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LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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USSR REPORT
LIFE SCIENCES
BIOMEDICAL AND BEHAVIORAL SCIENCES

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AGROTECHNOLOGY

UDC 665.11.002.68.099.2

WASTE-FREE OIL MILLING

Moscow MASLO-ZHIROVAYA PROMYSHLENNOST in Russian No 4, Apr 86 pp 27-28

[Article by V.I. Mosiyashchenko and A.A. Babicheva, Rostov Branch, Gipropishcheprom-3 [State Planning Institute for the Design of Food Industry Installations]]

[Abstract] Cursory details are provided for mixing and granulation technology for the production of feed based on sunflower seed shells and oil byproducts from sunflower oil milling. The nutritional value of such granulated products has been assigned a rating of 0.3-0.4 feed units, indicating that 3 kg of the granular product is equivalent to 1 kg of grain feed. Plants for the production of the granular feed have been constructed in UST-Kamenogorsk and Kerch, with respective capacities of ten and 5.17 thousand tons, and payback periods of 2.1 and 2.9 years. Figures 1.

12172/9835

CSO: 1840/2296

UDC 636:595.7.004.1

DEVELOPMENT OF SCIENTIFIC BASIS FOR LOW-WASTE ANIMAL HUSBANDRY BIOTECHNOLOGY

Moscow BIOLOGICHESKIYE NAUKI in Russian No 12, Dec 85
(manuscript received 28 Mar 85) pp 53-54

[Article by I.I. Gudilin, Novosibirsk Agricultural Institute]

[Abstract] A process has been developed for the biotransformation of manure into feed protein and (bio)humus, using domestic fly larvae. In the case of swine manure the essential features of the process consist of feeding the larvae on the manure for 5-6 days, during which time the larval biomass increases 300- to 320-fold. A method has been developed for processing the biomass into a meal, containing 43-45% digestible protein, 14-15% fat, ca. 3% nitrogen-free extractable substances rich in amino acids

(particularly methionine and cystine). The meal has been found effective in ensuring weight gain in pigs, chicks and fish. Concomitantly, the manure is transformed in biohumus which, when enriched with peat, form an effective fertilizer for wheat and corn. Under normal conditions 2-3 years are required for the transformation of the manure into humus. As a result of the successful use of the domestic fly in agricultural biotechnology, methods have been developed for large-scale fly culture.

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CSO: 1840/2298

UDC 633.51:631.82

EFFECTS OF ZINC ON CIRCADIAN RHYTHM IN METABOLIC ACTIVITY OF ROOT SYSTEM
OF FINE-FIBER COTTON IN RELATION TO MINERAL NUTRIENTS

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH
NAUK in Russian No 1, Jan-Feb 86 (manuscript received 30 Mar 84) pp 3-12

[Article by V.A. Shchitayeva, D. Agakishiyev, L.S. Aksanenko-Kostyak and
O. Akmamedova, Institute of Botany, Turkmen SSR Academy of Sciences]

[Abstract] The seeds of fine-fiber cotton 9647-I were treated with 0.5% zinc sulfate solution (500 ml/kg of seeds) prior to planting to evaluate the effects of such pretreatment on the metabolism of cotton in relation to fertilization. Depending on the stage of development, zinc had variable effects on the uptake of mineral nutrients and the synthesis of amino acids. With normal level of fertilization ($N_{200}P_{100}$) the harvest increased by 12.02 centners/ha, and with increased fertilizer dosage ($N_{300}P_{200}$) by 4.6 centners/ha. With optimal fertilizer dosage ($N_{200}P_{100}$) the harvests, the, were essentially equivalent to that obtained with increased fertilizer use, indicating that on an overall basis zinc pretreatment of the seeds increased the efficiency of mineral nutrient utilization two-fold. References 23: 22 Russian, 1 Western.

12172/9835
CSO: 1840/2300

DISTRIBUTION OF MICROBIAL ANTAGONISTS AGAINST AGENTS OF FUSARIAL WILT AND BLACK ROOT ROT OF COTTON IN TURKMEN SOILS

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 86 (manuscript received 7 Aug 84) pp 12-18

[Article by O.S. Lyubetskaya, E.I. Gorina and Kh.N. Orazov, Institute of Botany, Turkmen SSR Academy of Sciences]

[Abstract] Bacteria and actinomycetes were isolated from the soil in the vicinity of cotton and lucerne roots for assessment for antagonistic activity against black root rot (*Thielaviopsis basicola*) and fusarial wilt (*Fusarium oxysporum* f. *vasinfectum*) agents. Of the 633 isolates of nonsporogenous bacteria, 217 (32.7%) of the isolates were active against *T. basicola*, and 184 (27.7%) against fusarial rot. Sporogenous bacteria showed greater antagonistic activity, with 165 (60.0%) of the 271 isolates active against black root rot and 93 (34.3%) against *F. oxysporum*. The 208 actinomycete isolates yielded 29 (13.9%) isolates effective against *T. basicola*, and 25 (12%) isolates against *F. oxysporum*. Actinomycetes antagonistic against *F. oxysporum* were generally isolated from old oasis soils, and against *T. basicola* from light serozem and old oasis meadows. Bacterial isolates with antagonistic activity against both agents were generally equally well represented among all types of soil in Turkmenistan. References 8 (Russian).

12172/9835

CSO: 1840/2300

PREDICTION OF MASSIVE REPRODUCTION OF THE CUTWORM MOTH SPODOPTERA EXIGNA (LAPHYGMIA EXIGNA) IN TURKMENISTAN

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 86 (manuscript received 28 Mar 84) pp 25-28

[Article by M. Kurdov, Turkmen Republic Experimental Station for Plant Protection]

[Abstract] An analysis was conducted on the climatic factors in Turkmenistan favoring massive reproduction of the cutworm moth, a pest on cotton and other fields. A series of studies between 1957 and 1972 demonstrated that the population density of the cutworm moth is highly dependent on the climatic conditions in winter and spring. A cold winter and high precipitation favor the development of the moth. The cold temperatures reduce the metabolic rate of the pupae to a minimum, while heavy rains favor the development of weeds and wild plants that serve as a food supply for the caterpillars and moths. Thus, low temperatures on the order of 1°C or below

in January and February in combination with a rainfall 1.2- to 2.0-fold higher than normal in the winter-spring period favor massive reproduction and infestation. The population density of the cutworm moths in such situations greatly exceeds that of their natural enemies, with the result that extensive crop losses may be expected. References 5 (Russian).

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CSO: 1840/2300

UDC 632.954.581.192

EFFECTS OF CHLORMEQUAT CHLORIDE ON ACTIVITIES OF ENDOGENOUS COTTON COMPOUNDS

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 1, Jan-Feb 86 (manuscript received 28 Feb 83) pp 61-64

[Article by N.A. Palvanova and D.A. Agakishev, Institute of Botany, Turkmen SSR Academy of Sciences]

[Abstract] Chromatographic analyses were conducted on various endogenous compounds in cotton plants 15-20 days after the leaves were sprayed with a 0.1% preparation of the plant growth regulator chlormequat chloride. A series of endogenous factors with Rf values ranging from 0.34 to 0.95 in the selected experimental system were found to be responsive to chlormequat chloride, showing both stimulatory and inhibitory activity in the wheat coleoptile test. In general, the effects of chlormequat chloride were to enhance stimulatory activity in the root system and inhibitory activity in the above-ground components (primarily the leaves). As a result, the dry weight of cotton roots increased by some 30% with 40% soil moisture content. Figures 4; references 8 (Russian).

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CSO: 1840/2300

UDC 631.82:551.515

PLANT FROST-RESISTANCE, CLIMATE AND MINERAL NUTRIENTS

Moscow AGROKHIMIYA in Russian No 5, May 86 pp 108-115

[Article by N.M. Karmanenko]

[Abstract] A brief review is presented of the literature dealing with frost-resistance of plants in relation to climatic conditions and mineral nutrition. The process of adaptation resulting in winter hardiness is seen to reflect a series of metabolic changes involving proteins, carbohydrates and lipids, changes in uptake and utilization of phosphorus, restructuring of energy metabolism, changes in the viscosity of the protoplasm and in cell wall permeability. Air and soil temperatures constitute an

important factor in hardiness and survival, as well as the moisture content of the soil and the presence of a snow cover. The effects on the root system are to regulate uptake of mineral nutrients, with the phosphorus concentration and the phosphorus-potassium ratio constituting a particularly important factor in plant survival. Consequently, plant hardiness and productivity are highly dependent on the quality of mineral fertilizers employed, assuming appropriate ratios of nitrogen to minerals. Additionally, growth retardants have also been shown to exert a favorable influence on hardiness by promoting nutrient storage and anabolic processes. More recently, the rational use of a variety of cryoprotectors has come to be advocated as a means of enhancing winter hardiness. References 93: 1 Hungarian, 70 Russian, 22 Western.

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CSO: 1840/2305

UDC 581.192.7

PLANT GROWTH REGULATORS WITH RETARDANT PROPERTIES

Moscow AGROKHIMIYA in Russian No 5, May 86 pp 116-133

[Article by A.M. Reynbold]

[Abstract] A review is provided of the current literature dealing with a selected category of plant growth regulators with retardant properties. These agents retard plant growth with concomitant enhancement of photosynthesis, resulting in dwarf varieties that are often characterized by higher productivity and agricultural harvests. The retardants selected for discussion of their chemical characteristics, metabolic effect and susceptible crops included the quaternary ammonium salts, phosphonium and sulfonium salts, and hydrazine derivatives. Although many of the individual mechanisms of action through which such agents act have remained enigmatic, it has become apparent that in general they all function as antagonists of gibberellins. References 165: 2 Bulgarian, 2 Hungarian, 28 Russian, 133 Western.

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INFECTION OF BARLEY PROTOPLASTS WITH BARLEY STRIPE MOSAIC VIRUS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 86
(manuscript received 12 Oct 84) pp 18-22

[Article by T.I. Muzarok, S.I. Malyshenko, N.M. Natsvlishvili,
Yu.N. Zhuravlev and V.N. Kagramanov, Chair of Virology, Moscow State
University imeni M.V. Lomonosov]

[Abstract] An evaluation was conducted on the optimal experimental conditions for the infection of barley protoplasts with barley stripe mosaic virus (BSMV), using essentially the approach of Chin Ben-Sin and Tien Po [J. Gen. Virol., 58: 323, 1982]. The optimal conditions were determined to be as follows: 0.02 M potassium phosphocitrate buffer, pH 4.7, containing 0.1 M mannitol and 0.1 M sucrose, 5 µg/ml poly-L-ornithine, 10 µg/ml BSMV, 2×10^6 protoplasts/ml, and an incubation temperature of 24-25°C with 10 min incubation. Following infection the protoplasts were washed with 50 mM CaCl₂ solution. Maximum concentrations of virus were seen after 24 h; thereafter the concentration of viral particles in the protoplasts decreased, presumably due to protoplast degradation and release of viruses into the medium. Figures 5; references 15 (Western).

12172/9835
CSO: 1840/2308

UDC 631.584+631.45

EFFECTS OF INTERMEDIATE CROPS ON BIOLOGICAL ACTIVITY OF SOIL AND MOBILIZATION OF NUTRIENT ELEMENTS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 86
(manuscript received 24 Apr 84) pp 101-104

[Article by F.I. Levin and S.M. Belozarov, Chair of General Soil Science,
Moscow State University imeni M.V. Lomonosov]

[Abstract] Limed dernovo-podzolic soil was used for the cultivation of intermediate crops of white mustard and winter perko [sic], to test them for their effects on the biological activity of soil and availability of elements. Soil analysis after a white mustard crop showed a statistically significant increase in nitrates (by 10.17 mg/kg), phosphorus (by 9.10 mg/kg) and potassium (by 16.70 mg/kg). After the winter perko crop both nitrate and phosphorus levels increased (by 13.70 and 8.20 mg/kg, respectively), but potassium levels fell (by 5.40 mg/kg) due to its intensive assimilation by the crop. The cultivation of the intermediate crops exerted a beneficial effect on a subsequent barley crop, increasing the grain yield from the latter by 1.3-1.9 centners/ha. The effects on the barley crop were

attributed to the increased biological activity of the soil (e.g., micro-organisms) and increased availability of elements favored by the intermediate crop rotation. References 10 (Russian).

12172/9835
CSO: 1840/2308

UDC 595.7-11

EFFECTS OF INSECTICIDES ON ELECTRICAL RESPONSE OF STYLOCONIC MAXILLARY
SENSILLA OF BOLLWORM *HELIOTHIS ARMIGERA*

Moscow BIOLOGICHESKIYE NAUKI in Russian No 3, Mar 86
(manuscript received 9 Apr 84) pp 29-32

[Article by B.A. Muminov, Chair of Entomology, Moscow State University
imeni M.V. Lomonosov]

[Abstract] Electrophysiological studies were conducted on the responsiveness of the styloconic maxillary sensilla of the bollworm (*Heliothis armigera*) to conventional insecticides. Analysis of the response patterns demonstrated that all of the insecticides tested (Sevin, Lindane, Dipterex, phosalone) elicited essentially identical discharge patterns characterized as 'third type', with amplitudes of 0.3-0.6 mV. The neuron responsible for this pattern was also identified as that responding to stimulation by carbohydrates and dominates in formulating responses to toxins. The contribution of the other three neurons innervating a sensilla to the discharge pattern did not exceed 40-50% of the total response. Figures 2; references 11 (Western).

12172/9835
CSO: 1840/2307

CHEMICAL PRESERVATIVES FOR BALED HAY

Kishinev IZVESTIYA AKADEMII NAUK MOLDAVSKOY SSR: SERIYA BIOLOGICHESKIKH
I KHIMICHESKIKH NAUK in Russian No 2, Mar-Apr 86 pp 65-66

[Article by V.M. Boguslavskiy, L.P. Kovalchuk and S.A. Burtseva]

[Abstract] An analysis was conducted with several different chemical agents for their effectiveness in preserving bales of lucerne hay. Under the conditions of storage, bale temperature reached humidity level of 20 or 35-40%, favoring growth and spoilage by bacteria and fungi. Trials with different agents resulted in the identification of formic acid, propionic acid and sodium pyrosulfite as agents capable of suppressing the growth of *Bacillus* and *Pseudomonas* bacteria, and *Mucor*, *Rhizobus*, *Aspergillus* and *Penicillium* fungi. Under similar trial conditions, 25% ammonia and

carbamide were found ineffective. These observations indicate that under the climatic conditions prevalent in Southern Moldavia either formic or propionic acid or sodium pyrosulfite may be used for preservation of hay. Tables 2.

12172/9835

CSO: 1840/2281

BIOTECHNICAL ASPECTS OF PHOTOSYNTHETIC TRANSFORMATION OF SOLAR ENERGY

Moscow BIOLOGICHESKIYE NAUKI in Russian No 12, Dec 85
(manuscript received 7 Jun 85) pp 40-45

[Article by V.V. Alekseyev and M.Ya. Lyamin, Chair of Physics of the
Sea and Inland Water, Moscow State University imeni M.V. Lomonosov]

[Abstract] One of the approaches to the harvesting of solar energy involves transformation of biomass into methane, and subsequent conversion of methane into electric energy. At Moscow State University a Biosolar pilot device has been developed for the growth of *Chlorella* for subsequent conversion to methane. The entire apparatus consists of three major blocks: photo-synthetic, methane generating, and closed circuit block. The photo-synthetic block relies on the use of solar energy for the generation of algal biomass, which is then concentrated and decompressed to break down the cellular mass. The biomass is then subjected to anerobic fermentation in a methane tank. The biogas formed in the methane tank (80% CH₄, 16% CO₂, 2% H₂, 2% undetermined gases) is drawn off, while the salts of biogenic elements remaining in the liquid phase are recycled for algal growth. An additional device provides CO₂ from the air as an additional carbon source for growth. The data available to date on rendering the process more efficient have shown that preliminary gamma irradiation of the *chlorella* cells increases the rate of methane formation. Figures 4; tables 1; references 6 (Russian).

12172/9835
CSO: 1840/2298

EFFECTS OF HEAVY METALS ON ESCHERICHIA COLI MEMBRANES

Moscow IZVESTIYA AKADEMII NAUK SSR: SERIYA BIOLOGICHESKAYA in Russian
No 3, May-Jun 86 (manuscript received 18 Nov 83) pp 370-377

[Article by V.S. Lebedev, Institute of Chemical Physics, USSR Academy of Sciences, Moscow]

[Abstract] In order to better define the damaging effects of heavy metals on bacterial membranes, an E. coli system was exposed to AgNO_3 , $\text{Hg}(\text{CH}_3\text{COO})_2$ and CuCl_2 to assess their effects on proton extrusion and passive permeability of the cytoplasmic membrane to KMnO_4 . Addition of glucose to the medium resulted in proton extrusion, a phenomenon inhibited by Ag^+ and Hg^{++} in a dose-dependent manner. Cu^{++} did not cause complete inhibition of proton extrusion even at a concentration of 1 mM. The salts ranked as follows in enhancing MnO_4^- permeability: $\text{Ag}^+ > \text{Hg}^{++} > \text{Cu}^{++}$. The data were interpreted to indicate that Ag^+ and Hg^{++} ingress into the cells was energy-independent, with the effects dependent on the number of protein SH groups to which the metals were bound. Cu^{++} ingress, however, was energy-dependent, apparently as a counter-transport (antiport) to H^+ extrusion. Inactivation of the hydrogen pump by Cu^{++} , which in turn limits Cu^{++} influx, also limits the degree of damage caused to E. coli by Cu^{++} . Figures 3; references 16: 8 Russian, 8 Western.

12172/9835
CSO: 1840/2310

UDC 581.19:547.944:+577.17.049

EFFECTS OF TRACE ELEMENTS ON ALKALOID BIOSYNTHESIS

Leningrad RASTITELNYYE RESURSY in Russian Vol 22, No 2, Apr-Jun 86
(manuscript received 9 Oct 85) pp 272-279

[Article by G.N. Buzuk, Vitebsk Medical Institute]

[Abstract] A review is presented on the effects of various trace elements on biosynthesis of alkaloids, with the cursory data summarized in tabular form. The basic impression gained from a rather controversial literature on the topic is that lithium acts as a strong stimulant for the production of pyrrolidine, tropane and steroid alkaloids. In terms of its effectiveness in this regard copper appears to follow lithium, while cobalt seems to be quite specific in stimulating the biosynthesis of tropane alkaloids. Assessment of other trace elements shall have to be deferred until more unequivocal data are available. Figures 1; references 67: 2 Polish, 3 Czech, 41 Russian, 21 Western.

12172/9835
CSO: 1840/2290

UDC 595.7.001.5+595.7.004.1

INDUSTRIAL SIDE OF COMPREHENSIVE SCIENTIFIC PROGRAM ON 'IMPROVED EFFICIENCY OF INSECT CULTURES USED IN PLANT PROTECTION FROM PESTS AND AS FEED IN ANIMAL, FISH AND POULTRY HUSBANDRY'

Moscow BIOLOGICHESKIYE NAUKI in Russian No 12, Dec 85
(manuscript received 28 Mar 85) pp 50-53

[Article by V.B. Chernyshev, Chair of Entomology, Moscow State University
imeni M.V. Lomonosov]

[Abstract] The Soviet program on increasing the efficiency of insect cultures used in plant protection as a feed component in animal, fish and poultry husbandry is a multifaceted interdepartmental effort, with primary responsibility for its success borne by the Chair of Entomology, Biology Faculty, Moscow State University. In the USSR, the entomophage that has attracted most research interest belongs in the Trichogrammatidae family. Studies on cultivation conditions have resulted in scale-up plants that have reduced the cost of production of the Trichogrammatidae by better than 50-fold, while increasing productivity 15- to 20-fold. Another major effort involves studies on the genetics and selection of insect cultures that would perform optimally in plant protection and in the bioconversion of farm animal manure. Through such a bioconversion process, a valuable feed product can be obtained that contains animal proteins, as well as a humus-like material that possesses nematocidal properties and concomitantly limits environmental pollution. The value of the latter is enhanced by the fact that it can be obtained without a prolonged composting period. Consequently, the benefits of highly efficient and low-cost insect cultures render all efforts at their improvement cost-effective.

12172/9835
CSO: 1840/2298

ENVIRONMENT

UDC 614.72:615.285.7]-074:543.544

CHROMATOGRAPHIC DETERMINATIONS OF AIR CONCENTRATIONS OF VIDAT

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 26 Feb 85) pp 49-50

[Article by V.N. Oskina, Kiev Scientific Research Institute of Work Hygiene and Occupational Diseases]

[Abstract] Brief descriptions are provided for GLC and TLC determinations of vidat (N,N-dimethylcarbamido)-methylmercaptoformaldehyde-O-(N-methylcarbamoyl)-oxime), a systemic insecticide and nematocide. GLC was performed on 3% OU-17 applied to N-super chromaton, using nitrogen as the carrier gas. The system yielded a linear signal plot in the 2-20 ng range with a thermionic detector. TLC was carried out on silicagel plates with a 7:3 chloroform:acetone solvent. Following migration the plates were chlorinated and sprayed with o-dimethylbenzidine for development. Under the conditions employed the R_f value for vidat was determined as 0.4 ± 0.5 .

12172/9835
CSO: 1840/2179

UDC: 614.7

ROLE OF SOIL-VEGETATION COMPLEX IN INDICATION OF XENOBIOTIC LOAD OF ENVIRONMENTAL OBJECTS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 27 Feb 85) pp 88-89

[Article by A.A. Dekanoidze, E.A. Kordysh, V.N. Lityuk and S.N. Bastrakova, Lvov Scientific Research Institute of Epidemiology and Microbiology, Ukrainian Ministry of Health]

[Abstract] In a study of problems of environmental protection over a region, the authors investigated the content of specific components of

industrial emissions and wastes in the atmosphere, soil and water. The results indicate that in places of intensive pollution of the atmosphere with petroleum hydrocarbons and sulfur compounds, higher concentrations of these substances are also found in the soil. Further studies indicated that the lithochemical method is desirable for use in studies of the distribution of contaminants in the air. Studies of the soil and vegetation can replace studies requiring repeated collection of multiple air samples. The soil, a natural adsorbent and accumulator of chemical substances, is a reliable indicator of contamination of the air. Technogenous anomalies observed in plants of various stem and trunk heights can be used to indicate the vertical diffusion of gaseous emissions. References 7: 6 Russian, 1 Western.

6508/9835
CSO: 1840/2186

UDC: 616-057+613.62]:[621.791.947.55+621.791.755]-036.86"742"

ANALYSIS OF LOST TIME MORBIDITY AMONG OPERATORS OF PLASMA PIPE MANUFACTURING EQUIPMENT

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 5 Jun 85) pp 24-26

[Article by Ye.L. Sineva and A.V. Ilnitskaya, Scientific Research Institute of Hygiene imeni F.F. Erisman, Moscow]

[Abstract] The purpose of this work was to study the lost working time morbidity of plasma machine operators in pipe plants, who are exposed to noise, UV radiation, ozone and oxides of nitrogen during the working day, including peak concentrations of ozone--two to three times the maximum permissible concentration--high levels of ionization of the air and noise levels 2 to 14 Db above the permissible levels at 2000-8000 Hz. Plasma machine operators were found to show a reliable increase in lost time morbidity with increasing time service. Ozone was particularly blamed for the increasing number of cases of respiratory disease with lost working time. References 4 (Russian).

6508/9835
CSO: 1840/2194

EPIDEMIOLOGY

BRIEF

PASSIVE, ACTIVE CAUSATIVE AGENT--On 22 May 1986 the USSR State Committee for Inventions and Discoveries registered a discovery made by a group of Soviet medical men: V. Belyakov, academician of the USSR Academy of Medical Sciences, Prof K. Ivanov, Doctor of Medical Sciences A. Selivanov, and candidates of medical sciences P. Ostroumov and A. Khodyrev. Problems concerning the spread of epidemics have long been of interest to both medical men and nonspecialists. An opinion prevailed that the development of epidemics was regulated only by external effects. The properties of the causative agent and man's reaction to it were considered unalterable. The authors showed that this is by no means the case. In particular, the life of the causative agent of an infection (be it a virus or a bacteria) in the organism of the host man occurs in two phases, that is, active and passive. Naturally, the spread of an infection occurs in the active phase. In the passive phase, being in the organisms of individuals possessing immunity, the causative agent waits for the right moment. When people without immunity appear, the causative agent, reconstructing itself, attacks. The passive causative agent changes in order to deceive the immunity. It alters the membrane. Hence viruses different from the former, that is, A-2 and "Hong-Kong," give rise to new epidemics. The discovery makes it possible to approach the control of infections in a new way and is the scientific basis for the solution of the problem of their elimination. Possibilities of preventing not only the spread of an active causative agent, but also its formation, open up. [By I. Novodvorskiy] [Text] [Moscow IZVESTIYA in Russian 23 May 86 p 3] 11439/9835

CSO: 1840/1208

UDC 616.94-022.7-053.31-0-22.369-07:614.37:579.84]-078

CONTAMINATION OF NEONATAL DEPARTMENT WITH GRAM NEGATIVE BACTERIA

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 11 Nov 84) pp 90-91

[Article by I.G. Tekhova, Leningrad Sanitary Hygiene Medical Institute]

[Abstract] Bacteriological studies were conducted in a neonatal department to determine the level of contamination of the environment (air, fomites, hands of medical personnel, etc.) with Gram negative bacteria. Analysis of a total of 383 samples showed the presence of Gram negative bacteria in $15.6 \pm 4.5\%$ of the air samples, and in $46.7 \pm 4.1\%$ of the other samples. The room in which milk was prepared and the maternal room were particularly dangerous, with every sample obtained in the former room contaminated with Gram negatives and $66.7 \pm 11.1\%$ of the samples in the latter. The lowest level of contamination was found in the physical therapy room ($33.3 \pm 15.7\%$ positive samples). In terms of frequency of isolation, the Gram negative bacteria ranked as follows: *Acinetobacter* > *Enterobacter* > *E. coli* > *Ps. aeruginosa* > *Klebsiella* > *Proteus*. It is evident that special sanitary measures will have to be taken in neonatal departments to assure infant safety and protection from infection with Gram negative bacteria. References 2 (Russian).

12172/9835

CSO: 1840/2179

FIFTIETH ANNIVERSARY OF TURKMEN ANTIPLAGUE STATION

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 10, Oct 85 pp 43-46

[Article by K.B. Chagylov and R.T. Gerasimenko, Turkmen SSR Ministry of Health; Turkmen Anti plague Station, USSR Ministry of Health]

[Abstract] The Turkmen Anti plague Station was originally organized as part of the Institute of Microbiology and Epidemiology in 1935, and acquired independent status in 1938 as an institution of the USSR Ministry of Health. In subsequent years expansion of the Station consisted of the development of seven branches throughout Turkmenistan. The Station was founded and initially headed by the well-known microbiologists V.V. Suknev and N.A. Gayskiy. In addition to basic research and practical sanitary measures devoted to infectious disease control, particularly plague, the Station has an extensive program in health education for the populace, as well as providing scientific in-house training. On the basis of the scientific accomplishments of the staff the Station is now classified in category II of scientific research establishments. The staff of the Turkmen Anti plague Station will exert its energies to the utmost to insure compliance with the health-related goals set by party congresses.

12172/9835

CSO: 1840/2282

UDC 616/36-002+576.858

ANALYSIS OF VIRAL HEPATITIS B CASES AT ASHKHABAD MUNICIPAL INFECTIOUS DISEASE CLINICAL HOSPITAL

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 9, Sep 85
pp 35-37

[Article by E.B. Bayramova, I.G. Punskeya, T.B. Muratnazarova, L.V. Skavinskaya and M.P. Kadyrova, Chair of Infectious Diseases, Turkmen Order of People's Friendship State Medical Institute; Ashkhabad Municipal Infectious Diseases Clinical Hospital]

[Abstract] Cases of viral hepatitis B seen at the Ashkhabad Municipal Infectious Diseases Clinical Hospital in 1980-1981 were analyzed for characterization of typical clinical manifestations. Diagnosis in the case of a 700 patient cohort was based on serological assay for the presence of HBsAg. Age distribution of the patients revealed that 36.8% of the cases occurred in patients less than 7 years old, 12.3% of the cases involved patients 8-14, 48.0% afflicted those in the 15-59 bracket, and 2.4% of the cases were represented by patients older than 60 years. Most of the cases were diagnosed in winter, with 70% of the infections ascertained to have occurred via a parenteral route. A preicteric phase was lacking in 1.7% of the cases, in 62% it lasted less than 2 weeks, and in the remaining cases longer. The disease varied from mild (10%) to moderate (56%),

severe (34%) and fulminating (3%). A noteworthy feature of the cases encountered in Ashkhabad was the relatively low percentage of patients with pruritus (0.9%) and arthralgia (3.5%). Treatment was largely supportive with hormones, transfusion with blood components and substitutes, and vitamin therapy. References 4 (Russian).

12172/9835
CSO: 1840/2283

UDC 616.9-0.36.2+616.981.42

EPIDEMIOLOGIC PATTERN OF BRUCELLOSIS IN ASHKHABAD OBLAST

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 8, Aug 85 pp 20-23

[Article by O.Yu. Zakhartsev, L.T. Ivantsova and L.M. Zakhartseva, Ashkhabad Oblast Sanitary Epidemiologic Station; Epidemiology Course at Turkmen Order of People's Friendship State Medical Institute]

[Abstract] An analysis of the epidemiologic pattern of brucellosis in the Ashkhabad Oblast in the period 1974-1983 was conducted to determine factors that favor the persistence of the problem. At the present time, most cases involve individuals engaged in sheep husbandry, with a male to female ratio standing at 3. A noteworthy feature is the increase in the number of cases among the 15-19 year olds, followed by those in the 10-14 and 20-24 age brackets. Most of the cases center around privately-held sheep, reflecting inadequate sanitary and veterinary care. An obvious approach to further control and eradication of brucellosis will require intensification of educational measures as well as more effective veterinary control over privately-held sheep. Figures 3; references 7 (Russian).

12172/9835
CSO: 1840/2284

UDC 614.39

CENTRALIZED BACTERIOLOGICAL LABORATORY OF ASHKHABAD OBLAST SANITARY EPIDEMIOLOGIC STATION

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 8, Aug 85 pp 24-25

[Article by I.R. Mukhtarova, Ashkhabad Oblast Sanitary Epidemiologic Station]

[Abstract] In the course of 1977-1981, the bacteriological laboratories of the city of Ashkhabad and of the Ashkhabad Rayon were combined into the

Centralized Bacteriological Laboratory of the Ashkhabad Oblast Sanitary Epidemiologic Station. This move resulted in a more efficient and cost-effective operation with expanded research and service potential. To date, some 50% of the staff has received advanced training in microbiology and sanitation. The Laboratory also carries out educational functions and provides training to personnel from allied health institutions. Some 220 to 225 thousand microbiological procedures are performed per year, of which 42% deal with pathogenic bacteria and parasites, as well as viruses. The staff is ever alert to new developments and technologies in clinical microbiology, which are rapidly implemented in the diagnosis of infectious diseases and epidemiologic monitoring.

12172/9835

CSO: 1840/2284

HETEROSPECIFIC TRANSFORMATION OF SYNECHOCOCCUS CYANOBACTERIA

Moscow BIOLOGICHESKIYE NAUKI in Russian No 9, Sep 85
(manuscript received 11 May 85) pp 91-94

[Article by G.A. Grigoryeva, Chair of Microbiology, Moscow State
University imeni M.V. Lomonosov]

[Abstract] Heterospecific transformation for the ery^r marker was used to evaluate the genetic interrelationship among ten strains of *Synechococcus*. Tabulated data on the transformation frequencies among the strains demonstrated frequencies ranging from an order of 10^{-3} to 10^{-7} , with a spontaneous mutation rate on the order of 10^{-9} to 10^{-8} . Cells of strains R-2 and 602 were transformed with different frequencies by heterologous T-DNA from the different strains to an extent depending on the GC content. Transformation was obtained with DNA from strains with similar base composition (54-56 mole% GC), but not with T-DNA from strain 6603 with a 65.7 mole% GC. Differences between R-2 and 602 were underscored by the fact that T-DNA from strain R-13 transferred ery^r and str^r markers to 602 but not to R-2. Transformation frequency for R-2 with T-DNA from R-13 was two orders of magnitude lower than for transformation of 602. The resultant information was summarized to indicate that strains R-2 and 602 are the recipients of choice for taxonomic analysis of new *Synechococcus* isolates on the basis of heterospecific chromosomal transformation. In combination with nucleic acid hybridization, heterospecific transformation may be used to analyze the degree of genetic relatedness among various cyanobacterial species. References 18: 4 Russian, 14 Western.

12172/9835
CSO: 1840/2297

INDUSTRIAL MEDICINE

UDC 616-057-085(049.32)

TREATMENT OF OCCUPATIONAL DISEASES

Moscow KLINICHESKAYA MEDITSINA in Russian No 5, May 86
(manuscript received 30 Jul 85) pp 150-151

[Review by Professors G.I. Beloskurskaya and S.K. Kayshibayev, Alma-Ata,
of book by A.I. Levin and V.G. Artamonova, LECHENIYE PROFESSIONALNYKH
ZABOLEVANIY, Moscow, Meditsina, 1984]

[Abstract] This book addresses one of the more pressing problems in
medicine, namely the treatment of chronic occupational diseases. In their
fourth chapters the authors cover the principles and methodology of
treating dust diseases, dust toxicity, chemical intoxication, and pathology
induced by physical factors (noise, vibration, ultrasound, magnetic and
electromagnetic fields). While current therapies are covered in detail with
stress on differential and individualized approaches, conditions such as
intoxication with phosphorus, fluorine, chromium, etc., are not covered.
The lack of complete coverage was apparently due to a desire to limit the
size of the book.

12172/9835
CSO: 1840/2306

LASER BIOEFFECTS

UDC 613.647:621.375.826

DOSIMETRY OF LASER RADIATION AT WORKSITES

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 27 Sep 84) pp 35-39

[Article by V.A. Kashuba and V.T. Kibovskiy, Moscow Medical Stomatological Institute imeni N.A. Semashko]

[Abstract] Consideration is given to the factor involved in the dosimetry of laser radiation at the worksite, involving medical, research and industrial situations. The current standard, summarized in GOST 12.1.031-81, does not take into account reflected radiation and the potential health hazard that such secondary radiation may represent. While not going into specific details on the dosimetry of diffuse reflected laser radiation, the demonstration was made that the energy density (power) at an easily accessible point may be used to determine the energy density at a target site through extrapolation. Considerably more studies will have to be conducted to fully determine the potential health hazard presented by diffuse reflected laser radiation, based on the development of more refined dosimetric methodology. Figures 1; tables 1; references 12 (Russian).

12172/9835
CSO: 1840/2179

UDC 636:612.014.426

MORPHOLOGICAL CHANGES INDUCED IN TESTICLES BY HIGH-INTENSITY LASER RADIATION

Moscow IZVESTIYA AKADEMII NAUK SSR: SERIYA BIOLOGICHESKAYA in Russian No 3, May-Jun 86 (manuscript received 2 Mar 84) pp 459-464

[Article by G.N. Linkova, Moscow Agricultural Academy imeni K.A. Timiryazev]

[Abstract] Syrian hamsters were employed in a trial of the effectiveness of a Nd laser in inducing sterility. The testes were irradiated with a GOS-1001 laser emitting at 1.06 μm with an output energy of 1000 J/cm² for ca. 5 msec

with a 0.5 cm beam. The gross and histologic examinations over a period of 12 to 60 days revealed progressive atrophy of all the testicular elements and destruction of the components of the blood-testes barrier. In distinction to the case with thermal and mechanical trauma, there was no histologic evidence of neoplastic transformation. The basic mechanism underlying the pathologic changes was an autoimmune process accompanied by an increasing degree of granulation. Figures 3; references 7: 5 Russian, 2 Western.

12172/9835
CSO: 1840/2310

UDC 616.145.154-007.272-085.849.19-036.8-07

COMPARATIVE EVALUATION OF LATE OUTCOMES OF RETINAL VEIN OCCLUSION FOLLOWING CONSERVATIVE AND LASER THERAPY

Moscow VESTNIK OFTALMOLOGII in Russian Vol 102, No 3, May-Jun 86
(manuscript received 28 Aug 85) pp 59-63

[Article by L.I. Balashevich, candidate of medical sciences, and
E.V. Boyko]

[Abstract] A 1-2 year followup study was conducted on 108 patients with retinal vein occlusion, treated either with argon laser or conservatively, to assess both therapeutic approaches. Conservative treatment in the case of the 32 to 80 year old patients included conventional fibrinolytic, anticoagulant, angioprotective, vasodilator and antisclerosis agents. Either panretinal or paravenous laser irradiation was performed as indicated for occlusion of the central retinal vein or its branches. In 11% of the patients, occlusion was non-ischemic and self-resolving with retention of high visual acuity (0.7-1.0). Laser therapy in such patients was obviously not indicated. In the remaining 89% of the patients, visual acuity was affected and was not corrected by either mode of treatment. However, panretinal laser coagulation of the fundus oculi was felt to be effective in the prevention of secondary glaucoma. Care must be exercised with the latter procedure to avoid coagulation of retinal nerve fibers which would result in segmental losses in the field of vision. References 13:
8 Russian, 5 Western.

12172/9835
CSO: 1840/2301

LASERS IN PEDIATRIC SURGERY

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 8, Aug 85 pp 25-27

[Article by L.I. Prokopenko, Nebit-Dag Municipal Children's Hospital]

[Abstract] Beginning with 1983, 49 operations have been conducted at the Nebit-Dag Municipal Children's Hospital using Skalpel-1 CO₂ laser. The laser surgery was used in the management of a variety of surgical conditions including omphalitis, intestinal resection, removal of meningoceles and atheromas, hemangiomas, osteomyelitis, etc., beginning with patients less than ten days old. In all cases the recovery was accelerated and uneventful, resulting in shorter hospital stays. These findings, which represent the first attempts at using CO₂ laser surgery on pediatric patients, indicate that such therapy will find wider application and use in the future.

12172/9835

CSO: 1840/2284

LASER THERAPY OF STROKE-INDUCED DEJERINE-ROUSSY SYNDROME

Moscow SOVETSKAYA MEDITSINA in Russian No 4, Apr 86
(manuscript received 10 Jul 85) pp 41-43

[Article by G.Ya. Anishchenko, G.I. Pisareva (deceased) and V.D. Kochetkov, Central Scientific Research Institute of Reflexotherapy, USSR Ministry of Health, Moscow]

[Abstract] Therapeutic trials were conducted with OKG-13 helium-neon laser energy applied to a reflexotherapeutic point to manage 24 patients with Dejerine-Roussy syndrome, following ischemic stroke affecting the posterior meningeal artery region. The patients ranged in age from 35 to 65 years with a history of the syndrome lasting from 2 months to 5 years. In terms of clinical and electrophysiological parameters, a 50 mW/cm² beam was applied to a corporal point or a 15 mW/cm² beam to an auricular point for 30 or 15 sec, respectively, for a total treatment time of 5 min in the case of patients with severe pain. After 6 treatment sessions the corporal laser energy was reduced to 30 mW/cm². The total number of treatment sessions was 12-14, and repeated after a month if indicated. Lower energies were employed in the treatment of patients with less severe pain. Drug therapy was continued during the laser therapy, with the dosage cut in half. Clinical evaluation showed that positive results were obtained in

17 of the 24 patients. Eight patients were in stable remission for 2 years, and marked improvement was noted in 10 cases. Two patients presented with transient improvement. No clinical improvement was noted in 4 cases, and none was seen in 15 control patients managed in a conventional manner. References 5 (Russian).

12172/9835
CSO: 1840/2279

MEDICINE

BRIEF

INTRODUCTION OF MEDICAL ACHIEVEMENTS--(KazTAG)--Problems concerning an accelerated introduction of the latest achievements of medical science into practice are examined at the conference of chairmen of scientific medical councils of ministries of health of the Union republics with the participation of prominent scientists, executives of public health bodies, general practitioners, and directors of medical higher educational institutions.

M.A. Aliyev, Kazakh SSR minister of health, discussed the scientific achievements of the republic's medical men and the problems on which they worked. Reports by O.K. Gavrilov, chairman of the Scientific Medical Council of the USSR Ministry of Health, academician of the Academy of Medical Sciences, his deputies N.A. Shluger and V.F. Onishchenko, and I.P. Antonov, chairman of the Scientific Medical Council of the Belorussian SSR Ministry of Health, corresponding member of the USSR Academy of Medical Sciences, examined urgent problems in the area of the practical direction of medical science. Problems concerning the further upgrading of the work of scientific research institutions, training and improvement in the skills of scientific personnel, increase in the contribution of medicine to the fight for overcoming drunkenness and alcoholism, and establishment of a healthy way of life were discussed. It was stressed that the role of the scientific potential often was underestimated in practical activities connected with the protection of people's health and at times science itself suffered from insignificant subjects and isolation from urgent problems. Problems of mastering advanced methods of diagnosis and prevention of diseases and equipping medical institutions with the latest instruments require more attention. Immediate tasks include an improvement in medical services in rural areas, general preventive medical examinations of the population, and its more extensive provision with skilled help and drugs. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 31 May 86 p 3] 11439/9835

CSO: 1840/1208

UDC: 614

NEED TO PROTECT ORGANS OF RESPIRATION FROM HARMFUL AEROSOLS AND GASES IN
DOMESTIC SITUATIONS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 4 Jun 85) pp 63-65

[Article by G.B. Galperin, Institute of Biophysics, USSR Ministry of
Health, Moscow]

[Abstract] Harmful gases or aerosols may be liberated into the environment during cleaning in house or garden, beating of rugs, during repair or construction operations, or care of domestic animals, collection of hay, fertilizing, disinfecting, painting or varnishing and other common operations. The use of various synthetic materials and pesticides requires particular care. Increasing frequency of allergic reactions to substances is a matter of medical concern. In response to this, scientific studies have been performed on the manufacture of filtration and sorption-filtration respirators for the public. The new "Lola" respirator is a light, comfortable, mask type respirator made of waste materials used in the manufacture of the "lepestok" respirator. The "Lola" aerosol respirator and the "Lola-A" gas plus aerosol respirator with its additional sorption layer of carbon, are recommended for public use. References 10 (Russian).

6508/9835
CSO: 1840/2186

ANTIBIOTIC RESISTANCE OF PROTEUS ISOLATED FROM DIFFERENT SOURCES

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 3, Mar 86 pp 31-35

[Article by A.S. Bayramova, R.A. Agayeva, E.P. Korneva and S.A. Yakhyayeva, Azerbaijani Order of the Red Banner of Labor Scientific Research Institute of Virology, Microbiology and Hygiene imeni G.M. Musabekov]

[Abstract] A study was conducted on the role of farm animals in the circulation of antibiotic-resistant *Proteus mirabilis* and *P. vulgaris*, through analysis and comparison of human and animal isolates. The data for some 1230 human isolates obtained in the period 1974-1983 showed levomycetin resistance in 100% of the cases, rhodomycin (68.6%), streptomycin (29.8%), ampicillin (22.6%), and carbenicillin (19.7%). Most of the cultures were susceptible to Ceporin (89.8%), monomycin (86.3%), and kanamycin (85.5%). However, gentamicin was found to be the agent of choice with a susceptibility of 98.8%. Isolates from the farm animals showed similar spectra of susceptibility and resistance. Serologic analysis showed variations in the predominant clinical isolates over the years. Of the three predominant serogroups the incidence of 03 remained virtually unchanged over the period in question, the incidence of 028 decreased, and that of 041 increased. Comparison of data for the periods 1974-1975 and 1981-1983 demonstrated an increase in antibiotic resistance, apparently due to greater use of antibiotics in clinical medicine and in feed in agricultural practice. Figures 4; references 5: 4 Russian, 1 Western.

12172/9835
CSO: 1840/2302

GIANT CELL VIRAL HEPATITIS IN NEONATES

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 10, Oct 85 pp 41-43

[Article by M.Ya. Sakhatov and Kh.P. Permanov, Scientific Research Institute for Protection of Mother and Child, Turkmen SSR Ministry of Health; Chair of Pediatric Surgery, Turkmen Order of People's Friendship State Medical Institute]

[Abstract] A cursory case study is presented of a month old infant diagnosed as having giant cell viral hepatitis on the basis of liver biopsy obtained during a laparotomy. Evaluation of the clinical manifestations and histopathologic findings provided yet additional confirmation that definitive differential diagnosis cannot be based solely on clinical chemistries. Surgical intervention, for the purpose of obtaining liver biopsy in order to differentiate between biliary atresia and giant cell hepatitis, should

be performed as early as possible, but preferably before the age of two months. Figures 1; references 6 (Russian).

12172/9835
CSO: 1840/2282

UDC 616.98:579,842.23]-092,612.017.1]-078.73

CLINICAL AND IMMUNOLOGICAL CORRELATES IN GASTROINTESTINAL YERSINIOSIS

Moscow SOVETSKAYA MEDITSINA in Russian No 4, Apr 86
(manuscript received 29 Oct 85) pp 87-89

[Article by Ye.Yu. Novoselova, G.V. Yushchenko, G.S. Dvurechenskaya and N.N. Basova, Central Scientific Research Institute of Epidemiology, USSR Ministry of Health]

[Abstract] Studies were conducted on the correlation of clinical findings with serologic manifestations of gastrointestinal yersiniosis, based on the analysis of 505 cases. Comparison of the clinical findings with the results of standard agglutination tests demonstrated that the antibody titers were low (1:100) in patients with a light course of the disease. Four patients with a light clinical course constituted an exceptional category since their titers reached 1:200. In patients with a moderate illness the antibody titers were in the 1:200 to 1:400 range. Finally, 12 patients with a relapse had titers of 1:400 to 1:1600. Comparative analysis of agglutination with passive hemagglutination yielded excellent agreement of the results ($r = 0.99 \pm 0.07$). The serological titers were interpreted to indicate, on the basis of the clinical correlates, that titers of 1:100 in the agglutination test cannot be regarded as diagnostic without repeat testing. Titers of 1:200 or better, however, are diagnostic. References 8: 5 Russian, 3 Western.

12172/9835
CSO: 1840/2279

MICROBIOLOGY

UDC: 614.776:628.361]:614.771

SIGNIFICANCE OF SOIL ADSORPTION IN DYNAMICS OF BACTERIAL CONTAMINATION OF IRRIGATED LAND

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 19 Jun 85) pp 70-71

[Article by K.V. Gromyko, O.V. Guz and M.N. Nazirov, Central Asian Scientific Research Institute of Irrigation imeni V.D. Zhurin, Tashkent]

[Abstract] A study is presented of the activity of adsorption of *Escherichia coli* by serozem soils typical of Central Asia utilizing 8 soil samples, differing in mechanical properties, collected in Uzbekistan. The study showed that the *E. coli* was well adsorbed by all soil samples studied, the adsorption activity increasing with increasing percent content of physical clay. It is concluded that irrigation with bacterially polluted sewage must be performed considering the mechanical properties of the soil. Irrigation of fields containing less than 20% physical clay is not recommended, particularly in areas with high water table, since this may result in contamination of the ground water, in which the bacteria can survive much longer than in the soils. References 7 (Russian).

6508/9835
CSO: 1840/2194

UDC: 613.636:

HYGIENIC ASPECTS OF SAFETY ENGINEERING IN WORK WITH MICROORGANISMS AND PRODUCTS OF THEIR VITAL ACTIVITY

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 25 Sep 85) pp 90-91

[Article by V.M. Tarasenko, L.S. Dzhindoyan and N.S. Garin]

[Abstract] A discussion is presented of the development of the system of professional safety techniques for work with microorganisms and products

of their vital activity, a set of interrelated and interacting measures or organized actions by qualified specialists using necessary equipment to protect working personnel in the environment from biological occupational hazards. Such studies must consider the imperfect seals inevitably found in actual working environments as opposed to controlled laboratory situations. A successful occupational safety system is possible only where engineers and medical personnel carefully coordinate their operations. References 15: 10 Western, 5 Russian.

6508/9835
CSO: 1840/2194

UDC 663.18:631.528

MUTATION AND SELECTION OF MICROORGANISMS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 12, Dec 85
(manuscript received 28 Mar 85) pp 54-58

[Article by M.Kh. Shigayeva, Chair of Microbiology, Kazakh State University]

[Abstract] A brief review is presented on the use of natural and induced mutations in the selection of microorganisms for desired traits. Such studies have more recently been complemented by advances in genetic engineering, particularly as new strains are constructed by the implementation of site-specific mutations. Evaluation of various mutagens has also yielded unexpected dividend. For example, 1,4-diazoacetylbutane can exert either lethal effects on the spores of *Streptomyces griseus*, or enhance their viability depending on its concentration and duration of exposure. Low concentrations of this agent (25 µg/ml) increase the biomass 2-fold in 24 h cultures, a level of *S. griseus* that is not achievable even after 3 days of culture under conventional conditions. In addition, such low concentrations of 1,4-diazoacetylbutane reduce the frequency of spontaneous mutations. References 20: 6 Russian, 1 Czech, 13 Western.

12172/9835
CSO: 1840/2298

MICROBIAL NUCLEASES AND THEIR APPLICATIONS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 12, Dec 85
(manuscript received 7 Jun 85) pp 58-64

[Article by I.B. Leshchinskaya, Chair of Microbiology, Kazan State
University imeni V.I. Ulyanov-Lenin]

[Abstract] The research program entitled "Microbial Nucleases and their Applications" is conducted at a number of research establishments, and has resulted in the identification of the most promising sources of exo- and endonucleases. Additional studies have established the genetic control mechanisms, the influence of exogenous factors on their production, as well the structure-activity relationship of the various nucleases. Applied biochemical engineering technology has defined the parameters for the preparation of high-activity immobilized preparations used in a variety of industrial applications. In addition, several nuclease preparations have also been shown to act as interferon inducers, immunostimulants, and antineoplastic agents. Figures 3; references 26: 22 Russian, 4 Western.

12172/9835
CSO: 1840/2298

BIOLOGICAL EFFECTS OF MICROWAVE RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 85 pp 40-43

[Article by V.V. Varetskiy, V.N. Dyachenko, M.I. Rudnev, L.N. Galich, and Kh. Bassen, Kiev Scientific Research Institute for General and Communal Hygiene imeni A.N. Marzeyev: "Irradiation Conditions and Dosimetry in the Study of the Biological Effect of Non-ionizing Radiation of the Microwave Band"]

[Text] The extensive use of electromagnetic energy and the increase in the number and power of sources of non-ionizing radiation in the microwave band requires enhanced research on the study of the biological effects of this environmental factor [2, 4, 5]. For this purpose it is important to have an adequate modeling of the conditions under which electromagnetic waves [EMW] affect biological subjects. This is often accomplished by using anechoic chambers which make it possible to simulate the propagation and interaction of electromagnetic waves with biological objects in a well-defined field.

One of the most important factors determining the conditions of irradiation is the quality of the anechoic chambers, which depends, to a significant extent, on the absorptive material of which they are made [1,3]. In view of this, we selected a "thin-layer" material based on ferrite from the many available radioabsorptive materials. Its effective range of frequencies is 0.3 - 15 GHz, which corresponds to a wavelength of 1 - 0.02 m. The reflectance over the entire effective frequency band varies by 1 - 3 percent. The outer surface is pyramidal in shape, which facilitates good absorption of incident energy at various angles of irradiation. The low thickness (on the order of 5 cm) saves space in the anechoic chamber. The material withstands a flux density (FD) up to several watts per 1 cm² and is resistant to phenomena associated with biological subjects (for example, liquid animal wastes).

The inner dimensions of our anechoic chambers are 2.5 X 2.5 X 2.5 m, the walls of the room in which they are located are covered with a metal shield. There is a space beneath the floor of the chamber for incoming and outgoing cables. By means of artifact-free conductors these are extended through the floor of the chamber into the irradiation zone to transmit information from the biological subject while it is undergoing electromagnetic irradiation. Two photo-flashes are mounted in the electromagnetic shadow zone for use to stimulate evoked potentials. The animals are observed through a PTU-47 commercial television camera unit, with the transmitter outside the chamber.

Irradiation occurs from above so as to simulate a defined field and dense wave conditions with a frequency of generation of 2375 MHz. The animals (rats) are placed in polyethylene cages which are placed on four foam plastic stands 50 cm high, symmetrically distributed around the center of the irradiation zone, with each cage on its own stand. The distance between the two adjacent [sic] walls of a cage is about 15 cm, i.e., greater than the wavelength. The dimensions of each cage are 16 X 20 X 14 cm; cages are open on top. Food and water are not permitted in the cages during irradiation.

A special miniature E-field sensor (BRH/EIT) was used to verify that the chamber was indeed anechoic, as well as to confirm the spatial homogeneity and constancy of linear polarization, and of field dispersion by the cages and experimental animals. The sensor contains 3 orthogonal dipoles for providing an isotropic reaction and information about the direction of polarization within the limits of a spherical volume 3 mm in diameter. The sensor signals, transformed into light impulses by a miniature telemetric system, are transmitted to a receiver located outside the chamber along optical fibers without using conductors which disturb the field. The anechoic chambers are scanned by hand by attaching the sensor to a 1.5 meter plastic rod which is held by the experiment outside the chamber. The value of E^2 was mapped for an area of the irradiation zone 1 m^2 , from cage floor level to a height of approximately 30 cm. The measurements were performed both with and without the rats and cages present in the chamber. The BRH/EIT sensor was used to determine the extent to which the spatial homogeneity of the electromagnetic field within the cage is disrupted by the accumulation of liquid wastes from the animals; the process was simulated using tap water. The absolute value of the flux density in the center of the irradiation zone was measured with MZ-51 dose gauges which consisted of a wideband thermocouple transformer of super high frequency response and a Ya2M-66 digital wattmeter. The transformer is connected to a P6-32 measuring antenna with an attenuator. The overall measurement error was $\pm 20 \%$. For comparative purposes the readings of the MZ-51 gauge were compared with those of the American H1 1501 instrument which was calibrated in the U.S. National Bureau of Standards (calibration error $\pm 10 \%$).

In a biological experiment the flux density of incident radiation is not an adequate indicator for evaluating the energy which affects the biological subjects and thus does not always ensure replicable results. A more adequate measure of the energy acting on the biological subjects is the specific rate of energy absorption. At the present time, a number of approaches to measuring this quantity have been developed [9,10]. Of the experimental approaches used in irradiation in anechoic chambers the most widely used is the calorimetric determination of the energy absorbed by the corpses of animals during the process of irradiation by an electromagnetic field [7].

In our research, we used an improved calorimetric method which involved keeping the temperature of a control calorimeter identical to that of the experimental calorimeter by introducing additional energy into the control calorimeter; the amount of energy required was used to calculate the rate of specific absorption of radiation by the animals. This method does not require the measurement of the absolute values of temperature, or other thermal

parameters of biological subjects and calorimetric systems. Its rated error is mainly a function of the thermal capacity of the heat transmitting liquids and, when water is used, does not exceed 8%. As calorimeters, we used ordinary thermoses with wide mouths and capacity of 1 liter. On the bottom of the flask we placed rods of magnetic stirrers, which were covered with two cross-bars to prevent them being impeded by the bodies of the animals. In each calorimeter we poured the same amount of water at roughly the same temperature (close to the temperature of the room where the measurements were made). The control calorimeter contained a heating element which was a high frequency resistor. An identical element was placed in the experimental calorimeter. Two thermistors, which had been carefully selected on the basis of temperature coefficient and hooked up in a common bridge circuit, were used to sense the temperature differential between the calorimeters. Before measurement of the specific rate of absorption began, the bridge was electrically balanced while both thermistors were in the same calorimeter. Then they were placed in separate calorimeters and again the bridge was balanced by warming the water in the colder calorimeter using the appropriate heating element. Immediately after the heat exchange between the bodies of the control and irradiated animals and their calorimeters began, energy (Joule heat) was input to the control calorimeter by means of the heating element so that the bridge remained balanced. This process was terminated when the disbalance of the bridge no longer exceeded the temperature differential of the calorimeters to which reaction was reliable and did not change for the subsequent 15-20 minutes. The specific rate of absorption was computed according to the formula:

$$\frac{U^2 t}{R m T},$$

where t is the time to heat the control calorimeter (in seconds); m is the weight of the animal (in kg); T is the time during which the animal was irradiated (in seconds); U is the voltage on the heating element; R is the resistance of the heater (in Ohms).

The bodies of two rats weighing 0.25-0.3 kg were kept in the anechoic chamber for 14 hours and then irradiated. During irradiation one of them was placed in an open cage stretched out along the E vector, while the other was kept in the same chamber but shielded from exposure to electromagnetic radiation by absorbent material. The 3 remaining cages were empty. Specific rate of absorption was determined for levels of 100 and 300 W/m² and irradiation duration of 10 and 3 minutes, respectively, since, according to published data [6], there is no effect of heat loss with this irradiation schedule. In addition, we measured local distribution of specific rate of absorption in the carcass of a rat and a phantom. In these studies we used a miniature E field sensor and 3 orthogonal dipoles made by the Narda firm (USA), each of which was 1.5 mm in length [8]. In all measurements the subjects were positioned in the direction conducive to maximum interaction with the linearly polarized incident field. For a dummy we used a microwave equivalent of muscle tissue with conductivity of 2.25 S/m and density of 970 kg/m³, manufactured in the USA, which can be made to approximate the shape of a rat by means of two removable plastic foam matrices. Measurements were performed in the stomach and head of the phantom. The specific rate of absorption in the head of a rat

carcass was determined by introducing a probe into the brain through an opening in the temporal bone. The local specific rate of absorption in the head of a rat carcass and phantom was also measured in the presence of implanted glass electrodes used to record electroencephalograms and evoked potentials during the irradiation process so as to evaluate their effect on the specific rate of absorption in the animal's head.

The microclimate in the anechoic chambers while experiments are being conducted is maintained by BK-1500 air conditioners and heaters with enclosed filaments. The air temperature is maintained at a level of $21 \pm 2^\circ\text{C}$ and is monitored using previously calibrated thermistors included in the bridge circuit with output to a recording instrument. A BOPR-1.5 air purifier reduces dust and bacterial pollution in the chamber by a factor of 5-8 during the 15-30 minutes it is in operation (nominal data), which improves the maintenance conditions of the animals in a long experiment.

The results of measurements performed on an area of the irradiation zone approximately 1 m^2 demonstrated the absence of standing waves or other spatial variations in excess of 10 percent in the direction of wave propagation as well as in the plane perpendicular to it. Field polarization was linear and did not change no matter where the cages were placed. Scatter of the field by the cages was minimal and did not exceed ± 10 percent, even when animals were in the cages in addition to the one where the experiment was performed. When the cage was scanned from the level of the floor vertically up to its highest level and back there was a standing field varying by 25 percent when about 3 ml of water was poured on the bottom of the cage to simulate the accumulation of urine. The same result was obtained when the bottom of the cage was covered with a thin layer of slightly moistened saw dust. No animal was in the cage when these measurements were made. The absolute value of the flux density in the center of the irradiation zone was, for example, 10 mW/cm^2 (the M3-51 instrument hooked up with the P6-32 measurement antenna with total measurement error of ± 20 percent and 9.3 mW/cm^2).

The data on specific rate of absorption as determined by the calorimetric method are presented in Table 1.

Table 1. Magnitude of specific absorption rate (SRA)

Animal Carcass Number	Flux Density W/m^2	SRA (corrected for $\text{FD}=100 \text{ W/m}^2$)	SRA (corrected for $\text{FD}=10 \text{ W/m}^2$)
		W/kg	W/kg
1	100	2.6	0.26
2	300	2.8	0.28
3	300	2.7	0.27
4	300	2.8	0.28

The integral specific rate of absorption by the bodies of the animals scaled for 10 W/m^2 was 0.27 W/kg with fluctuations no greater than 3 percent.

The results of measurements of intensity of the electrical component of the field and evaluation of specific absorption rate in a phantom of a rat are given in Table 2.

Table 2. Intensity of the electrical component of the field and SRA in a phantom of a rat*

Part of body	Sensor Position	E^2 , V/m^2	SRA, W/kg
Stomach	Edge	70	0.2
"	Center	130	0.3
" **	Edge	80	0.2
"	Center	250	0.6

* Here and in Table 3 the data are corrected for $10 W/m^2$ incident radiation.

** Sic. Should read "Head."

The reading of the instrument with the sensor located in the center of the phantom's head did not change when the glass electrodes were put in contact with the liquid drainage conductors. At the same time when metal conductors approximately 2 cm in length were touched to the head of the phantom the reading decreased by 40 percent.

The results of measurements of the intensity of the electrical component of the field and evaluation of the specific absorption rate in the head of the carcass of a rat are given in Table 3.

Table 3. Intensity of electrical component of the field and specific absorption rate in the head of the carcass of a rat.

Animal Carcass #	Sensor Position	E^2 , V/m^2	SRA, W/kg
1	Edge	200	0.4
1	Center	540	1.0
2	Edge	320	0.6
2	Center	540	1.0
3	Edge	420	0.8
3	Center	670	1.3
4	Edge	320	0.6
4	Center	670	1.3

On the basis of the results of the measurements, it was established that the distribution of flux density in an anechoic chamber $2.5 \times 2.5 \times 2.5$ m in size, made of absorbent ferrite material is a good simulation of the zone of a defined field and its high homogeneity on an area of the irradiation zone approximately $1 m^2$. The quantity $0.3 W/kg$ obtained by direct measurement in the center of the stomach of a rat phantom coincides well with the reading of mean specific rate of absorption in the rat when the calorimetric method is used ($0.27 W/kg$). The data obtained with the phantom and rat carcass demonstrate that there is a great deal of inhomogeneity in the distribution of absorption of electromagnetic energy in the center of an actual biological subject and a simulation of it. Thus, specific absorption rate in the head of

the phantom is two times greater than in the stomach, while in the head of the rat carcass it decreases from the center to the edge by a factor of approximately 2. Within the bounds of the measurement error, no effect of the glass electrodes and the liquid drainage conductors used to record electrical activity of the brain was observed on the distribution of the field within the head of either the phantom or the rat. This suggests that they may be used in experiments where biological subjects are directly exposed to non-ionizing radiation.

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CSO:1840/2185

UDC: 613.647-07:612.663+612.663.014.4

INFLUENCE OF ELECTROMAGNETIC MICROWAVE AND POWER LINE FREQUENCY FIELDS ON
THE REPRODUCTIVE FUNCTION OF ANIMALS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 2 Apr 85) pp 87-88

[Article by I.P. Kozyarin, I.I. Shaviko, Kiev Medical Institute
imeni A.A. Bogomolets]

[Abstract] A study was made of the influence of microwave and power line frequency electromagnetic fields on laboratory animals, white rats of both sexes (24 females, 6 males). One group of animals was exposed to microwave radiation at $100 \mu\text{W}/\text{cm}^2$, 2 hours per day, other groups were exposed to power line frequency fields of 10 and 20 kV/m, also two hours per day, total time 60 days. Slight reductions were observed in the number of pups per female and the craniocaudal dimensions of the embryos were reliably smaller in the experimental groups, indicating that the electromagnetic fields had a slight influence on the reproductive function of the animals. It is suggested that the effects of the fields would vary directly with field strength. References 6: 5 Russian, 1 Western.

6508/9835
CSO: 1840/2186

UDC: 613.5:613.168]:61

EVALUATION OF ELECTROMAGNETIC SITUATION IN DEVELOPMENT ZONE, RESIDENTIAL
AND PUBLIC BUILDINGS

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 21 May 85) pp 80-81

[Article by Yu.D. Dumanskiy, D.S. Ivanov and I.I. Karachev, Kiev
Scientific Research Institute of General and Communal Hygiene imeni A.N. Marzeyev]

[Abstract] The electromagnetic situation must frequently be analyzed in a development zone adjacent to an electronic installation, including inside

buildings and residential areas. The intensity of secondary radiation in such areas may be significantly greater than the intensity of the direct radiated wave. The intensity of the electromagnetic field in such areas varies during the course of the day, primarily with varying mode of operation of the electronic installation. This means that measurement must be performed at different times of the day. Evaluation of the electromagnetic situation in places where people may be exposed to radiation in a development zone must also consider the possibility of increasing electromagnetic field intensity due to reradiation, with the field determined by the root mean square method considering all sources of radiation and reradiation. References 4 (Russian).

6508/9835

CSO: 1840/2194

UDC 613.632+615.916]:546.48]-07:[618.33+616.053.13]-099

COMPARATIVE EVALUATION OF EMBRYOTOXICITY OF VARIOUS CADMIUM COMPOUNDS

Moscow GIGIYENA I SANTARIYA in Russian No 8, Aug 85
(manuscript received 12 Jun 84) pp 11-14

[Article by S.Z. Khalilov, Central Order of Lenin Institute for the
Advanced Training of Physicians, Moscow]

[Abstract] Five simple cadmium compounds (chloride, sulfate, nitrate, iodide, oxide) were tested for embryotoxicity on outbred mice exposed to 1 mg/kg/day of a compound for 19 days. The resultant data showed that on per os administration the compounds were essentially equivalent in toxicity, resulting in statistically significant pre- and post implantation fetal loss, 9.85-19.90% and 4.06-7.02%, respectively, versus control values of 1.56% and 3.97%. Histologic examinations of the fetuses also revealed a high incidence of abnormalities attributable to the cadmium compounds. The latter also accumulated in the fetal tissues and the placentae, with the placenta clearly playing a barrier function. Postnatal development of mice exposed to the cadmium compounds in utero was marked by retarded weight gain and a higher mortality in the first 30 days (8.08-12.22% vs. control mortality of 6.59%), with the exception of cadmium chloride (6.03%). Additional studies are required to establish safe limits for cadmium exposure for per os and respiratory route exposures. References 16: 11 Russian, 5 Western.

12172/9835
CSO: 1840/2179

PREDICTION OF TOXICITY OF POLYMER COMBUSTION PRODUCTS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 15 Oct 84) pp 18-21

[Article by V.A. Vlasov, G.A. Vasilyev and N.V. Khovanov, Leningrad]

[Abstract] Mathematical analysis was conducted on the various combustion products of polymers to determine their contribution to overall toxicity, and to design a nonexperimental approach to the evaluation of toxicity based on chemical composition. Regression analysis of experimental data pertaining to W_{CL50} values and an index of relative toxicity (T) led to the

determination of correlation between toxicity and the concentration of released CO, CO₂, HCN, HCl, SO₂ and NO_x. Evaluation of the combustion and toxicity data for several polymeric materials demonstrated that, on statistical grounds, CO is the leading component responsible for toxicity, at least when large concentrations of other components are lacking. However, for materials that involve polyvinyl chlorides, polyurethanes, polyisocyanates and some other polymers, and evolve considerable quantities of HCl and HCN on combustion, more refined models will be required to take into account their contribution to toxicity. References 5 (Russian).

12172/9835

CSO: 1840/2179

FLUORINE IN FOOD PRODUCTS FROM ANTARCTIC KRILL AND ITS HYGIENIC SIGNIFICANCE

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 28 Sep 84) pp 21-24

[Article by R.D. Gabovich, N.F. Uzhva and L.V. Shelyakina, Kiev Scientific Research Institute of Nutritional Hygiene; Kiev Medical Institute imeni Academician A.A. Bogomolets]

[Abstract] Determinations were conducted on the level of fluorine in various food products derived from the Antarctic krill, to complement data available on other seafood. The fluorine levels in freshly frozen minced meat, krill coagulum, and granulated krill meat ranged from 630 to 690 mg/kg, the level in Okean paste products was 410 mg/kg, in isolated krill protein 64 mg/kg, and in the krill raw product (including shell) 1800 mg/kg. Studies on albino rats showed that 73% of the fluorine in ingested Okean was absorbed, which is 1.3-fold lower than the rate of fluorine uptake from water. It appears that food processing technology in the case of krill should be modified to ensure reduction in the fluorine levels and that, in the meantime,

a special case may have to be made in the case of krill since Soviet standards allow a maximum level of 10 mg/kg for fluorine in seafood. References 20: 18 Russian, 2 Western.

12172/9835
CSO: 1840/2179

UDC 613.632.4+615.917]:543.854.6

ASSESSMENT OF TOXIC SUBSTANCES PRODUCED IN COURSE OF OXO PROCESS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 23 Nov 84) pp 51-55

[Article by M.T. Dmitriyev, T.A. Kulesh and Ye.G. Rastyannikov, Scientific Research Institute of General and Communal Hygiene imeni A.N. Sysin, USSR Academy of Medical Sciences, Moscow]

[Abstract] An evaluation was conducted on the quantity and quality of organics released into the air in the course of an oxo process, to assess this process in terms of environmental pollution and health hazard. Adsorption on tenaks [sic] in a flow-through trap and subsequent analysis of the air sample constituents on an LKB-2091 chromato-mass spectrometer resulted in the identification and tabulation of 165 organic compounds. Of this group, 110 were represented by hydrocarbons and 55 by oxygen compounds. In chemical terms they consisted of saturated and unsaturated and aromatic hydrocarbons, terpenes, halogenated hydrocarbons, nitriles, thiocyanates, sulfides, alcohols, esters, aldehydes and ketones. From the point of view of toxicity, the identification of naphthalene, styrene, methyl propanal, butanal, tricyclene, alpha-methacrolein, acetates, butanoates, hexanoates, benzoates and other compounds was noteworthy. Figures 1; references 12: 11 Russian, 1 Western.

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DETERMINING CONDITIONS FOR USE OF GAS PHASE POLYMERIZATION HIGH DENSITY POLYETHYLENE IN FOOD INDUSTRY

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 28 May 85) pp 12-13

[Article by D.D. Braun, T.G. Voronel, L.A. Moshlakova and S.Ye. Demina, Moscow Scientific Research Institute of Hygiene imeni F.F. Erisman]

[Abstract] Sanitary-chemical studies and toxicologic experiments on animals are used to provide a hygienic evaluation of products made of a new polymer

material, high-density low-pressure polyethylene, planned for extensive utilization in the food industry. The materials tested were obtained by sequential polymerization of the ethylene monomer in the presence of a complex organometallic catalyst using a gas phase method. Studies of the general toxic and specific toxic effect of the products on the experimental animals indicated no significant changes. Water and oil extracts were found to have no biological effect. It is concluded that the new product is a promising material for the manufacture of products intended for contact with food. References 4 (Russian).

6508/9835
CSO: 1840/2186

UDC: 615.9.015.4.076.9(04

PLACE AND SIGNIFICANCE OF ACUTE EXPERIMENTS IN TOXICOLOGIC STUDIES

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 17 Apr 85) pp 60-62

[Article by Z.I. Zholdakova, Scientific Research Institute of General and Communal Hygiene imeni A.N. Sysin, USSR Academy of Medical Sciences, Moscow]

[Abstract] This article is a response to a previous article on the advantages of the LD₀ over the LD₅₀ in toxicologic experiments. It is stated that the complex problem of methods of studying the lethal effects of substances cannot be reduced to a simple alternative of selection between the LD₅₀ and the LD₀. Acute experiments have multiple purposes, including prediction of the capability of substances for accumulation, prediction of harmless levels of substances and correction of the results of calculated prediction on the basis of the experimental results. Depending on the tasks at hand, procedures used may vary widely. Acute experiments are required for rapid determination of the MPC of substances in water, in order to yield the maximum information concerning the substance and to eliminate or reduce the utilization of laboratory animals in long-term experiments when substances prove to be noncumulative or of little danger. References 9 (Russian).

6508/9835
CSO: 1840/2186

USE OF FLUORINE EXCRETION INDICATORS TO ESTIMATE EFFECTIVENESS OF MEANS OF
INDIVIDUAL PROTECTION OF ORGANS OF RESPIRATION

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 4 Jan 85) pp 89-91

[Article by Ye.Ye. Rozenberg, S.V. Shcherbakov, V.N. Lobarev, I.I. Golub
and G.B. Galperin, Sverdlovsk Scientific Research Institute of Labor
Hygiene and Occupational Diseases; Institute of Biophysics, USSR Ministry
of Health, Moscow]

[Abstract] A close relationship has been confirmed between the concentration
of fluoride compounds in the for of the workplace and the quantity of fluorine
excreted after the working shift or in the daily urine. This article studies
the possibility of using fluorine excretion in the urine to evaluate the
protective effects of the new "lepestok-V" sorption-filter respirator, which
is designed to protect the organs of respiration from hydrogen fluoride and
aerosol fluorides. Urine samples from 20 workers were taken over a period
of 5 days. The protective effectiveness of the respirator was found to
result in a significant decrease in the excretion of fluorine over the course
of 3 to 5 days, indicating that urine studies can be used to evaluate the
protective effects of new respirators. References 6: 2 Russian, 4 Western.

6508/9835
CSO: 1840/2186

UDC 615.2/.3.03:03:616.1/.4:008

CLINICAL PHARMACOLOGY AND PROGRESS IN SCIENCE AND TECHNOLOGY

Moscow KLINICHESKAYA MEDITSINA in Russian No 5, May 86
(manuscript received 9 Dec 85) pp 5-14

[Article by M.D. Mashkovskiy, All-Union Scientific Research Institute of
Pharmaceutical Chemistry imeni S. Ordzhonikidze, Moscow]

[Abstract] Progress in science and technology, particularly as applied to
medical sciences and technology, has led to the phenomenon that 85% of the
drugs currently in use were developed in the last four to five decades.
The development of clinical pharmacology proceeded from empirical observations
to present-day studies relying on the latest in medical monitoring
technology. These permit evaluation of drug effects in terms of biochemical,
immunological and physiological parameters, as well as in terms of subjective
and objective clinical terms. Recent trends in pharmacology have involved
detailed assessment of endogenous substances and evaluation of their
potential use in clinical medicine. In particular, such studies have con-
centrated on the endogenous opioids and derivatives prepared in the

laboratory. An area that has also received considerable attention is the development of immunopharmacology as a subdiscipline of pharmacology, dealing with various agents that affect the immune system (immunomodulators), both endogenous and exogenous. The program of the CPSU anticipates that productivity of the medical industry will increase 1.4-fold from 1986 to 1990, and that Soviet pharmacologists will make their contribution to this effort in the form of novel and effective drugs. References 16: 14 Russian, 2 Western.

12172/9835
CSO: 1840/2306

UDC 615.2/.3(035)(049.32)

DRUGS: MANUAL ON PHARMACOLOGY FOR PHYSICIANS

Moscow KLINICHESKAYA MEDITSINA in Russian No 5, May 86
(manuscript received 26 Dec 85) pp 149-150

[Review by V.Kh. Vasilenko, academician, USSR Academy of Medical Sciences, and A.L. Grebenev, professor, Moscow, of book by M.D. Mashkovskiy, LEKARSTVENNYYE SREDSTVA, POSOBIYE PO FARMAKOLOGII DLYA VRACHEY, Moscow, Meditsina, 1985 (parts I and II)]

[Abstract] This is the 10th revised edition of a popular text that has withstood the test of time. The present edition covers some 1230 drugs of current medical interest, presenting full details on their pharmacology and indications. A notable feature of Mashkovskiy's book is that older drugs are eliminated as they go out of use, a practice that keeps each edition current and attuned to the latest developments in clinical pharmacology. The book is unique among Soviet pharmacology texts in its completeness and, of this date, has no rival.

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CLINICAL NEUROPHARMACOLOGY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 85, No 10, Oct 85 pp 1573-1575

[Review by A.M. Veyn and M.S. Murtazayev, Moscow, of book edited by
Prof. Iv. Georgiyev, KLINICHNA NEVROFARMAKOLOGIYA (in Bulgarian),
Meditsina i Fizkultura, Sofia, 1982, 226 pp]

[Abstract] This is an excellent little book that represents a standard approach to neuropharmacology with clinical applications. The book consists of ten chapters giving conventional coverage to the subject matter in a matter-of-fact way. The largest chapter deals with the neurobiology, neuropharmacology and chemotherapy of Parkinsonism, since in many ways this has become a model disease in neuropharmacology. The book ends with a chapter on nootropic agents, with the notation that such agents have no clear delineation and may include such entities as GABA and vitamin B₆.

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PUBLIC HEALTH

BRIEFS

REHABILITATION OF DISABLED PERSONS--(KazTAG)--A republic scientific and practical conference on problems of medical and social-labor rehabilitation of disabled persons is being held in Alma-Ata. Workers of social security and public health bodies and trade-union committees participate in it. The report by D.Ye. Abdrakhimova, Kazakh SSR minister of social security, and speeches stated that the participation of disabled persons within their powers in social labor had a favorable effect on their way of life and physical and moral state. Specialized enterprises, shops, and sections for the placement of disabled persons in jobs were established. It was also noted that preventive work and improvement in sanitary and hygienic conditions made it possible to lower the level of initial disability.

At the same time, in the activity of public health and social security bodies and trade unions there are unsolved problems in this area. Rehabilitation treatment is not provided sufficiently, at times the quality of medical labor examinations is low, and concern for labor protection and safety techniques is not manifested everywhere. It is necessary to accelerate the overall mechanization and automation of production. Executives of the Central Committee of the Communist Party of Kazakhstan, of the republic's Council of Ministers, and of the Kazakh SSR Trade Union Council and directors of a number of ministries and departments took part in the conference work.

[Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 30 May 86 p 3] 11439/9835

CSO: 1840/1208

AWARDS FOR GEORGIAN SCIENTISTS--(GRUZINFORM)--For services in the development of pharmacological science and the training of scientific personnel E.P. Kemertelidze, corresponding member of the Georgian SSR Academy of Sciences, director of the Institute of Pharmacology of the republic's Academy of Sciences, was awarded the Order of the Red Banner of Labor. The Presidium of the Georgian SSR Supreme Soviet presented to her this high award of the homeland. The Tbilisi State Institute for Advanced Training of Physicians celebrated its semicentennial anniversary. Honor certificates of the Presidium of the Georgian SSR Supreme Soviet were presented to the group of this institute's associates, who worked productively in the public health system for a long time. Another group of the institute's associates and other workers of the republic's medical science received certificates conferring on them the honorary titles of "Georgian SSR Honored Scientist," "Georgian SSR Honored Physician,"

"Georgian SSR Honored Public Health Worker," and "Georgian SSR Honored University Worker." For long-term productive work honored certificates of the Presidium of the Georgian SSR Supreme Soviet were presented to a group of party, Soviet, and economic workers, scientists, and cultural figures. P.G. Gilashvili, chairman of the Presidium of the republic's Supreme Soviet, presented the awards. On behalf of the Central Committee of the Communist Party of Georgia, the Georgian SSR Presidium of the Supreme Soviet, and the Georgian SSR Council of Ministers he warmly greeted the recipients of awards and wished them good health and success in the realization of the large and responsible tasks set by the 27th CPSU Congress. [Text] [Tbilisi ZARYA VOSTOKA in Russian 6 May 86 p 3] 11439/9835

CSO: 1840/1208

ORGANIZATIONAL STRUCTURE OF ONCOLOGIC DISPENSARIES

Kiev VRACHEBNOYE DELO in Russian No 5, May 86
(manuscript received 3 Apr 85) pp 1-5

[Article by N.V. Guseletova, L.N. Zubok and T.A. Grishelevich, Kiev Scientific Research Roentgen-Radiological and Oncological Institute; All-Union Scientific Research Institute of Social Hygiene and Public Health Organization imeni N.A. Semashko]

[Abstract] The existing standards for the structural organization of oncologic dispensaries were established in 1947 by the USSR Ministry of Health and, with the passage of time, advances in medicine have made it necessary to subject these standards to a review. To date, such dispensaries and outpatient facilities can be classified on the basis of size or hospital beds (less than 199, 200-299, and over 300 beds). While in the seventies most such dispensaries had less than 100 beds, today 74% of such facilities have more than 200 beds. However, many dispensaries failed to keep pace with advances in oncology, with the result that in many cases they lack specialized services (e.g., chemotherapeutic, urologic, head and neck, thoracic, etc.). The specific organizational structure of a given dispensary should be determined by the local public health authorities and designed to meet local needs. In addition, at the present time only one oncologic dispensary--the Voronezh Oblast Oncologic Dispensary--has a physical therapy section to assist in the rehabilitation of oncologic patients, primarily women with a mastectomy. It is evident that considerable restructuring of existing facilities and services will have to be undertaken to meet future demands in oncology.

12172/9835
CSO: 1840/2286

AUTONOMIC DISORDERS IN CHRONIC ALCOHOLICS

Kiev VRACHEBNOYE DELO in Russian No 5, May 86
(manuscript received 2 Jan 86) pp 102-104

[Article by V.G. Barabanchik and P.P. Unich, Chair of Neural Diseases,
Kiev Medical Institute]

[Abstract] The state of the autonomic nervous system was assessed in 136 alcoholic males, ranging in age from 20 to 55 years, and with a history of alcohol intake from 2 years or less to 30 years. The patients were examined in a postabstinent period 2-3 weeks after a bout of drinking. The clinical manifestations of autonomic disorders differed in degree and were either reversible or irreversible depending on the underlying problem. The neurologic manifestations were either predominantly sympathetic, parasympathetic, or mixed. In the patient group with long-term alcoholism, 46 presented with the autonomic-asthenic syndrome, and 50 with the autonomic-trophic syndrome. Chronic alcohol intake was seen to induce, therefore, diffuse lesions in the central nervous system which, in time, became irreversible with an unremitting course of deterioration. References 5 (Russian).

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CSO: 1840/2286

CLINICAL, GENELOGICAL AND RHYTHMOLOGIC ANALYSIS OF PARANOID SYNDROMES IN ALCOHOLISM

Kiev VRACHEBNOYE DELO in Russian No 5, May 86
(manuscript received 19 Dec 84) pp 105-106

[Article by V.V. Shevchenko, Chair of Psychiatry, Faculty for the
Advanced Training of Physicians, Crimean Medical Institute, Simferopol]

[Abstract] Evaluation of geneological, clinical and rhythmical patterns underlying paranoia in alcoholics has led to the conclusion that alcoholic paranoid syndromes are favored by a premorbid paranoid constitution, with a significant exogenous component in the form of alcohol toxicity. This contention finds support in the fact that there is no convincing ontogenetic stage in alcoholic paranoia, but that manifestation is based on the degree of expression of paranoid signs in the premorbid stages and the duration of alcoholism. Alcohol, therefore, is more than a trigger mechanism and on those grounds alcoholic paranoid syndromes may be regarded as a clinical entity in its own right in psychiatry.

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INFORMATIONAL CONTENT OF INDIVIDUAL PARAMETERS OF COMPLEX REFLEX ACTIVITY
OF ANIMALS IN TOXICOLOGIC STUDIES

Kiev VRACHEBNOYE DELO in Russian No 5, May 86
(manuscript received 20 Nov 85) pp 111-113

[Article by V.A. Perekhrestenko, L.K. Yershova and P.Z. Stepanenko, All-
Union Scientific Research Institute of Hygiene and Toxicology of
Pesticides, Polymers and Plastics, Kiev]

[Abstract] Studies were conducted with the four-channel UIPR-4S apparatus
to analyze the information content of the various derived parameters in
cognitive assessment of toxic agents in toxicologic studies on rats.
The responses were analyzed in terms of motor activity reflecting complex
cognitive reflexes to noxious agents. The data showed that two parameters
were particularly informative in toxicologic investigations: latent
period of response and duration of first response. On the basis of these
two parameters adequate determinations may be made of the toxicity of an
agent under study. Figures 2; references 7 (Russian).

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UDC 575.191(477)

ORGANIZATION OF MEDICAL GENETICS SERVICE IN UKRAINIAN SSR

Kiev VRACHEBNOYE DELO in Russian No 11, Nov 85 pp 5-7

[Article by O.Z. Gnateyko and V.V. Melnik, Lvov Scientific Research
Institute of Pediatrics, Obstetrics and Hereditary Pathology, Administration
of Therapeutic and Preventive Assistance for Children and Mothers,
Ukrainian SSR Ministry of Health]

[Abstract] In recognition of the problems pertaining to medical genetics
and hereditary diseases, six medical genetics service centers have been
established in the Ukraine. The centers, located in Kiev, Lvov, Kharkov,
Donetsk, Simferopol and Krivoy Rog, serve a population of six to ten
million people in each oblast. The centers provide antenatal diagnosis and
counseling, as well as treatment for children with congenital diseases.
Special emphasis is also placed on advanced training in medical genetics for
medical professionals and the development of expert genetics laboratories.
Further advances in the quality and scope of service that such centers offer
is expected to come from closer cooperation among various medical establish-
ments in the Ukraine devoted to medical genetics, development of more
refined diagnostic techniques, and establishment of highly specialized
training programs in medical genetics.

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CSO: 1840/2295

CLINICAL TRENDS IN DISPENSARIZATION OF INFECTIOUS DISEASE PATIENTS

Kiev VRACHEBNOYE DELO in Russian No 11, Nov 85 pp 7-10

[Article by B.L. Ugryumov, Kiev Scientific Research Institute of Epidemiology and Infectious Diseases imeni L.V. Gromashevskiy]

[Abstract] In addition to prevention, dispensarization also has the important corollary of treatment and rehabilitation. In the case of patients with infectious diseases this involves careful monitoring, sometimes for prolonged periods of time, in order to prevent the establishment of a chronic process. In the case of such entities as viral hepatitis B, recurrence has been known to have lag period of 20 or more years, pointing to the need for an ongoing follow-up (preferably by a physician with intimate knowledge of the patient's medical history). Rehabilitation also represents a most important component, both for the society's and the individual's wellbeing. The latter aspect of the problem is all too often neglected with the patient left to his or her own devices and resources. However, it is only on the basis of comprehensive care that the party program for the health of the Soviet people can be successfully implemented.

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SCIENTIFIC BASIS FOR MAJOR TRENDS IN ORGANIZATION AND DEVELOPMENT OF NEPHROLOGICAL SERVICES IN UKRAINIAN SSR

Kiev VRACHEBNOYE DELO in Russian No 11, Nov 85
(manuscript received 20 May 85) pp 117-120

[Article by L.P. Pavlova, L.A. Pyrig and V.A. Trachenko, Scientific Organizational Department, Kiev Scientific Research Institute of Urology and Nephrology]

[Abstract] Specialized nephrological services were not organized in the Ukraine until the mid-sixties, with considerable progress made since then in line with general progress in medicine. Monitoring studies conducted in the Ukraine by the author's Institute in the 1976-1983 period, revealed a high and stable level of nephrological morbidity, making further expansion of nephrology in the Ukraine mandatory. Prior to 1981, only one hemodialysis center was in existence in the UkSSR With a capacity of 25 beds at the Institute. The Institute also offered renal transplantation services. At the present time, additional hemodialysis centers have been opened in Lvov, Donetsk, Odessa and Dnepropetrovsk. Further expansion was favored

by the formation of the Ukrainian Scientific Research Society of Nephrologists on October 15, 1982. However, despite the training programs and additional hospital beds that have been made available to patients with renal diseases many problems remain both in the Ukraine and in the Soviet Union as a whole. The fact remains that additional expansion is necessary both in specialized medical personnel and in facilities to meet the medical needs of this category of patients, and to bring it up to par with the other services that the Soviet health care system offers.

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ANALYSIS OF ORGANIZATION OF LABORATORY AND INSTRUMENTAL STUDIES ON CHILD AND ADOLESCENT HYGIENE AT SANITARY EPIDEMIOLOGIC STATIONS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 12 Jul 84) pp 39-42

[Article by G.L. Turovets, Scientific Research Institute of Child and Adolescent Hygiene, USSR Ministry of Health, Moscow]

[Abstract] A survey of the available literature has shown that in too many cases instrumental and laboratory methods are underutilized in the assessment of the various factors that impact on children and adolescents in the school environment. While the number of investigations involving instrumental and laboratory methodology has increased over the years, the increase has been largely due to more bacteriological studies. At the present time bacteriological monitoring of the school environment accounts for 55-60% of such investigations, while physical measurements (illumination, furniture dimensions, etc.) account for approximately 25%. Only 10-15% of such studies deal with sanitary and hygienic aspects. These findings clearly demonstrate that the sanitary epidemiologic studies need to be expanded in terms of assessing the health aspects of educational establishments. It also appears desirable to establish special laboratories for the assessment of child and adolescent hygiene in the school environment. Figures 1.

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COMPREHENSIVE APPROACH OF SANITARY EPIDEMIOLOGIC SERVICE OF MINSK TO
IMPLEMENTATION OF SANITARY, HYGIENIC AND ANTI-EPIDEMIC MEASURES

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 21 Jan 85) pp 43-44

[Article by N.V. Shestopalov, V.N. Kazak and A.M. Gantman, Minsk
Municipal Sanitary Epidemiologic Station]

[Abstract] Careful planning is the hallmark of the activities of the Minsk Sanitary Epidemiologic Station. An important aspect of such planned activity is the delineation of specific functions to avoid overlap and misunderstanding, and to carry out the entire mission in as cost-effective manner as possible. Careful documentation is formulated to cover all eventualities and define all responsibilities, and to set target dates. The use of such a systematic approach in the case of infectious diseases has resulted in the reduction of the incidence of acute intestinal infections by 30% over the last 4 years in Minsk. Further improvements in the morbidity statistics are to be expected with an ongoing program of comprehensive sanitary control.

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UDC 614.774:631.8]:614.777:[546.175+546.173

NITRITES AND NITRATES AS HEALTH HAZARD

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85
(manuscript received 14 Jan 85) pp 58-62

[Article by Yu.V. Novikov, N.I. Okladnikov, M.M. Sayfutdinov and
I.A. Andreyev, Moscow Scientific Research Institute of Hygiene
imeni F.F. Erisman]

[Abstract] A brief review is presented of the problems pertaining to nitrites and nitrates as environmental pollutants and health hazards. Pollution with nitrites and nitrates is shown to be primarily due to the extensive use of mineral and organic fertilizers, as well as sewage from farms where animals are maintained. The latter, in fact, are often heavily contaminated with fertilizers. The resultant pollution of ground and surface waters with these agents poses a serious health risk, particularly in the case of children. This is due in part to the greater ingestion of liquids by children, as well as their metabolic lability. The primary signs of toxicity are related to methemoglobinemia. The obvious control measures must include close monitoring of fertilizer use and appropriate sewage treatment at farms. References 39; 10 Russian, 29 Western.

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CSO: 1840/2179

DETERMINING ACTUAL AEROGENOUS LOAD OF CARCINOGEN ON POPULATION [USING BENZ(A)PYRENE AS EXAMPLE]

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 10 Jul 85) pp 13-16

[Article by N.Ya. Yanysheva, I.S. Kireyeva, I.A. Chernichenko, M. Kertes and K. Sabo, Kiev Scientific Research Institute of General and Communal Hygiene imeni A.N. Marzeyev; State Institute of Hygiene, Budapest, Hungary]

[Abstract] Lung cancer has become one of the most frequent forms of human cancer. This, in combination with the multiplicity of sources of carcinogens which enter the body by respiration, indicates the need for determination of the actual aerogenous load of carcinogens on the population. The task for research at present is to develop methodologic approaches for adequate determination of the summary aerogenous load of carcinogens. The method to be used must determine the aerogenous dose of a carcinogen as the summary level of its effect on the population, the actual aerogenous dose must consider its entry into the body from various sources, including air pollution by traffic and factories, as well as smoking. The mean annual concentration of a carcinogen is considered the most objective reflection of the level of the compound in the environment over a long period of time. An equation is presented which models the exposure of the population to benz(a)pyrene, allowing determination of the total dose of the carcinogen inhaled by the population from various sources and the differentiated loads of the carcinogen on various contingents within the population, including certain occupational groups. A direct correlation has been observed between the aerogenous load of benz(a)pyrene and the frequency of lung cancer. Mathematical modelling has allowed calculation of the risk of lung cancer with exposure to various doses of the carcinogen. Statistically-significant increases in lung cancer frequency are observed in the male population upon exposure to 2.5 mg or more, in the female population--1.5 mg or more. This indicates that the levels of exposure measured in this study in cities in Hungary could cause an increase in the morbidity of lung cancer. References 15: 7 Russian, 8 Western.

6508/9835

CSO: 1840/2194

EXPERIENCE OF OPERATION OF RAYON SANITARY-EPIDEMIOLOGIC STATION IN PREVENTIVE
SANITARY MONITORING

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86
(manuscript received 7 Aug 84) pp 71-72

[Article by Kh.M. Mamedakhunov and G.V. Shilkova, Zavodskaya Rayon
Sanitary-Epidemiologic Station, Dzhambul]

[Abstract] The authors share the experience of their sanitary-epidemiologic station in an area of intensive construction of industrial facilities. The station reviewed plans for many such facilities, finding violations of the standards in 83.6% of cases studied. In over 50% of cases, no satisfactory resolution was reached. Analysis of these results indicates that planning institutes pay little attention to problems of domestic services and of the working conditions of the workers. Monitoring the course of construction to be sure that the plans are followed is another important aspect of the work of the station. In six years, 174 cases of such deviations were found in 342 projects monitored. The authors claim the situation improved in 1983, with fewer violations observed.

6508/9835
CSO: 1840/2194

UDC 616-084.3:614.2

EXPERIENCE IN ORGANIZATION OF DISPENSARIZATION

Moscow SOVETSKAYA MEDITSINA in Russian No 5, May 86
(manuscript received 8 Oct 85) pp 58-62

[Article by Ye.I. Cherniyenko and V.V. Shkarin, Tula Oblast Department of
Health]

[Abstract] With the assistance and advice of the Tula Obkom of the CP, the health authorities have designed a mass health screening campaign that has encompassed 662 of every 1000 residents in the Oblast in 1983. The campaign is geared to include children, adolescents, invalids and veterans of the Great Patriotic War in the next two years, as well as agricultural and industrial workers. Extensive educational and monitoring programs have been designed by the health workers and party cadres to insure full compliance. Special features and courses have been organized for uchastok physicians that are ultimately responsible for health matters in their localities, and the 1st Moscow Medical Institute has established a special postgraduate training program for these physicians in the Tula Oblast.

It is the responsibility of every party organization and of every communist to do everything possible to make the dispensarization program a success.

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UDC 616-084.3-039.57

ORGANIZATION OF COMPREHENSIVE MEDICAL EXAMINATION IN DISPENSARIZATION OF THE POPULATION

Moscow SOVETSKAYA MEDITSINA in Russian No 5, May 86
(manuscript received 13 Jun 85) pp 62-64

[Article by N.A. Leonenko, L.M. Baranovskaya, and L.B. Polyanskaya, Kiev Scientific Research Institute of General and Communal Hygiene, Ukrainian SSR Ministry of Health]

[Abstract] Within the framework of the mass screening program in Ukraine considerable attention is given to a comprehensive medical examination. At the various polyclinics, the number of diagnostic laboratory procedures that are covered ranges from 25 to 120, indicating that in most cases considerable expansion of services could be accommodated. However, it is mandated that physicians take a highly individualized approach to each patient. It is encouraging that within the last five years some 84% of the physicians took additional advanced training, although the fact that a significant number failed to take advantage of available additional training remains a matter of concern. In addition, polyclinic physicians frequently appear to underutilize laboratory diagnosis services, particularly when it comes to cardiovascular, respiratory and gastrointestinal disorders. A survey of hospitalized patients has shown that only 30% had undergone a complete medical examination at a polyclinic before hospitalization, 46.3% had been subjected to a partial evaluation, and 20% were admitted without a previous work-up. These statistics indicate that physicians need to be more alert to the diagnostic services that are at their disposal, and that the scope of such services should be expanded where needed.

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CSO: 1840/2280

DEMOGRAPHIC HEALTH FACTORS

Moscow SOVETSKAYA MEDITSINA in Russian No 5, May 86 pp 113-115

[Review by Yu.P. Lisitsyn, corresponding member, USSR Academy of Medical Sciences, Moscow, of book by M.S. Bednyy, DEMOGRAFICHESKIYE FAKTOR Y ZDOROVYA, Moscow, Finansy i Statistika, 1984, 246 pp]

[Abstract] The book by Bednyy represents a genuine contribution in view of the efforts required to document a field of knowledge that is, more often than not, neglected. In addition, its value lies in the facts that it provides facts on the basis of which a demographic policy can be instituted in line with the requirements of the directives issued by party congresses and plenary sessions. Bednyy succeeded in correlating medical and demographic facts and figures in a logical arrangement, with particular emphasis on the birth rate, aging of the population, and longevity. The book could have benefited by utilizing more information from the sphere of social hygiene, but that is a tolerable shortcoming in no way demeaning its value as a scientific contribution.

12172/9835

CSO: 1840/2280

UDC 616-084.3:614.2](047+57)

EXPERIENCE WITH PREPARATION OF COMPREHENSIVE INTERDEPARTMENTAL PROGRAMS FOR FURTHER ADVANCEMENTS IN PUBLIC HEALTH IN 12th FIVE YEAR PLAN AND IMPLEMENTATION OF DISPENSARIZATION OF ENTIRE POPULATION

Moscow SOVETSKAYA MEDITSINA in Russian No 4, Apr 86
(manuscript received 1 Oct 85) pp 62-65

[Article by G.P. Skvirskaya, Moscow]

[Abstract] The RSFSR Ministry of Health has made an extensive study of health problems and of the necessary changes that need to be made in the health care system to successfully implement party programs, including mass health screening of the entire population. However, it must be recognized that in some sectors the movement is slow, and that this affects decentralization, expansion of rehabilitation services, inadequacies in dietetic services, work programs for pregnant women and invalids, etc. On the other hand, considerable success has been achieved in expanding treatment facilities, postgraduate training of medical personnel, and health education to alert the public to the importance of prevention and the values of mass screening. In some oblasts, such as Novogorod and Penza, plans have been made to encompass 95-97% of the

population in the mass health screening program by 1990. The full success of the Soviet health program rests on close cooperation among the various health institutions and party and government authorities.

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SELECTED PROCEDURAL ASPECTS OF DISPENSARIZATION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 4, Apr 86
(manuscript received 11 Feb 85) pp 66-71

[Article by V.N. Traskovskiy, Voronezh]

[Abstract] Mass health screening is a complex dynamic process, which is often assessed only in terms of subjective phenomena while neglecting the social and psychological components. This fact indicates that most analyses of mass health screening are superficial and, as such, far from comprehensive. The proper dialectical-materialistic approach requires recognition that the biological and social aspects constitute a unified concept, and that all theoretical and methodological approaches to dispensarization must be based on this understanding. In short, mass health screening represents social management of sanitary culture and public health.
References 24 (Russian).

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UDC 613.816([47+57]-22)

SPECIAL FEATURES OF ALCOHOLISM AND DRUNKENNESS PREVENTION IN RURAL SETTINGS

Moscow ZDRAVOOKHRANENIYE ROSSIYSSKOY FEDERATSII in Russian No 5, May 86
(manuscript received 16 Dec 85) pp 27-31

[Article by L.G. Rozenfeld, Chelyabinsk Medical Institute]

[Abstract] Special problems are encountered in rural areas in the prevention of alcoholism and control of drunkenness, in part due to a lower population density with less social pressure and more limited medical resources. Nevertheless, success can be attained by the organization of special mobile judicial teams which include a psychiatrist specializing in substance abuse problems to enforce, on site, laws and legislation pertaining to alcoholism at work. Such teams not only have

been shown to have a sobering effect on alcoholics, but also on supervisory personnel who are made aware that they bear responsibility for the status of their workers. An effective measure has also been the establishment of interdepartmental commissions, with the collective farm director as head, that unite government, collective farm, party and health authorities in a single program designed to deal with the problem of alcoholism. Such efforts, dependent for their success on full support from party and government workers, ensure that health facilities and personnel are provided to treat the patients, and that all educational resources are utilized efficiently.

12172/9835

CSO: 1840/2304

UDC 616.895.8-092:612.014.49]-036

CLINICAL AND DEMOGRAPHIC CHARACTERISTICS AND SOCIAL AND OCCUPATIONAL
ADJUSTMENT OF SCHIZOPHRENICS BELONGING TO THREE POPULATION GROUPS IN
NORTHEASTERN PART OF EUROPEAN USSR (CLINICAL AND EPIDEMIOLOGIC STUDIES)

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 86, No 5, May 86 (manuscript received 27 Jun 85) pp 713-719

[Article by R.G. Gaynullin, L.M. Shmaonova and V.I. Trubnikov, Department
of Epidemiology and Laboratory of Genetics, All-Union Scientific Center
for Mental Health, USSR Academy of Medical Sciences, Moscow]

[Abstract] A comparative analysis was conducted on clinical course of
schizophrenia, social and occupational status, and demographic characteristics
of three groups inhabiting the Komi ASSR. The total group of 885 persons
consisted of native Komis, isolated settlements of Russians representing
descendants of 16th and 17th century immigrants, and new immigrants and
their children. In terms of the clinical manifestations of schizophrenia
in the Komis, 'native' Russians, and new immigrants, the breakdown for
malignant schizophrenia was 10.6, 16.7 and 3.2% of the total patient
load, respectively. The corresponding figures for paranoid and sluggish
forms were 18.4 and 10.6, 25.0 and 11.7, and 16.7 and 8.7%. Progressive
schizophrenia was diagnosed in 47.9, 33.3 and 59.9% of the respective
patient groups, and recurrent form in 11.0, 11.7 and 11.1%. Indeterminate
forms accounted for 1.5, 1.6 and 0.4% of the cases in each of the groups.
Most of the patients were between 27 and 49 years of age with female
predominance (55.6-58.3%), with an overall morbidity of 4.62/1000 for those
14 or over. Analysis of occupational and social status demonstrated that
45.0% of the Komis were gainfully employed, 44.4% of the 'native' Russians,
and 64.4% of the new migrants. Of the Komi patients, 47.3% were assessed
in terms of incapacity as falling into invalid categories I-III, and
45.0% into categories I-II. The corresponding figures for the 'native'
Russian and new migrants were 51.9 and 51.0%, and 31.2 and 30.0%. Such
information can provide a basis for planning more goal-oriented psychiatric
assistance targeted to the needs of the individual groups.
References 22: 21 Russian, 1 Western.

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NEW DAY-CARE HOSPITAL FOR PRESCHOOL CHILDREN

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 85, No 10, Oct 85 pp 1585-1586

[Article by M.Sh. Vrono and V.S. Yastrebov]

[Abstract] In September 1984 a new day-care hospital has been established for preschool children as part of the Children's Clinic of the Scientific Research Institute of Clinical Psychiatry, All-Union Scientific Center of Mental Health, USSR Academy of Medical Sciences. The day-care hospital is designed to serve children with the early childhood autism syndrome and similar neurotic disorders, as well as those with developmental retardation. The staff consists of a pediatric psychiatrist, a pediatric neuropathologist, a pediatrician, a psychologist, a speech therapist, two teachers (one with a musical background) three nurses, and two attendants. The therapeutic and corrective measures employed at the center include individual, group and family psychotherapy, play therapy, speech therapy, and physical training. The center can accommodate 12-15 children for 5 days a week (excluding weekends), for a total of 9 to 19 hours per week per child. A complete course of treatment requires 6 months to one year. This approach has been found optimal for therapeutic success with the additional advantage that there is no separation from the family. References 3 (Russian).

12172/9835

CSO: 1840/2309

RADIATION BIOLOGY

RADIOACTIVE AEROSOLS IN MOSCOW AIR AND FOOD IN 1982 AND 1983

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 85 pp 35-38

[Article by A.S. Zykova, Ye.L. Telushkina, G.P. Yefremova and T.F. Voronina, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Text] In 1982 and 1983 a series of observations was performed in Moscow and its suburbs of the concentration of artificial radionuclides in the air and precipitation, as well as in certain foods of vegetable and animal origin produced in Moscow Oblast.

Radioactive precipitates were collected using the sedimentation method at five points within Moscow and in a suburban area at a distance of 30 km.

At each radioactive fall-out collection point, 4 dishes were exposed for 10 days and then were brought to the laboratory, where radiochemical and gamma-spectrometric methods were used to determine the total concentration of radioactive substances in the fall-out and individual radionuclides were identified.

Figure 1 shows the monthly density of fall-out of the total of beta- and gamma-radionuclides in Moscow, its suburbs and Toronto (Canada), which is located at approximately the same latitude as Moscow.

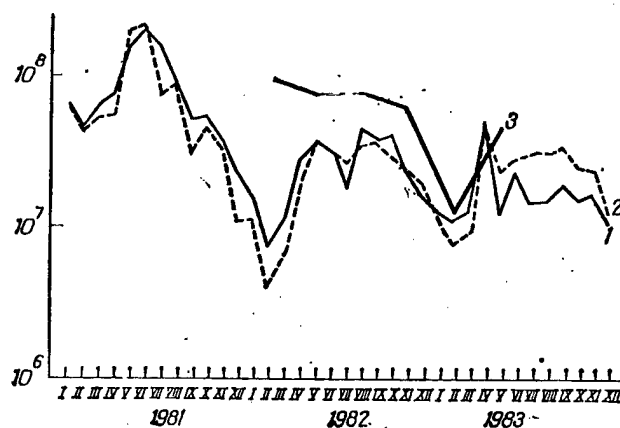


Figure 1. The density of radioactive aerosol fall-out in (Bq/km²) in 1981 -- 1983. Here and in Figure 2 the abscissa shows the time of the observation; 1-- Moscow; 2 -- suburbs of Moscow; 3 -- Toronto (Canada)

It is clear that the density of radioactive fall-out decreased over the period from 1981 to 1983. Analysis shows that the curves representing the fall-out of radionuclides in Moscow and in its suburbs are highly similar, demonstrating that the quantity of radioactive precipitates and the laws governing their fall-out in these locations were almost always identical, with the exception of the second half of 1983, when the density of radioactive fall-out was somewhat higher in the suburbs than in the city. The results of radioactive monitoring performed in Toronto indicated that in 1982 and the first half of 1983 the amount of radioactive fall-out was higher there than in Moscow [6]. The data in Figure 1 show that radioactive fall-out is not uniform at different seasons of the year.

In 1982 and 1983 the highest fall-out density of radionuclides was observed in April - June (the spring-summer peak) and August - October (the fall peak), which can be explained by the active exchange of air masses between the strato- and tropospheres and the increased amount of atmospheric precipitation which falls during those periods. The highest radionuclide fall-out density during the observation period occurred during April 1983 and equalled 52 and 50 Bq/km² in Moscow and its suburbs, respectively. Comparison of these data with the highest monthly mean radionuclide fall-out density in 1981 showed a fourfold decrease [2].

Table 1 shows the annual total beta- and gamma-active substance fall-out density and the concentration of various radionuclides in them.

As Table 1 shows, the fall-out density of radioactive substances in Moscow and its suburbs was approximately the same in 1982 and 1983 and varied within the range of 22.2 to 32.8 mBq/km² (from 6 to 8.8 mCi/km²). Comparison of these data with results obtained in 1981 showed that the fall-out of radioactive aerosols in 1982 - 1983 decreased substantially (by a factor of 3-5).

Table 1. Fall-out of radioactive aerosols (in 10⁷ Bq/km²) in 1981 - 1983

Year	Observation Pt	Total β -act.	⁷ Be	¹³⁷ Cs	⁹⁰ Sr	¹³⁷ Cs/ ⁹⁰ Sr	⁹⁵ Zr → ⁹⁵ Nb	¹⁰³ Ru	¹⁰⁶ Ru → ¹⁰⁶ Rh	¹⁴¹ Ce	¹⁴⁴ Ce → ¹⁴⁴ Pr
1981	Moscow	107	35.3	1.3	0.8	1.6	29	3	11.9	1.7	15.4
	Suburbs	95	27.4	1.2	0.8	1.5	27.2	3.8	12.2	1.9	14.7
1982	Moscow	32.8	43.2	0.9	0.6	1.5	nd	nd	nd	nd	nd
	Suburbs	29.2	34	0.35	0.35	1	nd	nd	nd	nd	nd
1983	Moscow	22.2	37	0.5	0.4	1.25	nd	nd	nd	nd	nd
	Suburbs	32.6	35.2	0.2	0.5	0.4	nd	nd	nd	nd	nd

Note: The limit of detection for ⁹⁵Zr → ⁹⁵Nb, ¹⁰³Ru and ¹⁴¹Ce was 0.75·10⁷ Bq/km²; and for ¹⁰⁶Rh and ¹⁴⁴Ce was 1·10⁷ Bq/km². Here and in Table 2, nd stands for not detected.

As gamma-spectrometric analysis showed, fission products such as $^{95}\text{Zr} \rightarrow ^{95}\text{Nb}$, $^{144}\text{Ce} \rightarrow ^{144}\text{Pr}$, $^{106}\text{Ru} \rightarrow ^{106}\text{Rh}$, and ^{103}Ru were not detected in radioactive fall-out in 1982 - 1983, since their concentration was below the sensitivity of the measurement method. Fall-out of the long-lived radionuclides, ^{137}Cs and ^{90}Sr decreased in Moscow in 1983 from its 1981 level by a factor of 2.6 and 2, respectively and equalled 5 and 4 mBq/km^2 (0.13 and 0.12 mCi/km^2). Aside from the observations of the level of radioactive fall-out, in 1982 and 1983 the concentration of radioactive aerosols in the air in Moscow was monitored continuously.

Using an aspiration device with a capacity of approximately $1000 \text{ m}^3/\text{hr}$, radioactive aerosols were sampled with a spectral filter 0.35 m^2 in area for 7 hours a day for 10 days. The radioactive aerosols remaining on the filter were identified radiochemically and through gamma spectrometry.

Figure 2 depicts the time course of the mean monthly concentration of beta- and gamma-radioactive aerosols in the air of Moscow, Moscow suburbs and Toronto [6].

Figure 2 shows that the concentration of radioactive substances in the air in 1982 and 1983 decreased substantially in comparison to 1981. In considering the curves representing the level of radioactivity of the air at various times of the year, it should be noted that the maximum concentration of radioactive aerosols was observed in April - May and September of 1982 and 1983, reaching $1.1 \text{ mBq}/\text{m}^3$ ($3 \cdot 10^{-14} \text{ Ci}/\text{m}^3$) in April, 1982.

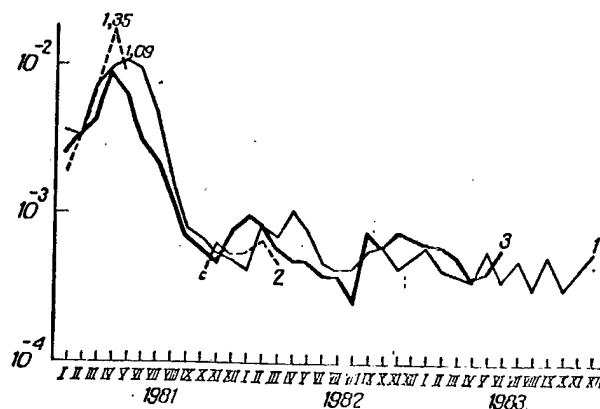


Figure 2. Concentration of radioactive aerosols (in Bq/m^3) in the air in 1981-1983.

Table 2 presents the mean yearly concentration of the sum of beta- and gamma-active substances and certain radioactive isotopes in the air in 1981-1983. It can be seen that the mean yearly concentration of radioactive aerosols in the air of Moscow decreased in 1982 and 1983 by a factor of 7 and 9, respectively, in comparison to 1981 and equalled 0.63 and 0.47 mBq/m^3 ($1.7 \cdot 10^{-14}$ and $1.3 \cdot 10^{-14} \text{ Ci}/\text{m}^3$). The concentration of ^{137}Cs and ^{90}Sr in the air decreased in 1983 by a factor of 3 in comparison with 1981 and equalled 0.02 and 0.01 mBq/m^3 ($5.5 \cdot 10^{-16}$ and $2.7 \cdot 10^{-16} \text{ Ci}/\text{m}^3$), respectively.

Table 2. The concentration of radioactive aerosols (in $n \cdot 10^{-4} \text{ Bq/m}^3$) in the air in 1981 - 1983

Year	Observation Pt	Total β -act.	^9Be	^{137}Cs	^{90}Sr	$^{137}\text{Cs}/^{90}\text{Sr}$	$^{95}\text{Zr} \rightarrow ^{95}\text{Nb}$	^{103}Ru	$^{106}\text{Ru} \rightarrow ^{106}\text{Rh}$	^{141}Ce	$^{144}\text{Ce} \rightarrow ^{144}\text{Pr}$
1981	Moscow	45.9	18.9	0.65	0.32	2	16.8	2.2	4	1.9	8.9
	Suburbs	51.4	16.2	0.35	0.26	1.3	23.5	3.5	4.1	2	9.6
1982	Moscow	6.3	21.6	0.76	0.1	7.6	nd	nd	nd	nd	nd
	Suburbs	6.1	25.2	0.07	0.07	1	nd	nd	nd	nd	nd
1983	Moscow	4.7	23.5	0.2	0.1	2	nd	nd	nd	nd	nd

Note: The detection limit was $0.75 \cdot 10^{-4} \text{ Bq/m}^3$ for $^{95}\text{Zr} \rightarrow ^{95}\text{Nb}$, and $1.5 \cdot 10^{-4} \text{ Bq/m}^3$ for ^{103}Ru and ^{141}Ce .

The concentrations of $^{95}\text{Zr} \rightarrow ^{95}\text{Nb}$, $^{144}\text{Ce} \rightarrow ^{144}\text{Pr}$, $^{106}\text{Ru} \rightarrow ^{106}\text{Rh}$, and ^{103}Ru in 1982 - 1983 were so small that they could not be quantified. In summarizing the data on the level of radioactivity in the air of Moscow during 1982 - 1983, it should be noted that in this period the density of radioactive fall-out, and also the concentration of radioactive aerosols in the air, decreased substantially in comparison to 1981.

During 1982 - 1983 the concentration of ^{90}Sr and ^{137}Cs was monitored in certain foods produced in 3 rayons of Moscow Oblast. To accomplish this, samples of milk were taken each quarter, while potatoes and vegetables were sampled in the third and fourth quarters of each year.

The results of this research averaged across the 3 rayons of Moscow Oblast for each calendar year are presented in Table 3.

The concentration of ^{90}Sr in the products examined was virtually identical in 1982 and 1983. The highest concentrations of this nuclide was found in root vegetables and potatoes, the lowest in milk. The concentration of ^{90}Sr in the majority of samples showed no changes compared to 1981.

Table 3. The concentration of ^{90}Sr and ^{137}Cs (in Bq/l, kg) in foods in 1981 - 1983 ($M \pm \sigma$)

(1) Объект исследования	^{90}Sr			^{137}Cs			$^{137}\text{Cs}/^{90}\text{Sr}$		
	1981	1982	1983	1981	1982	1983	1981	1982	1983
(2) Молоко	0.03 ± 0.009 (11)	0.04 ± 0.01 (12)	0.04 ± 0.007 (12)	0.12 ± 0.04 (12)	0.15 ± 0.02 (12)	0.1 ± 0.04 (12)	4	4.2	2.5
(3) Картофель	0.1 ± 0.03 (6)	0.09 ± 0.02 (6)	0.09 ± 0.02 (6)	0.15 ± 0.05 (6)	0.1 ± 0.02 (6)	0.09 ± 0.04 (6)	1.5	1.1	1
(4) Капуста	0.05 ± 0.02 (6)	0.07 ± 0.05 (6)	0.06 ± 0.01 (6)	0.08 ± 0.02 (6)	0.11 ± 0.02 (6)	0.1 ± 0.08 (6)	1.6	1.6	1.7
(5) Морковь	0.13 ± 0.047 (6)	0.25 ± 0.09 (6)	0.27 ± 0.22 (6)	0.14 ± 0.05 (6)	0.11 ± 0.06 (6)	0.2 ± 0.14 (6)	1	0.7	0.7
(6) Свекла	0.2 ± 0.11 (6)	0.3 ± 0.05 (5)	0.21 ± 0.12 (6)	0.11 ± 0.02 (6)	0.074 ± 0.02 (5)	0.22 ± 0.12 (6)	0.55	0.3	1

Note: Numbers in parentheses refer to the number of samples. (Key on next page.)

Key:

1. Food examined
2. Milk
3. Potatoes
4. Cabbage
5. Carrots
6. Beets

Approximately the same temporal pattern was observed in the concentrations of ^{137}Cs in the foods. However, a greater amount of this nuclide was found in the root vegetables (except potatoes), while the concentration in cabbage and milk was lower.

The ratio of concentrations of ^{137}Cs and ^{90}Sr differed among the different foods and it was found that the concentration of ^{137}Cs in milk and cabbage exceeded that of ^{90}Sr by a factor of 2.5 - 4.2 and 1.7, respectively, the two concentrations were approximately equal in potatoes, while in the other root vegetables the concentration of ^{137}Cs was lower than that of ^{90}Sr .

Analysis of samples obtained in different rayons of Moscow Oblast supported the conclusion that there is a great deal of variability in the concentrations of these radionuclides in various types of food products as a function of the location where the sample was obtained.

For example, the concentration of ^{90}Sr in carrots from the 1983 harvest ranged from 59 to 614 mBq/kg (1.6 -- 16.6 pCi/kg), i.e., differed by a factor of 10. This could have been caused by the physicochemical properties of the soil, from which the radionuclides entered the plants through their roots, and also by the physiological characteristics of the plants, or by certain other factors which affect the migration of radionuclides from soil to plants.

Using the actual data obtained on the concentrations of ^{90}Sr and ^{137}Cs in milk, potatoes, and vegetables produced in Moscow Oblast, as well as mean national levels of pollution of a number of basic foodstuffs (meat, bread, fish) and data from the Central Statistical Administration concerning the quantity of products consumed per person [1, 4], we evaluated the intake of these radionuclides by a member of the population and the dose of radiation attributable to these radionuclides. These computations assumed that inhabitants of Moscow consume milk, vegetables, and potatoes which are produced mainly in Moscow Oblast. The quantities of ^{90}Sr and ^{137}Cs which would be ingested with food products by the population of Moscow are shown in Table 4.

Table 4. Intake of ^{90}Sr and ^{137}Cs (in Bq/year) with basic food products by an inhabitant of Moscow in 1981-1983

Food Investigated	^{90}Sr			^{137}Cs		
	1981	1982	1983	1981	1982	1983
Bread products	22	20	19.5	30.5	28.4	26.6
Milk	4.3	5.8	5.8	17.3	21.6	14.4
Potatoes	9.5	8.6	8.6	14.3	9.6	8.6
Vegetables	9.7	15.2	13.1	10.4	11.38	15
Beef	9	9	9.5	44	36.0	34.2
Salt-water fish	6.8	4.4	5.5	11.3	11.3	10.3
Total	61.3	63	62	127.8	118.3	109.1

Starting with the data on the intake of ^{90}Sr and ^{137}Cs by the population, we calculated the equivalent doses of radiation, engendered in the human body in red marrow and endosteal cells by the ^{90}Sr and in the soft tissues by the ^{137}Cs . We calculated equivalent doses by means of the following formula, using data on the critical organs and tissues and on the metabolism of radionuclides in the human body recommended by International Commission of Radiological Protection publications No 10 [7] and No 30 [5]:

$$H_i = P_i f_i (\Gamma \Pi)_i \int_0^{70} R_i(t) dt, \text{ Sv},$$

where P_i is the dose coefficient or specific absorption of energy of a single decay of the i th radionuclide in 1 year by the irradiated organ or tissue (in MeV/yr decay or Sv/decay); f_i is the transport fraction, the fraction of the i th radionuclide passing into the depositing organ after ingestion; $(AI)_i$ is the actual annual intake of the i th radionuclide by the body (in Bq), $R_i(t)$ is a function describing retention of the radionuclide in the depositing organ:

$$\int_0^{70} R_i(t) dt$$

is the time integral, numerically equal to the number of decays in the organ over 70 years if 1 Bq of the i th radionuclide enters the organ in a year.

The dose coefficient for the i th radionuclide is:

$$P_i = 1.6 \cdot 10^{-10} \sum_j \frac{n_j E_j N_j Q_j}{m}, \text{ Sv/Bq},$$

where $1.6 \cdot 10^{-10}$ is the conversion factor for going from MeV/yr to Gy: E_j is the radiation energy of type j , of the i th radionuclide (in MeV); n_j is the radiation of type j produced in a single decay of the i th radionuclide, m is

the mass of the irradiated organ, tissue or entire body; N_i is a modifying factor (specific coefficient of absorption), which is a function of the structure of the irradiated organ (target) and the source organ and their locations relative to each other; Q_i is the quality factor; f_i is the fraction of the radionuclide in the depositing organ of the total amount taken into the body.

$$f_i = f_1 + f_2$$

where f_1 is the fraction of the radionuclide transported from the gastrointestinal tract into the blood (intake coefficient); f_2 is the fraction of the radionuclide transported from the blood into the organ or tissue.

The estimates thus produced of the equivalent doses of radiation to which the population is exposed are presented in Table 5.

As Table 5 shows, the annual level of radiation for the population of Moscow is between 1 and 3 millirems from ^{90}Sr and in tenths of millirems from ^{137}Cs . This corresponds to the evaluated interval of radiation dose for populations of various regions of the globe [3].

Table 5. Equivalent doses of radiation (in mkSv/yr) of the population of Moscow attributable to ^{90}Sr and ^{137}Cs entering the body in food

Year	^{90}Sr		^{137}Cs
	red marrow	bone surface	soft tissues
observed			
1981	11.6 (1.16)	25.7 (2.57)	1.67 (0.167)
1982	12 (1.2)	27 (2.7)	1.53 (0.153)
1983	11.7 (1.17)	26 (2.6)	1.44 (0.144)

Note: numbers in parenthesis are in millirems

Conclusions. 1. In 1982 and 1983, the total fall-out density of beta- and gamma- active aerosols in Moscow decreased by a factor of 3 - 5, while their concentration in the atmosphere decreased by a factor of 7 - 9 in comparison with 1981. This can be explained by the fact that nuclear weapons were not tested during this period.

2. The concentrations of ^{90}Sr and ^{137}Cs in milk, potatoes and vegetables from the 1982 and 1983 harvest were at approximately the same level and in the majority of food products remained virtually unchanged compared to 1981.

3. The equivalent annual doses of radiation sustained by members of the population of Moscow through red marrow and endosteal cells attributable to ^{90}Sr ingested with food, were 12 and 25.7 mkSv respectively, and that attributable to ^{137}Cs in the soft tissues was 1.5 mkSv, which corresponds well to data in the literature.

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CSO: 1840/2176

UDC: 614.73+6

RADIATION-HYGIENE STUDIES IN AREA OF ENVIRONMENTAL PROTECTION AT CERTAIN
NUCLEAR FUEL CYCLE PLANTS

Moscow GIGIYENA I SANITARIYA in Russian No 11, Nov 85
(manuscript received 3 Aug 85) pp 23-26

[Article by A.S. Zykova, A.I. Ryzhov, Ye.L. Telushkina and A.G. Pakulo,
Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] Nuclear fuel cycle installations can contaminate the environment with liquid, solid, gaseous and dust substances having harmful chemical and radioactive properties. Calculations of the expected radiation dose of population living within 1 km from a nuclear fuel processing plant tailings storage area indicates a potential dose of 75 mrad per MW of electric power per year. This indicates that mining, processing of ores, and manufacture of fuel do not cause significant contamination of the environment with radioactive nucleides. In spite of pollution reduction efforts, the environment may receive a complex of radioactive and chemical substances in the area of facilities involved in the nuclear fuel processing cycle. This requires a system of hygienic studies of such facilities. The main areas of study related to environmental protection should include methods of determining radioactive and chemical substances in emissions and wastes; determination of the degree of contamination of the environment around operating facilities; methods of computing radiation doses received by the population, including particularly internal radiation doses; and continued studies of the chronic influence of low doses of ionizing radiation and chemical factors on the health of the population. References 7: 4 Russian, 3 Western.

6508/9835
CSO: 1840/2186

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UDC 616.8:061.22(47+57)"1984"

JOINT SESSION OF PRESIDIA OF ALL-UNION AND ALL-RUSSIAN SCIENTIFIC MEDICAL SOCIETIES OF NEUROPATHOLOGISTS AND PSYCHIATRISTS AND CONFERENCE ON CURRENT PROBLEMS IN SOMATOPSYCHIATRY AND SOMATONEUROLOGY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 86, No 4, Apr 86 pp 626-627

[Article by M.A. Tsivilko, Moscow]

[Abstract] The joint session of the presidia was held on September 11-12, 1984 in Tyumen, and involved the participation of over 300 physicians from the city and the Tyumen Oblast (psychiatrists, narcologists, neuropathologists, and other specialists). The joint session was accompanied by a conference on current problems in somatopsychiatry and somatoneurology entitled "Changes in the Nervous System and Mental Activity in Somatic Diseases". Reports presented were of interest not only to psychiatrists and neurologists, but also to clinicians from other specialties. Emphasis was placed on the importance of early diagnosis of mental and neurological disorders in somatic diseases as a prerequisite for successful patient management and rehabilitation. The joint session ended with a resolution to further improve neuropsychiatric services in Tyumen and the Tyumen Oblast, with particular emphasis accorded to the prevention of alcoholism. Concrete plans were also made for the implementation of research results in the clinical practice of somatopsychiatry.

12172/9835
CSO: 1840/2292

UDC 616.8+616.89]:061.22.053+613.83:061.24.053](47+57)"1984"

PLENARY SESSION OF GOVERNING BOARD OF ALL-UNION SOCIETY OF NEUROPATHOLOGISTS
AND PSYCHIATRISTS AND OF SCIENTIFIC COUNCIL ON NARCOLOGY OF USSR ACADEMY OF
MEDICAL SCIENCES

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 85, No 8, Aug 85 pp 1267-1271

[Article by G.Ya. Lukacher, V.N. Mirtovskaya, L.V. Romansenko and
M.S. Popova]

[Abstract] Both of these plenary sessions were held in Poltava on October 23-25, 1984. The plenary session of the Society concentrated on present-day problems and achievements in neuropsychopharmacology and the principles underlying pathogenetic treatment of patients with neurological and mental disorders. In addition to psychiatrists and neuropathologists, the session was enriched by the active participation of pharmacologists and pathophysiologicalists who provided a more in-depth insight into the mechanism of action of psychotropic drugs. The plenary session of the Scientific Council on Narcology dealt with various aspects of alcoholism prevention, treatment and rehabilitation at the regional level. A number of problems were noted, including lack of cooperation among the involved institutions and of resources. The research work on alcoholism and drug abuse and their prevention conducted by and supervised by the All-Union Scientific Institute of General and Forensic Psychiatry imeni V.P. Serbskiy was approved, with further support ensured for the future.

12172/9835
CSO: 1840/2294

UDC: 615.9+613.632]:613.155.3:001

PROBLEMS OF IMPROVEMENT OF ORGANIZATION OF SCIENTIFIC RESEARCH AND THEIR
IMPLEMENTATION IN AREA OF HYGIENIC STANDARDIZATION OF HARMFUL SUBSTANCES
(BASED ON MATERIALS OF CONFERENCE OF KIEV SCIENTIFIC SOCIETY OF HYGIENISTS)

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86 pp 91-92

[Article by I.M. Trakhtenberg and V.F. Torbin, Kiev]

[Abstract] This article reports a session of members of the Department dedicated to the problems of improvement of the organization of scientific research work related to hygienic standardization of the permissible content of harmful substances in the air of the workplace. The major report in this area was prepared by a group of fellows of the laboratory of industrial toxicology, Kiev Scientific Research Institute of Labor, Hygiene and Occupational Diseases. This report emphasize the need for discussion and subsequent concrete solution of problems related

to the organization of research work on toxicologic evaluation of newly introduced chemical compounds, to provide a scientific basis for the MPC and for safe levels of exposure to new substances. Specific examples were used to prove the undesirability in many cases of extensive toxicologic studies of new substances which represent little danger. The article also indicated the need to involve specialists from sanitary-epidemiologic stations in the development of new standards. Other authors reported success in the area of determining the minimum necessary studies required to determine the maximum permissible concentration of new substances and the need for more precise regulation of methodologic approaches used in such studies.

6508/9835

CSO: 1840/2194

UDC: 613.648+614.73+614.876]:061.22(470.23-25)"1980-1984"

RESULTS OF WORK OF SECTION OF RADIATION HYGIENE, LENINGRAD DEPARTMENT,
ALL-RUSSIAN SOCIETY OF HYGIENISTS (1980-1984)

Moscow GIGIYENA I SANITARIYA in Russian No 3, Mar 86 pp 92-93

[Article by K.K. Poplavskiy]

[Abstract] During 1980-1984, the Radiation Hygiene Section, Leningrad Division, All-Russian Scientific Society of Hygienists held 45 meetings, discussing important problems of radiation hygiene, encompassing practically all areas of radiation hygiene, including dosimetry, radiobiological problems of radiation hygiene, radiation labor hygiene, problems of radiation communal hygiene, hygienic problems of medical utilization of sources of radiation, standardization of the natural radiation factor, training of personnel on radiation hygiene and means of increasing the effectiveness of training, the 25 years of operation of the Institute, and radiation safety when utilizing radioisotope test instruments.

6508/9835

CSO: 1840/2194

CONFERENCE ON TECHNICAL BIOENERGETICS

Moscow IZVESTIYA AKADEMII NAUK SSR: SERIYA BIOLOGICHESKAYA in Russian
No 3, May-Jun 86 pp 478-479

[Article by S.Kh. Tapaltsyan and G.A. Starovoytova]

[Abstract] The Second All-Union Conference on Technical Bioenergetics was held in Saratov on September 17-19, 1985. The conference was organized by Institute of Biochemistry imeni A.N. Bakh and the Institute of Plant and Microbial Biochemistry and Physiology of the USSR Academy of Sciences. Over 100 scientists participated in the conference, the proceedings of which were published in Moscow in 1985. The conference concentrated on theoretical and applied aspects of technical bioenergetics, biological conversion of solar energy and biomass into fuel, fertilizers, and other useful products. The general impression was that both theoretical and practical studies on technical bioenergetics in the USSR could use considerable expansion with better utilization of research resources. The conference concluded with recommendations that such meetings be held every 2-3 years, and that a yearbook on technical energetics should be published in the USSR. The participants also resolved that the 3rd conference be held in Riga in 1987-1988.

12172/9835

CSO: 1840/2310

UDC 621.471.03:[614.72:615.285.7].07

UNIVERSAL AUTOMATED EJECTOR FIELD ASPIRATOR, UEPA-I

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 85 pp 56-58

[Article by P.P. Kirilchuk and I.M. Chaban from the Zhitomir Oblast Sanitary Epidemiological Station]

[Text] After some redesign, we have used the AERa-I mine air extractor to take air samples in places where there is no electric power. The redesign consisted of mounting an air motion regulation unit in the AERa device, which made it possible to take air samples at a rate of 0.1 to 1 or 1 to 10 L/min depending on the method. Before this, the rate of taking samples was only 20 L/min, and only for dust content. After modification, however, the device had a number of design shortcomings: inability to take several air samples simultaneously and to fix absorbents at the necessary level and direction, lack of attachments for transporting absorbents to the locations where the air samples are being taken, and irregulatability of the rate of several simultaneously taken air samples.

All of the aforementioned shortcomings were eliminated in the device we designed, the universal automated aspirator, UEPA-I, which is intended for taking air samples to analyze the impurities contained in it. The effect of the device is based on drawing air through special filters or microabsorption devices with the help of an ejector device that is actuated by compressed air located in a steel balloon of the device. An automated regulator and rotameters serve to regulate the air flow. The sampling time is determined by a stopwatch.

The filters and absorption devices for taking samples have been selected based on sanitary and hygiene methods. The air leaves impurities in the filters and absorption devices as it passes through them. The volume of air that has passed through the absorption devices is established by knowing the rate and time of air passage. Having measured the quantity of impurities in the filters or in the contents of the absorption devices, it is possible to determine the amount of impurities in a unit of air.

Figure 1 presents a schematic of the device. Compressed air from the balloon (1) passes through a connection piece with a self-sealing gasket and enters a pressure regulator (5) where the pressure is reduced to 7 atmospheres. The air pressure in the balloon is regulated by a pressure gauge (4). The air passes from the pressure regulator through a shut-off valve (6) into an ejector (8), which draws the air being investigated through the adapters (absorbers) and

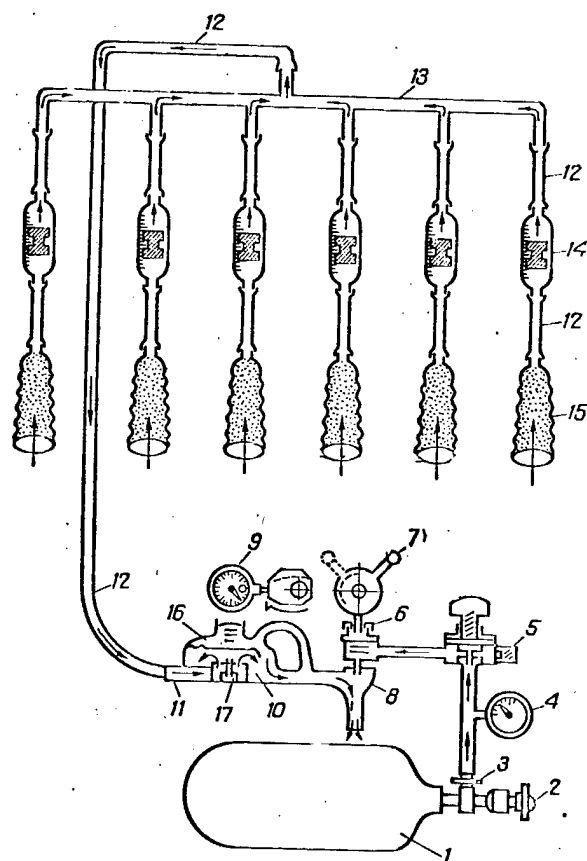


Figure 1. Schematic of the universal ejector field aspirator, UEPA-I.

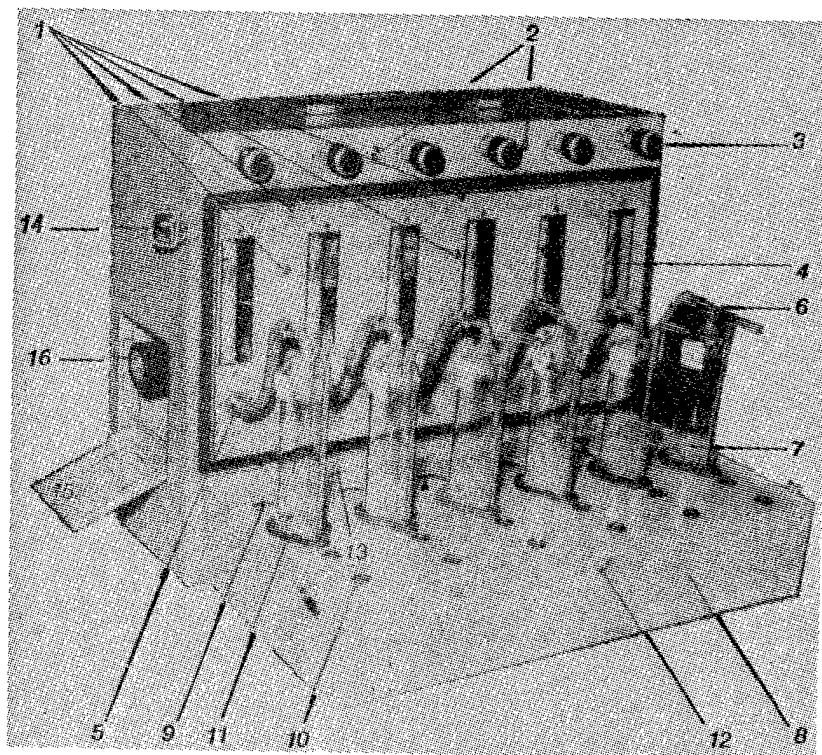
Key:

1. Balloon with compressed air
2. Balloon valve
3. Nut for connecting the balloon with the device
4. Pressure gauge
5. Pressure regulator
6. Shut-off valve
7. Switch knob
8. Ejector
9. Stopwatch
10. Automatic flow regulator
11. Flow regulator connection piece
12. Rubber tube
13. Collector or connective comb
14. Rotameter
15. Adapters (absorber)
16. Valve
17. Membrane

Figure 2. Front panel of the UEPA-I.

Key:

1. Screws to mount the mechanism
2. Screws to mount the collector
3. Rotameter valve knobs
4. Rotameter
5. Connection piece
6. Rubber tube
7. Absorber
8. Hinged unit
9. Holes for the connection pieces
10. Jack for adapters
11. Jack for absorbers
12. Button of the automatic catch
13. Hinges
14. Fasteners
15. Hinged panels
16. Balloon with compressed air



automatic flow regulator (10). A stopwatch (9), which fixes the sample selection time, is switched on simultaneously with the feeding of the air into the ejector.

The UEPA-I device is mounted in a duraluminum filter. The length of the aspirator is 400 mL. The mechanism is mounted inside the device and attached to its front wall by four screws (1) (Figure 2). Inside the device there is a collector, which is attached to its front wall by two screws (2). The following subassemblies are arranged on the front panel of the aspirator: rotameter valve knobs (3) for regulating the rate of sample selection, rotameters (4), conical glass tubes with floats for determining the air passage rate of the sample being taken, and connection pieces (5) for connecting the rubber tubes (6) with the adapters or absorbers (7).

To protect the panel from damages, the apparatus is equipped with a hinged unit (8), on the front wall of which are holes for the connection pieces (9) as well as a jack for attaching the adapters (10) or absorbers (11). The unit simultaneously serves as a receptacle for the adapters and adsorbers. To place the absorbers (adapters) inside the unit, its upper wall is opened by pressing on the button of an automatic catch (12). The unit is attached to the device with the help of hinges (13) and fasteners (14). The sides of the aspirator have hinged panels (15) covering rectangular openings through which the balloon with compressed air is placed and attached to the device with the help of a coupling nut and fastening wing nuts (1) (Figure 3).

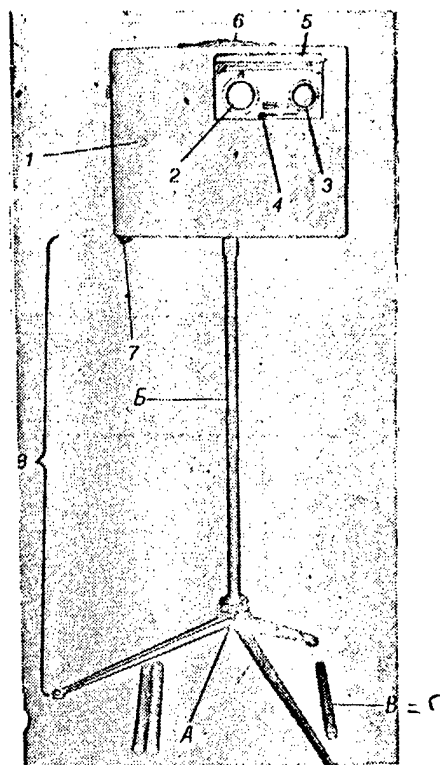


Figure 3. UEPA-I aspirator (view from behind).

Key:

1. Fastening wing nuts
2. Stopwatch
3. Pressure gauge
4. Switch mechanism knob
5. Hinged panel
6. Handle
7. Shock absorber
8. Tripod (A, base; B, stand rod; C, base rod)

To take air samples it is necessary to open the right hinged panel and take the tripod from the device and connect the stand rods with one another, and then

with the tripod base (base rod) and aspirator. Next, the hinged unit is opened, the absorbers (adapters) are removed and connected to the connection pieces (5) (see Figure 2), the balloon valve is turned opposite the hour hand, and the aspirator is placed with the front panel perpendicular to the motion of the wind or toward the source of the emission of the chemicals. After this, the switches (4) are placed into the "on" position (see Figure 3), and the stopwatch and ejector are automatically switched on.

Having established the necessary air sample selection rate with the help of the valve knobs (3) (see Figure 2), the time is fixed, and the samples are taken. After the accepted sampling time has elapsed (according to the stopwatch), the switch is transferred to the "off" position, which simultaneously switches off the stopwatch and ejector. The absorbers are disconnected, the samples are covered, and the absorbers are again placed inside the hinged unit, which is closed again. The readings of the stopwatch, sample selection time, number of absorbers, and other data are recorded.

The aspirator may take six air samples simultaneously at a rate of 0.1 to 1 L/min. The charges of one balloon (volume, 2L; working pressure, 180-200 atmospheres) are sufficient for drawing 400 L of air.

To establish the maximal time concentration of the substances being studied in an air atmosphere or their mean daily content, which requires drawing a large amount of air (400 L or more), it is necessary to take reserve balloons and to change them in proportion to the consumption of air.

When it is necessary to study air in order to determine the degree of dust content or the presence of a number of pesticides, the rotameters must be changed from 0.1-1 L/min to 1-20 L/min when the air-drawing rate is more than 5 L/min.

Before the air sampling is begun, the rotameters are regulated in a laboratory to the necessary air-drawing speed, which prevents its loss and increases the effectiveness of the suctioning during the sampling time. When samples are taken at a rate of 20 L/min, it is possible to take air samples simultaneously for the course of 10 minutes.

The advantage of the given device is its universality. With its help, it is possible to draw air through solid and liquid sorbents, strictly regulate the drawing speed, and study air not only for dust content but also for the presence of different chemicals. The possibility of changing balloons rapidly and establishing the necessary air-drawing speed simultaneously along all the channels is also a convenience. These operations are completed in 3 to 5 minutes. The charging of one balloon, which may be done at places with compressor installations (factories, fire units, rescue stations, etc.), lasts up to 10 minutes.

The device makes it possible to take air samples in places without electric power sources as well as at sites with the threat of explosion where turning on an electric aspirator is dangerous.

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UDC 61:001.4(035)(049.32)

ENCYCLOPEDIC DICTIONARY OF MEDICAL TERMINOLOGY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S.S. KORSAKOVA
in Russian Vol 85, No 7, Jul 85 pp 1084-1085

[Review by V.M. Bleykher, Kiev, of book by B.V. Petrovskiy, editor in chief, EKTSIKLOPEDICHESKIY SLOVAR MEDITSINSKIKH TERMINOV, Moscow, Sovetskaya Entsiklopediya, Vol I (1982), 464 pp, Vol II (1983), 448 pp, and Vol III (1984), 512 pp]

[Abstract] The present encyclopedic dictionary makes a significant contribution to Soviet medicine, and consists of a total of 56 sections with some 60,000 terms. The section on psychiatry encompasses some 2100 terms, and in that respect appears to be underrepresented in comparison with foreign psychiatric dictionaries that generally cover eight to ten thousand terms. Many of the concepts and ideas in psychiatry are presented in a cursory, incomplete or controversial manner. In addition, clinical psychology and psychotherapy are, in fact, short-changed. Of all the psychological tests, only Wechsler's is mentioned, and many psychotherapeutic modalities find no mention at all. The dictionary has already become a rarity and should be republished in a revised version.

12172/9835
CSO: 1840/2293

UDC 001.891:637.1

NEED FOR URGENT ACCELERATED PROGRESS IN SCIENCE AND TECHNOLOGY

Moscow MOLOCHNAYA PROMYSHLENNOST in Russian No 4, Apr 86 pp 1-5

[Article by Ya.I. Kostin, candidate of technical sciences, All-Union Scientific Research Institute of the Dairy Industry]

[Abstract] In order to meet the goals set by the various party congresses for national development, the Institute has concentrated on developing practical technology and means of its implementation. These efforts have

concentrated on automation and mechanization in the dairy industry, greater utilization of the raw dairy resources, and the development of new products. In the 1981-1985 period the Institute has completed 120 studies for technological innovations in the production of dairy products, designed to better utilize plant resources and increase the nutritive value of dairy products. From the economic point of view these innovations have resulted in savings of some 272 million rubles. For the future it is anticipated that, in the 1986-1990 period, 95% of the Institute's effort will be dedicated to the following six All-Union programs: Food Products, Apparatus (Pribory), Vitamins (Vitaminizatsiya), Child Nutrition (Detskoye Pitaniye), Packaging (Upakovka), and Development of Feed Production Plants (Razvitiye APK).

12172/9835

CSO: 1840/2311

UDC 577.1.04

CHARACTERISTICS OF LIQUID SCINTILLATOR JS-8

Moscow BIOLOGICHESKIYE NAUKI in Russian No 3, Mar 86
(manuscript received 27 Jun 85) pp 104-107

[Article by I.M. Myasnikova, L.P. Kurochkina and G.Ya. Kolomiytseva,
Interfaculty Problem-Solving Scientific Research Laboratory of Molecular
Biology and Bioorganic Chemistry, Moscow State University
imeni M.V. Lomonosov]

[Abstract] An analysis was conducted on the performance of liquid scintillator JS-8 [ZhS-8] in beta-spectrometers in measurement of tritium activity in aqueous samples. Determinations of capacity for water yielded a value of 17.6 vol% for distilled water, and for HCl a value of 21.6 vol% for 0.3 N HCl. Evaluation of quenching curves with various quenchers in comparison with quenched toluene standards yielded the following relationship for samples with identical ESP values: $F_{JS-8} = 0.95(F_T - 2)$. Failure to introduce this correcting factor into the calculations will result in significant (up to 50%) errors in estimated radioactivity, particularly in samples with low counting efficiency (high quenching). Figures 3; references 4: 1 Russian, 3 Western.

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CSO: 1840/2307

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