIOBIOLOGIYA in Russian Vol 31 No 2, Mar-Apr 91 (manuscript received 19 Mar 90) pp 175-179

[Article by A. M. Kuzin, Institute of Biological Physics, USSR Academy of Sciences, Pushchino]

UDC 577.391.582.26

[Abstract] A brief review is presented on the concept of natural backround ionizing radiation and the concept of low-dose radiation. Basically, studies over the last two decades (1965-1986) have shown that natural ionizing radiation exerts a beneficial physiological effect on living systems necessary for normal biotic growth and development. Low-dose radiation has been shown to stimulate growth and development, enhance longevity, fertility and immunity. Higher levels of radiation have adverse effects in proportion to dose. In general, for the majority of living systems, low-dose corresponds to a dose two orders of magnitude smaller than the LD_{50} dose, and can be discerned at doses that exceed the natural radiation backround by two- to three-orders of magnitude. Tables 2; references 14: 8 Russian, 6 Western.

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