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# **Science & Technology**

***Central Eurasia:  
Life Sciences***

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# Science & Technology

## Central Eurasia: Life Sciences

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27 MAY 1992

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**Reaction of Translation Initiation Factor 2 of Wheat Germ With Guanyl Nucleotides**

927C0371A Moscow BIOKHIMIYA in Russian Vol 56 No 12, Dec 91 (manuscript received 22 Feb 91; after revision 18 Apr 91) pp 2148-2158

[Article by S.M. Shaykhin, S.K. Smailov, A.V. Li, Ye.V. Kozhanov, and B.K. Isakov, Molecular Biology and Biochemistry Institute imeni M.A. Aytokhozhin, KazSSR Academy of Sciences, Alma-Ata; UDC 577.217.5]

[Abstract] Eukaryotic translation initiation factor 2 (eIF-2) is a subunit protein that binds initiator methionyl-tRNA (Met-tRNA<sub>i</sub>) in the presence of guanine triphosphate [GTP] to form the ternary complex Met-tRNA<sub>i</sub>-eIF-2-GTP. The said ternary complex in turn binds with a small ribosome subunit (40S) to form a 43S preinitiator complex. This process is considered to be one of the first stages in the initiation of polypeptide chain synthesis. Previous research has demonstrated that the factor eIF-2 in animal cells has an affinity to guanine diphosphate [GDP] that is two orders of magnitude higher than its affinity to kGTP. In order for factor eIF-2 to participate in new rounds of initiation, the GDP molecule bound to it must be replaced by GTP. In an effort to increase understanding of the mechanisms of regulation of the activity of eIF-2, the authors of the study reported herein worked to determine the dissociation constants of complexes of homogeneous preparations of eIF-2 from wheat germ (WGeIF-2) and rabbit reticulocytes (RReIF-2) with GDP and GTP. The WGeIF-2 was obtained from *Triticum aestivum* winter wheat (variety, Kakzhstanskaya 4). According to gel filtration measurements, the WGeIF-2 had an relative molecular mass of 150,000. Sodium dodecylsulfate [SDS]-polyacrylamide gel electrophoresis was then used to resolve the WGeIF-2 into four subunits with molecular masses of 37,000, 40,000, 42,000, and 52,000, respectively. The dissociation constant of GDP was determined to equal  $1.5 \times 10^{-7}$  M, and that of GTP was determined to equal  $1.5 \times 10^{-6}$  M for WGeIF-2. According to the study findings, only a tenfold higher GTP concentration is required for displacement of GDP from the nucleotide binding site of WGeIF-2. The affinity of GDP for eIF-2 from animal cells is known to be 100 to 300 times greater than that of GTP. The close values obtained for the dissociation constants of GDP and GTP for WGeIF-2 led the authors to hypothesize that the mechanism of guanine nucleotide exchange on plant eIF-2 may differ from that in mammal cells. Specifically, they suggested that the partner proteins of WGeIF-2 may play an important role in the said mechanism. They further stated that the possibility of regulation associated with regeneration of GTP from adenosine triphosphate [ATP] and GDP catalyzed by nucleoside diphosphokinase could not be excluded. Finally, they pointed to the fact that the GTP content in wheat germ cells increases tenfold in the first hour of germination and reaches 80 percent of the maximum level and that the adenylate energy charge increases from 0.6 to 0.8. They conclude by stating that this increase in ATP concentration and adenylate charge is consistent with the cells' energy requirements for polyribosome formation and protein synthesis. The authors acknowledged the assistance of A.S. Spirin, L.P.

Ovchinnikov, and A.G. Ryazanov, as well as that of associates of the Protein Biosynthesis Regulation Laboratory of the USSR Academy of Sciences. Figures 7, tables 2; references 36; Russian.

**Pyrocatechases of the Strain *Rhodococcus erythropolis*—Chlorophenol Destroyers: Purification and Properties**

927C0371B Moscow BIOKHIMIYA in Russian Vol 56 No 12, Dec 91 (manuscript received 1 Apr 90) pp 2188-2199

[Article by O.V. Maltseva, I.P. Solyanikova, and L.A. Golovleva, Biochemistry and Physiology of Microorganisms Institute, USSR Academy of Sciences, Pushchino, Moscow Oblast; UDC 577.152.3]

[Abstract] Conventional orthopath enzymes, which are induced in many microorganisms during growth on the basis of nonhalogenated aromatic compounds, are characterized by a narrow substrate specificity and are incapable of making effective use of chlorinated analogues. The ability of microorganisms to metabolize chloropyrocatechase is linked to the presence of a modified orthopath. The enzymes of this path are characterized by a broader substrate specificity and by a high affinity to chlorinated substrates and products of their decomposition. The key enzyme of this path is pyrocatechase II. Unlike pyrocatechase I (the enzyme of the usual orthopath), pyrocatechase II is capable of effectively splitting chloropyrocatechols. Other researchers have reported purifying and characterizing pyrocatechases of the second type from several gram-negative bacteria. In a continuation of this line of research, the authors of the study reported herein identified a strain of *Rhodococcus erythropolis*, specifically the strain 1 CP, that are capable of using such toxic compounds as phenol, 4-chlorophenol, and 2,4-dichlorophenol as their sole source of carbon and energy. The authors have previously demonstrated that the decomposition of chlorophenols by this strain occurs through chloropyrocatechases and have hypothesized the presence of a modified orthopath in *Rhodococcus erythropolis* 1 CP. In the present study, they have demonstrated the presence of two pyrocatechases, I and II, in *Rhodococcus erythropolis* 1 CP. The two pyrocatechases (designated C120 I and C120 II) were purified 151- and 175-fold, respectively. Studies of the stability of C120 I and C120 II revealed that storing both enzymes in a frozen state results in a significant loss of activity (50 to 80 percent after 40 days). When C120 II was stored in a buffer without mercaptoethanol at 4° it experienced only an 8 percent loss of activity after 40 days. Under the same conditions, C120 I lost 30 percent of its activity. Gel filtration revealed that C120 I has a molecular mass of 67 kDa, and C120 II has a molecular mass of 64 kDa. Studies of the two enzymes' substrate specificity established that the activity of C120 I with chloropyrocatechols did not exceed 2 percent of its activity with pyrocatechol. C120 II was found to have a broader substrate specificity: Its activity with chloropyrocatechol was three- to 50-fold higher than that of C120 I, and its activity with methylpyrocatechols was twice as high as that of C120 I. Studies of the apparent  $K_m$  for C120 I and C120 II revealed the following: C120 I has a  $K_{m \text{ app}}$  of  $3.3 \times$

10-6 M for C120 I and a value of  $17.6 \times 10^{-6}$  M for 4-chloropyrocatechol. In the case of C120 II,  $K_{m\text{ app}}$  was found to equal  $22.3 \times 10^{-6}$  M for pyrocatechol and  $1.2 \times 10^{-6}$  M for chloropyrocatechol. The optimum pH for C120 I was determined to be 7.8, and an optimum pH of 7.4 was found for C120. The optimum temperature for C120 I was found to be 35°, and that for C120 II was found to be 50°. Figures 4, tables 5; references 20: 2 Russian, 18 Western.

**Phenylalanyl-tRNA Synthetase From the Extreme Thermophilic Bacterium *Thermus thermophilus*: Analysis of Its Catalytic Effectiveness and Complexing With tRNA as a Function of Temperature**

927C0371C Moscow BIOKHIMIYA in Russian Vol 56 No 12, Dec 91 (manuscript received 18 Apr 91) pp 2244-2252

[Article by V.N. Ankilova, S.N. Khosyrev, and O.I. Lavrik, Bioorganic Chemistry Institute, Siberian Department, USSR Academy of Sciences; UDC 577.152.6]

[Abstract] In the past few years there has been a marked increase in the attention paid to enzymes from extremely thermophilic microorganisms. In a continuation of this line of research, the authors of the study reported herein worked to determine the optimal conditions for synthesis of phenylalanyl-tRNA (PhetRNA) from the extremely thermophilic bacterium *Thermus thermophilus*. *Thermus thermophilus* biomass was grown at the Biolar Scientific Production Association in Olayne (Latvia). PhetRNA synthetase was isolated from the *Thermus thermophilus*, and its activity was determined in accordance with a procedure detailed elsewhere. The experiments performed revealed that there is a narrow range of optimal  $Mg^{2+}$  concentrations for aminoacylation catalyzed by phenylalanyl-tRNA synthetase from *Thermus thermophilus* and that the said narrow range is temperature dependent. Specifically, the optimum  $MgCl_2$  concentration ranges from nine mM (at 25°C) to 10 mM (at 65°C) in the case of aminoacylation of PhetRNA from *Thermus thermophilus* (versus from eight mM at 25°C to nine mM at 65°C in the case of aminoacylation of PhetRNA from *E. coli*). Studies of the pH dependence of aminoacylation showed that the optimum pH is  $9.1 \pm 0.2$  (as referenced to 20°C). The change in the pH optimum of the aminoacylation reaction was found to virtually coincide with the temperature-induced change in the pH of the buffers used in the experiment. The technique of tryptophan residue fluorescence quenching was used to estimate the dissociation constant of the enzyme-tRNA complex and its temperature dependence. The dissociation constants found for *E. coli*-PhetRNA and for two complexes consisting of PhetRNA and two different synthetases of *Thermus thermophilus* differed according to the methylation level. The affinity of *E. coli*-tRNA was found to decrease as the temperature increased ( $K_d = 1.6$  nM for 45°C and 2.9 nM for 60°C). The  $K_d$  values for the first thermophilic PhetRNA were found to equal 2.5 nM at both 45 and 60°C, whereas those of the second thermophilic PhetRNA ranged from 2.60 nM at 45°C to 1.25 nM at 60°C. These results

were interpreted as an indication of the significant role of hydrophobic reactions in enzyme-tRNA complex formation. Another noteworthy finding was the fact that the  $\Delta H^0$  complex formation value found for both of the thermophilic PhetRNA complexes studied was positive, whereas the value of  $\Delta H^0$  found in the case of *E. coli* was negative. Comparisons of the fluorescence spectra of the free enzyme with those of the enzyme-PhetRNA complexes revealed that significant rearrangements occur in the enzyme molecule during the complex formation process. Figures 6, table 1; references 16: 7 Russian, 9 Western.

**Chemically Synthesized Gene Supports in *Escherichia coli* Biosynthesis of Polypeptide Whose Structure Corresponds to Leukocytic Human Interferon  $\alpha 2$**

927C0374A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 5, Aug 91 (manuscript submitted 7 Mar 91) pp 1248-1251

[Article by Z. A. Akimenko, S. A. Zykov, V. V. Shaprov, V. I. Ofitserov, I. P. Gileva, V. V. Kravchenko, and USSR Academy of Sciences Corresponding Member L. S. Sandakhchiyev, All-Union Scientific-Research Institute of Molecular Biology, Koltsovo, Novosibirsk Oblast; UDC 547.963.32+577.21]

[Abstract] Nucleotide substitutions in the *ifn*  $\alpha 2$  gene do not change the amino acid sequence of the interferon, with the exception of the N-terminal methionine residue, which is absent in the natural analog. Although researchers have demonstrated that lysates of *E. coli* that bear *ifn*  $\alpha 2$  as an expressing vector contain a product with biological and immunological properties of leukocytic human  $\alpha 2$ -interferon, only direct analysis of the primary structure of the polypeptide can prove it to be identical to the natural analog. The researchers here isolated the homogenous polypeptide expression product of *ifn* [ $\alpha 2$ ] in *E. coli* and described it with physicochemical techniques. The amino acid composition of the synthetic was found to be virtually identical to the natural  $\alpha 2$ -interferon. It was also ascertained that cysteine is the N-terminal residue in the polypeptide of the synthetic and that the sequence of the five amino acids from the polypeptide is C-D-L-P-Q-, which corresponds to the structure of the natural *ifn* [ $\alpha 2$ ]. Total hydrolysis of the polypeptide with carboxypeptidases A, B, and P indicated that mixture of amino acids forming also correspond to the C-terminal structure of IFN [ $\alpha 2$ ]. Leucine, arginine, isoleucine, lysine, and cysteic acid were identified in the analysis of the forming N-terminal amino acid peptides and in the fragmentation of the polypeptide. Figures 2, references 11: 5 Russian, 6 Western.

ec 91 pp

**Three-Dimensional Structure of Binase in Solution. Sequential Reference of Signals in  $2D^1$ -H-NMR-Spectrum**

927C0382C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 6, Dec 91 (manuscript received 12 Nov 91) pp 1282-1287

[Article by A. V. Kurochkin, M. P. Kirpichnikov, and Kh. Ruteryants, Molecular Biology Institute imeni V. A.

Engelhardt, USSR Academy of Sciences, Moscow; Biophysical Chemistry Institute, Frankfurt University, Frankfurt on Mayne, FRG; UDC 577.322.5]

[Abstract] Binase (EC 2.7.7.17), a guanyl-specific RNAase secreted by *Bacillus intermedius* 7P, is a monomeric protein consisting of 109 amino acids. It has no disulfide bonds and is very thermostable at a wide range of pH values. It is thus an interesting subject for protein engineering and investigating the dynamics of processes of protein conformation and catalysis at the atomic level. A complete individual reference of protein signals on all 109 amino acids of binase was produced. The results demonstrated that

the  $d$ -bonds found in the process of sequential reference made it possible to identify elements of the secondary structure of binase in solution. The central and C-terminal parts of the molecule are characterized by lengthy regions with  $d_{\text{an}}$ -bonds and infrequent short segments with  $d_{\text{nn}}$ -bonds. A comparison of results with data from X-ray structure analysis revealed that both  $\alpha$ -spirals and the 5-chain anti-parallel  $\beta$ -structure are also present in crystal form. Apparently the secondary structure of binase in solution is very similar to that in crystal form. In conclusion, a large set of correlations was developed for calculating the three-dimensional structure of binase in solution based on individual reference of signals. Figures 2; tables 1; references 10: 3 Russian, 7 Western.

**Diversion of Contaminated Meat Feared**

927C0361A Moscow MOSKOVSKIY KOMSOMOLETS  
in Russian 11 Mar 92 p 2

[Unattributed article: "An Ecological Criminal—a Sackful of Evil"; first paragraph is MOSKOVSKIY KOMSOMOLETS introduction]

[Text]... The rubber tube snapped, like a rider's whip, without, however, causing any significant harm to the staff of the All-Union State Scientific Control Institute of Veterinary Products. Just imagine ... They were immediately sprayed with fine and very foul things bearing the prosaic name of *Brucella* microbes. Carelessness became a tragedy.

Alas, we do not know how many occupants of this institution took a swallow of the above creatures. But we do know that 327 unfortunates almost fainted, for which reason they were immediately hospitalized. A total of 98 beds were occupied by institute staff members, while the rest were residents of neighboring buildings and those who had the misfortune of taking a walk nearby.

After mass-scale evacuation of unharmed staff members, all of the rooms were sealed tight and filled with formalin. The "organizer" and "ideological inspiration" of the terrorist act plodded to court and, upon the occasion of the forthcoming celebration of the 60th anniversary of October, there was speedy sentencing—probation. Other members of the "terrorist gang" were declared personae non grata, expelled from the institute and, for complete happiness, from the CPSU.

*Bacteriological weapons in the center of Moscow: Thank God there were no fatalities ... so far...*

After 15 years, only those whose health was damaged, whose nervous system, bones and joints were stricken, who became disabled because of the wicked microbes remember with a nervous shudder the unscheduled diversion. The rest were forbidden to remember....

At the present time, there are 13 institutions working with such pathogens of acute diseases, including the Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Scientific Research Institute of Virology imeni Ivanovskiy, and the Moscow Meat-Processing Combine (!). The latter breeding ground of infections was part of this cohort because of its extremely scarce products.

According to Lyudmila Aleksandrovna Tsvil, epidemiologist at the Moscow State Center for Sanitary and Epidemiological Oversight, there is a laboratory at the combine that tests incoming meat for Anthrax and, it appears, it is never idle. Tons of meat contaminated with expressly this foul organism are trucked into the capital with envious regularity, like birthdays, once a year. In 1987, for example, the diversionists of Voronezh played a dirty trick on the combine. It involved an entire shipment, rather than a single pig, that was infected with indigenous Russian anthrax. A year later, friendly Afghanistan palmed off infected karakul pelts to the Rostok Fur Combine, and another year later, there was vigorous trade by similar sheep cooperators in carcasses in the former Lyublinskiy Rayon.

The tragedy dating back 15 years, as maintained by Lyudmila Tsvil, did offer a lesson. The strictest (to the extent this is generally feasible in today's chaos) surveillance of enterprises capable of releasing pestilence among their fellow citizens was instituted. Tests are carried out only in specialized laboratories which are on the records of the center for sanitary and epidemiological oversight.

However, in view of the proclaimed slogan about free trade, it is growing impossible to curb the unsanctioned use of "bacteriological weapons." They say that even scientists striving toward the summits of scientific glory are toting bags of pathogenic material [home to their wives], sometimes forgetting them in the subway....

"Ladies and gentlemen," it is useless to hope that some of us will be spared. If something happens, it will happen to all of us. Every single one. But in a different sense.... [There is a play on words here that cannot be translated].

**Emergency Service Strike Planned**

927C0361B Moscow KOMSOMOLSKAYA PRAVDA  
in Russian 9 Apr 92 p 4

[Article by Yu. Kozyreva: "Hundreds More May Die in Moscow on 25 April...."]

[Text] ... Just do not think that we intend to scare you.

According to a report for a recent day in April, which the chief physician of the Moscow Emergency Service called "another rare calm day," 03 [numbered emergency station] responded to about 5000 calls. Of this number, 382 were for children, 1037 people were hospitalized, while 68 were cases of death on arrival; two expired in the presence of emergency physicians, while 23 victims of 22 motor vehicle accidents were treated; 148 people were involved in street and vehicular incidents, nine received knife wounds, three drowned, four hanged themselves, and three fell from considerable heights. In addition, there were three fires, two railroad incidents and one electric trauma.

Now let us multiply all these figures by four, and then we shall gain a real idea about the threatening consequences of the four day strike of the Moscow 03 service, tentatively scheduled for 25 April. Senior citizens, single people, and those who live from "call to call" will be particularly affected. Almost 90 percent of the emergency response contingent consists of people over 60 years old.

Since childhood we have firmly believed that 01, 02 and 03 would arrive immediately and help us.

In the mean time, the station gradually spread itself thin and was on the brink of ruin. This was the conclusion of the participants of a meeting, on 30 September of last year, of representatives of structural substations of the emergency service. The meeting elected a strike committee and approved its demands, the chief ones being to fire management and elect a new chief physician on an alternative basis.

Among the other "sore points" that had accumulated among medical workers, the most degrading one was their wages. Today, after all raises and supplements, the average ambulance ["traveling"] physician earns 991.20 rubles before

deductions, and a feldsher earns 793.44 rubles. Incidentally, the ambulance drivers earn four to five times more, and the medical professionals demanded that their income be at least equal to that of an average blue-collar worker at an ordinary enterprise, not to mention independent indexation.

There was also a demand for state insurance for work-related diseases: AIDS, viral hepatitis, tuberculosis, etc. The emergency service ambulances rushing to respond to calls are involved in accidents immeasurably more often than all other vehicles. However, the total paid (in case of death) from the insurance paid for by the station is only 6000 rubles.

The degree of detriment to ambulance physicians is classified slightly below that of mine workers. The emergency physicians do not simply walk away from the service, they run. Last year, the number of responses made by teams without a physician exceeded 40 percent. The role of the physician was performed more or less successfully by lowest-level medical personnel.

"... It is inadmissible for the government to decide, behind the back of the taxpayer, how much to lower the level of health care for the latter. The reduction in financing of the emergency service will strike first of all the least protected ones—retirees, our parents." As of 1 February, the station has declared a pre-strike condition. The order issued by vice-mayor Yu. Luzhkov on 15 March 1992 became the turning point to the finish line.

Here are the latest facts: This year, financing for the station was reduced. "Official sources" have verbally promised to also reduce the number of physicians.

The emergency service is being unobtrusively pushed toward "stretcher therapy." The logic is clear: 70 percent of the 03 calls are house calls.

The emergency service has no funds, yet they are urgently needed, at least in the most immediate future. If we do not find any, we shall remain without emergency services, not only for the four days of the strike, but for years. The medical professionals are thinking rationally: They propose to establish a three-party commission of emergency service—government—consumer (trade-unions could well serve to protect our interests and yours). Ultimately, we are concerned about ourselves.

The emergency service will reach a final decision about the strike on 24 April.

#### **Aflatoxins Found in Italian Semolina**

927C0361C Novosibirsk SIBIRSKAYA GAZETA  
in Russian No 8, Feb 92 p 3

[Unattributed article under the rubric "News": "Don't Eat Your Cereal, Sasha," dateline Kemerovo]

[Text] V. Zenkov, chief sanitary physician of the oblast signed a document authorizing disposal of 280 tons of Italian semolina that had been delivered to the Kuznetsk Basin.

It was found to be soaked and moldy (as a result of storage and transportation). Laboratory tests revealed, in addition, high levels of the toxic substance, aflatoxin.

Incidentally, not so long ago 160 tons of domestic semolina, as well as 10 tons of sausage, more than 17,000 tins of meat and fish, 250,000 liters of juice, 190 tons of honey, and more than 20 tons of baby food had already been removed from the market.

#### **Funding for Zeolite Program Terminated**

927C0361D Moscow TRUD in Russian 2 Apr 92 p 2

[Article by Yuriy Tokarenko, dateline Novosibirsk: "It Equals Fifty Chernobyls" under the rubric "Follow-Up"]

[Text] There were dozens of reader responses to the report on "Trap Promises Salvation" (TRUD, 13 October 1991). Let us recall that the subject was future operation of the RTTs [Republic Technological Center] under the Russian Council of Ministers, related to utilization of naturally occurring zeolites to eradicate the sequelae of the Chernobyl accident.

I took these letters to the general director of the RTTs, N. Petunkin, and he stunned me: Funding of the state innovative program called Zeonate had been terminated.

"Zeolite tablets, which are similar to our product, are being used well in Hungary, Japan and Bulgaria, but it is questionable whether we shall now be able to help people with them. Unfortunately, termination of funding has disarmed the search for new drugs based on zeolite at the Institute of Clinical Immunology, Siberian Department of the Academy of Medical Sciences, with which we had signed an agreement."

Later, I phoned the IKI [Institute of Clinical Immunology] and was told that preliminary research predicts recovery of highly effective agents for treatment of oncological diseases, immunological deficiencies and AIDS. Work has stopped due to absence of funds....

Who is responsible for this? It would seem that the State Committee for Chernobyl [SCC] would be the most interested in continuing this work.

In order to make the reasons clear, let me recall that the RTTs, with the cooperation of various scientific organizations, developed an innovative program which, because of its convincing arguments and reasonable cost, was approved and confirmed by the government in April of 1991. After all, zeolite is capable of actively absorbing cesium and strontium on food, soil, and water. Removed from the biological chain, they remain in the micropores of this mineral in a "bound" state. It had been planned in Russia to essentially solve the problem of decontaminating involved regions in the very near future. The set of measures included, in particular, the use of this mineral in the treatment of water for the food industry, in the development of special traps for the radionuclides in rivers and lakes, and in the production of devices that remove the toxic substances from raw materials and semifinished products. According to the estimates of specialists, all required about 60 million rubles at that time.

Whether it is a coincidence or not, after TRUD's article about the zeolite program, the SCC, which considers itself in this instance to be a monopolist, sent a commission to the RTTs to audit the financial records. It did not find any criminal. Immediately, an extraordinary conference was held, and a report about the work that was accomplished, obviously impossible to prepare within the indicated time, was demanded of the "competing" center. As a result, an unexpected summary was sent to the government about the "inexpediency of financing the activities of the RTTs due to absence of scientific data concerning the efficacy of natural zeolites...."

"How so?" remarked, in surprise, a member of the innovation council under the chairman of the Russian Council of Ministers, Yu. Makarychev; together with Petunkin, he had recently visited the zeolite brick plant in Cuba, where industrial radioactive waste is buried. "The program has passed all stages of expert evaluation...."

P. Zapalskiy, deputy minister of economics of Russia, also sent a puzzled letter to SCC: "It is inexpedient to hold up the financing of this program at the present time."

Probably an unenviable role was also played here by an article in the newspaper BRYANSKIY RABOCHIY, "The Affair of the 57 Million Chernobyl Rubles," by correspondent Yu. Lodkin, which was a sort of response to the one in TRUD. That correspondent, as he himself admits, "is far removed from the complexities of science," and from a "mundane point of view" he rated the zeolite program as useless and pelted it with criticism. What are the arguments in favor of such a position? In some farms of Bryansk Oblast that suffered from the accident, experiments with zeolites failed to yield a clear effect. Consequently, the RTTs has squandered public funds, having profited from the joint enterprises they created. However, together with the Bulgarians, original zeolite filters were developed, "springs" for medical institutions and apartments. A new technology was found to decontaminate soil. The SP [expansion unknown] organized by the center with Cuba is setting up production of zeolite bricks in Russia for the decontamination of industrial radioactive waste in the contaminated lakes of Chelyabinsk Oblast and the recently declassified Tomsk-7 chemical combine. Russo-Mongolian and Russo-Chinese enterprises are working on the use of zeolites in medicine and veterinary science....

The fate of the funds allocated directly for the innovation program (about 20 million rubles were received) is clearly indicated in the documents: most of the funds were spent on financing scientific research, which is based on the work of more than 40 academic, scientific research institutes.

In assessing fulfillment of the innovation program, N. Chelishchev, doctor of geological and mineralogical sciences, academicians B. Voytsekhovskiy and V. Laskorin, corresponding member L. Sandakhchiyev, and S. Dzhulina, director of the Institute of Experimental Veterinary Science of Siberia and the Far East, discuss the practical results obtained which, already in the immediate future, can be produced, and mention how valuable zeolites are in eradicating the sequelae of Chernobyl.

Right next to the SCC, under the very same Russian Council of Ministers, is the scientific council for "Zeolites of Russia," which has existed for several years and is headed by Academician Dobretsov. Its members are prominent scientists working with this mineral. (Incidentally, not a single member of this council is included in the SCC.) This is what we were told by L. Panin, deputy chairman of the council, corresponding member of the Academy of Medical Sciences, and director of the Institute of Biochemistry, Siberian Department of the Academy of Medical Sciences:

"There is no question that zeolites bind heavy metals and radionuclides. Products based on these minerals actively remove radionuclides from the body: from tissues and bone. This has been proven unequivocally. As for 'vague' results of broad use of zeolites in contaminated zones, this is due to the poor sophistication of production, rushing with the work, and working without accurate measurements. The zeolite supplement to cattle feed should not exceed 4-6 percent of total feed, otherwise the effect is diminished; yet there are places where it is believed that 'there cannot be too much of a good thing.' Previously, toxic chemicals were dumped on our fields without being measured, and now the same applies to zeolites...."

Listening to Lev Yevgenyevich [Panin], I recalled what others had told me. On the international market, the cost of this mineral is up to 400 dollars per ton. Western businessmen are willing to finance the RTTs provided the latter agrees to mine for and process Russian zeolite, and then sell it to them. The Japanese, for example, are ready to purchase it right now. They use the mineral in over 400 technological sectors, including drug production.

The great American authority in this field, D. Breck, believes that "It is rare in our technological society for the discovery of a new family of inorganic minerals to prompt such scientific interest and such broad application as in the case of zeolite." Breck's fellow countryman, Professor Manotib expressed himself even more positively: "The 20th century is the zeolite century."

Why then have we heard nothing about similar research in our country until recently, and all the more in 1988? I. Belitskiy, chief scientific associate at the Institute of Mineralogy and Petrography, sheds some light. He was part of a group of most outstanding scientists of our country who had worked in the Chernobyl zone proper. It would seem he knows everything about zeolites. According to him, there are an enormous number of projects at his institute that are based on this mineral, but most of them are classified.

Much of the work related to zeolites was automatically classified, since it concerned the decontamination problem, which means the atomic industry and Chernobyl. Most of the research was financed by the defense ministry and supervised by the KGB. This created a wide gap between the mineral and the vital needs of the people.

Russian health care can disregard this unique therapeutic mineral, as it has heretofore. Let us consider a possible example. According to the data of the Rosekomonitoring

[Russian Ecomonitoring, or Ecological Monitoring, Committee] (in particular, the independent Agrokhimradiologiya [agrochemical radiology] center in Bryansk), the size of the territory of Bryansk Oblast that is hazardous to human health is 40 percent larger than stated in the committee's documents. True, they occasionally cite the data of the sanitary monitoring service which failed to detect levels exceeding the standards for radioactive contamination in 12,000 water samples between 1987 and this year. On this basis, it is concluded that it is futile to make investments in water treatment. However, one thing was not taken into consideration: Our standards were set by agencies responsible for the contamination. In Bryansk Oblast there are special standards (temporarily allowed levels) that are held, in the words of experts, in absolute secrecy; the Russian Ecomonitoring Committee that tested the water did find 80-fold higher levels of radioactive contamination than the international standard allows.

At the same time, there were many letters from trade unions, scientific organizations, local councils in response to the TRUD article, with the request for assistance with treatment devices, since otherwise, as some write, it is impossible to provide pure water and food to relocated Chernobyl residents. I think that this would also be beneficial to local residents. The official admission has already been heard: The radiation burden on Russia today equals 50 Chernobyls. If the sluggish methodology of the Ecomonitoring Committee is not revised, all future steps taken by the committee will be tantamount to wandering in the dark.

### **Recombinant Vaccine Against Hepatitis B in Clinical Testing**

92WE0324 Moscow MOSKOVSKIY KOMSOMOLETS  
in Russian 5 Mar 92 p 3

[Article by Yana Zhilayeva: "What Is a Bigger Threat to Us Than AIDS: A Domestic Vaccine Against Hepatitis B Has Been Created"]

[Text] The virus is an old one, well known and well tested. Every year, worldwide, hepatitis sends more than 2 million to the next life, and nearly 50 million individuals come down with it.

In the CIS [Commonwealth of Independent States], hundreds of thousands of people die every year from hepatitis. More than 15,000 people are virus carriers.

The hepatitis B virus, like AIDS, is transmitted via the "blood-to-blood" system. But it spreads faster and on a larger scale. In Central Asia, for example, virus carriers constitute almost one-fifth of the population, which places nations on the brink of extinction.

Hepatitis B attacks the liver, causing cancer and cirrhosis. Nowhere in the world has an effective treatment for hepatitis B been created.

In the opinion of some scientists, we will have an epidemic of hepatitis B in the summer-fall of this year. The sources will be contaminated water, lack of sanitary conditions everywhere, and the shortage of medicines.

The best barrier to the spread of the virus is inoculation. A vaccine against hepatitis B has been successful for almost five years now in the West, and it has enabled the medical profession to lower the percentage of infected individuals to 0.5 percent among the population as a whole. A vaccine against hepatitis B has been employed successfully by us, too—by the medical people of the notorious 4th administration.

The World Health Organization has developed a program to eliminate hepatitis B throughout the world by the year 2000.

Solving the problem of the spread of the virus in our country can be done in one of two ways: either by buying the vaccine in the West or by developing it ourselves. To battle the virus, we need 30 million doses annually for 10-15 years.

The Ministry of Health has not had the money to buy Western vaccine or to develop its own, it doesn't have it now, and it will not have it.

Two years ago, a group of scientists created the scientific production biotechnology center Bio-VTI, with the help of the Institute of Bioorganic Chemistry imeni M. M. Shemyakin, the Soviet-Austrian joint venture Vneshtreydinvest, the Institute of Immunology, and the Institute of Virology. Without any government financing, the firm of 30 people (including a driver and an office manager) dared to develop a domestic vaccine against hepatitis B. And they did it! **The vaccine is undergoing clinical tests right now.**

"In terms of efficacy," says Mikhail Valentinovich Budanov, head of the department for isolating and purifying antigens at Bio-VTI, "our vaccine is on a par with other such vaccines in the world, and it's cheaper. Our vaccine is absolutely safe. Unlike with plasma-based vaccine, the production of our recombinant vaccine does not use the blood of people who are ill, which precludes the possibility of viral infection during vaccination. Our vaccine is made on the basis of...baker's yeast. Whether it's more effective or less effective, it cannot be harmful to a human being."

To date, the development of the domestic vaccine has not cost the state a single kopeck. Bio-VTI needs only 4 million rubles to completely finish its work and begin series production. At that point, the firm is ready to produce as many as 2 million doses of vaccine a year.

**New Approach to the Detection of Mutations in Populations**

927C0379A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 6, Oct 91 [manuscript submitted 19 Jun 91] pp 1475-1480

[Article by A. F. Nazarova, Institute of Evolutional Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow; UDC 575.174.2]

[Abstract] The ever-increasing pollution of the environment with various potential mutagens could lead to an increase in mutations in populations of living organisms, but the techniques used today to evaluate frequency of mutation produce contradictory results and are not capable of identifying mutations fast enough to take timely measures. High perinatal mortality, as well as the death of one-third of all zygotes before implantation, suggests that screening in humans in the early stages of ontogenesis is great and that some of the screened-out mutations reappear in the gametes of the parents. The failure of the efforts of domestic and foreign researchers to find mutations *de novo* by means of assessing the frequency of private variations of blood proteins would seem to suggest that a new system for detecting reappearing mutations needs to be developed, probably on the genome level. The researcher here studied several human enzyme loci (MAO, carboanhydrase, malate dehydrogenase, lactate dehydrogenase, esterase, superoxide dismutase), determined the frequency of private variations based on those loci, and computed mutation frequency for a Moscow population. The researcher pointed out that since mutations that appear in mitochondrial DNA can apparently be reproduced through later replication of the mitochondrial genome, mutations appearing in mitochondrial DNA egg cells will be reproduced many times over in the cells of the progeny during replication of mitochondrial DNA and can be found with restriction analysis of mitochondrial DNA. She then used restrictases that produce an invariant picture—i.e., do not detect polymorphism of restriction sites in populations living in an unpolluted environment—to study mitochondrial DNA mutations in mice. Figures 1, references 15: 6 Russian, 9 Western.

**Suitability of Statusmetric Approach to Evaluating Rate of Mutagenic Process in Human Population**

927C0382A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 6, Dec 91 (manuscript received 16 Sep 91) pp 1260-1263

[Article by P. L. Alekseyenko, Ye. N. Antipenko, G. A. Poddubskiy, and G. I. Razorenov, Ukrainian Hygiene Center, Kiev; Experimental Medicine Scientific Research Institute, USSR Academy of Medical Sciences, St. Petersburg; UDC 575.167:504.3.054]

[Abstract] Statusmetry is a method of automated quantitative evaluation and analysis of the status of complex multi-parameter subjects using minimized sets of informative indexes and is based on modern advances in the theory of pattern recognition, optimization, mathematical theory of the experiment, and multidimensional statistics. In this investigation statusmetric processing of epidemiological data on miscarriages was employed to determine which miscarriages could not be explained by known etiological factors and could therefore be attributed to mutations in the inheritance apparatus of the sex cells of the parents. The experimental cohort was comprised of randomly selected sets of parents in environmentally polluted cities (Simferopol, Zaporozhye, Mariupol) who had experienced miscarriages. The study involved only women under 35 years of age who had already given birth to a full-term child with an Apgar score of at least 9-10. Each set of parents was evaluated based on 130 parameters. The first step of the analysis was to assess how informative each of the parameters was. Ultimately, 22 parameters were selected as determining factors in pregnancy outcome, including: age of spouse, contact with occupational hazards, number of square meters of living space and income per family member, history of induced abortions and miscarriages, and alcohol abuse. The second step was to construct a conclusive functional model and respective definitive rule for it. This functional model allows researchers to predict the outcome of the pregnancy. In conclusion, this method may be recommended for assessing the rate of the mutation process in large scale epidemiological investigations of a human population. References 9: 7 Russian, 2 Western.

**Ferro-Exogenous Cofactor Determines Expression of Anti-Cellular Activity Mediated by Tumor Necrosis Factor**

927C0382E Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 6, Dec 91 (manuscript received 25 Oct 91) pp 1296-1300

[Article by V. B. Sadovnikov and A. R. Kalinina, Branch of Bioorganic Chemistry Institute imeni M. M. Shemyakin, USSR Academy of Sciences, Pushchino, Moscow Oblast; UDC 612.01]

[Abstract] The objective of this investigation was to determine whether iron is an essential exogenous cofactor of the anti-cellular effect of tumor necrosis factor (TNF). TNF-mediated cytotoxicity was tested on L-929 (murine fibrosarcoma) cells. A two-step test for assessing anti-tumor TNF activity was employed to study the effect of various test media on TNF-mediated activity. Co-incubation of L-929 and TNF on test media revealed that the anti-cellular effect of TNF is displayed only in the presence of serum components. However, adding 30 percent saturated transferrin

(0.06 mg/ml) to a serum-free complete solution restored TNF-mediated cytotoxicity. Grinding various test media revealed the overwhelming significance of iron ions as a cofactor of TNF anti-cellular activity among the multitude of other components of the serum microenvironment. The results demonstrated that the toxic effect of TNF on L-929 cells is due to the combined presence of target cells, TNF, and iron ions in the microenvironment. The authors concluded that the fact that iron enters the cell is fundamental, but the pathway of the effect has not been fully determined. It was also shown that TNF enhances the expression of the transferrin receptor on human diploid fibroblasts, probably as a result of increased binding of iron with ferritin. It was hypothesized that TNF only lays the conditions for the threat of the toxic effects of excess iron, securing the condition of excess iron in the cell. But whether it actually occurs depends to a certain degree on the implementation of protective mechanisms. In conclusion, the results suggest that the use of TNF in the immunotherapy of total hypoferrremia and neoplasia may not have the desired effect. Figures 3; references 8; Western.

**Methane-Producing Microorganisms: Component of Mars Biosphere**

927C0382B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 6, Dec 91 (manuscript received 18 Oct 91) pp 1272-1276

[Article by M. V. Ivanov and A. Yu. Lein, Microbiology Institute, USSR Academy of Sciences, Moscow; UDC 576.8]

[Abstract] Researchers have turned the focus of the search for life on Mars to autotrophs that do not need organic carbon. Because the poor ecological conditions on Mars make the possibility of finding photoautotrophs highly unlikely, researchers are now looking for chemolytoautotrophs. Fundamental to the proposed strategy for searching for life on Mars is concentration of efforts on searching for specific ecosystems suited to the functioning of specialized groups of microorganisms such as anaerobes, psychrophiles,

and oligotrophs. The most perspective of these are chemolytoautotrophs, methane-producing bacteria which inhabit ecosystems with temperatures of 0-100°C and which can develop in a pH range of 6.0-9.0. It has been found that methane-producing bacteria can fractionate the stable isotopes  $^{12}\text{C}$  and  $^{13}\text{C}$ . The results showed that the methane-producing bacteria label the products of their metabolism, methane and biomass, with an increased concentration of  $^{12}\text{C}$ . The authors conclude that the data they have cited on the fractionation of carbon isotopes in the chemolytoautotrophic assimilation of  $\text{CO}_2$  by methane-producing bacteria satisfactorily explain the isotopic composition of SNC meteorites. Finally, a complex of sulfate and isotope-heavy carbonate minerals in association with an isotope-light organic substance forms during a secondary change in the basalt-dunite rock of Mars under conditions of their surface change on the mother planet when solutions containing hydrogen are discharged with active involvement of methane-producing bacteria. Figures 2; references 15: 1 Russian, 14 Western.

**Effect of Piracetam on Unplanned Synthesis of Brain DNA**

927C0377A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 3, Sep 91 [manuscript submitted 28 Jun 91] pp 761-762

[Article by N. A. Tushmalova, V. G. Bezlepkina, F. F. Kokayeva, A. I. Gaznev, Moscow State University imeni M. V. Lomonosov and Institute of Biophysics, USSR Academy of Sciences, Pushchino, Moscow Oblast; UDC 612.821.2:612.822.1:615.214.3]

[Abstract] Although the class of psychotropic preparations to which piracetam belongs is known to stimulate learning, the fundamental molecular mechanisms that enable such an effect are not known. Experimental evidence, however, does indicate that learning has an effect on genome activity, and it has been established that conditioned-reflex learning results in an increase in the degree of methylation of brain DNA in rats and induces synthesis of brain DNA. Excision-repair is assumed to be the mechanism of the DNA modification in the learning. The researchers here, in assuming initially that activation of the brain genome underlies the positive effect of piracetam on learning, study the effect of piracetam on the dynamics of reparative synthesis of brain DNA in 20 Wistar rats. One set of experiments demonstrated that piracetam stimulated the incorporation of labelled thymidine in the DNA of the cerebral cortex within 2.5 hours of injection. In light of the possibility that piracetam's effect *in vivo* is associated with enhancement of blood supply to the brain, the researchers studied the effect of piracetam on DNA synthesis in a system of incubating cerebral cortex cells. Activation of synthesis was recorded 30 minutes after start of incubation. Within one hour after start of incubation, the quantity of labelled thymidine incorporated in the DNA was roughly comparable in the control and the experimental conditions. The researchers conclude that the elevated reparative synthesis in the cortex cells is achieved by means of a mediated influence that comes about as a result of the creation of conditions that promote the functioning of repair enzymes. Figures 2, references 10: 6 Russian, 4 Western.

**Recognition of Symbols and Their Generalization in Studies Based on a Projective-Associative Model of a Neural Network**

927C0377B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 3, Sep 91 [manuscript submitted 10 Jul 91] pp 763-767

[Article by G. I. Shulgina, L. V. Veselovskiy, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow; UDC 612.822.3]

[Abstract] According to one advanced image-recognition theory, recognition is achieved via preliminary processing of data and identification of a set of signs that later determine placement of an image in a given class. The identification can take place "with a teacher," in which case each example from the "learning set" has a label for the class to which it belongs, or "without a teacher," in which case there are no such labels. Some feel that the source of all the difficulties associated with such recognition centers on choice of signs and that a more productive approach is one that is based on consideration of knowledge of the principles of operation of the CNS, especially principles of the neurophysiology of behavior—an approach that is being developed in the hardware and software of new generations of computers. The researchers here created a model of a network consisting of excitatory and inhibitory neural-like elements for analysis of the systemic organization of brain structures during the processing of information, as well as for testing certain hypotheses. The model was realized in the form of a program for an AT personal computer in which the program computed at given measures of time a system of equations that took into account changes in the state of excitatory and inhibitory elements and the relationships between them. Neurophysiological data on the dynamics of the membrane potential of cell bodies in the interaction of excitatory and inhibitory influences were used in compiling the equations. The neural network could also learn as a result of elevation of the efficiency of neuronal contacts in the coincidence of presynaptic and postsynaptic impulses. The model involved two stages of operation: (1) learning and (2) recognition and generalization. In using the model for the recognition and generalization of symbolic information that does not necessarily bear any resemblance in terms of image or position in space, the researchers found that, after several measures of time, the model was capable of learning to recognize and categorize various symbols without identifying outer signs of similarity or difference. Figures 3, references 12: 11 Russian, 1 Western.

### Byelarus Takes Emergency Measures To Ensure Drug Supply

927C0358A Minsk BELORUSSKAYA NIVA in Russian  
3 Apr 92 p 1

[Article by V. Kebich, President of the Byelarus Council of Ministers, and N. Kavko, Minister of Affairs for the Byelarus Council of Ministers: "Resolution of Byelarus Council of Ministers. Emergency Measures for Supplying Drugs and Medical Supplies to the Public for 1992"]

[Text] In order to satisfy the demand of the health establishments and people of Byelarus for drugs and medical supplies, the Byelarus Council of Ministers has resolved:

1. The State Economic Plan will allocate \$80 million worth of supplies, equipment, and goods for public use in the first quarter of 1992 to the Ministry of Resources from the Byelarus assets for the stabilization of the market and market assets, according to the supplement for sale on the foreign market with the objective of purchasing the necessary drugs, pharmaceuticals, and medical supplies.

The State Committee on Foreign Economic Relations will issue export licenses for this production in an efficient manner.

The Ministry of Health will establish monitoring for the intended use by the public of supplies and equipment allocated according to the current resolution.

2. It will commission the Bank of Foreign Economic Activity in the formation of State Hard Currency Assets of Byelarus to list in order of importance on the account of the Ministry of Health the hard currency resources for purchasing drugs and medical supplies from abroad.

3. The Ministry of Health: In a five-day period will present to the Ministry of Resources the specifications for medications purchased from abroad; inform the Byelarus Council of Ministers on a monthly basis of the deliveries of drugs to the republic.

4. The State Committee on Foreign Economic Relations, the Bank of Foreign Economic Activity, the Ministry of Finance, the Ministry of Health, the State Economic Plan, and the Ministry of Resources will work through the matter of obtaining foreign credit to the sum of \$40-45 million for purchasing drugs and the technologies for their manufacture from abroad during March and April of this year.

They will outline the possibility of liquidating their credits by means of export deliveries of supplies and equipment. Specific proposals on the matter will be sent to the Council of Ministers of Byelarus by May 1, 1992.

5. The Ministry of Health and the Ministry of Social Welfare, Ministry of Finance, and State Committee on Labor and Social Protection of the Public by agreement with the Federation of Trade Unions of Byelarus will send to the Council of Ministers of Byelarus proposals for the favorable issue of drugs and medical supplies prior to May 1, 1992.

6. The Ministry of Health, oblast executive committees, and the Minsk Municipal Executive Committee will monitor the shelf life and efficient use of drugs and medical supplies that are sent as humanitarian aid.

The Byelarus Council of Ministers supports the initiative of the collective at the Mozyr Petroleum Refining Plant. They have resolved to obtain \$2 million worth of drugs from abroad by means of bartering.

The Byelarus Council of Ministers has requested that the directors of the following production associations search for a way to purchase imported drugs for their own labor collectives and the Byelarus public: Minsk Tractor Factory imeni V. I. Lenin, ByelavtoMAZ, Novopolotsk Petroleum and Organic Synthesis, Azot, Beloruskalyi, Atlant, Gori-zont, the association Belshina, and other associations and enterprises.

Supplement to the resolution of the Byelarus Council of Ministers dated 31 March 1992, No. 175

#### List of the supplies, equipment, and goods for public use allocated for the purchase of drugs, pharmaceuticals, and medical supplies from abroad.

| Resources and goods                               | Unit of measurement        | Quantity |
|---------------------------------------------------|----------------------------|----------|
| From the Byelarus assets for market stabilization |                            |          |
| Trucks                                            | pieces                     | 500      |
| Trailers and semi-trailers                        | —                          | 100      |
| Tractors                                          | —                          | 1,000    |
| Polyethylene                                      | 1,000 tons                 | 3        |
| Synthetic ammonia                                 | —                          | 4.8      |
| Commercial timbers                                | 1,000 square m.            | 28.6     |
| Lumber                                            | —                          | 8.5      |
| Building bricks                                   | millions                   | 7.5      |
| Fuel oil                                          | 1,000 tons                 | 15       |
| Diesel fuel                                       | —                          | 22       |
| Gasoline                                          | —                          | 22       |
| Caprolactam                                       | —                          | 2        |
| Truck tires                                       | 1,000                      | 2        |
| Tractor tires                                     | —                          | 4        |
| Metal cutting machine tools                       | —                          | 45       |
| Rolling-contact bearing                           | millions                   | 0.5      |
| Ceramic glazed tile (for internal lining)         | 1,000 square m             | 9        |
| Potassium chloride                                | 1,000 tons physical weight | 30       |
| Color televisions                                 | 1,000 pieces               | 10       |
| Refrigerators and Freezers                        | —                          | 1        |
| Household clocks                                  | —                          | 100      |
| Cameras                                           | —                          | 10       |
| From Market Fund                                  |                            |          |
| Color televisions                                 | 1,000 pieces               | 22       |

**List of the supplies, equipment, and goods for public use allocated for the purchase of drugs, pharmaceuticals, and medical supplies from abroad. (Continued)**

| Resources and goods        | Unit of measurement | Quantity |
|----------------------------|---------------------|----------|
| Refrigerators and freezers | —                   | 25       |
| Margarine production       | 1,000 tons          | 2.8      |
| Bicycles                   | 1,000 pieces        | 12       |
| Vodka, alcohol production  | 1,000 decaliters    | 30       |
| Pianos                     | pieces              | 350      |
| House clocks               | 1,000 pieces        | 250      |
| Carpets                    | 1,000 square m.     | 60       |
| Furniture                  | millions of rubles  | 2.5      |
| Cameras                    | 1,000 pieces        | 25       |
| Electric meat slicers      | —                   | 3        |
| Electric mixers            | —                   | 3        |
| Starch                     | 1,000 tons          | 0.9      |
| Matches                    | boxes               | 30       |

**Innovator To Head Laser Therapy Center**

927C0358B Moscow TRUD in Russian 2 Apr 92 p 2

[Article by I. Denisov: "Laser in Hands of Physician"]

[Text] It is not news that a low-intensity laser ray is a therapeutic ray.

It improves microcirculation in the organs and tissues, and it has anti-inflammatory and anesthetizing properties. It accelerates the healing of ulcers. The use of the laser has yielded good results in the treatment of many diseases: those in the cardiovascular system, respiratory and gastrointestinal tracts, peripheral nervous system, problems in the joints, and many others.

The author, doctor of medical sciences Ivan Korochkin, was awarded a State Prize for putting laser methods into practice in the treatment of coronary disease.

And now here is the news: Professor I. Korochkin has become general director and science director of the Moscow Alikor Laser Therapy Center in Ilinka. Here the periods for patient recovery are shortened without the use of powerful drugs, and sometimes without in-patient treatment. In particular, a course of duodenal or stomach ulcer treatment takes seven to 10 days (in-patient up to 21 days), and the pain is eliminated within three to four procedures. With acute radiculitis, the patient notes lessened pain after the first treatment and a significant improvement in condition by the third to fourth day of therapy.

We have already become accustomed to the fact that what is discovered in Russia is acknowledged abroad first. The method of laser therapy is no exception. A group of physicians from the Alikor Center has successfully presented the method in Vietnam. Contract proposals have been submitted by several firms in the USA and Italy; Moscow has finally given him official registration. Now this is good!

**Kazakh Enterprise To Manufacture Syringes**

927C0358C Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 15 Feb 92 p 6

[Unattributed article: "Medpolimer Is Health Guarantee"]

[Text] The joint venture Medpolimer manufactured its first batch of disposable syringes. Without waiting for the main shops to open (construction will be completed in 1993), the collective established an experimental sector for manufacturing 25 million syringes in the ultra-clean gallium workshop at the Pavlodar Aluminum Factory; the manufacture of 100 million syringes is planned for 1992 in one of the leased premises of the local chemical factory.

The objectives of Medpolimer are to guarantee health to the republic's population. With the manufacture of the syringes at the projected level, all of Kazakhstan will have syringes and disposable systems.

Today Pavlodar's Medpolimer has approached market relations in the best manner. In preparing for the large-scale manufacture of medical products, highly profitable goods such as face lotions and elixirs with ginseng additives will be manufactured here for the public. A workshop for cultivating 30 tons of mushrooms will be in steady operation.

**Kazakhstan Establishes Pharmaceutical Production Concern**

927C0358D Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 13 Feb 92 p 4

[Article by Yu. Pavlov: "Kazakhstan Has Its Own Pharmaceutical Concern"]

[Text] You have unfortunately become ill, but you cannot get on your feet as soon as possible. (Alas!) The drug situation here at present is also tight, very tight.

Moreover, where are we going to get the drugs, if our antiquated Chimkent Chemical and Pharmaceutical Plant, which until recently manufactured up to 40 medicinal substances, cannot manufacture even a single ready form (which incidentally has resulted in the loss of millions of rubles)?

Yes, by will of the center, Kazakhstan, which has a very wide range of medicinal raw materials, found itself in a medical respect (and is this all?) in the role of a beggar whose requests are far from completely satisfied.

The Cabinet of Ministers in December of last year approved an initiative of pharmaceutical enterprises and established its own concern for manufacturing drugs, biopreparations, and medical supplies, called Kazfarmbioprom. The "new kid on the block" with its first independent operations has already raised the trade turnover from 310 to 400 million rubles. Local oblast authorities have decided that agricultural enterprises will be attached to the concern. They will completely supply the concern with plant and animal materials. It is interesting that Kazfarmbioprom will also gladden us with perfumes and cosmetics.

Which actual plants have been attached to the concern? These are the production association Progress (Stepnogorsk), chemical and pharmaceutical and hydrolysis plants in Chimkent, and the collective farms Darmin and imeni Frunze in Chimkent Oblast, the Chimkent Zone Experimental Station at the Medicinal Plant Institute, the Feed Antibiotics Plant in Turkestan, the Alma-Ata Bioindustrial Group and Pharmaceutical Plant, the Ural Branch of Soyuzlakrits Production Association, medical subunits of the Semipalatinsk Meat Plant and Tselinograd Hormone Plant, and the small companies Ginseng, Ayslu, and Zhen-shen [Ginseng] in Pavlodar.

"For the time being," says K. Ushbayev, concern president, professor, and people's deputy of Kazakhstan, "our board is located in Chimkent, but the matter of whether its site will be in Alma-Ata is being decided." We are hoping that this will help Kazfarmbioprom quickly make strong business connections."

### Foreign Partners Sought for Manufacture of Medivac Helicopters

927C0360C Moscow TRUD in Russian 17 Mar 92 p 4

[Interview by A. Sabirov, Kazan, under the rubric "Mini-Interview," date and place not given: "Hospital Flying in the Sky...."; first paragraph is TRUD introduction]

[Text] The MI-17A, a medivac ["hospital"] helicopter, has been developed at the KVPO (Kazan Helicopter Production Association), but the medical specialists of Russia do not have such a machine. Why? V. Morozovskiy, chief of the KVPO export department, responds:

[Morozovskiy] The MI-17A is outfitted with all the equipment needed to support human life until the casualty or patient is delivered to a hospital. Physicians can perform operations in flight. The first such machine, with the inscription "Ambulance" on its fuselage, was outfitted with imported equipment from the Hungarian Medikor firm.

[Sabirov] It sounds like this is the only model?

[Morozovskiy] We were able to assemble a batch of six helicopters that were sent to Siberia and Central Asia. All of the specialized medical equipment for them was traded for an "extra" helicopter. Of course, half a dozen flying hospitals is not enough, and it is unrealistic to make such trades all the time. One of the possibilities for series production of the MI-17A is to establish a joint enterprise with a partner from the West.

[Sabirov] In this case, the domestic market will not receive a flying hospital....

[Morozovskiy] Yes, they will have to be sold for dollars in order to settle with foreign suppliers. I think that the value of human life is worth having the government allocate special, targeted funds for production of the Ambulance. One cannot skimp in medicine, even if there are not sufficient budgeted funds in the country for foodstuffs.

### Dialysis Equipment Shortage

927C0363A Moscow NEZAVISIMAYA GAZETA  
in Russian 21 Mar 92 p 6

[Interview with Russian chief nephrologist Pavel Filiptsev by Dmitriy Frolov; place and date not given: "Thousands of Patients May Die: No Money to Buy an 'Artificial Kidney'"]

[Text] People suffering chronic renal insufficiency have found themselves in a desperate position, one incompatible with any notions of a civilized society. Not one contract for delivery of imported dialyzers and of raw materials for their manufacture has been paid up as of today, last year's reserves are close to exhaustion, and this means that dialysis machines will stop at any moment.

"Someone must answer for this," said Russia's chief nephrologist Pavel Filiptsev in a telephone interview. Literally the next day he was dismissed from his post. This reaction by the ministry permits the conclusion that hushing problems up is still considered to be the best way of solving them.

The catastrophes should have been expected, Dr. Filiptsev feels. The supply problem has been extremely acute throughout all of the years of existence of hemodialysis in our country, and shutting off this sector's hard-currency financing is simply unimaginable. Atrocious as this may sound, in 30 years we haven't created anything of our own, and we have been oriented wholly on imports. The only plant manufacturing dialyzers in our country, in Belgorod-Dnestrovskiy, received its raw materials for semipermeable membranes from abroad. Now it is standing idle. Another, built in Borisov, near Minsk, was supposed to have worked on the basis of our own raw materials, according to the original idea. The plan was that it would begin production in May, and that it would cover practically the entire demand. I don't know why this wasn't clarified earlier, but it was revealed that it also needs imported materials, and that even if the plant were to begin working somehow anyway, it would be able to sell dialyzers only for hard currency—24 marks, plus 100 rubles.

Purchases of ready-to-use foreign products are not being made at the moment, of course, but even if hard currency is found somewhere later, it will be too late.

[Frolov] How many sets will be required?

[Filiptsev] Generally speaking, not that many at all—\$500,000 would be enough for Russia for a year. Germany's Frezenius sent us 20,000 dialyzers free of charge—that's enough for two or three weeks, but after that....

As of today, according to official data only 6-7 percent of persons needing help received it, while the remaining 93-94 percent simply died. Now this fate awaits everyone. For understandable reasons we have not kept statistical records, but the quantity of patients could be deduced from calculations made in the West—100-130 persons for every million inhabitants yearly. Hemodialysis is unavailable in Russia even in some oblast centers. It is not available in Belgorod or Bryansk. It is available in two places in Tula. In Moscow Oblast, in which 6 million people live, there are around 40 places, and they can't even support this small number of centers.

[Frolov] When you say they, I presume you mean the ministry. What is their stated position?

[Filiptsev] They don't have one. The urology and nephrology board was fired—what more can I say? I saw a huge pile of letters sent to the minister by hemodialysis department directors both from the provinces and from Moscow's leading clinics. No one received a reply, in the old ministry tradition. But the main thing is that in response to each letter, the deputy minister sent a resolution to the Russian medical equipment establishment with words like "issue" and "provide." But they know quite well that there is nothing to issue, and yet they stubbornly create the appearance that everything is all right.

The same situation also exists with kidney transplants. Immunodepressants necessary for transplants were not purchased for this year. We would like to go back to the old system of treatment, under which the probability of success is lower by a time and a half or two, but such operations are also impossible—we don't have the necessary supplies for them either.

[Frolov] Does this mean that you will not be providing any treatment at all to patients with renal insufficiency?

[Filiptsev] They say that chief physicians are divided into smart ones and dumb ones: The dumb ones are those who have an obstetric department and hemodialysis. There is less trouble without them. It is outrageous to modern medicine when a leading sector, one which had existed for dozens of years, is suddenly shut down. I can't recall such a thing ever happening before, but it looks as if hemodialysis and kidney transplants are under such a threat.

In August of last year the Russian Ministry of Health decided to establish a republic center of this profile. Two departments were allocated in the republic hospital, 121 beds were reserved, and as of 1 January it should have begun admitting patients. No one has rescinded the August order, but no one is even talking about the center today. All they are talking about is the shortage of assets. But in the final analysis, we need to have some sort of priorities.

Nonetheless, patients are talking more and more about paid dialysis, quoting specific addresses and sums. According to these rates, one such operation, which is usually carried out two or three times a week, costs from two to six thousand.

It is just as difficult to believe that the state's currency difficulties are really of such an extreme degree, especially on the backdrop of recent promises to make corresponding payments to military servicemen, so that they would not feel themselves to be the most deprived part of the society, or to nuclear scientists, the drain of whom to the West, and all the more so to the East, is so frightening to everyone. In any case, discussions regarding democratic principles occurring in parallel with violation of the right to medical care necessary to support health, formulated in the Human Rights Declaration, appear immoral.

## **Moscow Radiation Clinic Unable To Accept New Patients**

927C0363B Moscow IZVESTIYA in Russian 30 Mar 92  
p 2

[Article by Sergey Leskov: "Radiation Sickness Is No Longer Treated Here?"]

[Text] **The country's sole specialized clinic has been deprived of financing, and it has stopped admitting new patients.**

After Chernobyl, it seems as if all services associated one way or another with the accident or with recovery from it were inundated by a flow of critical remarks, valid for the most part. Just about the only exception was specialists in X-ray radiology who revealed and treated victims within the zone of the nuclear power plant. Specialists of the clinical department of the Biophysics Institute of the Academy of Medical Sciences coordinated this work, which made an impact on hundreds of thousands of people. It was precisely in this clinic that 115 of the 145 persons who suffered severe radiation sickness—heroic firemen, disaster relief workers, nuclear power plant operators—were treated.

The preparedness of medical personnel for the accident, not only the scale but also the nature of which was hard to even imagine, was amazing, given the universal confusion. It was unknown to the public at large that the first clinical department treating radiation sickness was established in our country as much as 40 years ago. While no one paraded the fact, there were plenty of patients even before Chernobyl. Tests were being conducted on nuclear weapons, atomic industry was developing, and radioactive elements were finding increasingly wider use in many sectors of the national economy—from mineral fertilizer processing to searching for flaws in pipeline construction.

According to Russian Academy of Medical Sciences Corresponding Member A. Guskova, director of the clinical department of the Biophysics Institute, physicians have been treating disaster recovery workers since the early 1950s, and the files presently contain the records of up to 500 patients who have suffered severe radiation sickness. Surveillance has already been maintained into the second generation of their families. Angelina Konstantinovna was herself I. Kurchatov's treating physician for many long years, and she accompanied him on trips to nuclear facilities into which Kremlin doctors were never admitted due to the highest secrecy. Mention must be made of all of this in order to understand the great and truly invaluable experience accumulated by our radiologists in research and clinical practice.

After Chernobyl, this experience became known to all the world, and today it is one of the few directions of medicine in which we are not just simply maintaining a world-level position: Our specialists receive invitations for consultation abroad, they participate in accident recovery measures, they help to write the most important handbooks for different countries, and they give lectures. Three years ago the clinic received special thanks from the U.N. General Assembly for its research. Special mention should be made of the level of the specialists. It would be rare to find medical personnel in our country who possess an international certificate

allowing them to practice in the West. Twelve physicians currently possess such a certificate in the radiation sickness clinic.

And today this unique center (the famous "Clinic No 6") is on the verge of closing. The physicians, who would receive a royal treatment in the richest countries, have been sitting around without wages for two months. There is no money to buy medicines, and the old reserves are close to exhaustion. Even if the money promised by the Ministry of Health arrives, half of the staff of just 100 associates of the small department will have to be laid off. All appeals by Professor A. Guskova to executives of the Third Main Administration, the Ministry of Public Health, the Chernobyl Committee of the Russian Supreme Soviet, the Russian government and the Ministry for Atomic Energy get a respectful reception, but nothing changes. As a result the clinic has not been accepting new patients for a month.

The question that may arise is this: Wouldn't it be cheaper to observe precautionary measures in work in atomic industry than to maintain a special clinic? Unfortunately given our universal indifference and the low level of qualifications and industrial safety, it will be a long time before we can create guarantees against dangerous consequences. Each year up to a thousand accident recovery workers and up to 500 persons injured in industry and in tests pass through the clinic. The polyclinic sees 4,000 patients. This is one of two centers in the former USSR where bone marrow transplants are carried out—10 unique operations a year. In the most recent case, doctors kept the life of a worker from the Byelarussian city of Nesvish, who received a lethal dose of radiation while working with a cobalt fertilizer irradiating unit, hanging by a thread for three and a half months. Medicine for this patient came from many countries, with its cost exceeding \$72,000. Once again a shameful picture: Everyone in the world understands the uniqueness of this clinic, and the need for supporting it, while in our country we can't find 8 million rubles a year to finance it.

One need not be a prophet, Academy of Medical Sciences Academician L. Ilin believes, to predict that the frequency of radiation sickness may increase in the immediate future. There are plans for taking several nuclear power plants off line and rebuilding them, and for dismantling numerous military nuclear facilities. It is terrible to even imagine what might have happened if a release had recently occurred at the Leningrad Nuclear Power Plant. It would be impermissible thoughtlessness to allow this unique medical collective to disappear at this time.

In the opinion of Academy of Medical Sciences Academician L. Ilin the position is also complicated by political discord. Radiation sickness afflicts everyone, and in order to fight the medical consequences of any disaster, we need to coordinate effort, and we need a unified information and scientific center. Unfortunately, an epidemic of separatism has taken over those who are responsible for public health problems. Absurd as it may seem, exchange of information even on Chernobyl patients has been halted. Out of 45,000 persons who had been on record in medical units of the nuclear department, only 14,000 are still under observation. Having neither experience nor specialists, the regions that

have separated away will simply be unable to provide their patients with the needed level of medical services.

"God forbid that a misfortune would occur in the country," was what Academician L. Ilin and Corresponding Member A. Guskova told me on separate occasions. "Besides the clinical department of the Biophysics Institute, there is no one in the country that can effectively fight radiation sickness. But in the present situation, even this department is powerless."

### Russian Health Minister Interview

927C0364A Moscow KURANTY in Russian 18 Feb 92  
p 3

[Interview with Russian Health Minister Academician Andrey Vorobyev by Yuliya Petrova; place and date not given: "How Do We Heal Medicine?"]

[Text] The threats of strikes by medical workers that rolled over Russia were a reminder that the solution to the problems of public health will not tolerate any further delays. This has really turned into a life and death issue now, though one of the life and death not so much of medical personnel as our own. This is why we all want to find an answer to the following question, which we decided to ask of Academician Andrey Vorobyev, minister of public health: How do we heal medicine?

[Vorobyev] Thank God the threat of a universal strike has been practically averted. But has this fragile tranquillity been restored for long? It's hard to say. I know for certain that asking doctors to strike is immoral—what you're actually doing, after all, is asking them to kill patients! The government may be bad or it may be good, but what do sick people have to do with it all? A strike is not the way to rectify the situation. We need to seek new forms of work. Only this can save public health.

[Petrova] But how do we rectify it? From what side do we attack this problem?

[Vorobyev] The first thing we should begin with is to make sure that every medical institution has obtained the status of a legal entity, and is able to work under the new conditions. Without this, all of our talk about insurance, privatization and paid medicine is nothing but hollow sounds. The first steps have already been taken: Almost all of the necessary documentation has now been drafted. We propose introducing insured health care as early as this year, rather than in 1993 as had been planned. We need to promote (but not impose!) privatization of the pharmacies. Under our terms, pharmacies will not be respecialized into new enterprises, and they must adhere to legislative acts adopted in the country regarding the quality of their products. We shouldn't do anything to hinder the appearance of private hospital beds and departments. But let me repeat that all of this should be in keeping with public health legislation currently effective in Russia. You can't get around the fact that medicine is not like selling beer out of a trough—we are dealing with human lives.

[Petrova] But private medical institutions are no longer something totally new to us.

[Vorobyev] Unfortunately some of the new medical cooperatives and associations represent something quite far afield of public health. I am referring to those atrocious institutions in which treatment is provided by sorcerers and charlatans. Their activities have now bloomed into a variety of colors, even though they are prohibited by law. The sad thing is that we do everything to provide publicity to witchcraft! This would be the same thing as showing porno films in school rather than providing sex education.

But I'm not saying that charlatans have taken over all medical cooperatives. There are many very serious enterprises with high-class specialists.

[Petrova] Well, if medical cooperatives are not the answer, then what is? Insured health care? Will we live to see the day of its introduction?

[Vorobyev] Let me repeat that we are beginning a transition to insured health care this very year. Though I'm certain that we will have to contend with serious resistance from those who have gotten used to working only in a dictatorial style. These medical workers have no concept of real medicine, and the ground is slipping from beneath their feet. Medicine doesn't need them, and for this reason they will resist.

[Petrova] Well, let's suppose that insured health care and private pharmacies have appeared in our country. How will they be able to survive in the presence of our extremely weak pharmaceutical and medical industry? Will they have to buy everything abroad? If so, understandably the cost of treatment would be so high that it would be better to just lie down in a coffin.

[Vorobyev] We needn't be pessimistic. Reorganization of our country's industry, which you referred to so unflatteringly, is also of course in our plans. Everything needs to be revived. Enormous opportunities have opened up, but unfortunately we are still making very poor use of them. Specialists from defense industry, which is now being switched to "peaceful rails," are approaching us with proposals for cooperation. This is, after all, where you find the most up-to-date production procedures and equipment, and the most sophisticated electronics. Were we to wisely utilize the enormous potential of defense industry, we could swiftly raise our health care close to the world level.

[Petrova] Nonetheless, we are still buying everything abroad—from bandages to the latest apparatus.

[Vorobyev] I have always been opposed to such total reliance on imports. For two reasons. First of all we ourselves have no awareness of how tightly these contracts chain us down. When for example you buy a computerized tomograph, you forget that in a year or two you will have to replace the tube in it, and this means tens of thousands of dollars. As a result every diagnostic center spends around half a million dollars each year on parts, materials and spare parts, because such centers were themselves established on a hard currency basis. This brings us to the second reason—public health is the first to suffer for this, because it is forced to cover these expenditures. On the other hand we could have used the same money to develop our own medical

industry. We simply need to put our pharmaceutical production on its own two feet, though I am in no way opposed to cooperation with the West. On the contrary! It is an absolute necessity for us today, but only in reasonable, mutually advantageous forms.

I feel that no humanitarian aid of any kind will be able to raise our entire public health giant to its feet—this aid will only alleviate its problems for some period of time. In the beginning of our discussion you asked me who is going to heal our medicine. I can give you an answer—only we can do that! We will not solve the problems of medicine unless we decentralize it. Though of course I'm not excluding state health care in any way either. We need to see that all forms of health care services—state, insured, charitable and private—quietly take root in our system, just like in the West. This is what can "heal" our medicine.

### **Defense Official Calls for Disaster Response Organization in Moscow**

927C0364B Moscow KURANTY in Russian 18 Feb 92  
p 3

[Unattributed article: "The City Is in a State of Emergency"]

[Text] This was the title of an interview of Colonel A. Karniz, a deputy to the Moscow Soviet, published by the newspaper KURANTY in August of last year. Recall that the discussion had to do with predicting states of emergency that could arise at times of accidents and disasters at facilities within the capital, and with the unsatisfactory condition of systems intended to protect and rescue Muscovites in such situations.

Readers' responses reaching the editor's office attest to the urgency of the problems touched upon in the interview. Sharing A. Karniz's concern over the situation that has evolved in the capital, the authors of many letters offer specific ways to ensure the safety of Muscovites, to prevent emergency situations and to improve the city's environment. For example Colonel N. Uskov, department chief at the Central Military Medical Directorate of the Ministry of Defense, writes: "When we establish a supradepartmental administrative agency in Moscow to predict and prevent states of emergency and carry out disaster relief measures, and when we form a disaster response organization, we will need to establish interaction between these services and the Ministry of Defense. We have mobile formations and qualified specialists, after all, ones who have already participated in disaster relief efforts not only in various regions of the country, but also abroad."

One would believe that N. Uskov's proposal would be utilized in the practical work of the disaster commission that has already been established under the Moscow government, and in the activities of similar structures of the capital's administrative districts.

A. Karniz's position was actively supported by Sh. Mikeyev, chairman of the permanent commission on military affairs

and states of emergency of the Moscow Soviet, by I. Stupanov, chairman of the deputy commission of the Sevastopolskiy Rayon Soviet, by K. Vulman, council chairman of the labor collective of a specialized enterprise, and others.

Colonel V. Potapov feels that "the existing civil defense structure may be a good foundation for creating a modern emergency rescue service in the capital, and the city's civil defense headquarters should be its center for operational control."

B. Nazarov, director of Moscow's "Region" Scientific-Technical Center, proposed an extensive accident prevention program in his response to the interview. "Complete and dependable information on hazardous facilities," he writes, "can be obtained only by subjecting all of Moscow's enterprises to safety certification. It would be useful to utilize experience accumulated in ecological certification in this case. A computer data bank on dangerous substances and enterprises should be created on the basis of the certification results."

The editor's office extends its thanks to readers who sent in responses.

### **Volgograd Ill-Equipped To Treat Young AIDS Patients**

927C0366A Moscow TRUD in Russian 4 Apr 92 p 2

[Article by correspondent O. Pozdnyakova: "AIDS and Angels: Case Closed. Infected Children Continue To Die"]

[Text] The republic procuracy has completed its investigation of a case titled "On Facts of Mass Infection of Children With HIV in Therapeutic Institutions of Volgograd." Indictments were announced against two persons—a department director and a nurse, and one hospital—Clinical Hospital No 7, where the HIV carriers were first revealed.

The collective of the hospital's pediatric ward is protesting, turning the attention of the press to the defenselessness of medical personnel, the low quality of forensic medical examination and the holes in the case.

But analysis of the specific three-year-old facts today would, I think, more likely strengthen the court's case. What we are concerned with more is whether or not lessons have been learned from the incident. Have the appropriate conclusions been made, so that the same thing would not happen again? Have any kind of guarantees appeared that at least our children are shielded from infection?

Volgograd's citizens were hit with two stunning news items simultaneously after the 1989 state May Day holidays. The first item was pleasant news—that the millionth resident of Volgograd had been born—a baby girl who is to become a woman and mother of the third millennium. At the threshold of the city's 400th anniversary, this birth should symbolize the city's happy future on the background of its well known historical past.

The second news item overshadowed the first, and came across as a bad omen: "HIV infection has been detected among Volgograd children. A commission from Moscow is working." As it turned out, infected children live in almost

every rayon of Volgograd and in other cities and rayons of the oblast (many had no suspicion of this). Who can forget how our hearts were struck by fear for our own? Next day the polyclinics were empty, youngsters were quickly taken out of hospitals, and it became roomier in day care centers and children's nurseries.

"How can we can we set the minds of the people of Volgograd at ease?" asked one of the city fathers and leaders in office at that time, after punishment was meted out and gratefulness was expressed to Moscow for providing disposable syringes. "The focus of the epidemic has been contained and put under surveillance," the chairman of the republic's Ministry of Health reassured him at a meeting of the ChPK—the extraordinary epidemiological control commission.

Later on, Volgograd was visited by Minister V. Kalinin himself, and several times he gave extensive interviews on the crisis in public health and even conducted an expanded board meeting here, though of course on another topic.

Soon the city was once again back in rhythm with the rest of the country.

Close to 10 Volgograd neopoliticians vigorously declared their candidacy and obtained chairs in the highest echelons of the republic's government. Champagne began to flow at exchange and festival openings, the foundations of new funds and new shrines were laid, and apartments, machines and land were distributed. In the beginning the oblast CPSU committee acted as the dealer, but later on the oblast committee was itself dealt with. But there was still not enough room for all of the offices, being that their number was increasing in the same geometric progression as the population of pediatric hospitals: Three beds were put in places where there used to be one, and eight patients were accommodated in an isolation cubicle for one.

It became so crowded in this huge city, in which the birth rate had dropped dramatically, that there was no room left for the children, and all the more so for infected ones. Responding to the local leadership the "popular masses" of Voroshilovskiy Rayon expelled them from a specialized day care center located on their "sovereign" rayon territory, and a "red light" went on in Krasno-Oktyabrskiy Rayon. New hospitals were no longer being built for children in the city, and when it came to space in general, things were getting "a little tight." Those who were infected did not die—as with all children they just stayed sick, and they needed to be treated somewhere. But as it turned out, there was nowhere to treat them. It finally became necessary to move several isolation cubicles into the irretrievably dilapidated City Infection Hospital No 21.

There was no finding a building in the city for an AIDS center. And when N. Gorshkov, who was appointed chief physician of the future establishment, was given nothing more than a desk in the oblast health department, he queried how he could possibly maintain constant medical observation of the 9,000 youngsters in Volgograd who had come in contact with infected children. But once again the Ministry of Health came to the rescue: According to its instructions, such children were required to be kept under

surveillance for only a year, even though the incubation period could be longer. But when it's on paper, it must be right. And many breathed a sigh of relief: Perhaps there isn't even a need for any kind of center now?

In the meantime, as it became clear just recently, Leningrad scientists participating in forensic epidemiological examination of the criminal case, with professors A. Tsinzerling and L. Zuyeva among them, officially declared last year that if a child comes in contact with an HIV carrier, and the first tests for antibodies to the virus using the IFA [not further identified] system proved negative, the danger that the child would still be a potential source of infection is not excluded. These children, they emphasized, must undergo a lengthy period of clinical observation and immunological examination.

If we go with the official version—that Hospital No 7 was in fact the source of infection, since an infected girl from the Kalmyk ASSR had been in it some time ago, then this would mean that the epidemic had not come to an end in the city. Even here, after all, in the “focus,” a specialized indicator of the presence of blood on syringes and other instruments following sterilization is still not available. There are no glyutar [transliteration] and gas chambers in which to process fibro- and gastroenterological instruments. Autoclaves have been worked twice beyond their useful life, and the supply order has not been filled by “Medtekhnika” since that same year, 1989. Since that time not a single piece of anesthesiological and respiratory equipment has been delivered here. The lives of children sometimes have to be saved with faulty equipment. In short, if they were to comply with all requirements, surgeons feel that rather than 15 operations, they would be permitted to carry out only two. We should add to this that while they are the only ones who do surgery on HIV carriers, they themselves are not protected in any way. Consequently they themselves also become potential sources of infection.

And so, was the “epidemic focus” in Volgograd really contained? And what were its real characteristics? For all of the three years, no one, either at the top or at the bottom, spoke on this subject under the excuse of “secrecy of investigation.” But today, once again it is time to announce an emergency situation.

Recently “only” three children were added to the 51 already infected in the oblast, and “just” a few have died. But if the hypothesis of parenteral infection could be applied to one group of victims, how do we explain the other cases? Twenty-six of the 54 children discovered to be infected had never been in contact with each other, and they had never been in Hospital No 7. The mothers and fathers of almost all of them are healthy. The source of infection was never found for 30 percent of the children. Finally, what do we do with the conclusion of experts that immunodeficiency not resulting from HIV infection was noted significantly more frequently among children who died in Volgograd than in other cities?

“While just five years ago only 5 percent of Volgograd children died with immunodeficient states (underdevelopment of the thymus gland), in recent years the number of

such deaths increased here to 75 percent,” said V. Kulik, director of the department of children's and infectious diseases of the Volgograd Medical Institute. “You can't replace the gland—it must be normal at birth. But our mothers aren't healthy today either, the maternity hospitals are in a disgraceful state, and so-called ‘protection of motherhood and childhood’ may be said to be a profanation. The attitude toward pediatric hospitals corresponds to the level of the society's degradation. The question today is not whether we will survive, but whether the children will survive. We are of course talking about a larger region. But even in Volgograd Oblast their health is worsening progressively. Strange as this might seem to anyone, the solution I see is to provide ecologically clean food and milk to children and pregnant women on an emergency basis, and to immediately build a plant in Volgograd producing pure drinking water, at least for the youngsters.”

A certain investigator I know recently assured me that until we rid ourselves of the system completely, until we topple from the pedestals and call the former regime of “these communists” by their true name, it would be meaningless to try to get such things done—there is no way to get at the truth. But if the only reason we want to know the truth is so that under the new regime we could present another political argument to the old one, it would be better not to know it. Because we know since time immemorial that he who first shouts “Stop the thief” is right. But if we need the truth in order to at least save the children, then let's gather our courage, and say aloud that we, the adults, have not yet sunk irreversibly to the point where we would barricade ourselves behind a bunch of political formulas good for any system and regime in order to justify our inaction.

As the bitter irony of fate would have it, those city rallies in which the faults of Marxism-Leninism were exposed had once been conducted in the Palace of Political Education. Just across the street—in Hospital No 21, a tiny being, transparent and substanceless, like an angel, with a white fuzzy head, was dying in an isolation cubicle. As the loudspeakers blared in the square, the child turned to me and looked at me hard. A question stood mutely in its blue tormented eyes: “Why?”

### Radioactive Contamination of Sewage in Moscow

927C0369A Moscow MOSKOVSKAYA PRAVDA  
in Russian 28 Mar 92 p 2

[Article by Ye. Subbotina: “Chernobyl in a Laundry Hamper: It's Not a Horror Story—It's Real”]

[Text] God grant health to workers of the Prozhektor Plant—they have spared me from journeys to the laundry's drop-off point and from the skyrocketing expenses of communal laundry. And I recently learned that the “Evrika” clothes washer designed in this plant is dependably shielding my family from the real possibility of sleeping on radioactive sheets under radioactive quilt covers. No, no, I'm not at all saying that the finished products of the city's laundries are now radioactive. But I would like to provide readers the opportunity to persuade themselves that the possibility cannot be excluded.

An enterprise of a unique sort stands in Shchukino, on Zhivopisnaya Street—a liquid radioactive waste treatment plant. By status it is a branch of a formerly totally “deaf” institution—the Scientific Research Institute of Inorganic Materials imeni Academician Bochvar. What the plant is doing is invaluable: Radionuclide-contaminated liquid wastes of the Kurchatovskiy, Biophysics and imeni Bochvar institutes, the Medradiopreparat Plant and the special laundry, are collected here.

It's a reliable structure, sturdier than most, and capable of processing up to 50 cubic meters of liquid wastes per hour. The plant is connected to its plants by excellent stainless steel pipelines. After going through a special treatment cycle, the water corresponds to the All-Union State Standard, and it may be released into open water—into the Moskva River in this case. By the way, there is a rumor circulating among Muscovites that the land around the indicated institutions is distinguished by high radioactivity. This is a myth: The radiation situation in the region is normal. The danger lies in something else—in that the liquid radioactive waste treatment plant has entered an era of crisis, having been deprived of its allocations from the budget. The fact is that financial relations with clients have always been based on contracts, and although payment was symbolic, this worried no one: Financing from the budget created the feeling there was strength in reserve.

I don't know what the result of the economic reforms will be in the country as a whole, but when it comes to the treatment plant, and consequently the city as a whole, the intermediate results of these reforms are not just disappointing—they are frightening. In the desire to make the budget deficit-free, the facility's state financing was cancelled, and the price of treatment immediately went sky high. And inasmuch as the producers of water contaminated by radionuclides must now also pay for everything out of their own pockets, the price, which has tripled in comparison with last year, is not to their liking. It seems as if this is only the beginning: Everything used in the production cycle is getting more expensive—acid, alkali, ion-exchange resin, electric and thermal energy, and so on. On 10 March the cost of treating one cubic meter of liquid wastes was 407 rubles. For scale, according to data of the IAEA the world price of treating one cubic meter of similar wastes is \$1,200.

Finding their wallets empty, the suppliers of dirty water decided that now that their backs were to the wall, they would reduce the quantity of liquid wastes. The previously established procedure for signing contracts broke down. The clients now dictated their own terms, including payment not in advance but at the time of service. We can understand them: Circumstances forced them to count every kopeck, but such an approach signifies transition of the plant to piece-work. It follows from this that this especially important nature conservation facility—something we can call such a treatment plant without stretching the point at all—is moving into a risky existence. The highly qualified personnel, who are not all that spoiled by their wages, will scatter. And what if an accident occurs? By mid-March they finally managed to squeak through an agreement, but one

client fell out of the nest anyway—the special laundry, whose director A. A. Gorbachev refused to sign the protocol.

The facility for which Aleksandr Aleksandrovich was made responsible deserves special discussion. It is unique: first, because it launders and decontaminates linens and overalls from 64 institutions working with radionuclides (the Electronic Device Plant, the Institute of Molecular Genetics, the Moscow Engineering Physics Institute, the Hematological Scientific Center, the Institute for Advanced Training of Physicians, and numerous others), and second, in its working conditions. The right thing to do would have been to close the laundry long ago for remodeling, and the Chernobyl events reminded people of this just one more time. But things happen quickly only in stories.

There are two shops here—a “clean” one and a “dirty” one. The “clean” one deals with lightly soiled linens, commonly referred to here as group one, the wash water from which may be dumped in the domestic sewage system. The “dirty” shop processes articles requiring not only laundering but also decontamination—this is group two. Manual labor prevails here. The washing machines are loaded and unloaded by hand, and the articles are transferred to a lift and dried manually as well. Wet linens are not subjected to dosimetric monitoring, and people who work with them do not know whether the articles have been successfully decontaminated. Sometimes an inspection conducted just prior to pressing reveals that the articles need to be reprocessed. It is this waste water from linens contaminated by radionuclides (from 20 to 30 cubic meters of it is created monthly) that must be surrendered to the treatment plant. Since the beginning of the new year this was found to be too expensive for the laundry, and the dirty water began flowing into the domestic sewage system. It was not until 16 March that Moscow's state public health physician N. Shestopalov issued an order not to accept group two linens. The “dirty” shop was closed down. The city epidemiological station appealed to Moscow's authorities, and particularly to Yu. Luzhkov, over a period of two and a half months. I can't say what the city authorities were thinking. Could it be that Yuriy Mikhaylovich was waiting until laundering prices would drop, and everything would take care of itself? Well, prices didn't drop and things didn't take care of themselves: Just soda ash alone, which formerly cost eight kopecks a kilogram, is now stretching toward something close to 25 rubles!

In this situation the director of the special laundry reasonably argued that if the treatment plant's collective agreed to the treatment plant's financial terms, it's own collective would remain without wages. Of course, it would be easiest of all to call him an extremist and condemn his actions, which couldn't be considered proper even when you stretch the point. (Let me reassure those who are greatly frightened that the city's sewage system might now be contaminated by radiation throughout: The liquid wastes are far from always dangerous, even after group two linens are washed; moreover the short time and the high dilution rate sharply reduce the danger, but still, one shouldn't wait around for the lightning to strike). The risk here is of a different sort: Where are those 60 plus institutions that used the special

laundry to send their dirty linens now? The quick reader, I'm sure, is one step ahead of me when I suggest the city laundries. Just try to distinguish radioactively clean from radioactively dirty at an ordinary drop-off point. This danger is real: Each year the laundry processed 200-250 tons of linens and overalls. Even if we "put a lid on" scientific research, which is now the trend in our country, it would be impossible to stop the work of hospitals and leave Moscow and the oblast without radio-isotope diagnosis. Consequently the linens will continue to be "labeled" by isotopes.

There is something else that is obvious as well: The life of facilities so important to the region's ecological well-being should not depend in its entirety on the ruble. The deficit-free budget toward which the government is striving is of course a good thing, but the means of attaining it are not so praiseworthy in this case—leaving a nature conservation facility without guaranteed financing is shortsighted: The price tag later on will be far higher. Unfortunately the Chernobyl primer has become a textbook. This is why I never tire of expressing praise to the collective of the Prozhektor Plant—thank you for my home laundry system.

#### **Effect of Heterologous and Homologous Exogenous Alcohol Dehydrogenase on Consumption of Ethanol by Albino Rats**

927C0374B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 5, Aug 91 [manuscript submitted 28 May 91] pp 1256-1259

[Article by USSR Academy of Medical Sciences Member I. P. Ashmarin, R. A. Danilova, A. V. Pshezhetskiy, Sh. K. Sagimbayeva, I. M. Fedorova, M. F. Obukhova, and V. K. Shvyadas, Moscow State University imeni M. V. Lomonosov; UDC 612.015+613.816+577.158.344]

[Abstract] Blood levels of acetaldehyde and endogenous ethanol has a definite effect on one's alcohol-consumption habits. Raising the acetaldehyde level suppresses the attraction to alcohol, whereas raising the ethanol level has the opposite effect. Two enzymes—alcohol dehydrogenase and acetal dehydrogenase—are responsible for the ethanol and acetaldehyde levels. Thus far, researchers have focused their efforts on suppressing acetaldehyde levels, and no attempts to administer homologous or heterologous alcohol dehydrogenase to modify alcohol consumption have been described in the literature. The researchers here strove to assess changes in alcohol consumption in experimental animals after parenteral injection of native homologous and heterologous alcohol dehydrogenase, as well as heterologous alcohol dehydrogenase modified by polyethylene glycol. Alcohol consumption increased by as early as the second day in albino rats administered homologous (rat) alcohol dehydrogenase and lasted some three or four weeks. Heterologous (equine) alcohol dehydrogenase, however, did not produce an increase in consumption for the first 10 days and actually lowered consumption after that period. In some experiments, but not all, the modified heterologous alcohol dehydrogenase did produce an increase in alcohol consumption. The researchers suggest that the homologous alcohol dehydrogenase lowers the plasma levels of endogenous ethanol, but they cannot explain the lengthy effect (as much

as four weeks) or the source of NAD<sup>+</sup> necessary for the manifestation of exogenous alcohol dehydrogenase activity in the blood. Figures 1, references 9: 2 Russian, 7 Western.

#### **Government Medical Center Called Return to Elitism**

927C0383A Moscow ROSSIYSKAYA GAZETA in Russian 14 April 92 p 8

[Interview with Vladimir Bakulin, head of Russian presidential administration's Treatment-and-Recovery Association until 9 April 92, under the rubric "In the Corridors of Power": "Backwards to an Elitist Medicine?"; first paragraph is source introduction]

[Text] On 9 April, a press conference was held with regard to the creation of a Russian-American international hospital based on our Fourth Administration [of the Ministry of Health] and Hospital Corporation International. Everything that was spoken of, however, can hardly come to pass, because on that very ninth of April, a presidential ukase was signed—"The Organization of a Medical Center Under the Government of the Russian Federation." Our correspondent asked for comments about that from Vladimir Bakulin, who, until 9 April, headed the Russian presidential administration's Treatment-and-Recovery Association.

[Bakulin] It was a complete surprise to me. On the morning of the 10th, they called me from the presidential secretariat and told me about the ukase and that Kuntsevskiy Hospital's Chief Physician Martynov had been named to replace me.

The system of the Treatment-and-Recovery Association (formerly the Fourth Administration of the Ministry of Health) requires nearly a billion rubles [R] a year to operate. By the end of the year, by our calculations, that sum will double. Plus \$20 million for the purchase of drugs, medical equipment, materials, and spare parts. From the very outset, it was clear that the budget couldn't handle all that and we would have to switch to cost-recovery status.

That course didn't just happen yesterday. It was worked out back in the "small" Fourth Administration of Russia, which I also headed. In the very first year of operation, through cost accounting, we managed to cover 90 percent of the 58 million needed to finance it. And here, after the consolidation with the Union treatment-and-recovery association, we moved in that direction immediately. We had already signed agreements for servicing more than 700 industrial enterprises.

After former politburo members were disattached from the polyclinic to Granovskiy, it became possible to solve the hard-currency problem, too. A protocol was signed with the American Hospital Corporation International regarding intentions to create a joint medical center that would serve foreigners as well as Russian citizens. By a decision of the head of the Presidential Administration at the organizational stage, I was charged with heading the work to be done by the association.

But now it turns out that all those efforts are going to rack and ruin—a government medical center is being formed on

the basis of the Treatment-and-Recovery Association. The main thing is the fourth clause of the ukase: "The appropriation of material and financial resources (including hard currency) is provided for by a specific line in the estimate of expenses of the Russian Federation Government."

The ukase, of course, like any other ukase, has to be adhered to. But it seems to me that in this case, to put it coarsely, they "tripped up" the president on this one. Because the former course was completely in line with Yeltsin's ideas on the elimination of perquisites and privileges and on insured, self-financed medicine.

[ROSSIYSKAYA GAZETA] You, of course, found out who was behind the decision?

[Bakulin] The fact is that the ukase was a surprise to everyone. The only one who could have authorized it is the head of the secretariat of the manager of the Russian president's state and legal administration [GPU—not further expanded].

ROSSIYSKAYA GAZETA: And in whose interests, in your view, is such a turn of events?

[Bakulin]: I think that, first of all, the system itself of the former Fourth Administration benefits. It has existed since 1928, and I was warned that anyone who tried to come in with his own code would be pushed out. I must say that we managed to provide plenty of reasons for dissatisfaction. We recently concluded an inspection of the computer center and found as-yet-unexplained transactions involving tens of millions of rubles. Monday was to mark the beginning of an inspection of the Kuntsevskiy Hospital—specifically, of the nature and efficacy of its cooperation with 30 foreign firms. Our intentions evoked an extremely negative response from the hospital's Deputy Chief Physician Volodin.

### German-Byelorussian Production of Dialysis Equipment

927C0383B Moscow IZVESTIYA in Russian 12 Mar 92 Morning Edition p 3

[Article by Mikhail Shimanskiy, dateline Minsk: "The Germans Are More Concerned About Our Hospitals Than We Are"]

[Text] IZVESTIYA has already reported that in Belarus, in the city of Borisov, our first-ever production line of "artificial kidney" machines is being set up, with the help of the German firm Frezenius (see No. 283, 1991). According to the data of the former USSR Ministry of Health, about 60,000 people in our country die of renal insufficiency every year.

There is only one way to maintain an individual [with renal insufficiency]: by periodically cleansing the blood of the protein metabolism products that poison the body. That function is performed by an artificial-kidney dialysis machine. These days, many thousands of individuals wait months for a dialysis spot to open up in some artificial-kidney department, but the machines are in disastrously short supply. Our country was unable to solve the extremely important problem of producing dialysis machines.

The German firm Frezenius has designed a production line for the dialysis machines at the Borisov Plant for Medical Preparations and is transferring to us the technology for manufacturing this unique medical equipment. The joint venture Frebor will produce 2 million machines a year.

Along with the director of the joint venture, P. Korolko, we inspected the shops that have already been finished.

"The working commission," the director said, "took the first turn of the venture and used it for equipment assembly and startup/setup operations. The commission drew no critical comments regarding the general construction operations, which is hard to believe. Domestic materials and equipment make up no more than 10 percent of the total cost of the venture. It's simply shameful, but the smallest things, even the simplest insulation materials, we had to request from the German firm, and it has delivered them quickly, even though that's not in the contract."

No less of a problem than the slim material-technical supply is the problem of the staffing of the future production line. There's no place in our country to learn how to make dialysis machines. From the first day of the contract, the Frezenius firm was ready to take our people for training. The management of the Borisov plant chose candidates for training in a special competition—primarily from defense and instrument-making enterprises. In the general opinion of our specialists, excellent conditions for training were created in Germany.

The most important news is this: an experimental model of the artificial-kidney machine has already been manufactured for the Borisov plant. True, it was manufactured in Germany, at the Frezenius plant, but workers of the Borisov plant assembled it with domestic materials. Now, that model of our first domestic dialysis machine is undergoing toxicological and health/chemical tests in institutes in Moscow. In Borisov, they're sure that the results will be good, because the German firm doesn't let bad equipment leave the premises.

And so, the production of an artificial-kidney machine is on the eve of startup. It is supposed to go on line in May. But today nobody—not the German firm, not the management of the Borisov plant—will vouch for the fate of the production facility...

The first reason for that involves the supply of raw materials. The Borisov plant has set a goal of producing 300,000 dialysis machines this year alone. The German firm has delivered casting components for 50,000 machines. And Frezenius didn't make those components, but bought them elsewhere. But that's enough raw material for just the startup of production. What about later? Nobody can answer that question for the time being.

"We cannot produce a single dialysis machine without plasticizer," Korolko said. "But the Kuskovskiy Chemical Plant, near Moscow, which makes it, has not responded to our many requests for at least 100 tons of plasticizer. And for that reason, it's possible that we will not be able to live up to our completed-unit production capacity."

The next problem involves hard-currency credit. That problem was supposed to be solved by the former USSR Ministry of Health. But the Union agency no longer exists, and the problem is still hanging. How are we going to acquire the necessary raw materials abroad without hard currency? That problem, more than any other, is worrying the director of the firm Pharmaplan (a daughter enterprise of Frezenius), Winfred Stefan [Vinfkhed Shtefan].

"The firm has a good many joint ventures throughout the world involving the manufacture of artificial-kidney machines," Stefan said. "But the kind that is being built in Borisov is a first for us. And we undertook this whole thing quite willingly. But we didn't think the current political situation in the CIS would so complicate our work."

Here's how the chairman of the corporation Farindustriya, V. Markaryants, sizes the situation up:

"This production is a sort of test balloon for attracting foreign technologies to our health care sector on a broader basis. We are planning a similar joint venture at Khimfarmkombinat in Kursk. Frezenius is a very solid firm with a great deal of authority. It is sincerely trying to help us, and we must not be so irresponsible as to miss an excellent opportunity to attract leading foreign technologies for the production of medical equipment."

The situation with regard to the unique production in Borisov, on which many millions have already been spent, is a reflection of the general state of affairs in our Commonwealth. Nevertheless, who will help the plant? Belarus, alone, is in no position to solve all the problems that are coming up.

#### **Clinical Tests of Cancer Drug Viturid Begin**

927C0383CB Moscow ROSSIYSKAYA GAZETA  
in Russian 25 Feb 92 p 6

[Article by A. Buyanova: "A Uniting Misfortune"]

[Text] Now the names of G. Stotskiy, T. Svishcheva, and T. Vorobyeva, who have come close to a victory over cancer, are known. Eliciting admiration is the work of the Ukrainian Ministry of Health Scientific Research Institute of Pharmacology and Toxicology, where preliminary clinical tests of the drug Viturid have been completed. Viturid demonstrates antitumor activity that is 10 times greater than similar drugs produced in the United States.

There is a Hospital No 40 in Moscow. Its physicians specialize in treating cancer. They give over their hearts and minds to the difficult, but noble work. But they treat cancer primarily with a chemotherapy that uses drugs that are not as good as Viturid.

On behalf of the thousands and thousands of cancer patients, I ask the health ministers of Russia and Ukraine to provide moral and material support to those people and their organizations and to authorize the production of the drug Viturid.

#### **Development of Blood Substitute Perftoran Resumes**

927C0383CD Moscow NEZAVISIMAYA GAZETA  
in Russian 22 Feb 92 p 6

[Article by A. Ostapchuk, under the rubric "Science": "The 'Ship of the Future' Could Become Scrap: Scientists, Businessmen, and Journalists Discuss the Fate of Unique Discoveries"]

[Excerpt] Tomorrow will witness the premier of a joint science/journalism broadcast from the Moscow Press Club, the program "Under the Symbol  $\pi$ ," which is devoted to the possibilities available to Russian science to pull out of the crisis, primarily the financial crisis. Taking part in the program were Russian Academy of Sciences Vice President Nikolay Laverov, Russian Academy of Sciences academicians and corresponding members, businessmen, and journalists.

The participants viewed videos about future science projects whose realization is now having financial difficulties. After all, until recently, only the state invested in basic science, but not it is not.

One of the videos told of the tragic history of the domestic blood substitute perftoran. In the 1970's, that preparation was created by a resuscitation specialist who was a staff member at the Center for Biological Research in Pushchino. The semiofficial scientific community began persecuting the scientist, and the Pushchino center was destroyed. Eventually, the individual killed himself. Only recently did the opportunity arise to resume work on that badly needed preparation. A joint-stock company was created—Perftoran, headed by Russian Academy of Sciences Corresponding Member Genrikh Ivanitskiy, who had supported the research in the past. But the proper conditions for improving the perftoran don't exist, and there's no equipment for producing it in sufficient quantities. And people, as before, are dying in the resuscitation departments because there's not enough blood for transfusions.

The vice president of the joint-stock company First Moscow Plant for Radio Parts, Vladimir Kryzhanovskiy, proposed setting up the equipment needed for producing the blood substitute. Here talks began between Ivanitskiy and the general director of the Tyumen-Moscow Hermes exchange, Vladimir Moryzhenkov, about developing a joint "policy for the support of the Perftoran project." [passage omitted]

#### **Epidemiology Official on Environmental Injury Compensation**

927C0387A Moscow SPASENIYE in Russian  
No 6, Feb 92 p 3

[Interview with Gennadiy Grigoryevich Onishchenko, deputy chairman of the State Committee for Epidemiological Inspection; place and date not given: "And We Will Thank God That We're Alive....: Who Will Protect Us From the Ecological Tyranny of Entrepreneurs? Only the Law and the Government"]

[Text] We met Gennadiy Grigoryevich Onishchenko, deputy chairman of the Presidential State Committee for

Epidemiological Inspection and deputy chief state physician of Russia, early in the morning, an hour before the official beginning of the work day.

As I walked over the crunching snow in the early morning frost on Vadkovskiy Lane, I thought about its name, and about how I liked it so much. Why?, I asked myself. I don't know, I just liked it. The sun was shining, and the air was easy to breathe. In a word, it was a good day.

Then at one point in the interview the master of the office referred to himself as a Vadkovskiy dreamer, and for the first time I found myself really thinking about the vicissitudes in the fate of the epidemiological service.

I remembered the open hostility I encountered as a private citizen at the Baumanskiy Rayon Epidemiological Station (two years ago). Even though what I asked them was so inconsequential—to pass judgment on the composition of the air and the level of the noise in my apartment building, with its windows facing Sadovoye Circle. They finally came over to measure the noise, but as far as the air was concerned.... Then my obliging memory recalled the time back during the Brezhnev-Promyslov era when it was "graciously" explained to me in the Moscow Soviet: "Leave it alone, lady, there's no hope of you getting out of Sadovoye. You'll most likely be there to your dying day." But my good comrades were wrong. Hope has now appeared. As the Central Prefecture announced, the center is no longer for the poor! This means that perhaps now I will be able to breathe something on the outskirts of Moscow besides gasoline vapors before I die.

Now that same service—though at its highest level—has been ordered to involve itself in protecting the life and health of my compatriots who are not the most fortunate on this earth. They are involving themselves, and, as it seemed to me, they sincerely wish to help people. What can I say? The times are changing, and together with the times, the state services.

**SPASENIYE:** Gennadiy Grigoryevich. Let's begin with statistics. Were any kept on the quantity of cases of disease caused by environmental pollution? And if so, where were they published?

**Onishchenko:** Unfortunately, figures of this sort were concealed by earlier politicians. Even statistics on infectious diseases were prohibited in the overt press. Consequently some specialists manipulated the figures to their liking, while others who were not privy to the facts were unable to influence the state of affairs.

Finally, three years ago secrecy was relaxed, and statistics of this sort were declassified. (They are now published by the journal EPIDEMIOLOGIYA). An opportunity to analyze the situation has now appeared. But still, we do not have complete data on the frequency of disease due to environmental pollution, but a certain picture has become clear in different zones of ecological crisis. We can say that the boundaries of the problem have been identified, but we do not yet have any sophisticated tools with which to gather evidence.

**SPASENIYE:** What do you need to do to get them?

**Onishchenko:** Just keep on working. We have doubtlessly made some headway on this road. The "Law on Epidemiological Welfare" was adopted on 19 April 1991. In it, Article 5 (in the section "Rights of Citizens") specifically discusses "compensation for damage to health resulting from violations of public health rules causing mass infectious and noninfectious diseases and poisonings as well as occupational diseases." Compensation is paid either by the enterprises or by the organizations or by the individual citizens to blame for disease. Voluntarily or by court order. Damages may also be compensated by an insurance organization.

**SPASENIYE:** Voluntarily—now that's a laugh!

**Onishchenko:** You know, if you put the seriousness of the problem in one tray of the balance and the doubts in the other, you'll find that we need to keep moving forward, and very quickly. This is why an entire series of documents and methodological instructions are being written in elaboration of the Law. We have already received the third version of a statute (taking the form of a legal act) defining the mechanism itself of compensating for damages.

**SPASENIYE:** Gennadiy Grigoryevich, let's look at the compensation procedure, or more accurately, the possible variants, using specific examples.

**Onishchenko:** All right. The simplest example: Let's take Kaliningrad, where a mass poisoning (of over 4,000 persons) by dairy products occurred in fall 1991. Specialists revealed that products had been contaminated at the dairy with dysentery bacillus. Everything was clear. Blame was shown. The culprit has been identified. Pay up.

The most complex variant. A city with many industrial enterprises. How will everything be handled there? Most likely the enterprises will engage in passing the buck in the classical tradition, because it is very difficult to present the bill to someone specific. And there's a chance you won't get caught.

What about in other countries, how do they do it? In general, the procedure is also hard to understand in industrial centers. But it's another matter if it's an accident or a disaster. For example if a chlorine tanker rolls over, or if a methane explosion occurs.

**SPASENIYE:** Still, what sort of actions are taken?

**Onishchenko:** First of all we need to determine who is at fault. Second, the degree of the damages inflicted. Another difficulty lies in the fact that each person is purely individual. Everything has to be accounted for—genetic predisposition, racial and ethnic features, and even the way of life.

**SPASENIYE:** Even so, the absolute truth is nonexistent. Or it is practically unprovable.

**Onishchenko:** Yes, there is no absolute truth, but damages close to the truth can be determined. Experience in doing so exists, for example, in Perm. Medical personnel of Uralsk Oblast tried to bring together everything they knew—the anthropogenic load upon the territory, and the written instructions already in effect. They modeled the situation. As a result they established an interdependence between morbidity and toxic releases by industry in the oblast. Such

that the solution (as to how to determine the primary cause of disease in the man-environment system with maximum accuracy) is there for us to find.

**SPASENIYE:** It would be good if it would become tangible. But while medical personnel are seeking the "ways" and "approaches," the health of the nation is approaching the critical mark, according to assertions of your own colleagues. Except from another department.

**Onishchenko:** I want the same thing. But if we continue to argue about what is absolute, we will never develop a mechanism for determining damages. Yes, there will be bumps and bruises at first. That's inevitable. I do not feed the illusion that enterprises, entrepreneurs, and even the government would perceive such a situation with enthusiasm. At any rate we will attack and defend ourselves, we will find the best lawyers. What is especially important in this connection is the algorithm (method, principle) of creating public opinion regarding these problems.

**SPASENIYE:** Am I right in thinking that entrepreneurs over there (beyond the hill) don't experience any special joy from services identical to yours? Though they do put a very high value on their own image, something I believe we won't see in our country for a very long time.

**Onishchenko:** Not all that long. As soon as competition appears. In the West, after all, up to 40 percent of production outlays are on internal quality control. But here in Russia we put our faith in good intentions. In the moral imperative. Morality is forgotten most of all only where you can smell a profit to be had. For the moment, such morality is being forgotten.

**SPASENIYE:** I'm afraid that a discussion on morality would cause us to digress very far. Let's return to the particulars regarding diseases resulting from an unfavorable natural environment. Do such diseases exist?

**Onishchenko:** Yes, of course. Some are absolutely anthropogenic. I do not exclude the possibility that AIDS is the result of our gross interference into nature. A niche for the AIDS virus has appeared.

**SPASENIYE:** Does that mean that someone released it, and if so, who?

**Onishchenko:** Smallpox was deliberately annihilated in the world 11 years ago, thus disturbing the biological balance. In God's eyes, you see, all are equal, be they smallpox virus or people. And how many other such actions has mankind taken?

**SPASENIYE:** We've now digressed from industrial centers to biology....

**Onishchenko:** Perhaps because the fear of smallpox, plague and cholera—that is, previously the most dangerous and widespread diseases—is written into our genes. But when it comes to chemical and physical contamination, this is the work of human hands.

I can name diseases that have manifested themselves as a result of anthropogenic effects. There is legionnaires' disease, the conditions for which are created by air conditioners in large buildings. Pseudotuberculosis is the result of improper storage of food products in the public food services system (refrigerators, vegetable bases). Over 100,000 persons are stricken by it in the CIS. Finally, T-cell leukosis. It's something on par with AIDS. If not even more terrible.

**SPASENIYE:** It looks like you've made both me and our readers as frightened as we will ever be. So what, as an example, does the statute currently being drafted (I'm not going to repeat its entire long name) suggest in regard to paying compensation to a person who has suffered? Can you give at least one example?

**Onishchenko:** Certainly. We do not claim to have made a new discovery in legislative practice by drafting this statute. What we tried to do was to put some life in the laws. We already have the RSFSR laws "On Medical Insurance of Citizens" (Articles 10, 15, 28) and "On Enterprises and Entrepreneurial Activity" (Article 29, Paragraph 2). They foresee compensation to physical persons. Damages resulting from unfavorable factors are paid during the time of illness (poisoning) or in the course of chronic illness (over an entire lifetime) out of the profits of the enterprise proven to be at fault. These laws put an end to the lack of constraints on enterprises, but in order for them to begin to operate, we still require some mandatory factors.

**SPASENIYE:** Such as?

**Onishchenko:** I think that we absolutely need special services operating within the framework of rayon epidemiological stations. Public relations services, perhaps. We also need to decisively change the public mentality. The time has come to develop a different culture in relation to our health. More interest must be displayed in it.

**SPASENIYE:** Are you suggesting that, for example, we visit the rayon polyclinic more often? Come now, give us a break!

**Onishchenko:** But why? The government can't provide for everything. You know what it is that makes, for example, Americans take care of themselves (through a moderate diet, walking and sports)? The high price of medical services! As far as your remark is concerned, let me come to the defense of my colleagues. Don't forget that doctors are products of the society just like people in other professions. And what about the law? It gives us knowledge, and most importantly, the right to fight for what is ours.

**SPASENIYE:** Excuse me, Gennadiy Grigoryevich, but will we live long enough to be able to defend the rights that have been granted to us?

**Onishchenko:** I may risk appearing a "Vadkovskiy dreamer" to you. Naturally it's not worth feeding any illusions. There will be no grand successes, but let's at least begin somewhere. We'll approve the statute, and we'll arm our specialists with a clear, comprehensible document. I sincerely wish to believe that owing to our work, Russians will at least receive **economic compensation** for spoiled health. And they will thank God that they're still alive.

**Kazakhstan Public Health Law**

927C0390A Alma-Ata KAZAKHSTANSKAYA PRAVDA  
in Russian 19 Feb 92 p 2

[Law of the Kazakhstan Republic on Public Health in the Kazakhstan Republic]

[Text] This Law determines the general, legal, economic and social principles of public health, and regulates social relations and the participation of organs of state government and administration, enterprises, institutions and organizations regardless of forms of ownership, and officials and citizens in establishing and reinforcing public health, defined as a state of complete physical, mental and social well-being.

**Section I. General Provisions****Article 1. Objectives of the Law of the Kazakhstan Republic "On Public Health"**

The main objective of the Law of the Kazakhstan Republic "On Public Health" is to realize the inalienable right of citizens to health, and to support the right to its protection, guaranteed by the Constitution of the Kazakhstan Republic.

**Article 2. Public Health Legislation of the Kazakhstan Republic**

1. Public health relations in the Kazakhstan Republic are regulated by this Law and by legislative acts of the Kazakhstan Republic that are not in conflict with it.

2. Rights of citizens and organizations established by public health legislation of the Kazakhstan Republic may not be limited by acts of executive government and local soviets of people's deputies. Such acts are considered to be invalid from the moment of their adoption.

**Article 3. Fundamental Principles of Public Health**

In order to ensure support of the rights of citizens to health protection in the Kazakhstan Republic, the following fundamental principles are implemented by this Law:

- responsibility of organs of state government and administration, employers and officials for creating conditions ensuring establishment, development and reinforcement of public health;
- social protection of citizens in the event of loss of health;
- responsibility of citizens for maintaining and strengthening their own health and the health of surrounding individuals;
- responsibility of medical and pharmaceutical workers and persons having the right to engage in medical and pharmaceutical activity for damages caused to the health of citizens;
- scientific and preventive orientation of public health and social medical measures;
- free, universally available health care rendered by state public health institutions;
- diversity in the development of public health in correspondence with the population's needs.

**Article 4. Competency of the Kazakhstan Republic in Public Health**

In the face of its supreme organs of government and administration, the Kazakhstan Republic:

- drafts and adopts legislative acts in the area of public health;
- ensures dependable ecological and epidemiological well-being and radiation safety on the territory of the republic;
- determines the strategy and approves the plans and programs of action to protect the health of the people and measures to implement them;
- supports development of fundamental and applied medical science;
- provides material, technical and financial support to state public health institutions;
- promotes formation of public organizations and associations assisting in the protection of public health, and supports and encourages their activity;
- signs international treaties;
- resolves other public health issues.

**Article 5. Direction of Public Health in the Kazakhstan Republic**

Direction is provided to public health in the Kazakhstan Republic by supreme and local organs of state government and administration in accordance with legislation of the Kazakhstan Republic.

The Ministry of Health of the Kazakhstan Republic directs the activities of republic medical, educational and medical scientific research institutions, and material, equipment and medicinal supply, and through local soviets of people's deputies it coordinates the activities of territorial public health organs and institutions, and it analyzes the state of public health. The Ministry of Health of the Kazakhstan Republic is responsible for operational leadership of departmental medical and public health services.

**Article 6. The Preventive Orientation of Public Health**

The preventive orientation of public health is maintained by the state and by employers through the establishment of a system of socioeconomic measures aimed at eliminating factors and conditions harmfully influencing the health of citizens, maintenance of the health, high level of performance and long and active life of citizens, and prevention of disease.

**Article 7. Public Associations in Public Health**

Trade unions, associations of physicians and pharmacists, the Society of the Red Crescent and the Red Cross, the Charity and Health Fund and other public associations take part in supporting public health in accordance with their charters and with procedures established by legislation of the Kazakhstan Republic.

Organs of state government and administration, employers and citizens provide all possible assistance to the activities of public associations in public health.

**Article 8. Responsibility of State Organs Regarding Public Health**

Republic and local state organs are responsible for ensuring living conditions for the population promoting establishment, development and reinforcement of health and reproduction of a healthy population, for ecological and epidemiological well-being, for prevention of disease, and for introduction of diversified medicine.

Republic and local state organs are responsible for developing cooperation among different sectors, for the population's participation in implementation of public health programs, for creation of an adequate material and equipment base for state public health institutions and medical and pharmaceutical industry, for providing medicines to the population, for developing donorship, for approving health care cost and quality standards, and for providing the conditions for development of the mass movement in physical education and health improvement, sports work and tourism.

**Article 9. Responsibility of Employers and Officials for Public Health**

Employers and officials bear responsibility for:

- ecological well-being, and for ensuring healthy conditions for the work, personal life and rest of laborers;
- compliance with public health and hygienic norms and the regulations on maintenance of work spaces and territories;
- informing workers and the population in regard to harmful production factors;
- damages inflicted upon the health of citizens;
- violation of the Law of the Kazakhstan Republic "On Public Health."

**Article 10. Responsibility of Medical and Pharmaceutical Workers as Well as Persons Having the Right To Engage in Medical and Pharmaceutical Activity for Damages Inflicted Upon the Health of Citizens**

Medical and pharmaceutical workers as well as persons having the right to engage in medical and pharmaceutical activity bear responsibility in accordance with legislation of the Kazakhstan Republic for damages inflicted upon the health of citizens.

**Section II. Rights and Responsibilities of Citizens in Public Health**

**Chapter 1. Rights of Citizens in Public Health**

**Article 11. Rights of Citizens for Public Health and Social Medical Assistance**

Citizens have the right to a guaranteed level of public health and social medical assistance, which may be rendered at their choice in any medical institution.

Citizens have the right to free choice of a physician.

Citizens are provided emergency health care by any nearest therapeutic and preventive institution irrespective of departmental subordination and forms of ownership.

**Article 12. The Right of Citizens To Refuse Treatment**

Citizens have the right to refuse examination and treatment at any stage, unless established otherwise by legislation.

Refusal of treatment is confirmed in writing.

**Article 13. The Right of Citizens to Ecological and Epidemiological Well-Being and Radiation Safety**

Citizens have the right to ecological and epidemiological well-being and radiation safety.

This right is ensured by the state by preserving a favorable environment that does not have a negative influence on the health of present and future generations.

**Article 14. The Right of Citizens to Medicinal, Orthopedic and Prosthetic Assistance**

Citizens have the right to medicinal, orthopedic and prosthetic assistance.

The categories of persons qualifying for privileges in the acquisition of medicines, orthopedic, prosthetic and corrective appliances, hearing aids, physiotherapeutic equipment and special transportation equipment are established by legislation of the Kazakhstan Republic, as are the conditions and procedures of providing and using them.

**Article 15. The Right of Marrying Citizens to Genetic Testing**

Citizens marrying on the territory of the Kazakhstan Republic have the right to undergo medical or genetic testing in the public health institutions of their choice with the purpose of safeguarding the health of the spouses and their progeny.

**Article 16. The Right of Citizens to Sanatorium and Health Resort Treatment, and to the Use of Health Improvement Institutions**

Citizens have the right to use sanatoriums and health resorts, vacation homes, preventive hospitals, vacation hotels, tourist bases, athletic facilities and other health improvement institutions.

**Article 17. The Right of Citizens to Information on Health and on Factors Affecting Health**

Citizens have the right to obtain the necessary information on their health and that of their children.

Citizens have the right to obtain information on the health of a spouse and parents unless established otherwise by law.

Citizens have the right to obtain information from public health organs and institutions and employers on prevention and treatment methods, on the morbidity level of the population, and on factors affecting their health, including the state of the environment and the conditions of work, personal life and rest.

Information on the health of citizens is provided by the examining and treating physician.

**Article 18. The Right of Citizens to Compensation for Damages Inflicted on Their Health**

Citizens have the right to compensation for damages wrongfully inflicted upon their health by the state, employers or other persons. The grounds and procedures of compensation for damage to health are determined by legislation of the Kazakhstan Republic.

**Article 19. The Right of Citizens To Obtain Medical, Pharmaceutical, Prosthetic and Orthopedic Care in Foreign Medical and Other Institutions**

Citizens have the right to obtain medical, pharmaceutical, prosthetic and orthopedic care in foreign medical and other institutions.

When specialized medical institutions conclude that a need for such care exists, state organs are obligated to provide assistance in its acquisition.

The state is obligated to ensure acquisition of the necessary pharmaceutical agents and prosthetic and orthopedic appliances from abroad in the presence of the corresponding conclusion of specialized medical institutions.

**Chapter 2. Protection of Maternity and Childhood**

**Article 20. The Right of a Mother to Health Protection**

A woman is granted the right to resolve the issue of maternity for herself. In order to protect the health of the woman, modern methods of preventing undesired pregnancy may be carried out with her consent; surgical sterilization is carried out only with the consent of the woman in the presence of medical indications, the list of which is determined by the Ministry of Health of the Kazakhstan Republic.

Maternity is safeguarded and encouraged by the state in the Kazakhstan Republic. Protection of maternity is ensured by organizing a wide network of special medical institutions; by paying assistance to a woman in the event of the birth of a child; by prohibiting female labor in heavy and unhealthful production conditions, by sensibly employing pregnant women and by providing them the possibility for carrying out medical prescriptions; by providing pregnancy and maternity leaves to working women; by paying child care assistance up to an age of one and a half years, and in the event of the child's illness; by establishing individual work schedules and part-time work. Other benefits may also be foreseen by legislation.

**Article 21. The Right of Children to Health Protection**

The state defends the rights and interests of children, and ensures their right to living conditions necessary for physical, mental, spiritual and moral social development.

Organs of state government and administration and employers ensure development of a wide network of special medical and pediatric institutions, and they are responsible for improving the health of children in them.

Children are subject to mandatory periodic medical examinations and permanent dispensary observation.

In the event of hospital treatment of children up to an age of three years, as well as of severely ill children of older age

groups requiring additional care according to medical conclusions, an opportunity is provided to the mother (father) or to another person caring for the child directly to remain with the child in the therapeutic institution while receiving social insurance assistance in accordance with the established procedure.

Children with defects in physical or mental development have the right to obtain social medical assistance in specialized pediatric institutions. The list of medical contraindications against placing such children in children's homes and in general-purpose educational institutions is approved by the Ministry of Health of the Kazakhstan Republic.

Evasion of the responsibilities of caring for and raising children in the family, and child abuse resulting in health impairment bear liability established by legislation of the Kazakhstan Republic.

**Chapter 3. Donorship**

**Article 22. Donation of Blood and Its Components**

Every healthy citizen from 18 to 60 years old has the right to donate blood and its components. Donorship is encouraged and donors are granted privileges by legislation of the Kazakhstan Republic.

**Article 23. Organ and Tissue Transplants**

Every citizen may be an organ and tissue donor.

Involuntary removal of organs and tissues and their transplantation are prohibited.

The procedure for transplanting tissues from one person to another and from animals to a person is established by the Ministry of Health of the Kazakhstan Republic.

**Article 24. The Right of a Donor to Compensation and Social Assistance**

When a donor suffers harm in connection with the performance of a donor function, he has the right to compensation for damages and social assistance, and in the event of death, the spouse, children, parents and dependents have the right to compensation and social assistance.

**Article 25. Artificial Fertilization, Embryo Implantation**

Artificial fertilization and implantation of an embryo are permitted on the basis of the mutual consent of spouses whose marriage has been registered. Artificial fertilization or embryo implantation are permitted in relation to an unmarried woman in accordance with her wishes.

Public health institutions insure, and bear responsibility for, observance of the anonymity of donors and maintenance of secrecy of artificial fertilization or embryo implantation in accordance with legislation of the Kazakhstan Republic.

The procedures and conditions of donorship associated with artificial fertilization and embryo implantation are established by the Ministry of Health of the Kazakhstan Republic.

The rights and responsibilities of parents in relation to children born following artificial fertilization or embryo

implantation are regulated by the Marriage and Family Code of the Kazakhstan Republic.

#### **Chapter 4. Responsibilities of Citizens in Public Health**

##### **Article 26. Responsibilities of Citizens To Observe Public Health Legislation**

Citizens are obligated to observe public health legislation and to be careful of their health and the health of surrounding individuals.

##### **Article 27. Responsibility of Citizens for Observing Medical Prescriptions**

To prevent infectious diseases, citizens are obligated to fulfill prescriptions regarding fluorography, immunization and medical examinations at times established by public health institutions.

Persons undergoing hospital treatment are obligated to observe the regimen effective in the medical institutions.

##### **Article 28. Responsibilities of Citizens in Caring for the Health of Children**

Citizens are obligated to care for the health of children and for their physical, spiritual and mental development, and to instill the habits of a healthy way of life.

Pregnant women are obligated to promptly register for medical treatment, undergo examination and carry out medical prescriptions.

Parents are obligated to follow the rules promoting birth of normal children, to observe intergenetic intervals, and to carry out medical prescriptions following the birth of a child.

##### **Article 29. Obligation of Citizens Ill With Tuberculosis, Leprosy, AIDS and Venereal Diseases To Undergo Examination and Treatment at the Demand of Medical Institutions**

Citizens ill with tuberculosis, leprosy, AIDS and venereal diseases are obligated to undergo examination and treatment at the demand of medical institutions.

In the event that citizens evade examination and treatment, they are subject to compulsory certification and treatment, and in cases established by legislation they are subject to compulsory admission.

The grounds and procedures of ordering compulsory treatment for citizens are regulated by legislation of the Kazakhstan Republic.

##### **Article 30. Responsibility of Citizens for Assisting in Transporting and Providing Medical Aid to Patients**

Citizens are obligated to provide assistance in transporting and rendering medical aid in cases where the life of the patient is in jeopardy.

#### **Chapter 5. Rights and Responsibilities of Citizens of Other States and Persons Without Citizenship in Public Health**

##### **Article 31. Rights and Responsibilities of Citizens of Other States and Persons Without Citizenship Regarding Public Health in the Kazakhstan Republic**

Citizens of other states and persons without citizenship permanently residing or temporarily visiting the territory of the Kazakhstan Republic enjoy the same rights and bear the same responsibilities in public health as do citizens of the Kazakhstan Republic.

The procedures by which public health and social medical assistance is rendered to citizens of other states and persons without citizenship temporarily visiting the territory of the Kazakhstan Republic are determined by the Ministry of Health of the Kazakhstan Republic.

#### **Section III. Public Health Resources**

##### **Chapter 6. Public Health Financing**

##### **Article 32. Sources of Financing of State Public Health**

The sources of financing of state public health are:

- assets of republic and local budgets allocated on the basis of long-term economic standards;
- assets of international organizations in international programs;
- hard currency allocations from republic and local hard currency funds;
- nonbudgetary stabilization funds;
- medical insurance assets;
- assets obtained by medical institutions for medical and other services to employers in excess of the standards, and for rendering paid services and other forms of economic activity;
- deductions from the profits of enterprises, associations and organizations, specific subsidies from ministries, departments and other administrative organs, and charitable contributions by organizations and citizens, including of other states;
- other sources, use of which is not contrary to law.

##### **Article 33. Use of State Public Health Assets**

State public health assets are allocated to:

- state medical insurance for workers of budget-supported organizations and nonworking citizens;
- specific comprehensive public health programs;
- development of the material and equipment base of state public health;
- maintenance of therapeutic, preventive and epidemiological institutions;
- training and advanced training of medical personnel;
- development and introduction of medical science;
- elimination of infectious disease epidemics.

Assets coming to public health, irrespective of their source, form the public health fund in accordance with a procedure established by legislation of the Kazakhstan Republic.

**Chapter 7. Medical Insurance for Citizens of the Kazakhstan Republic****Article 34. Medical Insurance**

Medical insurance (mandatory and voluntary) is a means of financing public health out of budget assets and insurance premiums paid by employers and citizens in order to compensate for damages suffered by insured persons in the event of illness or injury, and to compensate for the outlays of medical institutions.

Citizens are subject to mandatory medical insurance.

Assets allocated for mandatory medical insurance are created on the basis of established standards out of:

- budget assets for medical insurance of citizens working in budget-supported organizations and for nonworking citizens;
- insurance premiums paid by employers for medical insurance for their workers;
- insurance premiums paid by self-employed citizens.

Employers may voluntarily insure their workers for amounts in excess of the premiums for mandatory medical insurance.

Citizens may additionally insure their health with their own assets.

**Article 35. Medical Insurance Institutions**

Medical insurance is provided by independent insurance institutions possessing the rights of a legal entity and possessing a charter fund. Soviets of people's deputies, employers and citizens may act as founders of medical insurance institutions. The assets of medical insurance institutions are exempt from taxes and from deductions into the state budget, with the exception of income from their economic activity.

**Article 36. Rights and Responsibilities of Medical Insurance Institutions**

Medical insurance institutions have the right:

to sign contracts with insurants and medical institutions irrespective of form of ownership.

Medical insurance institutions are obligated:

- to monitor the volume and quality of therapeutic and preventive care, and receipt of assets from insurants;
- to pay for the services of medical institutions and self-employed medical workers.

**Article 37. Contract Relations and Medical Insurance**

1. In accordance with a medical insurance contract (mandatory or voluntary), the insurer (medical insurance institution) promises, in return for a prearranged payment (insurance premiums), to compensate the insurant (employer, citizen) for outlays associated with health care in the event that an incident (illness, injury) indicated in the contract occurs.

After paying his first premium, the insured citizen receives a medical insurance document (insurance policy) specifically indicating all forms of medical services and health care to be rendered, and determining the responsibility of the parties.

2. The insurer signs a contract with therapeutic and preventive institutions regarding provision of medical services to interested citizens, and promises to compensate for expenditures associated with this.

3. The rules of civil legislation of the Kazakhstan Republic apply to relations established by medical insurance contracts.

**Chapter 8. Public Health Personnel****Article 38. Public Health Personnel**

Public health personnel include medical and pharmaceutical workers as well as scientific, pedagogical, engineering and technical workers in accordance with a list of the Kazakhstan Republic Ministry of Public Health.

Training, use and advanced training of personnel are at the expense of the state, employers and private individuals.

The Kazakhstan Republic Ministry of Health ensures continuity of secondary special and higher medical education and supports the republic's demand for medical personnel, scientists and medical school teachers.

**Article 39. The Right To Engage in Medical and Pharmaceutical Activity**

The right to engage in medical and pharmaceutical activity, including in private practice, is possessed by persons who have received special training and diplomas certifying graduation from the corresponding higher or secondary special educational institution of the Kazakhstan Republic or the USSR, as well as persons who have received diplomas by nostrification.

The right to provide treatment by nontraditional methods, including folk medicine, by persons not possessing a special medical education is granted in accordance with a procedure established by the Kazakhstan Republic Ministry of Health.

Medical and pharmaceutical workers who have not worked in their profession for more than three years are permitted to engage in medical and pharmaceutical activity after an apprenticeship in accordance with procedures established by the Kazakhstan Republic Ministry of Health.

The right to engage in medical and pharmaceutical activity is forfeited by court proceedings.

**Article 40. Professional Rights of Medical and Pharmaceutical Workers**

The honor and merit of medical and pharmaceutical workers and their professional and social rights are protected by law.

Interference in the professional activity of medical and pharmaceutical workers by organs of state government and administration, by other organs and organizations and by

citizens is prohibited, with the exception of cases in which medical and pharmaceutical workers violate their professional responsibilities.

Medical workers have the right to use any form of transportation in cases threatening the life of the patient for travel to the patient's location or for his transportation to the nearest therapeutic and preventive institution.

#### **Article 41. Privileges Granted to Public Health Workers**

Public health workers have the right to acquisition of privatized housing free of charge.

Medical and pharmaceutical workers directly providing medical and medicinal assistance to the population have the right to housing space on priority.

Public health workers whose activity requires them to travel have the right to free travel on public transportation by decision of local soviets. The list of such workers is determined by the Kazakhstan Republic Ministry of Health.

Salaries and rates established for public health workers in rural areas are not less than 25 percent higher than the rates of specialists engaging in this form of activity in urban conditions.

Public health workers in rural areas possessing their own livestock are provided feed and land parcels on which to graze their livestock and from which to cut hay on terms equal to those of workers of agricultural enterprises.

Besides the privileges foreseen by legislation of the Kazakhstan republic, additional privileges may be established for public health workers by local soviets of people's deputies.

#### **Article 42. Professional Responsibilities of Medical and Pharmaceutical Workers**

Medical and pharmaceutical workers carry out their activity on the basis of the principles of medical ethics, which regulate the moral mutual relations of medical workers with patients, with their relatives, and among each other.

Medical and pharmaceutical workers are obligated to improve their professional knowledge by undergoing (cycles of) postgraduate training in networks of educational subdivisions for advanced training and retraining, in accordance with procedures established by legislation.

Medical and pharmaceutical workers are obligated to provide citizens with emergency medical aid and bear liability for failing to render such aid.

Medical and pharmaceutical workers bear liability for damages inflicted upon the health of citizens in correspondence with legislation of the Kazakhstan Republic.

Medical and pharmaceutical workers do not have the right to make public any information they become privy to in execution of professional responsibilities regarding diseases and the intimate and family life of citizens. Public announcement of such information is permitted in exceptional cases involving diseases of a socially dangerous nature, and when requested to do so in writing by investigatory and court organs.

Medical and pharmaceutical workers are obligated to fulfill other professional responsibilities in accordance with procedures established by legislation.

### **Chapter 9. Resort Areas (Climatobalneological Factors)**

#### **Article 43. Climatobalneological Factors of Public Health**

Climatobalneological and other natural resources of public health include territory of the Kazakhstan Republic on which therapeutic mineral springs, therapeutic mud and other resources suitable for medical purposes are found.

Organs of state government implement measures with the participation of public associations to make wide use of climatobalneological and other natural factors for the purposes of safeguarding public health.

### **Section IV. Activity of Public Health Institutions and Organs**

### **Chapter 10. Ensuring the Ecological and Epidemiological Well-Being and Radiation Safety of the Population**

#### **Article 44. Ensuring the Ecological and Epidemiological Well-Being and Radiation Safety of the Population**

Ecological and epidemiological well-being and radiation safety are ensured by means of comprehensive hygienic, epidemic control and antiradiation measures and by a state public health inspection system, regulated by legislation of the Kazakhstan Republic.

#### **Article 45. Implementation of State Public Health Inspection**

State public health inspection is implemented as a necessary guarantee of ecological and epidemiological well-being and radiation safety by the epidemiological service of the Kazakhstan Republic Ministry of Health.

The prescriptions of organs of state public health inspection are binding upon all employers, officials and citizens.

### **Chapter 11. Provision of Medical Aid to the Population**

#### **Article 46. The System of Institutions Providing Medical Aid**

Medical aid is provided to the population by polyclinic outpatient and hospital institutions, medical units, institutions for the protection of maternity and childhood, dispensaries, first aid services, sanatorium and health resort institutions, medical cooperatives and other institutions regardless of forms of ownership, as well as by individuals in private medical practice.

Additional special medical institutions are established for disabled persons and veterans of the Great Patriotic War and for persons equal to them by decision of the republic's government. The republic's ministries and departments have the right to establish a departmental medical network.

The capacity and types of state therapeutic and preventive institutions and the forms of their activity are established by soviets of people's deputies in response to proposals of public health organs and institutions.

**Article 47. The Rights of State Therapeutic and Preventive Institutions**

A therapeutic and preventive institution has the right:

- to develop and approve its own organizational structure and staff, and to independently select the form of management, labor organization and wages;
- to exercise all rights of a legal entity in accordance with legislation of the Kazakhstan Republic.

**Article 48. Obligations of Therapeutic and Preventive Institutions**

Therapeutic and preventive institutions are obligated to ensure:

- accessible, prompt, qualified health care;
- provision of emergency medical aid;
- preparedness for work in emergencies;
- implementation of special preventive medical measures for the prevention, diagnosis and treatment of diseases presenting a danger to surrounding individuals;
- compliance with the rules of public health, hygiene and epidemic control;
- interaction and continuity with other public health institutions;
- propaganda of a healthy way of life, and health and hygiene education for the population;
- interaction with internal affairs organs, military commissariats, social welfare organs, expert medical and labor commissions, and with industrial, educational, trade, agricultural and other institutions, enterprises and organizations.

**Article 49. Special Measures To Prevent Diseases Presenting a Danger to Surrounding Individuals**

Public health organs and institutions and medical workers implement special measures to prevent and reveal, including anonymously, diseases presenting a danger to surrounding individuals (tuberculosis, mental and venereal diseases, leprosy, AIDS and infections requiring quarantine).

The procedures used to implement special measures to prevent the indicated diseases which are a danger to surrounding individuals are established by the Kazakhstan Republic Ministry of Health.

**Article 50. Procedures of Surgery, Blood Transfusion and Employment of Complex Diagnostic Procedures**

Surgical operations, blood transfusions and complex methods of diagnosis are employed with the consent of patients, and as regards patients under 16 years of age and mental patients, with the consent of their parents, guardians and close relatives. Such consent may be rescinded except in cases where physicians have already initiated medical intervention and its cessation or reversal is impossible in connection with a danger to the life and health of the given individual.

In cases where delay in surgery, in blood transfusion and in implementation of a complex diagnostic method threatens

the life of the patient, and it is impossible to obtain the consent of the indicated persons, the decision is made by the physician or a medical commission.

**Article 51. Conduct of Clinical and Biomedical Experiments, Employment of New Methods**

Clinical and biomedical experiments are conducted as a rule on animals, and on a person with his written consent. An experiment is halted at any stage at the demand of the subject, and in cases in which a danger to his health arises. Therapeutic and preventive institutions employ experimentally confirmed methods of prevention, diagnosis and treatment by special permission. The procedure of clinical and biomedical experiments and use of new methods of diagnosis and treatment are determined by the Kazakhstan Republic Ministry of Health.

**Article 52. Determination of the Moment of Death. Conditions for Removal of Life Support**

Death is certified by a physician.

The criteria of death are established by the Kazakhstan Republic Ministry of Health.

Life support may be removed only in cases in which death is certified.

**Article 53. Procedures of Postmortem Examination**

The procedures of postmortem examination are determined by the Kazakhstan Republic Ministry of Health.

**Article 54. Organ Donations**

Organs may be donated by means of a pledge of the donor, and the donation becomes valid following his death. A pledge to donate organs may be annulled by the donor. Relatives may contest a pledge in court.

Information on organ donations is not subject to public announcement.

The corpses of persons who remain unidentified and unclaimed for 45 days are also recognized to be anatomical donations.

**Article 55. Provision of Medical Care to Citizens Engaged in Physical Culture and Sports**

Local soviets of people's deputies organize special dispensaries, offices and a network of sports and health improvement complexes for citizens engaging in physical culture and sports. All citizens who regularly participate in physical culture and sports are obligated to undergo annual medical examinations and regular medical check-ups.

Public health inspection organs monitor the condition of spaces and territories used for physical culture and sports.

**Article 56. Provision of Health Care to Citizens Maintained Under Confinement**

Citizens whose freedom has been legally restricted in the absence of a court sentence, citizens serving out court sentences away from prison and citizens placed in temporary holding cells and special institutions are provided medical care at public cost.

Persons placed in prison isolation cells and serving out prison terms are serviced by the departmental medical service of the Kazakhstan Republic Ministry of Internal Affairs.

**Article 57. Provision of Medical Care to Tuberculosis Patients**

Tuberculosis patients are subject to mandatory dispensary observation and treatment, they are provided antituberculosis drugs and sanatorium and health resort treatment free of charge, and they enjoy privileges foreseen by legislation of the Kazakhstan Republic.

Patients tested positive for tuberculosis mycobacteria are subject to mandatory hospitalization, and they are provided housing in accordance with existing legislation.

**Article 58. Provision of Medical Aid to and Rehabilitation of Persons Suffering Mental Diseases**

The grounds and procedures of providing medical aid to persons suffering mental disorders and of their rehabilitation are regulated by a special law.

Persons suffering mental disorders are guaranteed rights established by legislation of the Kazakhstan Republic.

Soviets of people's deputies and their executive organs monitor compliance with legislation on protection of the mental health of the population and on treatment and rehabilitation of mental patients.

**Article 59. Provision of Medical Aid to Patients With Venereal Disease and AIDS**

Special laboratories, offices, including for anonymous treatment, hospitals and dispensaries are established by local soviets of people's deputies at the request of public health organs and institutions for prompt revelation and treatment of persons suffering venereal diseases and AIDS. Application of compulsory measures is permitted in cases of avoidance of voluntary treatment. Persons who refuse to appear for examination and treatment and who spread venereal disease and AIDS bear liability in accordance with legislation of the Kazakhstan Republic.

The rights of citizens stricken with AIDS are protected by legislation of the Kazakhstan Republic.

**Article 60. Provision of Medical Aid to Patients Suffering Alcoholism, Drug Addiction and Toxic Substance Abuse**

Local soviets of people's deputies provide for a system of measures to prevent and treat alcoholism, drug addiction and toxic substance abuse.

Special offices, hospitals and dispensaries are organized by local soviets at the request of public health organs and institutions in order to treat the indicated categories of patients, including to provide anonymous treatment.

The rights of citizens stricken with alcoholism, drug addiction and toxic substance abuse are protected by legislation of the Kazakhstan Republic, and it provides for rehabilitation and job placement.

**Article 61. Provision of Medical Aid to the Population**

A state policy of providing medical aid to the population is pursued in the Kazakhstan Republic.

Social medical assistance includes a system of measures to establish and develop a network of social medical institutions, to provide housing and personal privileges, and to ensure that employers fulfill medical recommendations with regard to improving the health of workers and organizing a sensible working and eating schedule.

The Kazakhstan Republic Ministry of Health approves standards and organizes publicity for a sensible diet.

Social medical assistance is provided to citizens with impaired health and chronic diseases, citizens possessing risk factors, citizens working in unfavorable conditions, preschool children, students and other socially unprotected strata of the population.

Soviets of people's deputies, state organs, employers, public associations and officials are obligated to implement socio-economic measures making it possible for the population to exercise the right to social medical assistance.

**Section V. Medicinal, Prosthetic and Orthopedic Assistance**

**Article 62. Provision of Medicinal Agents to the Population and Control of Their Production and Use**

The responsibility of providing medicinal assistance to citizens is imposed on state pharmaceutical, epidemiological, therapeutic and preventive institutions, as well as upon persons having the right to engage in private pharmaceutical activity.

Pharmaceutical, epidemiological, therapeutic and preventive institutions have the right to dispense medicinal agents approved for use by the Kazakhstan Republic Ministry of Health.

Control over the quality of manufacture of medicinal agents and removal of obsolete and ineffective drugs from circulation are monitored in accordance with legislation of the Kazakhstan Republic.

**Article 63. Monitoring Production and Use of Medicinal Narcotics**

Only those narcotics that are intended for medical, veterinary and scientific purposes are produced, processed and stored in the republic.

The right to produce, process, import, store, transport and sell narcotics is possessed by organizations permitted to do so by the health and internal affairs ministries of the Kazakhstan Republic.

Narcotics are produced and used in accordance with international treaties.

**Article 64. Prosthetic and Orthopedic Assistance**

Citizens have the right to prosthetic and orthopedic assistance.

Disabled persons have the right to high-quality prosthetic and orthopedic appliances manufactured on the basis of modern technology.

In the event that a disabled person acquires a prosthetic or orthopedic appliance at his own expense, he is paid compensation in accordance with a procedure established by legislation of the Kazakhstan Republic.

Organs of state government and administration allocate the necessary assets, provide for training of specialists and organize production of prosthetic and orthopedic appliances, and establish the necessary conditions for their use.

#### **Section VI. Expert Medical Examination**

##### **Article 65. Expert Certification of Temporary Incapacitation**

Expert certification of temporary incapacitation of citizens is carried out in therapeutic and preventive institutions by a physician or by a medical consultation commission (VKK) in accordance with procedures established by the Kazakhstan Republic Ministry of Health.

The fact of temporary incapacitation is certified by a document—an incapacitation certificate. The incapacitation certificate gives the laborer the right to time off from work and to assistance paid from the social insurance fund.

##### **Article 66. Expert Certification of Permanent or Prolonged Incapacitation**

Expert certification of permanent or prolonged incapacitation of citizens is carried out by medical commissions for determination of disability (VTEK).

The procedure for organizing and conducting expert certification of permanent or prolonged incapacitation is established by the Kazakhstan Republic Ministry of Social Welfare in accordance with legislation.

##### **Article 67. Forensic Psychiatric Expert Examination**

Forensic psychiatric expert examination of citizens is conducted by a commission consisting of physicians specializing in psychiatry.

It may be conducted only by order of an investigatory organ, an examining magistrate or a procurator, and by court order.

Persons suffering mental illnesses may be placed in special psychiatric hospitals for compulsory treatment only by court order.

##### **Article 68. Forensic Medical Expert Examination**

Forensic medical expert examination of citizens, corpses and material evidence pertaining to criminal and civil cases is conducted on the basis of a decision of an investigatory organ, an examining magistrate or procurator, or on the basis of a court order, by an expert of an office of forensic medical expert examination, and in his absence, by any physician, in accordance with established instructions of the Kazakhstan Republic Ministry of Health.

The content and the procedures of ordering and carrying out forensic medical expert examination are determined by the criminal and civil codes of the Kazakhstan Republic.

#### **Section VII. Concluding Provisions**

##### **Chapter 12. Liability for Violation of the Kazakhstan Republic Law "On Public Health"**

###### **Article 69. Liability for Violating This Law**

State legal, disciplinary, material, administrative, civil and criminal liability are established for violation of this Law.

The grounds of such liability and the procedures of its imposition and its consequences are regulated by legislation of the Kazakhstan Republic.

##### **Chapter 13. International Treaties**

###### **Article 70. International Treaties**

If rules other than those contained in this Law are foreseen by international treaties of the Kazakhstan Republic, the rules of the international treaty are applied.

[signed] President of the Kazakhstan Republic N. Nazarbayev  
Alma-Ata, 10 January 1992

#### **(Appendix) Definitions and Terms**

Employers—organs of state government and administration, enterprises, institutions and organizations, irrespective of forms of ownership, providing work.

Epidemiological well-being—a state of the human environment ensuring preservation and reinforcement of public health through a complex of legislative, planning, technical, public health, epidemic control and organizational measures to improve the conditions of work, personal life, nutrition, child-raising, education, rest, and participation of the population in physical culture and sports.

Environment—the human habitat, including its natural aspects (air, water basins, soil), the conditions of work, personal life (housing, recreation sites, transportation resources), education, and child-raising, as well as drinking water, food and industrial consumer goods which have, or under certain circumstances may have, influence (positive or negative) upon human health.

Radiation safety—the complex of planning, technical, public health and organizational measures to protect the individual and environmental features from the harmful effects of ionizing radiation.

Transplantation—transfer and subsequent adaptation of tissues and organs within the same organism or from one organism to another of the same species for the purposes of compensation of a defect, stimulation and restoration.

Embryo implantation—introduction of a human embryo into the mucous membrane of the uterus.

Immunization—establishment of insusceptibility to some disease, attained by introducing killed or weakened agents of the same disease or serum from vaccinated animals into the organism.

Intergenic interval—the time interval between births.

Organ donation—the granting, by any citizen following his death, his body or part of it for medical, scientific research and educational purposes.

State public health inspection—a function of the state epidemiological service, surveillance and control over compliance with public health legislation and other public health norms and regulations by enterprises, institutions and organizations.

Nostrification—a procedure of official recognition of diplomas obtained in other states.

Diversity of public health—different forms of rendering medical aid: state, private, public, military, cooperative and others, including by small joint ventures using foreign capital.

### **Chief Nurse Position Established in Health Ministry**

927C0392A Moscow *MEDITSINSKAYA GAZETA*  
in Russian 3 Apr 92 p 8

[Article by Professor Georgiy Komarov, editor-in-chief of *MEDITSINSKAYA GAZETA*, under the rubric "Our Profession and Society": "Head Nurse"; first paragraph is *MEDITSINSKAYA GAZETA* introduction]

[Text] The Ministry of Health of the Russian Federation has adopted a decision to establish the position of chief nurse of the Ministry of Health and it will accept submitted suggestions for its consideration for one month after publication of this issue of *MEDITSINSKAYA GAZETA*.

Each candidate for such a high position must submit her plan of action described on two to three typewritten pages, her biography, and a recommendation from the council of nurses of a medical treatment and preventive-care institution.

As it was learned at the Russian Ministry of Health, this is not a search for a rank-and-file capable official or a token gesture, but something more.

This newspaper asked Professor A. Vorobyev, health minister, A., Moskvichev, deputy minister, and nurse G. Perfilyeva, dean of the department of higher nursing education of the Moscow Medical Academy, to comment on this piece of news.

**A. Moskvichev: "This refers to a specialist-professional, and not servicing personnel."**

In recent years there has been a decline in the prestige of the nursing profession. The wages are actually below the poverty level.

With the shortage of technical personnel at medical institutions, nurses have become increasingly burdened with unskilled work, for the performance of which their medical knowledge and skills are not required. This has led to a significant drain of nurses from health care institutions to various commercial entities, commerce and consumer service enterprises.

At the same time, the best nurses, who chose their occupation deliberately and are endlessly devoted to their patients,

are staying at the medical institutions and have no intentions to quit. The Russian Ministry of Health considers it a pressing task to solve a set of complicated problems related to the largest contingent of medical personnel.

By introducing the position of chief nurse of the Ministry of Health, it is not a "personnel problem" that we wish to solve, rather, we want to restore the prestige of the nursing profession, improve work and the system of remuneration for its work.

A medical nurse, being first of all a nurse of mercy, can and must perform skilled work, and make use of the medical knowledge acquired through years of training.

Apparently, there will be serious restructuring in the field of education and specialization of nurses and feldshers. This will unquestionably involve the level and breadth of theoretical knowledge, considering the complexity of modern diagnostic, laboratory and therapeutic equipment, the profusion of electronic equipment, microprocessor and computer technology, use of isotopes, and basically new physical methods.

Many tests and manipulations that are considered in our country to be the prerogative of physicians are carried out by nurses all over the world. Of course, this requires special training and a high degree of responsibility, but at the same time, it brings satisfaction and determines the prestige of the occupation. No doubt, wages will also have to be changed.

Evidently, we shall change substantially the standards for proportion of physicians and nurses in all health care services and institutions. The nurses will become the main figures, true specialist-professionals, rather than "service personnel."

The task for the Russian Ministry of Health is to stimulate their initiative, creative research, and active involvement in management, preventive, diagnostic, and therapeutic work, making use for this purpose the best of their own experience and of the experience of other countries.

We believe that establishment of position of chief nurse of the Ministry of Health will enable us not only to find a talented person, a capable organizer of nursing, but also to stir up all nurses; it will enable us to see many unique individuals, highly skilled specialists devoted to their humane cause. I am sure that, after examining the programs submitted to the ministry, one could write about many of them in our professional *MEDITSINSKAYA GAZETA* on the eve of its 100th anniversary.

In Russia, there have always been strong traditions of humanism, of devoted service to one's profession, self-sacrifice among medical workers. It is not only on the fields of numerous battles, but also in "heroic ordinary times" that our nurses—the hardest workers, and feldshers earned the right to a worthy life, fair wages for their difficult work, appropriate solution of social problems, and prestige of the profession.

**G. Perfilyeva: "We are not 'average.'"**

Our country is probably the only one where all medical workers are divided into "junior" "mid-level" [the Russian

word is "average"] and "senior" categories. Over a period of many decades physicians have developed an unwillingness to recognize nurses as equal, independent specialists, and nurses developed the psychology of executors, assistants of physicians. The "second-rate" nature of the profession lowered its prestige and public recognition, thereby causing enormous detriment to health care.

The absence of a scientific and methodological base in nursing, deficient education and narrowing the professional range down to the ancillary-service level actually excluded nurses from direct participation in diagnostic and therapeutic work, limited the use of their potential creativity, and resulted in dissatisfaction with their work. All this was accompanied by a low wage level, which placed nurses among last (not counting students and pensioners) in income.

Heavy and often unskilled work, "vague" duties, untapped medical knowledge, poverty-level wages, absence of prospects for creative growth, and unsettled life—these are the elements that determine the high "drain" from the profession, which has reached 30 percent in recent years.

We often pose the question: Why are health care standards higher in many countries of the world with considerably fewer physicians than in Russia? It is all very simple. In those countries, the nurse is an *active participant, enjoying equal rights, in the therapeutic process, rather than part of the "mid-level personnel."*

Such a situation makes it possible to shorten hospital stays for patients, providing skilled nursing care in the home and specialized medical care by nurses on an ambulatory basis. For the sake of comparison, let us indicate that mean hospitalization per patient in 1990 constituted 16.2 days in the USSR versus five to nine days in the United States.

It is expensive to receive treatment in hospitals and by physicians; this is why departments, nursing treatment and care homes are established, which are considerably cheaper, but well-furnished with modern medical equipment. Studies carried out at Hamilton University revealed that Canada, for example, could save another 300 million dollars per year through more judicious use of highly qualified nurses instead of physicians.

The availability of medical care abroad is not attributable to the number of physicians, but to the specialized and qualified nursing service. The training of such highly qualified nurses costs the government half the amount needed for physicians.

But we cannot understand why our health care ideologists and scientists did not think of this. This applies to economists too. Instead of developing theory, refining the nursing system, and opening departments of higher nursing education at higher education establishments, we continue to churn out ineffective "mid-level" medical workers.

The nursing profession is by no means chosen because of "average" mental capacities. This choice is based on ethical, psychological, social, demographic and other reasons.

Nurses can work well in the management aspects of health care, in science, they can carry out diagnostic tests independently, perform preventive and some therapeutic work, but not as blind executors, rather, as participants enjoying equal rights, within the limits of their competence, level of training, and specialization.

Of course, nursing medical practice requires legislative regulations, definition of the areas and limits of competence. Without this, I am convinced that health care cannot be reformed.

We wish that MEDITSINSKAYA GAZETA would shed broader light on nursing with all its profound problems and by far not fully used reserves.

**Professor A. Vorobyev: "They knew two languages."**

You know, I became a physician through heredity. I am a third-generation physician. After graduating from the institute I went to the Volokolamsk hospital. But it is perhaps for the first time, at this hospital during my internship, that I encountered nurses who enjoyed equal rights in their work with physicians.

I have already had occasion to discuss this, but with reference to the discussion raised by MEDITSINSKAYA GAZETA, I shall repeat an incident that I shall never forget. A seriously ill patient was undergoing surgery for recurrent volvulus. His abdomen was "opened," but it would not "open," everything was enveloped in adhesions. The young [female] surgeon whom I was assisting tried diligently to handle the situation, and then began to cry and ... left the operating room.

Three of us remained near the operating table: surgical nurse Klavdiya Ivanovna, a junior nurse who was instilling ether from a vial on the gauze mask, and I, a student. Klavdiya Ivanovna said simply and decisively: "Andrey, do not be afraid, we'll do everything ourselves." This was my initiation as a physician, and I received the blessings of nurse Klavdiya Ivanovna. Incidentally, the operation was successful and the patient recovered. This happened 40 years ago, but it seems only yesterday.

I worked with Klavdiya Ivanovna and other remarkable, unusual nurses at the Volokolamsk hospital after graduating from the institute.

I was fortunate enough to also meet at that hospital the talented surgeons Nikolay Mikhaylovich Plotnikov and the late Vladimir Ivanovich Varsobin. Under the most difficult conditions they performed virtually all operations, from appendectomies to suturing heart wounds. Still, the nurses played the deciding role.

Later on, at the hospital of MPS [expansion unknown] imeni N. A. Semashko, I met nurses who had started to work under the hospital's founder, Savva Mamontov. They knew one or two foreign languages, some of them had graduated from a private girls school. They were amazing nurses! They were strict, and even stern sometimes, but true professionals; they would stand up when I, nothing but a boy in comparison to them, passed by. That was their etiquette. It

did not degrade them or elevate me, it was a gesture of respect for the calling of a doctor.

These nurses determined my attitude toward nursing work. Many of them are friends of mine to this day, without distinction of ranks and titles.

I believe that the term, "mid-level medical workers," which has unfortunately become so popular, is utterly unsuitable for such nurses, and not needed at all.

There is the physician with his own tasks, and there is the nurse, with hers. It is too bad that the nurse often becomes some sort of "all-around worker": Run there—please wash the floors—they are sometimes treated with unwanted familiarity [use of familiar pronoun]—it is no misfortune, even if [the nurse's] hair has turned to silver.

For some reason, no one asks a neurosurgeon to perform an appendectomy or an infectious disease specialist to treat mental patients. Similarly nurses should be specialized, and know their own special field: neurosurgery, infectious diseases, etc.

Furthermore, I believe that the nurse should also keep the patient's chart. Yet to this day we discuss whether she has the right to puncture a vein. What physician will find a vein better than a nurse?

The nurse should participate in consultations. My entire medical career attests to this. There has always been a nurse with me when I made rounds, and I discussed every patient with her, since she knew things about him that are simply impossible for a physician to learn or that remained unnoticed.

And the wages of nurses should correspond to those of physicians, with raises as knowledge and qualifications are advanced. There are nurses abroad who are department directors. It is not uncommon for a budding physician to be under her supervision, and there is nothing remarkable about the fact that such a nurse earns more than the physician. This is a normal phenomenon. In villages and small towns, where people know one another well, the nurse is a respected person. Yet in many large clinical and research centers, although a nurse performs important work, she cannot ever become either co-author of research work and publications or be a prize recipient. This is unfair....

**The click of the dictating machine reminds us that the tape has come to an end, but the tape of grateful memory will play for a long time for us, the minister and me.**

Almost 30 years ago, thousands of versts from Volokolamsk, in the hospital of the village of Ananyevo in Issyk-Kul Oblast, another nurse stood by the operating table and spoke the same words, late one night, to another intern and handed him a scalpel. The junior nurse instilled ether on the mask....

In parting, I posed to Andrey Ivanovich one more question which, apparently, will not fail to affect each physician: Why is it that in our country the only professional symbol of distinction for nurses is a prize and corresponding Florence Nightingale medal?

Without minimizing in any way the importance of this highest international award for nursing, we cannot forget that under fire in Sevastopol, the candle of Sasha Sevastopolskaya and Yekaterina Bakunina was lit much earlier, and MEDITSINSKAYA GAZETA recently informed its readers about this.

And the idea was conceived for MEDITSINSKAYA GAZETA, together with the Russian Ministry of Health, to announce a competition for the badge of highest professional accomplishment for nurses. This competition does not have to have a specified deadline. Let the prize be modest (and perhaps sponsors would be found!), let the drafts be written in long hand and simple terms, that is not important. What is important is that we are all indebted to nurses, whose hands picked us up in our first second on earth, whose anxious, kind hearts rushed to us at difficult times, whose fragile shoulders carried bleeding casualties from the fire of battle and destroyed buildings, and whose tears accompany our departure into eternity.

#### **Family Planning Service Registers With Russian Justice Ministry**

927C0393A Moscow MEDITSINSKAYA GAZETA  
in Russian 3 Apr 92 p 6

[Material prepared by A. Gadasina: "Human Rights and Safe Sex"]

[Text] The Russian Family Planning Association has registered with the Russian Ministry of Justice. Our correspondent asked its president, I. Grebeshev, to tell about the purposes and tasks for this new social organization:

"First of all, I should like to tell why such an association was founded in Russia. Our demographic situation can be considered catastrophic. The health of women and future generations of the Russian Federation is in great danger.

"There was a dramatic decline of birthrate in Russia in 1991, and for the first time in postwar years the mortality rate exceeded birthrate, as a result of which there was negative population growth. Such a situation developed in particular among the Russian population. There is no need for a long explanation for this: economic instability, lower standard of living, armed conflicts on the territory of the former union, the political situation in the CIS [Commonwealth of Independent States], and the threat of unemployment. At present, a family cannot be certain of a good future for its offspring.

"The fact that women do not want to have children is the chief but not only problem that compels us to sound the alarm. Today, as it was decades ago, abortion is the main method of birth control. Russia is in first place in the world (including CIS states) in number of abortions, about 4 million per year. Every Russian woman undergoes an average of four to five such operations in her lifetime. This method which is barbarian in itself, not only affects the health of women and offspring, but also many are no longer able to bear a child in the future. The number of childless couples is rising.

"The situation is particularly acute with respect to abortions among adolescents—they undergo 45,000 abortions per year, and with each passing year their number is rising, yet these are future mothers.

"Abortions lead to truly dramatic consequences. I am referring to high mother and infant mortality, gynecological morbidity, premature labor, complications of pregnancy and parturition, deterioration of the health of the nation as a whole.

"The situation is aggravated by the menacing rise in sexually transmitted diseases (syphilis, gonorrhea), as well as AIDS, among the population, particularly young people. Every fifth new case of syphilis is recorded for adolescents, while they constitute one-third of new cases of gonorrhea.

"There is yet another important aspect to the problem, dissemination of information about modern contraceptives. Incidentally, how can we even discuss such propaganda when a box of condoms in commercial shops of Moscow costs up to 50 rubles! We are virtually dooming young people, not only to abortions, but venereal diseases, and their number is growing. Nor should one find comfort in the relatively small number, as compared to many countries, of HIV-positive and AIDS cases. Here too, we are in the risk zone.

"In general, healthy sex is love plus modern contraception. The intimate life of many of our women is associated with the constant fear of an unwanted pregnancy. In essence, the population of Russia is deprived of a guaranteed right to safe sex and contraception, whereas modern contraceptives, as well as information on this subject, are available to the general public in the entire civilized world. Young and mature people should know what medicine has to offer in this regard, they should know the good and bad points of different contraceptives. Each couple, each woman must have the right to make an individual choice and opportunity to acquire the agent of her choice without restrictions. And we should like to help them.

"Of course, the word, 'plan,' is associated for many people with something bureaucratic and heartless. But when discussing planned parenthood, it refers first of all to freedom of decision as to number of children, when to have them, to practice birth control in accordance with the specific situation in each family and, consequently, birth only of wanted infants to healthy parents prepared for this event. I have already mentioned the danger of abortions. There is another important point: There is an increased risk of disease and deficiency of the neonate and worsening of the mother's health with the birth of each successive child at intervals of less than two years.

"Work on family planning must be individualized and consider traditions, religious canons, distinctions of a given family, its cultural level. In essence, this means working with what is the most intimate and dear to a person. One should also bear in mind that asocial behavior is often related to sexual problems, and this becomes the reason for many fears and complexes. On the other hand, it is expressly

harmony in this area of human relations that helps overcome difficulties and failures in other areas of life more calmly and appropriately.

Our association, the activity of which is supported by the government, was formed at the initiative of the Coordinating Committee for Family Affairs, Mother and Infant Protection under the Russian president. It will function in close collaboration with the International Family Planning Federation.

We plan to open branches of the association in different areas, with regional family planning centers. The qualified advice of specialists can be obtained at these institutions. The queries can also be anonymous, which is often very important to young people and adolescents. Another task of ours is to train obstetrician-gynecologists, as well as internists, pediatricians and general practitioners.

"We are very hopeful that television, radio and the press will help in our work. The mass media can constantly provide professionally literate information on these subjects, form public opinion and the proper attitude toward the problem. It is important for accessible literature to be published, if only in the form of inexpensive pamphlets mailed to specific readers—adolescents, young and middle-aged people, and others. After all, each age has its own problems. Incidentally, our plans also include publishing.

"But imagine that you have read a relevant booklet and a question arises concerning intimate problems. There must be a place where you can go and talk about everything calmly and openly and get answers to your questions; while women can go to specialists in women's consultation offices with their problems, young men and men in general are without such help. This is when the branches we opened will be of assistance.

"I believe that the committees for family affairs, protection of mothers and infants organized in the 50 territories of Russia could also cooperate in this work. Of course, we shall not replace the state structure, our task is to have all concerned sides join forces to solve this problem.

"I should like to mention that freedom of reproductive behavior should be viewed as one of the aspects of personal freedom. This is expressly how the problem is interpreted in the entire civilized world.

"The Russian Family Planning Association hopes to find understanding and support on the part of Russian citizens, each of whom may become an individual member of the association, while all organizations and enterprises could become collective members."

For information about the activities of the association one can write 101497 Moscow, Vadkovskiy Lane 18/20, phone: 289-23-23.

### Epidemiology Service Enforcement Problems

927C0393B Moscow MEDITSINSKAYA GAZETA  
in Russian 3 Apr 92 p 3

[Article by A. Prokin, MEDITSINSKAYA GAZETA correspondent, dateline Voronezh: "The Mafia Against the Sanitary Service"; first paragraph is MEDITSINSKAYA GAZETA introduction]

[Text] An extraordinary thing happened in the apartment of health inspector ["sanitary physician" is title used in Russia], N. Vorobyeva, on Sunday evening. A strong blow ripped out the lock, and the door opened. There was a strong, slightly inebriated, young man in the doorway. He looked silently at the people in the apartment, turned around and left. There are some who would have interpreted this deed by a drunk as hooliganism, but Nataliya Ivanovna was convinced that this was the market mafia showing its teeth.

She was led to such a conclusion by the events of recent weeks. The sanitary service of the city began to carry out raids to check adherence to rules of trade in the markets and streets on Saturdays and Sundays. N. Vorobyeva was also a participant. Many infractions were discovered: sale of goods of poor quality, without certificates, and sometimes under unsanitary conditions. The directors of the markets were fined a sum equaling three months of income; some inspectors were fined a sum equal to a month's income; and a 50-ruble fine was imposed on hundreds of various cooperatives, firms, and private merchants. Their reaction was often to offer bribes, issue threats, and mouth obscenities.

There are chiefly women in the sanitary service, and although two militia men were assigned to the raid brigade, physicians and their assistants were quite uncomfortable, especially since the uncivilized marketing conditions, the enjoyment of profits by means of various infractions, and the virtual absence of punishment reinforce the idea that anything goes. This is what the inspectors tell us. L. Zemlyanaya, assistant to the health inspector states: "The minute you start to check the shashlik [shish kebab] vendors, you are surrounded by about ten people who are half-drunk, obvious criminals, who begin the threaten you. You wonder whether you can escape from this circle or not."

The chief of the toxicological laboratory of the oblast center of State Sanitary and Epidemiological Surveillance, N. Kopeykin tells us: "They bring us carloads of wine and brandy from the south for testing. Sometimes there is an overt ultimatum to the staff: A certificate is needed rapidly, we'll pay anything you wish. If not, when we meet in the evening, we'll have a talk...."

"More diplomatic" relations are also formed. The chief physician of the rayon center, L. Khoronyuk says: "We discovered adulterated brandy in one of the firm stores. Its director was not incensed and immediately removed the merchandise from sale, but the following day, he sadly reported that a misfortune occurred. He was robbed, and it was expressly alcoholic beverages that were stolen. It is obvious that the brandy will be sold elsewhere. Try to find it, and prove it...."

It is during the raids that the sanitary workers encounter all sorts of things, and they become increasingly convinced that the problem will not be solved by such methods. Wise people say that imposing fines on, for example, a director or inspector, does not phase them at all. They like this disorder since one can gain much more than a month's salary under such conditions, as if in cloudy water. Also, considering the present devaluation of currency, what does a fine of 50 rubles mean to a private merchant or cooperator?

For many, there is only one solution. We need strict vertical responsibility, not only administrative, but also economic. If those responsible are to be fined, the fine should be for a very large sum; for a private individual the fine should be so perceptible that it would be economically disadvantageous to disrupt law and order.

For the time being, however, since there is no clear-cut mechanism to implement the law dealing with sanitary and epidemiological welfare of the public, while the real economic responsibility is shrinking more and more, arbitrary rule and chaos will flourish. Yet, they are associated with diseases. There already have been recorded cases of botulism, salmonellosis, etc., etc. And when the health inspectors bring at least some order to trade they face threats. The incident with the forced door proliferates with various rumors at work and only aggravates the fear. I was told quite seriously that the paneling was cut, then the door was broken at the apartment of N. Vorobyeva, and a note with a direct threat was left for her.

All this is conjecture. But, on the other hand, if the described episode was not a chance occurrence and the market mafia did indeed show its teeth, inspectors are absolutely unprotected. The scare could be more serious. In such a case will the sanitary service be able to perform its duties? I wish to stress once more that it employs mainly women, but men are not in an easier position in such a situation.

### Shortages at Tbilisi Children's Hospital

927C0394A Moscow MEDITSINSKAYA GAZETA  
in Russian 3 Apr 92 p 4

[Article by M. Melkonyan, MEDITSINSKAYA GAZETA correspondent: "Give the Children a Chance". First paragraph is MEDITSINSKAYA GAZETA introduction.]

[Text] In the beginning the hospital operation was completely smooth. The 720 bed Tbilisi Children's Hospital, built several years ago, smoothly entered pediatric service in Soviet Georgia. The well-equipped surgical ward, which took on the most complicated operations in Georgia, even corrected congenital defects in newborns. And the premature infant nursery center was also the best in Georgia.

That is the way it was. Today the hospital is more like a blockade hospital. In March the beds were half empty. Less than one-third of the 240 surgical beds were filled, and only with emergency patients. Planned patients have enough anesthesia and sutures. But when children with fractures are admitted, parents are plainly told to get the plaster of Paris, and they are given the address of the cooperatives. The price of the plaster is too high for the therapeutic establishment.

The hospital remained virtually unheated all winter. Children with acute appendicitis were dressed for operation in warm sweaters and sweat pants. Of course, this is contrary to regulations. But what do you do when the temperature in the operating room does not rise above 11 degrees? And then in the very middle of the operation the electricity goes out. This winter has already gotten surgeons in the habit of working with kerosene lamps and candles.

And then there is the tiny person born early and whose life is supported by an incubator. Candles and kerosene lamps will not help him. And when the electricity suddenly is cut off, the little one is instantly without heat and oxygen. Neonatologist N. Mamalatiya, apparently sensing the question I was about to ask, hurried to inform me that the hospital finally has its own diesel generator, and at least the resuscitation isolation rooms have stopped overheating due to the constant gaps in the municipal energy supply.

But the capacity of the local electric motor is limited (the hospital wits have christened it Gela Hydroelectric Station, in honor of the chief physician Gela Sakvarelidze, somewhat prematurely, before they were able to start it). And even when the centralized electricity supply is functioning in the wards and the heating instruments are operating at full capacity, the temperature is 10 degrees below the established norm. Each child is wrapped in four or five blankets. But all the attempts of the physicians to protect the children from pneumonia and respiratory infections are not successful. They also watch for intestinal infections. After all, when there is no electricity you cannot even sterilize the probes, and there are so few of them that it has been forgotten that they were designed for disposable use. In addition, if you also add the chronic shortage of hemodez, disinfectants...

One of the physicians reproached me: "You lay it on thick in order to describe the impoverished situation of the Tskhinvali hospitals. But what do we have that is better?!" True. Today the Tbilisi hospitals are on almost the same level as the Tskhinvali hospitals. Because the war also passed through Tbilisi. Because after the fratricidal tornado, our life, which was poorly organized even before the war, is now 100 times more complicated; it affects the helpless children the most. Who said that children are the privileged class? They are the class that suffers the most! Rephrasing a well-known saying, we could say that when adults fight, without any doubt the children lose.

...Chief physician Yu. Eliashvili arrived from Tkibuli and said that nursing children with pronounced hypotrophy had begun to be admitted to the local hospital—due to malnutrition. They petrify your heart. The head administrator D. Dzhodzhuia acknowledges that even at night he wakes up wondering how to feed the smallest ones.

How do we help them? Appealing to the Ministry of Health (now the Ministry of Health and Welfare) is useless. It is helpless. It is not even in a position to supply hospitals with drugs, and it pays no attention to all of the pleas to not disconnect at least the children's hospitals from the energy system.

And the managements of therapeutic and prophylactic care for children and mothers are now concerned with obtaining food for the children rather than organization of pediatric service.

In February and March 18 tons of infant formula were sent to Georgia as humanitarian aid. Specialists well-known throughout the entire republic racked their brains in determining how to divide the formula among the 55,000 artificially fed tiny children. Who would get it, and who would be deprived? The humanitarian aid was divided among children from the most impoverished families.

No matter how hard it is today in Georgia, it is more uncomfortable to stand with an outstretched hand waiting for new aid from foreigners. Saving our childhood is the sacred duty of the government itself—in any way possible. Allow me to be blunt: If no expense was spared for the fratricidal war and the money was found for rebuilding the destroyed Tbilisi, then we can find the money for children's nutrition, drugs, and heat, since the preservation of a viable generation and the future of Georgia depends on it.

Earlier it was certain that such an article in the press would elicit an instant reflex reaction. Now this is not so. But we cannot especially wait for the disaster to affect the children, the most suffering and unprotected class.

### New Hospital in Novosibirsk

927C0394B Moscow *MEDITSINSKAYA GAZETA*  
in Russian 3 Apr 92 p 4

[Unattributed article: "Good News"]

[Text] A new district hospital with 25 beds was opened in the village of Berezovo, Maslyaninskiy Rayon, Novosibirsk Oblast, to replace the old, semi-dilapidated one. It has a physiotherapy department with Soviet equipment and a laboratory. A local collective farm spent two million rubles on the new hospital. Its chief physician, N. Parfenov, provided a great deal of effort in the construction. In the great Russian tradition the hospital was christened by Father Viktor from the Maslyanin St. Nikol's Church.

The residents of Berezovo can be proud: Their hospital is one of the best in the rayon. The residents of many surrounding villages will be treated here.

### Manufacture of Medical Service Helicopters "Unprofitable"

927C0397A Moscow *MEDITSINSKAYA GAZETA*  
in Russian 3 Apr 92 p 4

[Article by A. Sabirov: "Why the Helicopter Cannot Take Off". First paragraph is *MEDITSINSKAYA GAZETA* introduction.]

[Text] Such was the title of an article we published two years ago (02 February 1990) about a helicopter equipped for surgery, an experimental model that became a sensation at the international aviation showroom in Bourges.

This machine was developed at the Kazan Helicopter Association above the plan, using pure enthusiasm. With the design bureau imeni Mili they calculated how to arrange

nonprofile equipment aboard the serial Mi-17, and they found a partner, the Hungarian firm Medikor, to equip the showroom with imported medical equipment in order to use the helicopter not merely as an "ambulance" for transporting physicians and wounded, but as the most modern operating room.

Finally there was hope for saving those in need of the urgent care of a surgeon directly at the site of the accident or disaster. But the merits of the machine for some reason could not be discerned at the former USSR Ministry of Health. When they did look into the matter, they wanted to outfit the flying operating room with Soviet rather than imported equipment. It took several months to convince the Ministry of Health that we simply did not have the necessary equipment. In the meantime, Medikor changed their minds about selling us the equipment for rubles. Hard currency was necessary for the mass production of the helicopter.

The Kazan people nevertheless found an alternative that made it possible to produce a batch of six machines. The equipment was obtained in exchange for an extra helicopter with the assistance of the Intertraverse firm. They got the permission for this in the USSR Cabinet of Ministers.

As the Union structures slowly died, the helicopter association produced the first batch of six machines. They had just completed the sixth before the very end of the USSR. All the helicopters were sent to the addresses determined at the last moment by the USSR Ministry of Health: to Bishkek, Dushanbe, Burunday, Adal, Khabarovsk, and Krasnoyarsk.

Now the flying operating rooms save lives in six regions. Emergency rescue services in the remaining regions continue to dream about helicopters with the red cross on the fuselage.

No one knows whether there will be a seventh machine. In any case, the governments of the Commonwealth, judging by everything, are not yet up to it. Presidential machines are used only by request. The file of requests for them is filled a year in advance. They are building their own army, and here helicopters are apparently needed, but without the red cross on the side.

"Today we have orders for medical helicopters, if we could only fill them," says V. Morozovskiy, director of the export department at the Kazan Helicopter Association. No one will give us the hard currency to buy the medical equipment, and the association does not have the resources for philanthropy, each time giving away an "extra" helicopter.

Understandably, an extra machine today could be sold for dollars or used for an advantageous barter. Hard currency needs to be invested in the production of a completed medical helicopter, but the CIS [Commonwealth of Independent States] pays only with inconvertible currency. Where is the sense?

But you cannot give up hope on an obviously profitable and vitally important matter.

One of the possible alternatives for saving the idea is the creation of a joint venture with western partners. We in this case will provide the helicopter and technology, and the partners will provide the equipment or the hard currency to obtain it; we will begin together the mass production of the machines. This alternative is currently being reviewed and negotiations are in progress. But if the joint venture is created, production most likely will move to the West. After all, selling the machines for rubles is not profitable. Finally, the foreign demand has not yet been researched, and we do not want to sell them for half-price.

The helicopters with the red cross are most needed by us. This is the opinion of not only their developers, but also the medics. Where else do you find such distances and lack of roads, such poorly accessible places? We also have the "hot spots" where people are shot and die every day. Disasters happen at least as often here as in other corners of the planet. If we do not master the mass production of our machines, we will later be buying something similar from abroad at greater cost.

In their time our aviation and helicopter engineers were allocated enormous resources for new military technology. Today, if we are serious about conversion and are seriously worried about human lives, we need to find the resources for the mass production of the flying operating rooms. Russia or the Commonwealth will be making government orders for their production. Even now, when we do not have the resources to solve our food problems, we cannot cut back on medicine.

**Change in Accessibility of  $^{137}\text{Cs}$  for Root Assimilation by Plants in the Chernobyl Accident Zone**

927C0379B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 6, Oct 91 [manuscript submitted 26 Aug 91] pp 1498-1500

[Article by S. K. Firsakova, N. V. Grebenshchikova, S. F. Timofeyev, A. A. Novik, and Lenin Academy of Agricultural Sciences Academician R. M. Aleksakhin, Belorussian Branch, All-Union Scientific Research Institute of Agricultural Radiology, Gomel; All-Union Scientific Research Institute of Agricultural Radiology, Obninsk; UDC 631.41:546.36]

[Abstract] To determine how soon land can be farmed after the Chernobyl accident, one must be aware of the

possible variation in time of the rate of incorporation of radiation from the soil by plants. Permanent stations were set up in natural meadows in Gomel Oblast on soddy-podzolic/sandy soils and sandy loams to assess the role of biogeochemical processes that could change the accessibility of  $^{137}\text{Cs}$  for plants. The concentration of  $^{137}\text{Cs}$  in meadow-pasture plants dropped as much as 100-fold between 1987 and 1990 as a result of radionuclide's leaching to deeper layers of soil and the binding by the solid phase of the soil. Land reclamation techniques also reduced the concentration of the radionuclide, by 2- to 8.5-fold. In both cases—reclaimed land and unreclaimed land—the drop in radionuclide concentration was most dramatic right after the accident, but slowed as time passed. References 5: Russian.

### Automated Workstation for AIDS Detection

927C0360A Moscow LENINSKOYE ZNAMYA  
in Russian 11 Jan 92 p 1

[Article by A. Longinov, under the rubric "Current Topics":  
"Heading' Against AIDS"]

[Text] It happened that the "Heading" Association founded in the summer of 1991, which united under its umbrella the producers of consumer goods and services in the broadest sense, began on the very first days of its inception to strike a rather vigorous attack against this terrible ailment of the 20th century.

In our opinion, development and establishment of the first LABRAM [automated laboratory workstation] can be considered a genuine result; all new collaboration concepts are concentrated there, it takes into consideration medical and radio engineering innovations, ethical and social aspects of this disease in our country and abroad. But what does the acronym LABRAM mean? We shall ask Vyacheslav Luzin, candidate of economic sciences, general director of the "Heading" Association of Producers of Consumer Goods and Services, to answer this question.

"The decoding is simple here," states Vyacheslav Petrovich, "it stands for automated laboratory workstation—LABRAM [laboratornoye avtomatizirovannoye rabocheye mesto]. But the entire purpose lies in the fact that it refers to an entire computer technology for detecting the sick and HIV-infected cases, which can be duplicated in the required quantity. All of the necessary data are collected on diskettes and can be used in the clinical practice of medical services. According to the official data, as of 15 December 1991, 52 people died of AIDS in our country, and 672 virus carriers were recorded, 65 of whom contracted the disease.... True, I must say that I do not have complete confidence in information ensuing for decades from the same administrative offices that are as large as railroad stations. It is known that AIDS has already reached Altay. A 32-year-old woman, mother of two children, spent a whole month in the hospital before the terrible virus could be discovered. She was diagnosed as having AIDS by Moscow physicians after they received material for tests. At the present time, many wish to be tested for AIDS, but this is not easy to do: There are no facilities, needed equipment, or special programs.... This is why our center has prepared concrete proposals to solve this complex problem...."

[Longinov] Vyacheslav Petrovich, as far as I know, a description and development of the first LABRAM was effected to a considerable degree by a serious firm in Odessa, "Apros," which is headed by Aleksandr Kovalev, an experienced manager and physicist; but this firm, which is part of the "Heading" Association, undertakes only complicated, substantial, and labor-consuming developments.... Do you not feel that the LABRAM system could become too expensive and unaffordable for physicians?

[Luzin] In developing such a thoroughly thought-out force against AIDS, "Apros" was thinking more of serious, immediate and effective assistance to medical specialists facing this plague of our times, than it was of the business aspect. There can be no question of cost here, I am sure of it.

Customers will be able to determine immediately.... The Tver Nuclear Power Plant and a few other organizations can voice their opinion on this score....

[Longinov] Can one obtain more specific information about this development of the Heading Association?

[Luzin] Of course, people are ready to answer your questions in Moscow and Odessa; the phone numbers are: 284-77-27 and 281-63-92 (in Moscow), 22-08-76 and 22-40-19 (in Odessa).

### New Russian Pharmaceutical Organizations

927C0360B Moscow TRUD in Russian 21 Mar 92 p 2

[Interview by T. Bystrova under the rubric "Timely Interview": "Influenza and Cough No Longer Feared?"; first two paragraphs are TRUD introduction]

[Text] The subject is drug products...From time to time we are reminded of it by our readers who seek assistance from the editorial board. Impressed by one of these letters, we addressed Soyuzfarmatsiya [Union Pharmaceutical Association], an institution that furnishes drugs to us. There was a new sign on the doors, which meant....

A. D. Apazov, general director of the Russian Farmimeks [Pharmaceutical Export] Association agreed to explain the situation.

"At the present time," he said, "two structures have been created in Russia: Farmimeks will deal with supplying imported products and Rosfarmatsiya [Russian Pharmaceutical Association], domestic ones."

[Bystrova] How does this benefit the consumer? As I understand it, these two tasks are closely interrelated. Do you plan to perform them by constantly consulting one another about different information, and coordinating each step? Will not too much time be spent on this?

[Apazov] It is always difficult to make a forecast, but we must start working in a new way, and without delay. The Russian Ministry of Health is optimistic, relying on the healthy competition between the two associations and, accordingly, expecting positive results.

[Bystrova] We need not fear either influenza or coughs? May God grant it. Although, I must confess, it is not easy to imagine a competition between two government entities that have retained for the time being a government monopoly on the distribution of drugs that are chronically in short supply.

[Apazov] Let us clarify which drugs are scarce. Mainly the simplest products are scarce, whereas we try to provide, no matter what, those of vital importance, i.e., products without which a patient will simply die. The effort this requires is another matter. After all, business ties have been disrupted, delivery of raw materials are interrupted, some chemical and pharmaceutical plants are down, and I shall not discuss contractual discipline.... Furthermore, we owe 300 million dollars to foreign firms for drugs already delivered. You can understand their attitude toward creditors, when they do not fulfill their obligations.

[Bystrova] Does this mean that we shall no longer be seeing imported products?

[Apazov] No, you cannot say that. In the first place, the debt is being paid off, be it slowly. In the second place, the foreign firms are also dependent on our orders; the contract called for them to produce drugs in packaging inscribed in Russian. No other country will buy them, and their shelf life is limited. For this reason, our foreign colleagues are compelled to sell on credit.

[Bystrova] The government promised that the cost of drugs will increase by four times. How then can you explain the fact that the cost of some drugs is much higher than that?

[Apazov] The difference is attributable to taxes on the increased cost at all stages of production and sale.

Such a taxation policy is utterly incomprehensible. If there are no tax breaks for enterprises producing drugs and pharmacies, as well as price control for raw materials and supplies needed to produce drugs, the drug crisis will worsen.

As for the prices of imported products, it is planned to set an exchange rate of 12 rubles per dollar for centralized procurement. True, the representative of domestic commercial pharmaceutical firms oppose this, in the belief that this would be a hard blow to their enterprises; they are afraid that imported pills may turn out to be cheaper than theirs, and they insist on applying the official exchange rate of more than 100 rubles per dollar. But even now, for example, one kilogram of Aponti-80 (powder for children suffering from phenylketonuria) costs 1.041 rubles 60 kopeks [as published]. It is not difficult to calculate that at market rates

we would have to hand over 20,000 rubles for the same kilogram. Is this conceivable?

[Bystrova] The vitamin shortage is particularly perceptible in the spring. And with the present poor diet, I imagine that every other person suffers from hypovitaminosis. Unfortunately, vitamins are not often available at pharmacies. Why?

[Apazov] We did not place orders for imported vitamins, there were more serious things to think about. Moreover, our enterprises assure us that they can cope with vitamin product by themselves. As far as I know, the Belgorod Vitamin Plant is loaded with products, but no one is taking them because of the high wholesale prices.

[Bystrova] Finally, please tell us what one can do when given a prescription for a drug that is not available at a pharmacy.

[Apazov] First go to the physician; ask him whether the drug could be replaced with another. If not, turn to the pharmacy manager. He should do all he can to furnish the medicine to a patient. Otherwise, go to a higher pharmaceutical organization. You know, they say that where there is a will there are a thousand ways, and where there is none there are a thousand obstacles. Believe me, very much depends on the pharmacy worker.

[Bystrova] Aleksandr Dmitriyevich, I shall take you at your word. Let us do a good deed. Here is the letter of Aleksandr and Olga Popov from Shadrinsk, who live in the Vostok boarding house for the disabled. They have an acute need for cerebrolysin and lidase. But you know full well what our attitude is toward people, particularly when they cannot fend for themselves. Shall we help them?

[Apazov] We shall try. Let me keep the letter.

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