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Results, Prospects of Biological Satellites

937C0171C Moscow KOMSOMOLSKAYA PRAVDA in Russian 21 Jan 93 p 2

[Article by O. Volkov: "The Space Watch of Krosha and Ivashi"]

[Text] On 10 January, the brief orbital watch of the Kosmos-2229 biological satellite, which had been launched in the Bion program, came to an end. As the research program directors noted, the flight was made possible by close cooperation with specialists from various countries.

The deputy director of the Institute of Biomedical Problems, Yevgeniy Ilin, announced that most of the experiments were successful and that scientists have already begun a comprehensive examination of the members of the international crew: darkling beetles from Turkmenia, silkworm larvae from China and Uzbekistan, drosophila flies from Spain, newts from France, and Russian-Canadian tadpoles (the papa was from abroad, the mama, from the Moscow State University biological faculty), as well as natives of the Sukhumi ape reserve, now living in Russia—the macaques Krosha and Ivashi.

The monkeys are doing fine, as you yourself can see from their happy little mugs. Although during the flight, it must be admitted, the monkeys ran into some difficulty. For example, the nipple in Ivashi's cabin through which the food came didn't work properly, and Ivashi had to be satisfied with just the juice of dog rose. As a result, over the 11-1/2 days of flight, the "cosmonaut" lost 12 percent of his body weight. As Ye. Ilin assures us, however, that didn't have any effect whatsoever on the monkey's health. One other unplanned problem forced the flight to be cut by a full day. The satellite went into a "solar" orbit and we constantly exposed to the scorching rays of the star, as a result of which the inside temperature rose by 10°. The macaques, of course, are heat-loving animals, but the scientists decided not to risk it, especially since the landing would be in twenty-degree cold in the dry Kazakh steppe.

But in a serious vein, the flight of Kosmos-2229 was a serious milestone in the development of the Bion program. Over a period of 20 years, beginning in 1973, a total of 10 Soviet biological satellites were launched (the last one was Russian), and a great deal of research on the effects of weightlessness and space radiation on the bodies of animals has been done. For example, it has been established that weightlessness has no direct harmful effect on intracellular processes or on the mechanism of the transmission of hereditary information. After the flights, no pathological or irreversible changes have been observed in the animals, life spans have not diminished, and perfectly normal progeny have issued.

The data received from the research make it possible to develop new preventive methods aimed at reducing the effects of adverse factors on the bodies of the cosmonauts during the period of adaptation to weightlessness, during the flight, and upon return to the ground.

And last, the most painful question these days—that of finances and priorities. There are no other programs in the world like the former Soviet, now Russian, Bion program. Not even the Americans, who are known to be the leaders in many areas of cosmology, have been able to achieve such results. But now, it's probable that we won't even be able to make use of such data by ourselves—space is too expensive. But our specialists are not letting that stop them.

"The spending of the American side in this is rather considerable by our standards," says Ye. Ilin. "But that doesn't mean that they have simply bought us. Our scientists haven't received a kopeck. All the money was spent by the Americans on the development of equipment, which served as a contribution, as it were, to the 'overall pot.' These days, you can't even think about serious space research without international cooperation."

For now, it's not clear when the next domestic biosatellite will fly (or if it will fly!). The Americans, by the way, have again postponed the launch of a similar vehicle, until 1996.

Nucleus-Cytoplasmic Interaction in Wheat Resistance to Fungal Pathogens

937C0118B Moscow GENETIKA in Russian Vol 27 No 12, Dec 91 (manuscript received 2 Jan 91) pp 2103-2108

[Article by Ye. A. Voluyevich, A. A. Buloychik, Genetics and Cytology Institute, Belorussian SSR Academy of Sciences, Minsk; UDC 575.153:633.11:582.282.112]

[Abstract] This work presents the results of investigation of the quantitative resistance of alloplasmic and substituted lines of soft wheat plants var. Leningradka in the early and late stages of ontogenesis following infection with a population of oidium. The cytoplasm for the alloplasmic lines came from *Aegilops squarrosa, Ae. ovata,* and *Triticum spelta.* The cytoplasm donors for the substituted lines were domestic and foreign varieties that differed in ecological and geographical origin. The results showed that the role of soft wheat cytoplasm in the resistance of the plants to oidium is significant in the early stages of ontogenesis and the milk-yellow-ripeness stage. In addition, analysis of the quantitative resistance of the alloplasmic lines to oidium revealed a significant modifying effect of the foreign cytoplasm on the number of spores bearing the etiological agent of the disease at both stages of ontogenesis in the host plant. The differentiated reaction for resistance to oidium of the lines that bear the Leningradka var. genome and the cytoplasm of the soft wheat indicate the intraspecies cytoplasmic mutability for this trait. In conclusion, cytoplasms that inhibit the development of fungus in one or both stages of ontogenesis, and especially cytoplasms that inhibit fungus development throughout vegetation, which prevents the spread of the spores to other plant organs, are recommended for use in applied selection. It is hoped that cytoplasm selection will increase the resistance of soft wheat to oidium. Tables 4; references: 5 Russian.

Advanced Biotechnology for Production of Transgenic Sheep

937C0163A Moscow DOKLADY ROSSIYSKOY AKADEMII SELSKOKHOZYASTVENNYKH NAUK in Russian No 9-10, Sep-Oct 92 (manuscript received 29 Jun 92) pp 25-30

[Article by I.L. Goldman, Ye.D. Bashkeyev, P.A. Gogolevskiy, S.G. Kadulin, A.A. Yazykov, V.S. Novak, G.A. Dvoryanchikov, N.P. Rudko, A.B. Zhadanov and L.K. Ernst, academician, Russ. Agric. Acad., All-Russian Scientific Resarch Institutes of Animal Husbandry and of Animal Physiology, Biochemistry and Nutrition; Moscow State University; "Yaroslavskoye" Scientific Industrial Association; Institute of Molecular Biology, Russ. Acad. Sci.; UDC 636.32/.38:57.089.38]

[Abstract] An efficient method was devised for the production of transgenic sheep using multiploid Romanovskiy ewes as recipients in ovum transplantation. The essential features consisted of using zygotes from naturally ovulating ewes, microinjection of the male pronucleus with recombinant DNA (plasmid mMT 1/bGHatt) encoding bovine somatotropin, and use of donors as recipients. The high rates of gestation (84.2 percent), lambing (36.1 percent) and yield of transgenic lambs (2.1 percent of transplanted zygotes; confirmed by PCR analysis) demonstrated that this approach required 3-fold fewer ewes for the production of transgenic sheep than more conventional methods relying on induced ovulation. Figures 3; tables 3; references 11: 3 Russian, 8 Western.

Biotechnology

High Velocity Mechanical Injection for Transferring Foreign DNA in Early Mouse Embryos

937C0118C Moscow GENETIKA in Russian Vol 27 No 12, Dec 91 (manuscript received 02 Sep 91) pp 2182-2186

[Article by I. A. Zelenina, M. L. Semenova, A. A. Alimov, V. A. Kolesnikov, V. A. Golichenkov, and A. V. Zelenin, Molecular Biology Institute imeni V. A. Engelgardt, USSR Academy of Sciences; Biology Faculty, Moscow State University imeni M. V. Lomonosov; UDC 575.2.084: 599.323]

[Abstract] The objective of this investigation was to determine the potential for using a selective approach for genetic manipulation of 60-100 mouse embryos from C57 black/J and SHK mice. Plasmid pSV3-neo, which bears the neomycin-phosphotransferase gene, was used for transfection. The results showed that the two factors that affected embryo death, which was less than 30 percent, during firing were the size of the microparticles and the extent of the dispersion, and the stage of development. The tungsten particles employed to transfer the DNA into the embryos were found in the cytoplasm, nuclei, and mitotic chromosomes. Data from amplification and dot-blot hybridization demonstrated the presence of the neo gene in the total DNA obtained from a female born after implantation. In addition, it was shown that three of the 27 animals analyzed after birth had DNA sequences analogous to those of neo-gene sequences. In these three, two positive results were recorded in the transfer of plasmid DNA into a blastocyst, and one positive was recorded in the transfer into a morula. Thus, the findings showed that it is possible to use high velocity mechanical injection of DNA to insert foreign genes into early mouse embryos, which expands the possibilities for the use of this method to produce transgenic mammals. Figures 3; tables 1; references 13: 4 Russian, 9 Western.

Benthic Meiofauna of Lakes Affected by Chernobyl Fallout

937C0161A Minsk VESTNIK BELORUSSKOGO GOSUDARSTVENNOGO UNIVERSITETA. SERIYA 2. KHIMIYA BIOLOGIYA GEOGRAFIYA in Russian No 3, Oct 92 pp 24-29

[Article by V.A. Babitskiy; UDC 574.475(28)]

[Abstract] Population densitites and vertical stratification of benthic meiofuana were assessed in July 1991 in three lakes in the Gomel Oblast subject to Chernobyl fallout. The study involved the highly euthrophic Lake Revucheye and the less euthrophic lakes Rislavskoye and Svyatksoye. The results showed that the distribution patterns and densities were predicated on the intrinsic geochemical characteristics of the lakes and directly related to the distance from the shore. The taxa identified in the three lakes were represented by Rhizopoda, Nematoda, Ostracoda, Oligochaeta, Chydoridae, Cyclopidaa, Chironomidae and Tardigrada. The meiofauna counts were richer in variety and 5.8- to 10.2-fold as high in the benthic layers (1-2 cm) of Lake Revucheye than in the less eutrophic lakes. In addition, the benthic counts of dormant Daphnia eggs in lakes Revucheye, Rislavskoye and Svyatskoye were 5.1, 0.21 and 5.64 x 10E+6 specimens/m^2, although none were observed in the the hydrogen sulfide-saturated hypolimnion of the latter lakes. Figures 2; tables 2; references 10: 4 Russian, 6 Western.

Bioconversion Congress in Ivano-Frankovsk

937C0171F Moscow RABOCHAYA GAZETA in Russian 10 Jun 92 p 2

[Article by D. Tuz, under the rubric "Environmental Problems": "Ode to a Worm"; first paragraph is source introduction]

[Text] **If it hadn't been for the Second International Congress on Bioconversion of Organic Waste, which took place in Ivano-Frankovsk, I never would have learned that we should make a bow to...the worm. To the common earthworm, the red California worm, or any other variety raised by means of selection—so-called vermiculture. Don't laugh or sniff scornfully. Believe me, the work actually does deserve the greatest respect. It has worked for thousands of years creating the soil that now feeds us. If the attitude toward the worm is respectful, that longtime toiler promises to come in handy to mankind more than once. It will come in handy in the way it always has.**

Unsurpassed, conscientious orderly

They say that four years ago, the deputy chairman of what is now the Prikarpatplodorodiye [Carpathian Fertility] Corporation, S. I. Korzhan, brought in a contraband shipment of the California worm from abroad. The unfamiliar guest was warmed in Tlumachskaya Selkhozkhimiya and bred. From there, its relatives "crawled across" the former Soviet Union. Thus, the Carpathians became a pioneer in domestic vermiculture. Now, in the Tlumach affiliate of the Biokonversiya association there are worms from Poland, Hungary, the United States, and the Philippines. Hundreds of delegations—from our country and abroad—have visited the vermiculture farm. It was strange to see participants of the congress gather up in the palms of their hands biohumus from beds where the worms toil. And a professor from Germany, Otto Graff, rubbing it and smelling it, said, "Real chernozem!"

"That's high praise for us," noted the president of Biokonversiya, Corresponding Member of the Ukrainian Agricultural Academy I.P. Melnik. "When the substrate is properly prepared, vermiculture works well and there doesn't have to be any kind of smell."

The worm, which is used to treat manure and chicken droppings, is nothing new. It's another matter, however, that in the Ukraine, it could be used more widely to destroy the manure piles that grow near animal-husbandry complexes, polluting the air and ground water.

But the Carpathian people went further. Outside of Ivano-Frankovsk, near the municipal purification facilities, participants of the congress were acquainted with the work of the small enterprise Resursy. And they saw that the worm can actually do anything. There it renders harmless the wastes from fruit and vegetable facilities, canning combines, milk plants, and meat and bread combines and the sludge of waste waters, as well as fecal matter. They needed more than just diligence to assimilate vermiculture to such waste. But an even harder task was to win the municipal authorities and the municipal services over to the idea that a considerable amount of garbage could be gotten rid of in that manner.

B. S. Pirnak, the director of Resursy explained: "We proved it, and won them over. And a year ago, they and Biokonversiya founded our small enterprise. The benefit is twofold, even threefold almost. The city became cleaner, the dump didn't fill up so fast, and we have biohumus. But life is not without its paradoxes. Here I rescued the directors of the enterprises from the wastes for which they had been fined by the health-epidemiological station, and now they are asking money for the wastes that we process."

They started with eight beds, and now they have more than 200. Seeing the actual benefit to the environment, the authorities have set aside an additional five hectares of land so the enterprise can grow.

"Everything except glass, plastic, and metal—even cardboard and wood shavings—works: You just have to pulverize it and compost it," Bogdan Stepanovich explained to those present. "And biohumus can be produced both as an industrial humus and as a pure humus that can be used to grow vegetables in greenhouses and in open spaces. Depending on what the substrate is prepared from."

Listen to all the complaints today about the poor environmental conditions in Ukraine. And look at how many local wars are being waged against garbage dumps that, like dragons, are encroaching homes and arable land. You can't even count how many dispatches fly into Kiev with requests that hard currency be set aside for the purchase of imported plants for processing garbage. But here the French have cut through a Gordian knot of problems with organic waste—and nobody is hurrying to follow in their footsteps. It's really true: No man is a prophet in his own country! It would seem to be much simpler to just put the wastes in the beds, put the worms in, and let them go to work. (It takes just five people

and some equipment to handle the job at Resursy.) And nothing rots, or stinks, or pollutes. And you can earn some good money selling the biohumus. But no, the municipal services haven't rushed to take up the experience of the Capathians. The delay, apparently, has to do with orders from the top—we can't do anything without those orders. And if that's so, then they should be issued without wasting any more time.

Worm Meal

During the congress, I heard so much praise of the worm and the biohumus he produces that it wouldn't fit into one article. Against the backdrop of the scientific reports that were made by scientists from Germany, Hungary, Czechoslovakia, and Russia, the developments of the Ukrainian Agricultural Academy, the Biogumus Ukrainian Scientific Research Center, and the Biokonversiya Association stood tall. Their biomass is increasing soil fertility, they are treating soils contaminated with chemicals, and they are making it possible to produce environmentally clean products even on land on which Chernobyl left its mark.

Our scientists have developed a technique for accelerating the fermentation of manure for processing by vermiculture, and they have raised a population of worms that do well with chicken droppings. Senior research associate of the Ukrainian Agricultural Academy O. P. Sheremet explained, for example, that wonderful results have been obtained with the use of Riverm, an uncommon vermicompost developed at the academy, for leaf feeding of plants.

All of this, of course, is interesting. But what I heard from the deputy director for science of the Biogumus Ukrainian Scientific Research Institute, V. A. Slobodyan, exceeded all my nonprofessional expectations:

"That little worm, moreover, is a unique healer. I would highly recommend that worm meal be added to the diet of our Chernobyl children, of children with weak immune systems, and of pregnant women."

Neither you nor I, dear reader, was at the American competition of dishes prepared with worms, and that's why a "Yuck!" involuntarily jumped out of my mouth when I heard his words.

"How can you eat that?"

"What do you mean? The worm is extremely clean. It doesn't have any pathogenic microbes. But it does have a set of amino acids and other substances that stimulate hemopoiesis."

I had no choice but to believe my conversation partner. Besides, a paper was read at the congress by G. A. Babenko, a doctor of medical sciences from Ivano-Frankovsk: "The Biological Activity of Tissue and the Biological Fluids of the Red California Worm and Its Unique Healing Features."

It was said that in terms of nutritional value, vermiculture is on a par with pork. And that it has long been used as an additive to children's diets abroad.

The further I went, the more interesting things got!

"Preparations made from worms are used to treat psoriasis and pityriasis," reported V. A. Slobodyan. "Work is under way to manufacture drugs for so-called male diseases. And magnesium, which is contained in large quantities in the biohumus, strengthens the synthesis of biologically active substances that are used for cancers."

It turns out that much of what is being rediscovered here was known to the ancient Egyptians. It's no wonder they used to punish people for taking worms out of Egypt.

By the end of the congress, the worm had become just as familiar to the attending journalists as it was to the fanatics of vermiculture and biohumus. And even the mention of worm meal no longer brought a squeamish grimace to our faces. Obviously, we won't ever take to dishes prepared from worms, or even from frogs, which people in France eat. We needn't be sorry about that, but about the fact that most of the work done by our scientists, which was reported at the congress, has not yet grown out of its "laboratory breeches." And the work that has, sometimes doesn't find application, because of stereotypes in our thinking. In Israel, they say, two kilograms of humus cost $2; here it costs 4-6 rubles. But are we hurrying to get it for our own dachas or greenhouses, so we can have those same environmentally clean vegetables? Even the report that Saudi Arabia seems to have bought vermiculture from us for dollars is no cause for joy. For the health of our own people should be more valuable than any hard currency. And how much more do we need that vermiculture ourselves to heal land destroyed by chemicalization, to get rid of organic wastes that are ruining the atmosphere, to manufacture drugs. It's sad to think we're exporting it. No matter what you say, those ancient Egyptians were wiser...

Effectiveness of Immunomodulators in Complex Therapy for Lung-Cancer Patients

937C0156A Moscow KLINICHESKAYA MEDITSINA in Russian Vol 69 No 12, Dec 91 [manuscript submitted 3 Sep 90] pp 55-59

[Article by V. P. Vagner, Ye. G. Voytkevich, G. I. Zakora, Ye. D. Chirvina, Scientific Research Oncology Institute, Rostov-na-Donu; UDC 616.24-006.6-089.163/.168-059: 615.275.4]-036.8-07:612.0711]

[Abstract] The low level of effectiveness in the use of widely known immunomodulators such as levamisol, tactivin, and group A drugs stems from the absence of well-established guidelines for doses and dosages that are based on histological tumor structure, stage, interaction of immune-system cells, or patient survival rate. The researchers here analyzed the effects of decaris and retinol on immune-system indices based on the morphofunctional characteristics of tumor-tissue cells in stages II and III of lung cancer in 122 men. The researchers found that substantial changes in immune cells that served as regulators; the functional activity of the cells responsible for humoral immunity was suppressed in the glandular form of the cancer. Moreover, the functional activity of the T lymphocytes was down in the planocellular form, as was the quantity of natural killer cells. The more widespread the tumor process, the greater the disruption of the regulatory interrelationships of the immune cells. Analysis of the peripheral blood indices after administration of decaris indicated that the functional activity of lymphocytes in response to PHA consistently increases in both stages II and III. The most mobile of the indices in the administration of decaris was functional activity of T cells, as well as subpopulation ratio. The most pronounced effect was noted in the form with a higher degree of migration. Retinol produced a normalization of the balance of the regulatory cells both in the planocellular form and in the glandular form in stage III, with a negligible effect measured on the other immune indices of the peripheral blood. Overall, the researchers noted that in stage II, both drugs enhance proliferation of T lymphocytes and the activity associated with the transformation of monocytes into macrophages. In the planocellular form, they increase the number of large granular lymphocytes. Typical of both drugs, however, is a stabilization of the number of T lymphocytes, without any substantial effect on the interrelationships of cells in the local process. Only retinol slowed metastasis. References 8: 5 Russian, 2 Western, 1 Japanese.

Clinical Effectiveness of Treatment of Nonspecific Pulmonary Disease With Low-Energy Laser Radiation and Intrapulmonary Administration of Drugs

937C0156B Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 63 No 12, Dec 91 [manuscript submitted 11 Mar 91] pp 18-23

[Article by V. M. Provotorov, P. Ye. Chesnokov, S. I. Kuznetsov, Department of Therapy, Pediatric and Stomatological Faculties, Voronezh Medical Institute imeni N. N. Burdenko; UDC 616.24-002.631-085.849.19-036.8]

[Abstract] The researchers here used a combined therapy to treat individuals with severe forms of pulmonary disease, i.e., acute abscesses of the lungs or infection-dependent bronchial asthma involving frequent attacks, lengthy history, or a tendency to worsening of the condition, with little effect produced by broncholytics. The individuals were treated either with laser ($\lambda = 0.89$ μ; pulse train frequency 1500 Hz, 2-3.3 W, unfocused beam, 8-10 minute exposition, 7-10 procedures) plus methipred and antibiotics (transthoracic intrapulmonary administration), or with the glucocorticoid and antibiotics only, or with methipred alone (intramuscular administration). The researchers noted no response to physical exertion in some 90 percent of the first group after treatment, in 80 percent of the second group, and in 75 percent of the third group. Groups 1 and 2 showed a consistent increase to normal in relative and absolute T-lymphocyte count and demonstrated normalization of cellular and humoral immunity. The third group, on the other hand, demonstrated suppression of T lymphocytes because of the theophylline-sensitive fraction, with a decline in IgG levels. Remission of 5-7 months was observed in 50 percent of group 1 and in 45.5 percent of group 2. Some 52 percent of group 3 showed exacerbation of their condition within two months. Complete recovery in terms of clinical, biochemical, and X-ray indices was observed in 94.1 percent of group 1 and in 86.2 percent of group 2. Figures 2, references 13: Russian.

Effect of Laser Fragmentation of the Lens Mass on Eye Tissue in Experiment

937C0156D Moscow VESTNIK OFTALMOLOGII in Russian Vol 107 No 5, Sep-Oct 91 [manuscript submitted 14 Mar 90] pp 60-63

[Article by Cand. Med. Sci. A. V. Svirin, D. O. Kolesnikov, Cand. Med. Sci. T. M. Volobuyeva, Abdul Karim Khasan, Department of Eye Diseases, Treatment Faculty, Second Moscow Medical Institute imeni N. I. Pirogov; UDC 617.741-089-615.849.19]-089.168-07:[613.713+617.735]-018.74]

[Abstract] In studying the side effects produced on the posterior epithelium of the cornea by intracapsular Yag-laser fragmentation of the transparent lens fibers, the researchers performed the fragmentation on 18 chinchilla rabbits with maximum mydriasis. The fragmentation consisted in successive application of intracapsular laser coagulates over the entire area of the lens at varying depths inside the capsular sac. Pulse power ranged from 3 mJ to 7.7 mJ; number of pulses, 55-160 or more; exposition time, 10^{-8} s; diameter of spot at point of focus, 30 μm. The experimental data involved four groups of eyes: (1) those exposed to 100 or fewer pulses at 4-6 mJ; (2) 100-160 pulses at 6.1-7.7 mJ; (3) more than 100 pulses over entire range of power; (4) more than 160 pulses at 3-7.7 mJ. No appreciable changes were noted in the posterior epithelium of group 1 eyes, whose cells kept their proper hexagonal shape, with clear boundaries. Key-lock-type intercellular contact was undisturbed, microrelief was pronounced and represented by microvilli. No visible changes were noted in group 2, either. When the number of pulses was raised to more than 100, there was a direct dependence noted between the damage to the posterior epithelium and the number of pulses. Cell shape became more ovallike. No changes were noted in any of the groups in the layers of the retina. The researchers concluded that damage to the posterior corneal epithelium depends more on the number of pulses than on the energy level of the laser. A safe number of coagulates would not exceed 100. Figures 3, references 10: 3 Russian, 7 Western.

Use of Yag-Neodymium and CO_2 Lasers To Produce Small-Intestine Anastomoses

937C0156E Moscow KHIRURGIYA in Russian No 12, Dec 91 [manuscript submitted 24 Jun 91] pp 80-84

[Article by Cand. Med. Sci. V. G. Gondzhilashvili, Docent V. I. Ryabov, Cand. Med. Sci. M. V. Smolyaninov, I. A. Kazmin, V. V. Dorofeyev, Cand. Med. Sci V. V. Utkin, Scientific Research Institute of Laser Medicine, Moscow; UDC 616.341-089.86:615.849.19.03]

[Abstract] Experimental research was used to develop standardized equipment for creating "laser-welded" connections in sexual organs of the abdominal cavity with series-manufactured lasers. A total of 169 experiments were performed on chinchilla rabbits in which so-called terminal-terminal anastomoses of the small intestine were produced, with the walls joined edge to edge, inverted, and everted. Laser power levels ranged from 0.6 W to 15 W. Chronic experiments involved 195 rabbits of the same breed, with the strength of the bonds checked at intervals of 1, 3, 7, 14, and 30 days. Laser power levels were 0.9 W for the CO_2 laser and 10 W for the Yag-Nd laser, and the experiments focused on the use of a second, reinforcing row of stitches and the absence of such. The edge-to-edge method of joining the intestines in the first set of experiments proved the strongest in all cases, with the energy levels of 0.9 W (CO_2 laser) and 10 W (Yag-Nd laser) producing the strongest "welds." No additional microsurgery equipment was needed to produce the bonds. In the chronic experiments, by day 14, no differences could be detected in the strength of the bonds made with reinforcing stitching and those made without them. The extent of the vascular response when there was no structural tissue damage covered about 5.2 mm over the first three days. The zone of coagulational necrosis was irregular (0.5-1.5 mm). Maximum stenosis of the lumen in the groups without peritonization 16.48 percent or less on day 3 after the operation and 11.33 percent on day 30. References 20: 1 Russian, 19 Western.

Lasers and the Plasma Scalpel in Surgery for Hepatic Echinococcosis

937C0156F Moscow KHIRURGIYA in Russian No 11, Nov 91 [manuscript submitted 27 Dec 89] pp 74-78

[Article by A. V. Vakhidov, Yu. I. Kalish, F. A. Ilkhamov, T. V. Azimova, S. S. Agzamkhodzhayev, R. G. Grigoryan, Tashkent Affiliate, VNTsKh [not further expanded]; UDC 616.36-002.951.21-089:615.849.19]

[Abstract] In studying the feasibility of using a combination of laser and plasma scalpel to treat hepatic echinococcosis, the researchers performed operations on 46 individuals with the Skalpel-1 and Romashka-1 CO_2 lasers, the Plazmennyy skalpel [Plasma Scalpel] unit, and the LG-75 and AFL-01 He-Ne lasers. Upper median laparotomy was used for surgical access in 34 patients, and right-side subcostal incision, in the remaining 12. Clinical followup indicated that use of either laser or plasma scalpel cuts down on operation time and blood loss; reliable hemostasis and cholestasis are also achieved. Formalin need not be use for sanitation purposes. The coagulated wound surface of the liver was found to be sterile. The postop period is shortened most with combined use of the plasma scalpel and the He-Ne laser, and peristalsis of the intestine returns 1-1.5 days sooner. Postop hospital-stay was shortened to 19.5 days from 21.9 when either the laser or the plasma scalpel was used. Combination treatment that included the He-Ne laser shortened that stay to 9.5 days. Figures 4, references 8: Russian.

Surgical Treatment of Hepatic Echinococcosis With the CO_2 Laser

937C0156G Moscow KHIRURGIYA in Russian No 11, Nov 91 [manuscript submitted 22 Feb 90] pp 79-80

[Article by Cand. Med. Sci. S. O. Ordabekov, Emergency Hospital, Dzhambul; UDC 616.36-002.951.21-089:615.849.19]

[Abstract] Sixty-eight individuals underwent surgery for hepatic echinococcosis in which a CO_2 laser was used. Results were extremely favorable in that the laser produced coagulation of the small blood vessels and intrahepatic bile ducts, destroyed protoscoleces, arrested purulent infection. That promoted faster healing and resulted in few postop complications. Reliable hemostasis and cholestasis were produced, and the wound was sterile. No serious complications were noted in any of the 68 patients, who had an average hospital-stay time of 12.8 days, as opposed to 19.4 for the control group. References 9: Russian.

Brief Review of Transplants of Hemopoietic Tissue in the Treatment of Victims of the Chernobyl Accident

937C0156C Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 63 No 12, Dec 91 [manuscript submitted 14 May 90] pp 83-85

[Article by G. D. Selidovkin, A. Ye. Baranov, S. G. Pushkareva, L. V. Yevseyeva, A. A. Gordeyeva, N. V. Gorbunova, Institute of Biophysics, USSR Ministry of Health, Moscow; UDC 616-001.28-02:614.876(477)]-089:616.419-089.843]-089.168-07]

[Abstract] Four individuals with stage III acute radiation sickness (ARS) received transplants of allogenic marrow after an external dose of 6 Gy, as did nine stage IV ARS patients, three of who had been irradiated with 7-8 Gy and six of whom had received 9 Gy or more. Secondary disease was prevented with cyclosporin in 12 individuals. All the patients underwent selective decontamination of the intestinal tract with biseptol-480 and nystatin. Of the 13 patients, two survived. Temporary adaptation of the haploidentical marrow was observed, although it was subsequently rejected. Analysis of the transplantations indicates that the pale of its application is rather limited, although the technique is entirely precluded for use in treating acute radiation sickness. At present, the irradiation dose range for which it may be applied should be limited to 8-10 Gy of uniform external gamma radiation, because at smaller doses, current techniques make it possible to prevent complications, counter radiation syndromes, and, to some extent, guarantee the survival of the patient. Allogenic marrow transplantation does not. With larger doses, the survival of the patient depends to a large extent on the severity of the radiation damage not related to the marrow. Improvement of the techniques for treating radiation burns and intestinal syndromes is enabling the use of allogenic marrow transplantation in patients exposed to more than 8-10 Gy. References 14: 10 Russian, 4 Western.

Ophthalmic Morbidity in Palestine

937C0157A Moscow VESTNIK OFTALMOLOGII in Russian Vol 105 No 5, Sep- Oct 91 (manuscript received 21 Mar 91) pp 63-65

[Article by V. N. Golychev, Chair of Ophthalmic Diseases, Tversk Medical Institute; UDC 617.7-036.22(569.4)]

[Text] Thousands of students from the countries of Africa, Asia, and Latin America are studying in the medical higher educational institutes of our country. More than 900 physicians from developing countries have been trained in the Kalinin (Tversk) Medical Institute alone.

Foreign students are given special attention in the teaching process, and we work with them on an individual basis, including in the ophthalmology department [1-3]. However, due to the shortage of respective information the professors at the department are not very familiar with the specific aspects of ophthalmic disease from different regions, not to mention the specific countries from which the students have come.

By invitation of the Union of Palestinian Medical Committees, the author had the opportunity to work on a voluntary, unpaid basis during vacation (August-September 1990) as an ophthalmologist in the territories of the West Bank of the Jordan River and the Gaza Strip (Palestine). We examined 1,427 persons (2,848 eyes) in different cities and residential areas (Tulkarm, Zebabdi, Kalkiliya, Nablus, Beyt-Sakhur, Gaza, Jerusalem).

Only 196 were classified as healthy. Attention or care on the part of the ophthalmologist was needed in the remaining cases (2,652 eyes). Table 1 presents data on ophthalmic morbidity.

Table 1. Ophthalmic Morbidity on the West Bank of the Jordan River and the Gaza Strip

Opthalmic Pathology	Number of Eyes	
	Total	%
Conjunctivitis	884	30.7
Disturbances in refraction and accomodation	534	18.6
Cataract or condition after removal	494	17.2
Retinal dystrophy	147	5.1
Opacification of the cornea	144	5.0
Changes in eye due to diabetes	107	3.7
Contagious granular conjunctivitis, stage III-IV	98	3.4
Primary and secondary glaucoma	74	2.6
Congential ophthalmic pathology	71	2.5
Pterygia	68	2.4
Strabismus	49	1.7
Diseases of the optic nerve	31	1.1
Eye trauma and sequelae	31	1.1
Other	141	4.9
Total...	2,873*	100

Note. The number of diagnoses exceeds the number of eyes, since two or three diseases were noted in a single eye.

Acute and especially chronic conjunctivitis was found most often. Many of the infections were seasonal and evidently attributable to increased sun exposure in the spring and summer. Inflammatory processes in the mucous membrane of the eye facilitate the development of pterygium; therefore, it is found more often in Palestine than in countries with a moderate climate.

A cataract in the initial stage in the inhabitants of the West Bank of the Jordan River and the Gaza Strip has considerable climatic aspects. In half of the cases opacification occurs not in the cortex, but in the nucleus of the lens, and therefore, can quite early and frequently reduce visual acuity extremely. It should be noted that this form of cataract is sometimes difficult to recognize with side illumination and in transmitted light, even with a dilated pupil, and the use of biomicroscopy is needed without fail.

Conservative treatment in the immature opacity is not employed here. And the remedies for improving the metabolic processes in the lens, such as vitamin drops, vitayodurol [sic], katakhrom [sic], etc., are not available in local

pharmacies. With this in mind, only freshly prepared copper solutions can be recommended [4].

One of the aspects of retinal dystrophy is that the frequency of pigmented abiotrophies among them is high (45.7 percent), frequently with a considerable decrease or loss of visual function. Sixty percent of the cases of detected pigment dystrophies are recorded in the Gaza Strip.

As far as the condition of the eye in diabetes mellitus patients is concerned, 68 (64 percent) of the 107 eyes examined had diabetic, more often neovascular or proliferative, retinopathy, frequently with manifestations of partial or complete hemophthalmia with a considerable decrease or loss of eye function. Such an unfavorable course of diabetes with respect to the eye, in our opinion, can be attributed to the following: late detection of the disease and failure of the patient to adhere to his diet.

The significant frequency of opacification of the cornea that sharply decreases vision is explained to some degree by contagious granular conjunctivitis suffered many years ago. Opacification of the cornea is the leading cause of blindness on the West Bank of the Jordan River and the Gaza Strip (Table 2). In accordance with International Classification of Diseases, by blindness we mean a condition of the eye with visual acuity with correction of less than 0.05.

Table 2. Frequency and Causes of Blindness on the West Bank of the Jordan River and the Gaza Strip.

Cause of Blindness	Number of Eyes
Opacification of the cornea, including that due to contagious granular conjunctivitis	35
Congenital pathology	33
Retinal pathology, including pigmented abiotrophy	25
Glaucoma	14
Diabetic affliction of eyes	12
Pathology of the optic nerve	9
Other	17
Total...	146

Another leading cause of blindness is congenital eye pathology: congenital glaucoma, microphthalmia, widespread kolabomy, or the absence of some eye membranes. Half of the cases of this serious eye pathology are noted in the Gaza Strip. Marriages between relatives appear to play a significant role in the development of congenital ophthalmic diseases. In 35 out of 71 cases, the parents of children with congenital eye pathology were related by blood. It should be noted that 30 percent of patients with pigmented retinal abiotrophy, which is part of the reason for blindness in Palestine, had parents who were related by blood.

Primary and secondary glaucoma, diabetic retinopathy, optic nerve atrophy, and retinal detachment often lead to blindness.

Thus, on the West Bank of the Jordan River and in the Gaza Strip there is a high incidence of ophthalmic disease. The frequency of conjunctivitis, cataracts (especially nuclear), opacification of the cornea, pigmented retinal dystrophy, diabetic retinopathy, and congenital ophthalmic pathology is particularly high. The primary reasons for blindness are opacification of the cornea, which most often develops subsequent to suffering contagious granular conjunctivitis, and congenital ophthalmic pathology. Marriages between relatives as well as pigmented retinal abiotrophy play a significant role in these diseases.

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Correction of Poor Vision Using System Including Spreading Intraocular Lens

937C0157B Moscow VESTNIK OFTALMOLOGII in Russian Vol 105 No 5, Sep-Oct 91 pp 66-68

[Article by S. E. Avetisov and A. S. Vvedenskiy, All-Union Scientific Research Institute of Chief Diseases, USSR Academy of Medical Sciences, Moscow; UDC 617.751.6-08]

[Text] One of the optic systems that improves the image on the retina involves the combined use of a spreading intraocular lens—the IOL (ocular) and a collecting glass lens (objective). This system is afocal, since the anterior focus of the objective coincides with the posterior focus of the ocular, and thus the rays of light passing through these elements are converted into a parallel bundle.

Although the first attempts at correcting poor vision with this system were made several decades ago, analysis of published data shows that this method has not yet become popular. Moreover, theoretical discussions make it possible to suggest that there may be cases in practice in which the use of this method for correcting poor vision would be the method of choice. In addition, the conditions necessary for solving the problem of whether to use this method should be considered: 1) pronounced dystrophic changes in the central zone of the retina in the so-called terminal stage; and 2) cataract, which biomicroscopy data may show to be a cataract affecting visual acuity.

After a number of preparatory examinations had been performed (which included selecting the set of techniques to be employed for soundly based selection of the patients and creating the techniques for calculating the optic strength of the spreading IOL and eye glass), we felt it was possible to use this method to correct poor vision in the clinic.

This report presents a clinical example of the correction of poor vision using a magnifying system that includes a spreading IOL.

Patient A, born in 1929, was seen in the institute for severely complicated myopia, central maculodystrophy of both eyes, central partial congenital cataract, diverging strabismus of the right eye, and a beginning cataract in the left eye.

Data from an objective screening showed that correction did not improve visual acuity in the right eye enough for the patient to count fingers at a distance of 20 cm, and the left eye was 0.2 co sph -15.0 diopters (far), and 0.125 co sph -3.0 diopters (near). The accessory apparatus and anterior section of both eyes were normal for her age. The right eye deviated to the outside and the angle of strabismus was 15x on Girshberg's scale, with a full range of movement. There was a cataract in the right eye in the posterior and central layers (zonular cataract), and in the left eye it was in the posterior and partially central layers. Isolated, finely dispersed opacities were found in the vitreous body. Ophthalmoscopy data showed that in the right eye a "dry" central dystrophic area 2-2.5 diameters of the optic nerve disk in size was visible behind the fler through the paracentral sections of the lens (Fig. 1). A similar area smaller in size (1-5 diameters) was seen in the left eye. The anteroposterior axis in both eyes was 29.9 mm. Investigation showed that retinal visual acuity in the right eye was 0.12 and in the left eye was 0.32. Results of electrophysiological research showed that the internal layers of the retina were intact and that there was a moderate decrease in the conductivity of the axial bundle. The absolute central scotomas were determined using campimetry.

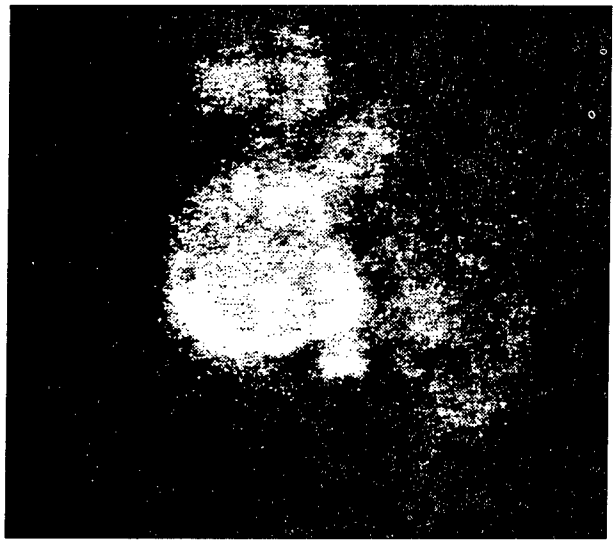

Fig. 1. Central "dry" dystrophic area in right eye. The blurriness of the ophthalmic picture is due to cataracts.

The medical history revealed the following. Since the patient had had poor vision with her right eye since childhood, she did all the visual work (near as well as far) with her left eye. During the observation process we did not note any dynamic changes in the status of the central zone of the retina; however, in recent years the patient began to complain of deteriorating vision in the left eye, which especially bothered her when working at short distances. This deterioration was attributed to an increase in the size of the cataracts (which were also present in the right eye). Discussion of the alternatives and perspectives for treatment revealed that vision in the left eye into the distance was what the patient wanted, and the objective of treatment should come down to making it possible to read at short distances. In connection with this it was suggested that the patient's right eye be examined to determine the possibility of prescribing a magnifying system for short distances.

Identical visual acuity for short distances (0.2; text No. 9) was achieved using a test selection of two versions of a so-called amblyocontact system—a soft contact lens (-) 20.0 diopters and eyeglass (+) 13.0 diopters and (-)17.0 diopters and (+) 15.0 diopters. We attributed the lack of any change in visual acuity in the test correction provided by the amblyocontact system that vary magnification to the presence of cataracts, which in addition to changes in the retina affected visual acuity. Based on this, the patient was offered a vision correction treatment for the right eye for short distances using a system that included spreading IOL and collecting eyeglass, and after detailed explanation of the proposed treatment, the patient agreed to the operation.

The operation was performed on 26 Oct 1989: extracapsular extraction of the cataract with the implantation of a biconcave IOL, model Alekseyev, with an optic strength of -10 diopters in the fluid of the anterior chamber (strength of the IOL was calculated using the reflection of the cornea, size of the anteroposterior axis, and potential increase). Midriatics were prescribed in the early post operation period due to iritis stage I-II. After the iritis was arrested and the midriatics were discontinued, we noted partial (in the outer quadrant) impaction of the pupillary part of the iris in the edge of the IOL, and as a result of this, partial pupillary block with hypertension. In connection with this, three weeks after the operation we performed laser iridotomy in nine hours, which in spite of retention of partial impaction of the iris (Fig. 2) normalized ophthalmotonus.

Fig. 2. Partial impaction of the iris with the edge of the IOL. The picture after laser iridotomy is performed.

The patient has been under observation for 1.5 years. No anatomical or functional changes in the operated right eye were noted during this period. Visual acuity in the right eye—the patient can count fingers at a distance of 20 cm. With the use of a test glass lens +34.5 diopters, the patient read text No. 6 of the tables for testing short distance visual acuity, which in size corresponds to newsprint. The working distance was approximately 60 mm. It was calculated that as a result of the combination of elements with the indicated optic strength, magnification in the retina was 7.2. It was recommended that the patient wear eyeglass +12.0 diopters and a 3x magnifying glass in her daily life, taking into account the lack of mass produced glass lenses of the indicated strength.

In our opinion, the results can be used for the following preliminary conclusions. First of all, we need to note that as a result of using the magnifying system, completely satisfactory visual acuity for short distances was achieved. However, it should be noted that with a significant increase in the size of the anteroposterior axis (typical for eyes with extreme myopia) there are favorable conditions for the prescription of magnifying systems to decrease the absolute amount of the optic strength of their components. In our opinion, this assertion agrees with clinical observations of patients with extreme, complicated myopia that have been operated on for cataracts. These observations suggest that in a number of cases after the operation, in spite of the significant increase in visual acuity at long distances, the patients complain of problems with reading texts which they satisfactorily read without correction before the operation. This is explained by the fact that for an extremely myopic eye, the work up close without correction was equivalent to vision against a combination of the correcting myopia of the glass lens and the variety of the magnifying agent—the hyperocular (that is, a highly positive lens). Based on the above, a question on the selection of eyeglass with high optic strength may arise in the analysis of the results obtained in this case. This is explained by the fact that a significant increase in imaging is needed when the central afflictions in the retina are large (which occurred in this case). It is necessary to note that the seven-fold increase achieved in the working distance (60 mm) in this case would be completely acceptable for short distance vision (a hyperocular of +24 diopters would be needed to achieve a similar increase; however, the working distance in this case would be only 33 mm).

It is necessary to take into account the increase in the risk of upsetting the hydrodynamics of the eye after implanting a biconcave IOL with a higher absolute optic strength, the use of which is necessary to achieve adequate magnification in the eyes with an anteroposterior axis that is "normal" in size. In these conditions it is necessary to develop extremely negative IOLs with a "fine" edge, which would not result in significant topographic changes in the structures of the anterior chamber in the eye.

Laser Treatment of Alcoholism

937C0171A Alma-Ata KARAVAN in Russian 20 Nov 92 p 3

[Interview with Yermek Azirovich Alimkhodzhayev, psychiatric therapist, head of the full-cost-accounting Lazer applied-science division of the Alma-Ata Oblast Council of the Society of Sobriety and Health, by KARAVAN correspondent Yu. Ivolgin: "Lazer Against Bacchus"; first two paragraphs are source introduction]

[Text] *Meet psychiatric therapist Yermek Alimkhodzhayev, 37 years of age. He graduated from the Alma-Ata medical Institute and is the developer of a unique technique for treating chronic alcoholism with a laser. There is no other such technique in the world.*

Alternative medicine—just what is the phenomenon? KARAVAN correspondent Yu. Ivolgin spoke it with the head of the full-cost-accounting Lazer applied-science division of the Alma-Ata Oblast Council of the Society of Sobriety and Health, physician and psychotherapist Yermek Alimkhodzhayev.

Ivolgin: Yermek Azirovich, the drain of specialists from official medicine has increased lately. What, in your view, are the reasons for that?

Alimkhodzhayev: Primarily, they're purely mercantilistic reasons. After all, the problem at this point resides in the plane of physical survival. You'd agreed that the wage levels of medical workers can't stand up to any kind of criticism. So the main reason is in the principles of organization of medicine that we inherited from a totalitarian system. Mainly, the notorious free, accessible-to-all medicine. That is the reason for the devaluation in society of the status of the physician, as it made him something in-between an ordinary service worker and an official from the statistics bureau. That is what is at the root of the lack of responsibility and the devil-take-it attitude toward their own health among most of our countrymen.

Ivolgin: So what can we do?

Alimkhodzhayev: The question, of course, is rhetorical. I think it's mainly the parliament of the republic who must answer that. If we're going to espouse the principles of democracy and the transition to a market economy, we need a law on health care, and a draft of that law should be the focus of a detailed discussion in society.

A great deal of hope right now is being placed on insured medicine, but it can work only if the economy is highly efficient. That, unfortunately, is not something we can boast. And then, insured medicine can't solve the fundamental problem—the distribution of drugs. Again it'll be in the high-level offices where they'll be solving the problem of who needs space, technology, equipment.

Ivolgin: What advantages does the head of a full-cost-accounting division have?

Alimkhodzhayev: As far as advantages go, only one: I and my colleagues have acquired a freedom and independence in the professional realm, and that is the main thing a physician needs to work. A diploma gives me the right to treat people, and the Hippocratic oath serves as the moral criterion for my work.

Ivolgin: And what about problems?

Alimkhodzhayev: Oh, there are more than there have ever been. Space, equipment, advertising—it would be hard to list them all.

Ivolgin: They say that NPO Lazer can bring joy back to the life of almost any hopeless alcoholic. Is that true?

Alimkhodzhayev: Yes, our division is involved in the treatment and rehabilitation of individuals suffering from a predilection for alcohol with a patented technique that uses lasers. Moreover, we work in the realm of interaction between individual and environment, a realm that houses 95 percent of the problems associated with health. To put it simply, we use original psychotherapeutic techniques to help patients to draw on the immense potential that resides in each of us to heal. The list of illnesses in which those techniques work is practically endless. Our telephone numbers are 69-60-31 and 33-55-42.

Ivolgin: I'm aware of the fact that your division helps not only the victims of Bacchus, but also men and women who have sexual disorders.

Alimkhodzhayev: Our reflexotherapist/physician handles that. Reflexotherapy is a nontraditional treatment technique. It consists in producing an effect on biologically active points, of which there are more than 300 on the human body. Acupuncture, pressure-point (finger) massage, electric and laser acupuncture—using those techniques we are successful in treating impotence and frigidity, enuresis in children, and we can remove painful symptoms for varying origin.

Ivolgin: Many physicians are treating alcoholism. Does the prospect of competing with such leading figures of domestic drug-abuse treatment as Dovzhenko bother you?

Alimkhodzhayev: I'm familiar with the technique used by A. R. Dovzhenko, and I must say that it is very effective. It should be noted, however, that the efficacy of the treatment depends largely on the personality of the psychotherapist. There are many good psychotherapists who are successful with the technique. Here in the city we have two specialists who have the right to use it—B. S. Aydeldyayev and V. M. Khlynovskiy.

As for what you call the "prospect of competing," that is exactly what medicine doesn't have enough of right now. People should have the right to choose.

Laser Treatment of Tuberculosis

937C0171B Moscow NEZAVISIMAYA GAZETA in Russian 25 Sep 92 p 6

[Article picked up from wire service INA Solaris: "Laser Puts Tuberculosis Patients Back on Their Feet: Women Do Better With the New Treatment Than Men Do"]

[Text] A new, effective treatment for destructive forms of pulmonary tuberculosis that uses lasers has been proposed by specialists from the Institute of General Physics of the Russian Academy of Sciences and medical professionals from Uzbekistan and Moscow. It consists in direct irradiation of the lesion focus in the lungs with ultraviolet laser emissions. A total of 1,000 operations performed in tuberculosis centers in Tashkent, Moscow, and India have demonstrated clinical improvement in 90 percent of patients. Abacillation (removal of bacilli in the body) was achieved in 75 percent of patients. Women do better with the new treatment than men do.

The operation itself is rather simple. With patient under local anesthesia, the surgeon uses an X-ray to find his way to the spot and inserts a saline solution into the cavity with a syringe. Then the syringe is disconnected from the needle, which remains in the patient's body. A light guide along which the laser emission runs is inserted into the needle. The entire procedure takes 10-15 minutes.

In addition to the treatment of tuberculosis patients, the laser has demonstrated good results in the treatment of inflammatory processes of the skin, the genitourinary organs, and the gastrointestinal tract and in the treatment of postop, traumatic, and trophic wounds.

The cost of the Almitsin medical laser is roughly 350,000 rubles.

New Food Products To Counter Radiation Effects

937C0171D Kiev RABOCHAYA GAZETA in Russian 3 Oct 92 p 2

[Article by V. Smykovskaya: "Medicinal Chocolate"; first paragraph is source introduction]

[Text] **New confections—Zdorovye [Health] wafers, Zdorovye chocolate, Agat [Agate] bonbons—have been developed by the Kiev Confectionery Plant, the Kiev Trade and Economics Institute, the Scientific Research Institute of Nutritional Hygiene of the Republic Science and Hygiene Center, and the Kiev Scientific Research Institute of Pediatrics, Obstetrics, and Gynecology. The wafers are just like any others, but they contain more glucose. The chocolate is made from cocoa, as well as dietary albumin.**

The inclusion of dietary albumin in the wafers, the chocolate, and the bonbons enriched them not only with a full-fledged protein, but also with iron, which is a hemopoietic biological element that prevents the development of anemia. Salts of alginic acid reduce the levels of heavy metals, slow the absorption of radionuclides, and reduce the dose of internal irradiation.

"Will these sweets appear on the market soon?" I asked the makers.

The chief of the marketing department of the confectionery plant, I. B. Mogilevich, told me that three tons of the Zdorovye wafers have already been produced, and two tons of the Agat bonbons. And we'll be seeing them very soon on the shelves of stores in Kiev and the rest of the oblast. In the future, all of Ukraine will be tasting the "medicinal" wafers, chocolate, and bonbons.

By the way, the prices of the new "dainties" are fairly low for these times. For example, one kilogram of the Agat bonbons is 71 coupons, 20 kopecks; the wafers, 31; and the chocolate, about 90 coupons, plus a trade markup.

Radioprotectant Sausages Developed

937C0171E Alma-Ata KARAVAN in Russian 11 Dec 92 p 3

[Article: "Sausage Treats Against Radiation"]

[Text] Meat products and canned goods that remove radioactive substances from the body will appear on the shelves of Moscow stores in the future.

According to reports from the Moscow Experimental Sausage Plant, work on a recipe for radioprotectants—biological plant formulas that will be inserted in sausages, ready-to-cook meat products, and canned goods.

Those products are intended primarily for the radiation-contaminated Tula, Bryansk, Kursk, and Chelyabinsk oblasts, as well as for personnel from nuclear power stations and nuclear submarines. However, in the opinion of specialists, the sausage products are in no way contraindicated for Muscovites who have been exposed to any adverse natural factors.

Novel Photodiagnostic Device

937C0171G St. Petersburg S. PETERBURGSKIYE VEDOMOSTI in Russian 26 Sep 92 p 2

[Article: "Support the Idea!"]

[Excerpt] [Passage omitted]

There Are No Others Like It

The photograph you see [not reproduced here] is unique, and hardly anyone would be able to guess what kind of equipment is being used in it by the head of the department of endoscopy at the hospital at the Kirov plant, M. Ye. Zarubin, or what the equipment is for. There are no other instruments in the world like the small instrument on the physician's table, which is called a photodiagnoser. The physician, touching a special sensor to the arm of a patient, can, with great accuracy, detect in the patient a gastric ulcer or a duodenal ulcer and determine how far along the illness is. No endoscopic examination is required.

The instrument (which is now going through certification in the Ministry of Health) was developed and built by a small circle of specialists in the Khorda firm, which was organized not very long ago. In fact, a year ago, several engineers who had worked many years at enterprises of the defense industry decided to set up their own business. As a result, they organized a limited partnership.

The photodiagnoser, says the director of Khorda, V. N. Deynega, and Chief Engineer B. N. Smirnov, is one of their first creations. But they have already built several so-called user telephone multiplexers. Use of that device is convenient where several people work, but there is only one city telephone connection and no possibility of getting an additional number. The multiplexer provides hookups for four or eight inside users, a city connection for each, an automatic switchboard for calls with the city automatic dial office for each required internal user, and a host of other operations that expand considerably the sphere of use of the collective telephone system.

It should be mentioned that devices that do similar things are manufactured abroad. But the Khorda multiplexer, in the words of its creators, is much more universal and there are no others like it.

To organize the manufacture of those items on a broader scale and the development of other ideas, this small firm needs help. It needs production space, capital investment, and help in filling orders and delivering the sets. Its telephone number is 252-24-86.

"Poltava Bischofite" or Gold Under Our Feet!

937C0172A Kiev HOLOS UKRAYINY in Ukrainian 30 Dec 92 p 7

[Article by V. Semenenko, Poltava]

[Text] Bischofite: this "magical fern flower" hid far in the earth crust, about two and a half kilometers deep. But because of its inaccessibility it became even more attractive, primarily to the foreign firms, alas not to our own specialists.

I will start with the question: Do you know what bischofite is? I will answer immediately: This is a solid material. It has been mined for many years in the areas of the Caspian Sea, in Kara-Bogaz-Gol Bay, and it is used widely in metallurgy.

Thirty years ago, bischofite deposits were discovered in the Poltava Region. However, this discovery became the stumbling block: An unknown underground power bent, cut, and tore apart pipelines made of even the strongest metals. For many years it was a hidden enemy of the petroleum prospectors, an enemy that hid in a thick layer of the earth, in a 20-50 meter stratum with one perfidious property—the ability to flow. Many wells were not completely drilled because of it.

In a nut-shell, this discovery brought us some mischief rather than the laurels.

What if we should have converted the enemy into a friend—this idea occured to O. I. Bibich, Chief of the Poltava Petroleum-Gas Exploratory Expedition for testing these wells. He shared this concept with his supervisor—Vasyl Stefanyshyn, director general of the "Poltava Petroleum Gas Geology" concern. Vasyl Mykolayevych should have been given the credit: He supported enthusiastically this idea of his subordinate—to tame this natural power.

On the 14th of December, 1990, he published an order to organize a research-production effort in mining of bischofite salts in the Poltava region. Work has been started on two wells . The ultimate goal of this work was to exploit the deposits and to supply the national economy with this critical crude material.

In the process of organizing the research-production mining of bischofite, it was decided to restructure the No. 6 well of the Poltava area and to revitalize the already operating exploratory-prospecting wells, principally those in which it would be possible to carry out the mining of bischofite salt brine.

I asked two of the participants to discuss the process of this undertaking:

—Ivan Bibich, chief of the expedition:

The order from the concern, which can be viewed as the connecting bridge to the market relationships, was executed. We issued [possibly missing text] bischofite of good quality, suitable for the use in various branches of the national economy, especially in medicine. We can mine this extremely valuable crude. However, fully realizing that new projects must be developed, we are presently not quite ready to put it on a proper footing.

To tell the truth, we should acknowledge the professionals in the city on the Neva river. In accordance with the agreement, they performed complete chemical analysis of two bischofite probes, prepared the rules for its mining and thus contributed to the blessing of this new project.

—Valeriy Vynnychenko, director general of the "Poltava Resource" concern:

Towards the end of 1990, a critical situation developed in Ukraine concerning production of refractory and setting mixtures for steel production. The total dependence on imports of the starting materials from abroad was felt sorely (Turkey, Korean Peoples Democratic Republic) and even from Russia (Chelyabinsk Oblast). Back in 1986, the importation of magnetite powder reached the level of 717 thousand tons, totalling 118 millions of Karbovanets, of which 2.6 millions were in hard currency.

Along with this, the dependence of the fire-proof material industry on the imported crude is becoming very dangerous. Suspension of the deliveries may occur for any reason at all. Hence, Ukraine badly needs an independently owned base of magnetite crude. Bischofite should provide this.

This crude material could be used widely in national economy. In the country-side, bischofite could be used as an additive to the feed, for incubation of duck eggs, to improve the quality of chicken eggs, to stimulate an increase in meat production per animal, and in milk yield per cow.

Lets look at this issue from the point of view of the construction worker. It should be stressed here that this is a forgotten problem of the past. Bischofite is an excellent preserving agent—during the 1930's, in the Middle East, materials like eggshells, sawdust, or straw were used as cement fillers. This technology could be used even to this day.

Those that responded to the creative initiative of the Poltavians should be commended. The scientific and professional cadres of the Dnipropetrovsk Medical Institute and those of the Institute of Geotechnical Mechanics, Ukrainian Academy of Sciences headed by Professor A. Zorin, developed medicinal preparations based on bischofite for therapy and prevention of the most common diseases prevalent in the industrial and ecologically disastrous areas. They have also developed and were able to obtain an approval for clinical use of materials used in filling teeth; and incidentally, these fillings are stronger and more resistant to bacteria than the commonly used ones. A method for breaking down kidney stones measuring over 3 cm in size has been developed.

Also, based on the bischofite, the Dnipro river workers developed compounds for the breakdown of strong solid materials. This makes it possible to destroy cement, granite, marble or such without the use of explosives.

The research on the discovery and practical use of these diverse properties of bischofites are being continued intensively. What about our countrymen? Only Dr. M. Voronin, from the third Poltava polyclinic has evaluated the curative properties of this briny wonder and was able to apply it in treatment of burns, various wounds, exemas, dry scabs, etc. All of this thanks to the bischofite. These are but some aspects of what bischofite can do in medical care . In summary, speaking figuratively, bischofite could become the magic wand. But one condition must be met: More than one well must be drilled as soon as possible. An entire saline industry must be developed consisting of hundreds of such wells.

One should add, "the magic fern flower" is hidden deep in the earth, about 2.5 km deep. But because of its inaccessibility, it becomes even more fascinating to the foreign companies, but alas, not to our professionals.

Construction of Plague Microbe Identification System Based on Genetic Probes

937C0118A Moscow GENETIKA in Russian Vol 27 No 12, Dec 91 (manuscript received 18 Apr 91) pp 2063-2070

[Article by Yu. A. Popov, Ye. G. Bulgakova, A. N. Kulichenko, O. G. Shishkina, A. I. Lezhnev, E. A. Fedotov, and O. A. Kirillina, All-Union Anti-Plague Scientific Research Institute "Mikrob", Saratov; UDC 575:616.981.452]

[Abstract] The objective of this investigation was to construct genetic probes based on the nucleotide sequences of plasmids pFra, pPst, and pCad of replicons from the plague microbe. The results showed that the production of DNA probes based on the nucleotide sequences of three typical plague extrachromosomal replicons made it possible to identify both typical and atypical strains. The successful construction of DNA probes based on three plasmid replicons of the plague microbe makes it possible to discuss the development of a system for testing for *Yersinia pestis* strains, an important aspect of which is that the recording effectiveness does not depend on the functional condition of the cell. In addition, it was shown that the use of the set of DNA probes in laboratory practice will make it possible to obtain specific information on the presence in cells of a given strain. The DNA probes used in standard hybridization conditions make it possible to quickly, specifically, and reliably identify the *Y. pestis* strain. In conclusion, the probes have a sensitivity range of 10^4-10^6, which is sufficient such that the constructed DNA probes can be used not only in laboratory conditions, but also for investigating material from infected animals and flea carriers. Figures 1; tables 1; references 19: 7 Russian, 12 Western.

Triticale Pathogen Septoria Nodorum: Assessment of Virulence Polymorphism in Belarus

937C0164A Minsk VYESTSI AKADEMII NAVUK BELARUSI in Belarusian No 3-4, Mar-Apr 92 (manuscript received 09 Jul 91) pp 26-31

[Article by A.A. Valuyevich, A.Yu. Lupey, H.M. Hardzey and I.A. Hardzey, Institute of Genetics and Cytology, Belarusian Academy of Sciences; UDC 632.4.01/08:582.288.22+[633.11+633.14](476)]

[Abstract] Differential analysis of the virulence of monosporous isolates of Septoria nodorum obtained from the leaves of Dar Belorusi winter triticale was performed on a series of cultivars of triticale, wheat and rye. Dispersion analysis on 29 S. nodorum isolates revealed considerable variability in virulence, depending on the test plant and geographic origin of the pathogen. In the final analysis, the results showed that six highly aggressive S. nodorum isolates—1-St, 8-St, 11-Vd, 6-Mg, 8-Mg, 3-SHch—can be used to form a suitable panel for testing triticale resistance to this fungal pathogen within the confines of Belarus. Tables 2; references 13: 6 Russian, 7 Western.

Physiology

Physiological Role of Taurine: Literature Review

937C0165A Minsk VYESTSI AKADEMII NAVUK BELARUSI in Belarusian No 3-4, Mar-Apr 92 (manuscript received 25 Jan 91) pp 99-106

[Article by L.I. Nefedov, Institute of Biochemistry, Belorusian Academy of Sciences; UDC 577.164.122]

[Abstract] Taurine, a conditionally essential nutrient, has generated much interest because of its seemingly ubiquitous involvement in mammalian physiology and development. One of its primary functions entails conjugation of bile acids and xenobiotics, but taurine has also been shown to be an antioxidant and a factor that stabilize cell membranes, exerts cardiotropic effects, modulates neural transmission on a selective basis, functions as an endogenous intracellular calcium agonist, and influences a variety of endocrine functions. Taurine has been demonstrated to be nontoxic in humans when administered in daily doses of 15 g, and appears to be a promising therapeutic agent in radiation sickness, hepatitis, cirrhosis of the liver, angina pectoris, alcoholism, epilepsy, parkinsonism and a number of other conditions. References 73: 13 Russian, 60 Western.

Health Status of Adult Population in Western Rayons of Bryansk Oblast in 1989

937C0158B Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 36 No 9, Sep 91 pp 8-14

[Article by R. N. Turayev, MNIRRI, RSFSR Ministry of Health; UDC 616-053.8(470.333-15)-02:614.876(477)]

[Text] The health status of the population in Bryansk Oblast is studied within the framework of an annual public health screening of those individuals exposed to radiation.

In 1989, 148,824 people (10 percent of the population of the oblast) were living in five rayons of the western territories of Bryansk Oblast, with 105,744 persons living in the rayons of "stringent" control (Table 1).

Table 1. Population in the Controlled Rayons by Group as of January 1, 1990.

Rayon	Population	Numbers in the Controlled Territories				Clean-Up Participants	Number Evacuated	Under Observation	
		Adults	Children	Pregnant Women	Total			Total	At the Union Level
Klintsovkiy	29146	3544	597	38	4141			4141	635
Krasnogorskiy	22700	10260	3480	127	13470	4		13474	3611
Novozybkovskiy	62396	47489	13107	684	60596	28		60624	13819
Gordeyev	16503	10208	2926	301	13123	4		13127	3230
Zlynkovksiy	18079	10864	2967	121	14375	2	1	14378	3091
Total...	148824	82356	23076	1156	105705	38	1	105744	24271

The demographic processes in the oblast were studied. According to data from statistical materials, a decrease in both overall mortality and infant mortality in the population has been noted since 1985. A slight decrease in the birth rate has been recorded; however, it is not presently possible to make any conclusions about the reasons for these phenomena. Studying the dynamics of demographic processes in the western rayons even for the past five years makes it possible to assess the demographic indexes for individual rayons and make preliminary conclusions about the reasons for the change in the demographic situation. It should be noted that demographic processes in the rayons to a large degree depend on the emigration of the youth as well as mothers with small children, which cannot help but affect the overall demographic situation. Table 2 presents the overall data on the demographic situation in the oblast.

Table 2. Dynamics of Demographic Processes in Bryansk Oblast.

Index	1985	1986	1987	1988	1989
Population (in thousands)	1475.7	1473.3	1474.4	1476.0	1470.8
Birth Rate per 1,000	15.3	16.3	15.9	15.1	14.2
Overall Mortality per 1,000	13.2	11.3	11.8	12.4	11.9
Infant Mortality per 1,000 births	18.4	17.2	18.6	17.4	14.1
Natural Increase per 1,000	2.1	5.0	4.1	2.7	2.3
Average Life Span, Years		69.8		68.4	70.8

The Leningrad Scientific Research Institute of Traditional Hygiene has completed a calculation of the average radiation doses to the thyroid with radioactive iodine in the public during the accident; the averages ranged from 10-250 rem, depending on the zone of observation and the age of the patient. The level of radioactive cesium in the body was also calculated. Based on these calculations, the radiation doses to the public were assessed and recommendations given for resettling the inhabitants of these populated areas who would exceed a dose of 35 rem if living there until the year 2056.

In spite of dosimetric measurements made, the high assessment of their reliability, and the agreement of results of the measurements made by various organizations, the physicians and public working in the rayons do not trust the data they are given on the radiation situation, which is associated with the low level of radiation knowledge of the physicians and, in our opinion, the artificial "pumping" of the stress situation by a number of local specialists and the media.

Organization of clinic observation and the network of establishments. Public health screenings are performed using active (visiting the workplace and establishments) and passive (by request) methods. The screenings are performed in the polyclinics of the central rayon hospitals (CRH), most of which have been built in the past 20 years and make it possible to perform the necessary diagnostic screening of patients and treat them.

The number of people screened is rather high. Pregnant women have all been screened, and almost all children (91-98 percent) have been screened. The adult population has the lowest numbers, especially in the rayons in which much of the rural population is elderly. The decrease in the percentage of the public screened in 1989 from 1988 should be noted. The most significant decrease in the number of those screened was in Gordeyevskiy and Klintsovskiy Rayons (Table 3).

Table 3. Public Health Screenings in 1988 and 1989.

Rayon	Number To Have Been Screened		Number Actually Screened		% Screened	
	1988	1989	1988	1989	1988	1989
Klintsovskiy						
Total	4163	4141	3981	3397	95.6	82.0
Adults	3522	3544	3376	2806	95.8	72.9
Children	641	597	618	589	96.5	98.0
Pregnant Women	63	38	63	38	100	100
Zlynkovskiy						
Total		14375		11993		83.0
Adults		10572		9129		86.3
Children		2910		2864		98.4
Pregnant Women		134		134		100
Gordeyevskiy						
Total	12937	13123	11857	11935	91.6	90.6
Adults	9916	11201	8836	6923	89.1	61.8
Children	2791	2915	2791	2680	100	91.9
Pregnant Women	230	301	230	301	100	100
Krasnogorskiy						
Total	13895	13470	13637	11419	98.1	83.1
Adults	10392	10260	10327	7962	99.3	77.6
Children	3310	3480	3310	3457	100	95.1
Pregnant Women	193	127	193	127	100	100
Novozybkovskiy						
Total	48910	60596	44366	51063	90.7	84.3
Adults	37665	47480	33136	38409	88.0	80.9
Children	11245	13107	11230	12654	99.9	96.5
Pregnant Women	714	750	714	750	100	100
Western Region						
Total	79905	50705	73841	51063	97.7	74.3
Adults	61495	82356	55675	65229	90.5	79.2
Children	17987	23076	17877	22224	99.4	96.4
Pregnant Women	1200	1350	1200	1350	100	100

In most cases the statement of facts of the detection of diseases is limited in public health screenings. Not all of the victims identified are placed under observation, and not all are given prophylactic treatment.

Medical Staff. Medical staff support in the therapeutic and prophylactic establishments, in spite of the measures used by the RSFSR Ministry of Public Health and the Public Health Directorate of the Bryansk Oblast Executive committee, is lower overall than in the oblast and RSFSR.

In comparison with 1985, the number of physicians in Bryansk Oblast increased by 831 (in 1985 the number was 4,512, and in 1989 it was 5,343), and the number of allied health personnel increased by 2,793 (in 1985 it was 12,201, and in 1989 it was 14,994). The number of health personnel in the western rayons of Bryansk Oblast also increased. At present there are currently 428 physicians and 1,337 allied health personnel working in these rayons, which corresponds to 8 percent for physicians and 9 percent for allied medical personnel of the total number of specialists in the oblast (10 percent of the population lives in these rayons).

During the past four years 322 physicians, or 29 percent of the total number of young specialists sent to the oblast, have arrived in the western rayons; 211 physicians have left since 1986; thus there has been a net increase of 111 physicians in these rayons. The situation with allied health personnel is somewhat better than with physicians.

One of the reasons for the emigration of physicians and their refusal to come here is the critical situation with housing; thus, as of January 1, 1990, there were 180 health personnel in line for an apartment in the western rayons.

According to the list of staff, there are 1551.5 allied health personnel in the western rayons; as of January 1, 1990, taking into account pluralism, 1,428 positions were filled (1,337 persons), with a shortage of 123 persons.

Lately, the supply of allied health personnel has improved due to the acceptance into medical academies of high school graduates from the controlled rayons, without the need for them to take the exams.

As a result of the shortage in the migration of physicians to Zlynkovskiy, Gordeyevskiy, Krasnogorskiy, and Novozybkovskiy Rayons, some specialties (therapists, endocrinologists, and ophthalmologists) are not filled.

A complete screening is not always performed due to the lack of specialists at the sites. A complete blood analysis is performed only with children (and even then not always).

In connection with the shortage of skilled personnel in the rayons, a team of specialists from the scientific research institutes and Central Therapeutic and Prophylactic Establishments in Moscow is being sent to the CRH. Patients are sent by local public health agencies and may also visit the medical establishments in Moscow or Bryansk on their own.

Lately the use of special research methods has expanded in the course of public health screenings, as a result of which the quality of diagnostics has increased and the radiation load on the patients has decreased. Since 1989 the use of fluorography in the western rayons has been banned. In 1989 ultrasound scanners were used in all the rayons for investigating the thyroid in children. Endoscopic research methods are still not widely used in all rayons. The Klintsovskiy and Krasnogorskiy CRHs have human radiation counters (HRC); however, data on the research has not been entered into the dosimetric records, which makes it impossible to determine individual doses in the public. In spite of the fact that the laboratory of the Leningrad Scientific Research Institute of Radiation Hygiene in Novozybkov has an HRC, the CRH does not send patients there for screening and does not tabulate the data. Data on the use of special techniques are presented in Table 4.

Table 4. Use of Special Techniques in the CRH in the Western Rayons in 1989

Rayon	X-Ray Examination	Fluorography	Ultrasound Examination	Endoscopy	HRC
Klintsovskiy	16209	5457	1291	2505	1328
Krasnogorskiy	2914	3235	2697	500	1450
Novozybkovskiy	6894		11449	1121	
Gordeyevskiy	7611		891	201	
Zlynkovskiy	4767		1048	51	
Total...	38364	8692	17375	4386	2778

Status of Morbidity. In connection with the fact that the population in individual rayons under observation is small, and the rayons often change their administrative structure, calculation of standardized indexes for some forms of disease began in 1986 throughout the entire western region.

Table 5 presents data on some forms of morbidity in the population of the western rayons and overall throughout Bryansk Oblast.

Table 5. Indexes of Morbidity in Bryansk Oblast (per 100,000) in 1988 and 1989

Disease	Oblast		Western Rayons		Controlled Rayon	
	1988	1989	1988	1989	1988	1989
All Types of Disease	56327.0	56367.7	45745.9	63212.1	61535.7	62009.5
Infectious Diseases	1631.2	1875.3	2171.4	1413.9	620.1	1116.7
Tumors	759.7	746.7	748.5	845.0	714.3	1268.1
Diseases of the Endocrine System, Disturbances in Metabolism or Immunity	330.8	626.5	604.7	1036.8	142.9	8716.1
Thyrotoxicosis	24.8	33.0	42.2	37.2	13.0	15.8
Diseases of the Blood and Hemopoietic Organs	10.4	25.6	12.1	121.2	26.1	12.6
Psychological Disturbances	924.6	1155.6	1458.2	1885.7	311.7	334.4
Diseases of the Nervous System and Sense Organs	5919.1	6657.3	2665.8	9651.1	10698.0	11627.7
Glaucoma	28.4	33.0	42.2	37.2	13.0	15.8
Diseases of the Circulatory System	1685.1	1901.5	1971.6	3221.6	1373.6	1555.2
Diseases of the Respiratory Organs	24052.0	20998.7	14575.3	17535.9	31113.6	21012.6
Diseases of the Digestive Organs	2952.8	1724.7	1926.8	2146.3	1409.0	1362.8
Diseases of the Urogenital System	2431.1	2414.9	1778.6	3599.1	4529.2	3119.9
Diseases of the Skin and Subcutaneous	4536.7	4346.7	3490.1	4027.1	6678.6	2561.5
Diseases of the Skeletomuscular and Connective Tissue	3589.8	3376.5	3143.0	4066.7	2230.0	1353.3

An analysis of statistical data on morbidity throughout the oblast makes it possible to make preliminary conclusions about the fact that overall throughout the oblast morbidity remained at the previous level from 1988 through 1989, the detection of diseases in the western rayons increased, and the detection of diseases in the controlled rayon also remained at the previous level; however, the absolute figures for morbidity in the controlled rayon agree with morbidity in the western rayons for 1989.

An analysis of morbidity for the individual groups shows that infectious morbidity in the western rayons dropped by 65 percent for the year, while at the same time on the average for the oblast and the controlled rayon it increased. This indicates the increase in the work of the sanitation and epidemiology station agencies and control of the sanitation and epidemiologic situation.

Overall morbidity with tumors throughout the oblast remains stable. A slight increase in tumor morbidity was noted in the western rayons and an increase of almost two-fold in the controlled rayon, which is associated with the participation in the screening of highly-qualified specialists and the detection of victims who have suffered for a long time from various benign and malignant tumors.

Increased efforts on the part of the endocrinologic service have resulted in a two-fold increase in the detection of endocrine diseases in the oblast and western rayons. In the controlled rayon the detection of endocrine pathology increased by almost sixty-fold, which was prompted by sighting endocrinologic screenings being performed for the first time. This increase was also reflected on the average-oblast index. It should be noted that the detection of thyrotoxicosis in the western rayons decreased, since the bulk of victims was identified in the previous years.

Highly-skilled blood examinations began to be performed only since 1989 in the western rayons, which resulted in an increase in the detection of diseases of the blood and hemopoietic organs. More detailed analysis of the results of the travelling investigations of the specialists showed that, in general, iron-deficiency anemias are diagnosed. The iron deficiency is attributed to a disturbance in the diet of the public.

An analysis of the remaining indexes also indicates that the use of modern diagnostic techniques and the involvement of highly skilled specialists in the examinations sharply increases the detection of diseases. Therefore, dynamic observation of the public over the course of a number of years will be of certain scientific and practical interest.

The controlled territories were subjected to radioactive iodine fallout, and the public received certain doses of radiation to the thyroid. Great attention to the study of the status of the thyroid is needed due to possible errors in determining the amount of the dose, inadequate study of the problem of synergism of the effect of the endemic nature of the rayon and radiation of the organ. In the pre-accident period little attention was paid to studying the status of this organ. A large number of deviations in the status of the thyroid are currently being detected in the course of skilled screenings. However, in the study of the status of the thyroid in the control Karachevskiy Rayon, virtually no changes were detected in the population of the western rayons in comparison with the control (Table 6).

Table 6. Dynamics of Disease Detection in the Thyroid in the Adult Population of the Western and Controlled Rayons of Bryansk Oblast per 10,000 Inhabitants for 1986-1989.

Form of Disease	1986	1987	1988	1989	1989 (Controlled Rayon)
Simple Goiter	109	116	117	115	179
Nodular Goiter	102	124	108	120	135
Primary Hypothyrosis	0.3	1.2	1.4	1.0	—
Chronic Thyroiditis	0.4	2.7	4.0	9.3	10.4
Hyperplasia	1628	1768	1415	1974	1453
Number Screened	61227	56492	67889	67430	14307

In all rayons a large number of thyropathies and malignant tumors of the organ were detected (Table 7) which necessitated increasing the number of surgeries.

Table 7. Distribution of Malignant Tumors of the Thyroid in the Western and Controlled Rayons

Region	1985	1986	1987	1988	1989
Western Rayons	2	8	24	15	6
Controlled Rayon	—	2	1	1	9
Oblast	22	49	66	68	78
Oblast—Western Rayons	20	39	41	52	63

Data on the dynamics of the diseases indicate the absence of an increase in the frequency of nodular and diffuse forms of goiter. An increase in the identification of thyroiditis was due to the use of ultrasound.

An analysis of the activity of endocrinologists shows that the endocrinologic service is not working hard enough. Thus, in 1989 in the oblast endocrinologic clinic, 54 persons were hospitalized for operations; at the same time

there is a line for hospitalization at the MNIRRI [as published]. There are clearly not enough endocrinologists at the CRH. Of the 12.5 posts in the western rayons only 7.75 are filled.

An endocrinologic ward has been created at the Novozybkovskiy CRH, but it is not fully functioning due to the incomplete staff and poor laboratory service. These problems are causing a considerable flow of patients to the medical establishments in Moscow.

Cancer in Bryansk Oblast even prior to 1986 was higher than in the republic as a whole. It should be noted that in 1988 in the controlled rayons the cancer rate was lower than the morbidity in the oblast and lower than in the control rayon.

The increase in the detection of diseases in the population of the western rayons that was recorded in 1986 and 1987 is associated with the universal public health screening of the population. Subsequently we noted a decrease in cancer morbidity of the population in all rayons, with the exception of Klintsovskiy, which has the smallest number of persons observed with respect to the total number of inhabitants in the rayon, and the contingent of those being screened is constantly expanding in addition to those under mandatory screening. The active detection of cancers in these rayons reached 36 percent, with an oblast average index of 20.6 percent, which characterizes the increase in the quality of cancer diagnosis in the western rayons.

In 1987 there was an increase in detection of cancer of the thyroid, which may be attributed to the increase in the quality of diagnostics and the sending of skilled specialists to the rayons. There was no increase in morbidity for the remaining locations.

The hematologic service has a hematologic ward of 40 beds in the oblast hospital and 12 beds in the therapeutic ward of the children's hospital.

There are no hematologist staff positions in the rayons. There are four hematologist positions in the oblast, and they are all filled.

Laboratory investigations are supported by the hematologic, biochemical, and cytology laboratories of the oblast hospitals. Karyologic screenings are not performed in the genetics laboratory.

According to data of the work of the hematologic ward, which was organized in 1987, there was an increase in the number of hematologic diseases, which was particularly high in 1988 for groups of acute leukemias, lymphosarcomas, erythremias, hypoplastic anemias, and other diseases.

In the western rayons of the oblast for 1987-1989, there were 13 cases of acute leukemia recorded (5.3 percent of the total number of diseases) in adults and 12 in children.

It is not possible to associate the rise in the frequency of morbidity with acute leukemia in the controlled rayons with radiation, since karyologic screenings were not performed.

The considerable number of patients with thrombocytopenic purpura (in 1988 there were 37 children, and in 1989 there were 39 children) is noteworthy, but only one of these children is living in a controlled territory.

The number of patients with hypoplastic anemia remained stable for the period 1986-1989 (four patients). The greatest number of iron-deficient anemias was found in children in Zlynkovskiy Rayon: In 1987 there were 74, and in 1989 there were 120. In connection with this it is necessary to pay particular attention to the screening of children in other rayons as well. Table 8 presents data on the structure of hematologic diseases.

Table 8. Structure of Hematologic Diseases in the Oblast (According to Data from the Hematologic Ward of the Oblast Hospital)

Year	Total Treated	Acute Leukemia		Chronic Myeloleukemia	Chronic lympholeukemia	Myeloma	Erythremia	Lymphosarcoma	Myelofibrosis	Thrombocytopenia	Anemia	
		Total	Number in the Western Rayons								Total	Including Hypoplastic
1987	409	44	3	33	96	27	18	2	20	22	90	14
1988	687	112	5	49	100	63	46	32	26	49	119	17
1989	560	90	5	40	82	51	38	20	20	31	100	9

Analysis of infection morbidity shows that in the controlled rayons it is somewhat increased, but the same increase was also noted in the control Karachevskiy Rayon, and the greatest outbreak occurred in 1988 (Table 9).

Table 9. Dynamics of Infection Morbidity per 100,000 for 1985-1989.

Rayon	1985	1986	1987	1988	1989
Krasnogorskiy	10441	13574	11241	15233	8471
Gordeyevskiy	—	12354	13211	13384	7868
Novozybkovskiy	55256	46278	39850	58820	48894
Klintsovskiy	12336	12271	9273	16095	11233
Karachevskiy (Control)	17139	27419	11429	12153	11773

The greatest number of infectious diseases was noted in Novozybkovskiy Rayon, which may be due to the fact that Novozybkov is a city with a large number of employees of industrial enterprises, which need to have medical certificates and leave for caring for a sick child. The other rayons have rural populations in which recording of such diseases is poor.

Analysis of infection morbidity does not make it possible to tie irradiation of the public with the decrease in immunity, and thus reveal any relationship between irradiation and the change in morbidity.

Study of morbidity of the cardiovascular system is an illustration of how the recorded morbidity is associated with the quality of the screenings and the effect of stress on the population. Thus, the detection of hypertension in the western and controlled rayons shows that public health screening even with the simplest measurement of arterial pressure made it possible to identify hypertension in the controlled rayon two times more often than in the period prior to thorough medical examinations, and even several times more often in rayons with a very low level of medical care in the pre-accident period (basically prior to the arrival of specialists from Moscow scientific research institutes). Thus, the morbidity in the Brasovskiy and Karachevskiy Rayons increased, and in Krasnogorskiy Rayon it increased by three-fold, although it did not reach the level of the control rayons. It should be noted that the number of victims identified is insignificant and therefore it would not be fully correct to make any conclusions (Table 10).

Table 10. Dynamics of Hypertension Morbidity in the Public for 1988-1989

Rayon	Number of Victims	
	1988	1989
Klintsovskiy	15	35
Gordeyevskiy	35	61
Krasnogorskiy	3	69
Novozybkovskiy	79	185
Zlynkovskiy	13	65

A similar explanation could be offered in the analysis of the morbidity with coronary heart disease and stenocardia. These indexes indicate the high detection rate of hidden diseases as a result of electrocardiograms and more diligent attention given the patient during the screening. The small total numbers of patients identified is also noteworthy, as the calculation of the indexes using these numbers may depend on statistical fluctuations. However, the possible increase in morbidity with cardiovascular diseases caused by the constant stress of the population should not be disregarded.

Improving the sanitary conditions of the public. Some work is in progress on improving the sanitary conditions of the public following detection of pathology during public health screenings (Table 11).

Table 11. Improvement in Health in Population of Western Rayons in 1989 Among Those Screened

Rayon	Total Screened	Victims Detected	Hospitalized	Outpatient Treatment
Klintsovskiy	3710	1998	251	1998
Krasnogorskiy	11419	2801	276	2508
Novozybkovskiy	51063	15628	14	8822
Gordeyevskiy	11793	4149	1069	2586
Zlynkovskiy	11993	5975	252	4199
Total...	89978	30551	1862	20113

In the course of sanitation improvement measures it is necessary to make sure that there are not any contraindications or specific needs for their implementation associated with living in the radionuclide-contaminated territory. The patients need to be sent for health improvement to sanatorium-type establishments, and only the screening physician should make recommendations for allocating the vouchers and sending patients for treatment. Any therapeutic or physical therapy procedures may be used, depending on the health. Patients may be sent to health resorts anytime of year, without any seasonal limitations. However, the health status and the fact that rest is most effective when it occurs in the same climatic zone in which the person resides, since drastic changes in the climate and the need to adapt upon arrival and departure may have a negative effect, the extent of which has not yet been studied, should be taken into account.

Conclusion

An analysis of morbidity for 1989 in the controlled rayons of Bryansk Oblast did not make it possible to establish the effect of radiation on the health status of the population.

Further ongoing observation of the health status of the public and complete improvement in health for all detected victims, especially children, are needed.

The involvement of considerable efforts and resources, the equipping of CRHs and other establishments involved in

public health screening, and large-scale work on training specialists to implement public health screening programs are necessary for the public health screening of the people living in the territories with radioactive fallout. At present strong public health observation of persons living in the territories with contamination densities of 15 Ci per 1 km^2 at a modern level is practically unrealistic.

Problems Facing Pharmaceutical Industry Explored

934E0264B Moscow IZVESTIYA in Russian 10 Mar 93 Morning Edition p 6

[Article by IZVESTIYA writer Yevgeniya Manucharova: "The Domestic Pharmaceutical Industry Is Trying To Win Over the Market"]

[Text] **The domestic pharmaceutical industry, accustomed to monopolizing our market for many years, is making enormous efforts to capture it anew after the invasion of foreign firms. The manufacturers see the main cause of their troubles in their deliberately inequitable position with the foreign firms and believe that the Minzdrav [Ministry of Health] is creating the best conditions for the competitors.**

The crippling of the domestic producers has been intensified by the List of Vitally Necessary Medicines. It guarantees the sale of products and the priority of purchasing by the pharmacy network. The medicines named in the list are also supposed to be sold at a 50-percent discount. Currently, for the greater part, these are imported goods. The list is supersaturated with them and, due to this, illegally inflated. The specialists believe that the version proposed by the first Russian congress, "Man and Medicine," is sounder than the one currently in effect at the suggestion of Minzdrav's Council of Experts.

And, in the pricing policy, the plants also see lobbying for importing. This is also what Rosfarmatsiya [Russian pharmacy], the network leader, believes. For example, valocordin will undoubtedly be sold faster than our corvalol: It is cheaper, although the components in both preparations match.

The plants' main complaint against Minzdrav is this: Foreign exchange is being used for the acquisition of finished medicinal goods (which frequently duplicate ones already available from the domestic industry) and not for the acquisition of new processes, equipment, and raw materials. The domestic preparations forced out of our market remain in the plant warehouses. Thus, the enterprises are being deprived of working capital.

This was the topic of discussion at a meeting of the leaders of the Russian medical industry's enterprises and organizations with the leadership of Minzdrav (Minister of Health E. Nechayev was present and A. Vilken, the deputy minister, gave a report on the status of the industry).

The plants' complaints against the ministry also pertained to the licensing policy. Without licenses, the plants cannot trade with foreign countries near and far. The Minzdrav established a 25-day time frame for obtaining them, but it is also not being maintained. This is depriving the enterprises which have signed contracts of customers and, thus, of the opportunity to earn hard currency themselves. Ye. Vinogradov, the general manager of the Novokuznetsk Organika Chemical and Pharmaceutical Production Association, concentrated in his speech on the plants' demands on the ministry: "The enterprise can operate normally only then, when 50 percent of its output is sold abroad (just as throughout the entire world). Without this, it is impossible to get to a balanced foreign exchange market and to have a balanced budget. However, they are dragging their feet on the licenses. And not at all because there is a need for a product which a foreign customer wants to buy. Here, no one is buying it—they say there is no money. But Hoffman Le Roche is giving me new technologies which will make it possible for the enterprise to reach a new level. I am paying for this—with aspirin. Our aspirin meets international standards. The Minzdrav will not buy me such technology. I do not need any help or any credits or subsidy, I need nothing from the ministry. Simply let me work on my own. That is all."

However, this is precisely what the pharmaceutical plants are not being allowed to do. An upper limit on profits has been established for them and they cannot exceed a 30-percent profitability level in contrast to all the other sectors (in particular, to those which supply them with raw materials and equipment). Thus, the plant is buying at a loss to itself at free-market prices and, again at a loss to itself, selling its products at fixed prices. The meeting's participants unanimously called for the repeal of this decree. And here is what was completely new: The Minzdrav promised them its help here, considering it possible to hold down prices without doing so at the expense of the plants. Seemingly, everyone already understood: under the conditions of the limitation on profitability, the domestic pharmaceutical industry would not only fail to get out of the crisis, but would simply cease to exist.

Now in the sector, the process of conversion of enterprises to joint-stock companies (with subsequent privatization) is proceeding rapidly. The plants objected to Minzdrav's proposal that a block of shares be held for a period of not less than five years in state property and rejected the establishment of any kind of "Medical Industry Development Fund" into which the new AOs' [joint-stock company] dividends ought to go.

Now, the Minzdrav is drafting a special decree on the operation of the medical industry under the new conditions, where, very likely, the problems raised by the meeting will be reflected.

Privatization of 'Biomash' NPO Plant Contested

93P60150A Moscow TRUD in Russian 28 Jan 93 p 2

[Article by Lidiya Ivchenko: "The Building 'D' Affair. A Private Firm Has Privatized a Major Medical Factory for a Song"]

[Text] One morning in January a group of men wearing paratrooper uniforms and armed with police truncheons took the fence of the guarded territory of the Moscow Scientific Production Association "Biomash" by storm and ensconced themselves in a building under construction. The leader of the detachment explained to the NPO

[scientific production association] management that the men of this private sub-unit were acting under contract with the "Apromed" joint-stock company, which has been asserting a claim to the seized building, and that they would remain there as long as their employer required. At the same time, "Apromed" was planning to demolish the fence and make a gate in order to have its own entrance to the building, which it considers its own.

This is a story for the prosecutor rather than for the newspaper. It contains a host of complicated legal issues, and all possible investigations amount to clearing them up amidst an avalanche of contradictory documents. But the essence of the matter is that a laboratory building built at government expense and intended for the medical industry has been appropriated by the private "Apromed" company. And "Apromed," of course, will not relinquish it voluntarily.

For a long time the collective of the VNIIbiokhimashproekt, created to develop technologies based on fine microbiological analysis, had not even had normal working conditions. They had randomly rented premises scattered around Moscow and had taken shelter in attics and cellars. But they gradually built a place for themselves and finally created the complex of buildings in which the laboratory building under construction, building "D," as it was called, was assigned not the least significant role. Important things were being done within the walls of the institute, including things for military purposes, for which the institute is now being reproached by its former chiefs, who have become the managers of the "Apromed" AO [joint-stock company]. After all, it's stylish now to curse the military-industrial complex, forgetting that it was not just a consumer but also a creator, who created not the worst products in the world and who brought the country hard currency.

With the start of conversion, the NPO "Biomash," of which the institute is now part, focused totally on the problems of the national economy, developing technologies for obtaining biologically active substances for medicine, the food industry, and agriculture. Here they created processes for obtaining beta-carotene (prevents many disorders, including oncological ones), amino acids, pectins, microbiological polysaccharides (they increase the yield of oil from wells). They found stimulating additives for animals, ecologically pure plant protectants, biological fertilizers, the technology for obtaining extracts from medicinal herbs with a high output of useful substances, and much else.

Naturally, the workers became interested in having their developments pass beyond the boundaries of the laboratories and yield as valuable products as possible. And here the collective placed their greatest hopes on building "D," which, as it were, completed the experimental-production cycle.

In June 1990, when the USSR Council of Ministers Decree No. 590 "On Approving the Regulation on Joint-Stock Companies and Companies With Limited Liability" came out, on the wave of new trends the former managers of the NPO decided to create a joint-stock company in order, in their words, to attract money from commercial structures and finish construction of the building. In a few short days "Biomash" became one of the founders of the "Apromed" AO, which was headed by M. Kuzmich and V. Makarevich, who simultaneously remained the deputies of the "Biomash" general director. Working in the interests of the private structure created by them, they contributed the unfinished building "D"—state property which did not belong to "Biomash"—to the joint-stock company's capital fund.

"Perhaps at the time we didn't know, didn't understand what we were doing, that actually privatization was occurring," says "Apromed" AO President M. Kuzmich, "but this uncompleted building, then valued at 1.1 million rubles, was contributed to the capital fund. Yes, it was state property, but after official registration of the documents, everything transferred to the capital fund, in accordance with the 'Law on Property in the RSFSR,' becomes the common property of the stockholders..."

And that is how it all began. In the beginning the collective protested: Why hadn't people been asked? After all, the decision to create a joint-stock company was made individually by General Director V. Popov, in violation of the fifth paragraph of the aforementioned Council of Ministers decree. The director "reassured" the gathering that the NPO was not part of any joint-stock companies. When this was said, "Biomash" had already been listed as a founder of "Apromed" for a half year. As it turns out, were there reasons to conceal the truth? At the same time documents were being officially registered. Literally one month later the uncompleted building "D" was transferred to the "Apromed" AO balance sheet. And what is more, quietly, secretly, one gave, the other accepted... This in place of the real commission, documents, and grounds that are required for actions of this kind.

Under the pressure of circumstances, the new director of the NPO, K. Alibekov, announced [its] withdrawal from the joint-stock company, especially as the deal had been declared illegal by the "Biopreparat" concern (arisen from the fragments of the former Minmedprom) to which "Biomash," together with other subdivisions, belonged. Naturally he wanted to return his investment. Nothing of the sort happened. One may invest, but not "un-invest"—the stockholder has no right to demand his shares back.

"It is now the property of the joint-stock company," explains M. Kuzmich. "Now, if everyone begins to demand his investment back, we will have to disband ourselves! We are ready to reimburse 'Biomash' the monetary value of its investment..."

There is probably no point in explaining what a thousand-square-meter facility is, compared with 1.1 million inflated rubles. That's right, an enterprise which operates 70 percent for public health needs (the concern supplies 8 billion rubles worth of medicines, blood transfusion systems, etc.) has lost its production area. A private company engaged in the manufacture of cosmetic cream and hair gel has become the proprietor of a building built at government expense. What is more, without compensation, having for this a "Certificate of Ownership for a Privatized Enterprise," issued by the Russian State Property Committee.

I personally had a lot of questions about this. Is it lawful to consider irreversible a conversion to joint-stock company status carried out by the unconstrained decision of people who were simultaneously wearing two official hats? Is

uncompensated transfer of a building under construction—state property—into private hands contrary to the RSFSR Law "On Privatization of State and Municipal Enterprises in the RSFSR," lawful? Was it from state positions that former Deputy Chairman of the Russian Property Committee A. Yutkin—who began this "privatization" with his decision—spoke? And is a "Certificate of Ownership for a Privatized Enterprise" issued for a building that no one had privatized, legal?

Everyone interprets these answers in his own way: this is not at all easy amidst the masses of mutually exclusive laws, regulations, decrees and addenda. To crown it all off, by decree of the Russian Federation Government dated 30 December 1991, building "D" is included in a list of the most important construction projects for 1992 being financed from the state budget! It's enough to make your head spin...

I feel for the collective of the scientific production association but I can offer them only one suggestion—apply for arbitration, for the knot of legal ignorance, shortsightedness, scheming and deception can only be untied (or cut) by a court. And I have related this for others' edification: in a complex time of conflict, when innumerable abuses exist, it is still best to learn from others' experience.

Psychology

Dynamics of Mental Deadaptation in Chronic Stress Among Residents of Rayons Contaminated by Chernobyl AES Accident

937C0155 Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 91 No 12, Dec 91 [manuscript submitted 21 Nov 90] pp 3-6

[Article by Yu. A. Aleksandrovskiy, G. M. Rumyantseva, V. V. Yurov, A. N. Martyushov, All-Union Methodological Center for Marginal Psychiatry, All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, Moscow; UDC 616.89-02:614.876(477)]

[Abstract] The structure of nervous and mental disorders and other forms of mental deadaptation is studied among 300 individuals who had lived for at least four years in various population centers of Mogilev Oblast in Belorussia. A distinctive feature among all the individuals examined several years after the accident at Chernobyl was a high level of illness brought on by chronic somatic diseases (hypertension, gastrointestinal problems, pulmonary pathology, locomotor problems). The frequency of diagnosis of a given disease was generally a function of age, with older examinees reporting more problems. All the individuals evidenced fears that their health or the health of those closely related to them was being adversely affected by radiation. The researchers broke the cohort into five groups: individuals with neuroses, presenting primarily as neurasthenia (22.4 percent); individuals with neurosislike symptoms (25.7 percent); individuals with higher-than-usual excitability or hysteria (8.9 percent); individuals with preclinical disorders 38.0 percent); and individuals with no signs of mental pathology (5.0 percent). References 14: 8 Russian, 6 Western.

Radiosensitivity of Bone Marrow Cells and Postradiaton Kinetics of Myelopoiesis (Analysis of Chernobyl Sequelae Data)

937C0029A Moscow RADIOBIOLOGIYA in Russian Vol 32 No 1, Jan-Feb 92 (manuscript received 22 Nov 90) pp 3-18

[Article by G.P. Gruzdev and A.S. Chistopolskiy, Institute of Biophysics, USSR Ministry of Health, Moscow; UDC 576.35:539.1.04]

[Abstract] Bone marrow radiosensitivity and neutrophil formation kinetics were assessed in the case of 61 patients for 2 months after 0.1-12.5 Gy whole-body ionizing radiation as a result of the Chernobyl accident. The analysis encompassed the entire granulocytic pool in various stages of maturation. The basic findings from the analysis of peripheral blood neutrophil kinetics were that the pre- and post-radiation precursor pools differ significantly in radiosensitivity. Whereas the former cells have a limited capacity for production of mature neutrophils, the regenerative potential of the latter cells is much greater. This difference finds reflection in the fact that the transit time for the "normal" myeloid cells to neutrophils is approximately 32 days. That of the latter progenitor cells responsible for neutrophil repopulation after irradiation has been shown to be shorter and directly related to the radiation dose. Accordingly, the latter consist of more mature committed cells which, because of their maturity, are more tolerant of radiation and require less time for transit from the bone marrow to the vascular system. Figures 3; tables 1; references 16: Russian.

Mechanism of Radioprotective Action of Sulfolane

937C0029C Moscow RADIOBIOLOGIYA in Russian Vol 32 No 1, Jan-Feb 92 (manuscript received 27 Feb 91) pp 130-133

[Article by N.A. Ogurtsov and N.A. Vysotskaya, Institute of Physical Chemistry imeni L.V. Pisarzhevskiy, Ukr. SSR Academy of Sciences, Kiev ; UDC 577.391:621.386.86]

[Abstract] In order to determine the relationship between radioprotective efficiency and radiolytic products, a comparative analysis was conducted on the breakdown products of sulfolane and some of its derivatives. Accordingly, sulfolane, 2-sulfolene, 3-sulfolene and potassium 3-sulfolanyldithiocarbamate were subjected to 0.02-250 kGy (0.18-20 Gy/sec) irradiation from a Co source. The results indicated that the radioprotective effect of sulfolane were due to formation of sulfonyl anion radicals and hydrosulfonyl radicals that did not undergo ring cleavage but formed adducts with e^-aq and $H^\cdot$, resulting in regeneration of sulfolane. Thus, sulfolane exerts its protective effects by trapping reducing radicals—but not $OH^\cdot$ radicals—produced by radiolysis of water. The congeners of sulfolane lacking radioprotective properties underwent irreversible degradation. References 7: Russian.

Tissue Radiation Doses in Populations of Territories Affected by Chernobyl Fallout

937C0115A Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 5-6, May-Jun 92 (manuscript received 8 Mar 91) pp 27-29

[Article by V.I. Korolev, Medical Internship, Samara; UDC 614.876(477)]

[Abstract] Prospective dosimetric analysis was performed on the prevailing γ-radiation levels in Ukraine, Belarus and Russia resulting from the Chernobyl fallout and lifetime and 50 year-equivalent doses. The study was largely based on Cs-137 fallout since this radionuclide accounts for > 80 percent of the backround gamma radioactivity. Heaviest collective and individual radiation burdens prevailed in Belarus, and the lowest in the Urals. The lifetime bone marrow exposures have been estimated to range from 0.24 to 8.8 mSv in the various areas. The anticipated 50 year whole-body burdens have been calculated as 2.9-116 mSv, with a corresponding range of 2 to 81.2 mSv for bone marrow, and 0.8-32 mSv for male gonads and 0.5-15 mSv for female gonads. This information should be included as backround information in long-term health monitoring and in assessing the stochastic nature of radiation sequelae. Tables 2; references 11: 10 Russian, 1 Western.

Internal Irradiation From Long-Lived Radionuclides in Chernobyl Fallout

937C0115B Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 5-6, May-Jun 92 (manuscript received 16 Jul 91) pp 29-31

[Article by N.I. Pilipenko, L.Z. Kalmykov, V.V. Barabashova and V.I. Gubskiy, Kharkov Scientific Research Institute of Medical Radiology, Ukrainian Ministry of Health; UDC 616-008.849.4:615.849.2]-02:614.876(477)]

[Abstract] Radioscopic and radiochemicals studies on evacuees from Pripyat and adjacent areas conducted 3-40 days after the Chernobyl accident made possible identification of radionuclides that were internalized in that timeframe. The results showed ingress of the gamma- and beta-emitters Zr-95, Nb-95, Ru-103, I-131, Cs-134,137, Ba-140, La-140, and Ce-141, the alpha-emitters Pu-238-240,242, Am-241, and Cm-242,244, and the beta-emitters Sr-90 + Y-90. Within the first few days of the accident in > 96 percent of the subjects the internal dose due to Cs-137 was < 5 mSv, while the bone marrow dose from Sr-90 was < 5 mSv in > 93 percent of the cohort. The calculated 50 years doses for both radionuclides were approximately 19 mSv; furthermore, there was no correlation between Cs-137 and Sr-90 in individual urine samples due to variability in the fallout parameters. Tables 2; references 2: Russian.

Attenuation of Sr-90 Bioaccumulation by Alginates

937C0115C Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 5-6, May-Jun 92 (manuscript received 6 Sep 91) pp 31-34

[Article by V.N. Korzun, Yu.G. Voronova, A.N. Parats, A.V. Podkorytova, L.A. Rogalskaya, V.I. Saglo and A.I. Skorikova, Ukrainian All-Union Scientific Center for Radiation Medicine; UDC 616.849.2.015.25: 547.458.88].07]

[Abstract] Bioaccumulation of orally administered Sr-90 to 220 g female rats on a diet including 0.4 g/day of sodium alginate or calcium alginate was reduced to 26.6 and 12.9 percent, respectively, of the level of accumulation in animals on conventional laboratory chow. Feeding 0.8

g/day of laminaria was almost as effective as calcium alginate. Accordingly, it appears that incorporation of alginates and/or laminaria in the diet of at-risk populations as a result of the Chernobyl accident seems warranted. Optimal alginate intake for humans has been calculated at 15-29 g/day within the context of a varied diet. Tables 2; references 45: 25 Russian, 20 Western.

Radiation Level of Populace in Bryansk Oblast With Plutonium Deposited in Soil After Accident at Chernobyl Nuclear Electric Power Plant

937C0158A Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 36 No 9, Sep 91 pp 4-6

[Article by N. P. Ivanova and N. S. Shvydko, Leningrad Radiation Hygiene Scientific Research Institute, RSFSR Ministry of Health; UDC 614.876:[614.771:546.799.4.02.238/.240](470.333)]

[Text] For radiation hygiene assessment of the "soil" component of "Chernobyl" plutonium we need:

—to determine the concentration of the radionuclide in the soil;

—to develop approaches to analyzing the system—the source of pollution (the soil)—man for establishing the dose coefficient, which relates the human radiation dose to the characteristics of plutonium deposition in the soil, using criteria of ecological and radiation hygiene standards with consideration of the parameters that best fit the specific conditions of radiation of the people and available data on the migration ability of plutonium in the environment.

These parameters were obtained and analyzed based on Pathway analysis in our previous investigations.

Material and Methods

The objective of this study was to assess the ^{238}Pu, ^{239}Pu, and ^{240}Pu dose loads on the population of the controlled territory of the western rayons of Bryansk Oblast who either work in agriculture or live in this territory, using set levels of soil contamination with plutonium isotopes and dose coefficients calculated in accordance with the reported positions.

When calculating the effective equivalent dose (EED), which formed as a result of the plutonium isotopes deposited in the soil, we regarded that portion of these doses that entered the body through the mouth or through inhalation of the radionuclides resuspended above "undisturbed" and tilled soil. Corrections were made to calculate for new information on the metabolism and dosimetry of plutonium isotopes.

Results and Discussion

Table 1 presents the annual EEDs calculated in accordance with the above outlined approaches, which formed as a result of the people in the rayons in question inhaling the plutonium isotopes that had been deposited in the soil.

Table 1. EED (in μSi/year^{-1}) of Radiation of the Population of Bryansk Oblast With Plutonium Isotopes Deposited in the Soil (Inhalation Component)

Residence	^{238}Pu	^{239}Pu and ^{240}Pu	Total
Zaborye	4.0	15.1	19.1
Yalovka	2.4	10.5	12.9
Svyatsk (north-eastern direction)	2.9	44.9	47.8
Staryy Vyshkov	7.2	12.7	19.9
Staryye Bobovichi	10.1	50.3	60.4
Dobrodeyevka	8.7	13.7	22.4
Vyshkov	2.6	8.7	11.3
Barki	9.9	13.6	23.5
Ushcherpye	3.9	9.6	13.5
Veprino	8.4	12.8	21.2

Table 1 shows that the EED due to ^{238}Pu varies from 2.4 to 10.1 μSi/year^{-1}, and due to ^{239}Pu and ^{240}Pu varies from 8.7 to 50.3 μSi/year^{-1}, differing by 5-6 times for different populated areas. The total EED of radiation with plutonium isotopes is 11-60 μSi/year^{-1}.

Table 2 presents the calculated EED of radiation for mechanics due to inhaling the components. It is clear that the radiation dose due to inhalation of plutonium isotopes for mechanics is 86-459 μSi/year^{-1}, which exceeds the respective figures for residents of these populated areas by 7-8 times.

Table 2. EED (in μSi/year^{-1}) of Radiation of Mechanics of Bryansk Oblast With Plutonium Isotopes Deposited in the Soil (Inhalation Component)

Residence	^{238}Pu	^{239}Pu, ^{240}Pu	Total
Zaborye	31	114	145
Yalovka	18	79	97
Svyatsk (northeastern direction)	22	341	363
Staryy Vyshkov	55	97	152
Staryye Bobovichi	77	382	459
Dobrodeyevka	65	104	169
Vyshkov	20	66	86
Barki	75	104	179
Ushcherpye	30	73	103
Veprino	64	98	162

In moving on to assessment of that portion of the dose that is formed due to alimentary means of the radionuclide entering the body, it should be noted that a set of parameters, both dependent and independent of the properties of plutonium, was used in the calculation [2] (Table 3).

Table 3. EED (in μSi/year^{-1} x 10^{-2}) of Radiation of the Population of Bryansk Oblast With Plutonium Isotopes Deposited in the Soil (Alimentary Component)

Residence	Radionuclide	Plant Product Contamination		Animal Products						Full Dose
		Root	Airborne	Meat			Milk			
				Feed Contamination		"Direct" Inhalation	Feed Contamination		"Direct" Inhalation	
				Root	Airborne		Root	Airborne		
Zaborye	^{238}Pu	10.1	23.0	5.2×10^{-3}	0.1	9.2×10^{-2}	0.9×10^{-3}	2.0×10^{-2}	1.1×10^{-2}	0.33
	$^{239,240}Pu$	32.2	75.0	1.7×10^{-2}	0.37	0.33	3.2×10^{-3}	7.0×10^{-2}	3.6×10^{-2}	1.08
Total...										1.41
Yalovka	^{238}Pu	6.0	13.8	0.3×10^{-2}	6.6×10^{-2}	5.5×10^{-2}	5.5×10^{-4}	1.2×10^{-2}	6.6×10^{-3}	0.20
	$^{239,240}Pu$	22.3	52.1	1.2×10^{-2}	0.26	0.23	2.2×10^{-3}	5.0×10^{-2}	2.5×10^{-2}	0.75
Total...										0.95
Svyatsk (northeastern direction)	^{238}Pu	7.26	16.5	3.7×10^{-3}	7.9×10^{-2}	6.6×10^{-2}	6.6×10^{-2}	1.4×10^{-2}	0.8×10^{-2}	0.24
	$^{239,240}Pu$	95.9	223.7	5.0×10^{-2}	1.1	1.0	9.6×10^{-3}	0.33	0.1	3.22
Total...										3.46
Staryy Vyshkov	^{238}Pu	17.9	40.8	9.0×10^{-3}	0.20	0.16	1.6×10^{-3}	3.6×10^{-2}	2.0×10^{-2}	0.59
	$^{239,240}Pu$	27.1	63.3	1.4×10^{-2}	0.32	0.28	2.7×10^{-3}	6.1×10^{-2}	3.0×10^{-2}	0.91
Total...										1.50
Staryye Bobovichi	^{238}Pu	25.1	57.0	1.3×10^{-2}	0.27	0.23	2.2×10^{-3}	5.0×10^{-2}	2.7×10^{-2}	0.83
	$^{239,240}Pu$	107.3	250.3	5.5×10^{-2}	1.25	1.10	1.1×10^{-2}	0.24	0.12	3.60
Total...										4.43
Dobrodeyevka	^{238}Pu	21.6	49.0	1.1×10^{-2}	0.24	0.20	0.2×10^{-2}	4.3×10^{-2}	2.3×10^{-2}	0.71
	$^{239,240}Pu$	29.4	68.6	1.5×10^{-2}	0.34	0.31	0.3×10^{-2}	6.6×10^{-2}	3.3×10^{-2}	0.99
Total...										1.70
Vyshkov	^{238}Pu	6.5	14.8	3.3×10^{-2}	7.1×10^{-2}	5.9×10^{-2}	5.8×10^{-2}	1.3×10^{-2}	0.7×10^{-2}	0.22
	$^{239,240}Pu$	18.7	43.7	9.0×10^{-3}	0.22	0.20	1.9×10^{-3}	4.2×10^{-2}	2.1×10^{-2}	0.63
Total...										0.85
Barki	^{238}Pu	24.6	56.0	1.3×10^{-2}	0.27	0.22	0.2×10^{-2}	4.9×10^{-2}	2.9×10^{-2}	0.81
	$^{239,240}Pu$	29.0	67.8	1.5×10^{-2}	0.34	0.30	0.3×10^{-2}	6.5×10^{-2}	3.2×10^{-2}	0.98
Total...										1.79
Ushcherpye	^{238}Pu	9.8	22.3	0.5×10^{-2}	0.11	0.09	9.0×10^{-4}	2.0×10^{-2}	1.1×10^{-2}	0.32
	$^{239,240}Pu$	20.6	48.2	1.1×10^{-2}	0.24	0.21	0.2×10^{-2}	4.6×10^{-2}	2.3×10^{-2}	0.69
Total...										1.01
Veprino	^{238}Pu	20.9	47.5	1.1×10^{-2}	0.23	0.19	0.2×10^{-2}	4.2×10^{-2}	2.3×10^{-2}	0.69
	$^{239,240}Pu$	27.4	63.8	1.4×10^{-2}	0.32	0.29	0.3×10^{-2}	6.2×10^{-2}	3.1×10^{-2}	0.92
Total...										1.61

When comparing the data that characterize the contribution of plant and animal products to the radiation dose, we can conclude that the former comprises 99 percent of the dose load from the soil alimentary components of the plutonium isotopes, with two-thirds of it due to airborne entry and one-third due to root entry. The proportion of animal products is negligibly small—only 0.7 percent of the dose load comes from meat and milk, and this is primarily due to the airborne and "direct" inhalation component, and not root entry of plutonium.

The full annual EED of radiation of the general public and mechanics due to inhalation and the alimentary component is presented in Table 4.

Table 4. Annual EED of Radiation With ^{238}Pu, ^{239}Pu, and ^{240}Pu (in μSi/year^{-1})

Residence	Inhalation Component		Alimentary Component		Total Dose	
	General Public	Mechanics	General Public	Mechanics	General Public	Mechanics
Zaborye	19.1	145	1.4	1.8	20.5	147
Yalovka	12.9	97	1.0	1.2	13.9	98
Svyatsk (northeastern direction)	47.8	363	3.5	4.5	51.3	367
Staryy Vyshkov	19.9	152	1.5	2.0	21.4	154
Staryye Bobovichi	60.4	459	4.4	5.8	64.8	465
Dobrodeyevka	22.4	169	1.7	2.2	24.1	171
Vyshkov	11.3	86	0.9	1.1	12.2	87
Barki	23.5	179	1.8	2.3	25.3	181
Ushcherpye	13.5	103	1.0	1.3	14.5	104
Veprino	21.2	162	1.6	2.1	22.8	164

It is perfectly clear that in the contaminated area the primary means by which plutonium isotopes enter the human body is by inhalation— inspiring soil particles stirred up by the wind and farm machinery. The dose due to the alimentary component for the general public is 6-7 percent, and for mechanics it is 1-1.4 percent of the total figure.

Although the contribution of the inhalation and alimentary component to the dose may change with time, since the metabolic processes of plutonium in the systems of the soil and the air near the ground and the soil and plants are in many ways also determined by the age of the deposits, prognostic assessments of the EED of radiation of the inhabitants of Bryansk Oblast with plutonium isotopes were performed for 70 years with differentiation of the indicated components in accordance with the correlation obtained at this stage of the work (Table 5).

Table 5. Predicted EED of Radiation With ^{238}Pu, ^{239}Pu, and ^{240}Pu (in μSi/year^{-1}).

Residence	General Public			Mechanics		
	Inhalation Component	Alimentary Component	Total	Inhalation Component	Alimentary Component	Total
Zaborye	13.4	1.0	14.4	101.5	1.3	102.8
Yalovka	9.0	0.7	9.7	67.9	0.9	68.8
Svyatsk (northeastern direction)	33.5	2.5	36.0	254.1	3.2	257.3
Staryy Vyshkov	13.9	1.1	15.0	106.4	1.5	107.9
Staryye Bobovichi	42.3	2.9	45.2	321.3	3.7	325.0
Dobrodeyevka	15.7	1.2	16.9	118.3	1.6	119.9
Vyshkov	7.9	0.4	8.3	60.2	0.6	60.8
Barki	16.5	1.3	17.8	125.2	1.6	126.8
Ushcherpye	9.5	0.7	10.2	72.1	0.9	73.0
Veprino	14.8	1.2	16.0	113.4	1.5	114.9

Based on the figures presented we can conclude that in the ten areas screened, the effective equivalent dose of radiation over a 70 year period is within 0.08 to 0.45 cSi for the general public and 0.6 to 3.2 cSi for mechanics.

It is possible that further systematic research will permit certain refinements and corrections to be made in the obtained figures.

Impact of Radioecological Situation in Belarus on Steroid Hormone Function

937C0164B Minsk VYESTSI AKADEMII NAVUK BELARUSI in Belarusian No 3-4, Mar-Apr 92 (manuscript received 02 Oct 91) pp 66-72

[Article by Ya.F. Kanaplya, H.L. Luksha, M.A. Haurylin and L.K. Syachko, Institute of Radiobiology, Belarusian Academy of Sciences; UDC 577.391.+577.17]

[Abstract] An analysis was conducted on the impact of backround levels of radiation in the Homel and Mohilev oblasts of Belarus—affected by Chernobyl fallout—on steroid hormone function in 2-3, 6-9 and 11-12 month old female Wistar rats. Assessment of cytoplasmic and nuclear steroid receptors of hepatic and uterine tissues and lymphocytes for progestins, glucocorticoids and estrogens revealed considerable time-dependent departures from control values. Fluctuations in receptor concentrations were predicated on perturbed transcription and translation mechanism, as well as on impeded receptor translocation between the nuclear and cytoplsmic compartments. These observations provide further elaboration of the profound effects that the raised backround radiation levels exert on living organisms at the molecular and receptor levels. Figures 2; tables 3; references 11: 6 Russian, 5 Western.

Miscellaneous

Chief of Third Main Administration Remains in U.S.

93P60166A Moscow MEDITSINSKAYA GAZETA in Russian 11 Dec 92 p 2

[Article by F. Smirnov: "Chief of Third Main Administration Fails To Return From U.S."]

[Text] The head of the Russian Health Ministry's Main Administration of Medical-Biological and Extremal Problems (the former Third Main Administration), Viktor Koshcheyev, failed to return at the appointed time (17 November) from a 10-day business trip to the United States. Instead he sent a statement concerning his resignation from the position of main administration chief and director of the "Zashchita" Emergency Medicine Center without indicating the reason. As the first deputy chief of the main administration, Vladimir Reva, informed us, it is early to talk about Koshcheyev's motives for defecting. It is known only that he has a daughter studying in the United States and that the objective of the ill-starred business trip was negotiations with one of the American institutes about cooperation with the "Zashchita" Center in organizing emergency rescue operations.

At present, the state security organs are studying this unpleasant incident—after all, to this very day many areas of the activities of the Main Administration of Medical-Biological and Extremal Problems are state secrets. Did Koshcheyev have access to secret information? The Security Ministry's press center refused to give us information about this. But in the words of Russian Federation Deputy Health Minister Vladimir Shakhmatov, the main administration chief "took no state secrets with him," since recently he had not studied secret documents and had not visited classified plants. Evidently consciously. And the information to which Koshcheyev had access working in the field of space medicine is no longer secret. "If such a case had happened several years ago, the consequences would have been far more serious," said Shakhmatov.

As "MG" [MEDITSINSKAYA GAZETA] has learned, Viktor Koshcheyev signed a one-year contract with one of the American institutes. He reported this in his statement recorded on a video cassette and sent to Russia (at present this cassette is being studied at the Ministry of Security).

In times not so remote, Koshcheyev would certainly have been held up to shame and declared a traitor and betrayer of his native land. Now such attributes are unpopular. Of course, everyone has the right to decide for himself what country to live and work in. But, apparently, such a decision should still be made in a civilized and proper way. Viktor Koshcheyev acted otherwise...

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