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BIOTECHNOLOGICAL ADVANCES, ADVANTAGES IN AGRICULTURE DESCRIBED

Riga SOVETSKAYA LATVIYA in Russian 19 Feb 83 p 2

/Article by M. Beker, academician of the Latvian SSR Academy of Sciences and deputy director of the Institute of Microbiology imeni Avgust Kirkhenshteyn: "Biotechnology and the Agroindustrial Complex"/

/Text/ An independent branch of the national economy -- the microbiological industry -- has been developing in a successful manner in our country for approximately 15 years. Extensive use is being made in agriculture of nutrient yeasts, vitamins, bacterial fertilizers, plant growth stimulants, biological agents for combating plant pests and other preparations produced by this industry.

However the microbiological products are still being produced in insufficient quantities. Our republic, which has developed animal husbandry operations, is experiencing an acute deficit of protein, especially in the rations for hogs and poultry. According to data supplied by the Ministry of Procurements for the Latvian SSR, 15 years ago the mixed feed contained on the average 19 percent conventional protein and at the end of the 10th Five-Year Plan -- only 15 percent. A reduction in the protein content in the rations leads to a reduction in the productivity of the animals and to overexpenditures of feed per unit of product.

The protein deficit can be offset through the cultivation of definite agricultural crops, through more complete utilization of the waste products of the food industry, through the output of the microbiological industry and by protein concentrates obtained from local raw materials.

The productivity of livestock is adversely affected by a low content of essential amino acids in the rations, particularly lysine. The republic's animal husbandry requirements for lysine amount to approximately 4,000-5,000 tons annually. The Livany Experimental Biochemical Plant is presently supplying the republic with approximately 1,200 tons of lysine. The methods developed by our institute and this enterprise for improving the technological process have made it possible to increase the effectiveness of lysine biosynthesis by twofold compared to the planned figure and this has doubled the output of products. However, in order to satisfy completely the requirements for lysine it will be necessary to either modernize the plant or establish appropriate departments at the sugar plants.

Bacterial fertilizers, plant growth stimulants and biological agents for protecting plants are of great importance to agriculture. Ideally, use should be made of the experience accumulated by our Estonian colleagues. There, at dairy plants, units are in operation which produce the leaven of lactic acid bacteria. And at one of the dairy enterprises, successful work is being performed by a department engaged in the production of nutrient yeasts from whey, using a technology proposed by Belorussian microbiologists. More close collaboration among the scientists and the introduction of leading experience can accelerate considerably the solving of many vital problems. Here greater interest must be displayed by the scientific workers and practical workers -- by everyone engaged in introducing new innovations into production operations.

Today biotechnology is based not only upon the use of microorganisms but also upon the enzymes secreted by them. Here a fine example is the use of certain enzymes in the food industry; this made it possible to save a considerable quantity of grain, since the enzyme preparations replaced the barley malt. Enzymes are being used more and more in the production of juices, for increasing the yields of products, in the canning industry, in bread baking and so forth. A considerable reduction can take place in the expenditures of agricultural raw materials for the production of alcohol, since modern biotechnology requires more improved methods for converting carbohydrates into alcohol.

At the Institute of Microbiology, jointly with the Biological Faculty of the Latvian State University, rather successful work has commenced in connection with the use of bacteria for alcohol fermentation, which is of great importance for brewing, for wine-making and especially for the production of baker's yeasts. These developments may prove useful for the modernization of existing production efforts, for improving the quality of products and increasing their yields.

Under the conditions prevailing at agroindustrial associations, it is easier to achieve complete and efficient utilization of the waste products of the processing industry. Also obvious is the fact that it is extremely advisable to analyze the specific nature of each RAPO /rayon agroindustrial association/ in the republic, for the purpose of outlining optimum means for employing a biotechnology in the processing of agricultural raw materials. Great opportunities are available in this regard. The microbe technology can be employed successfully in the preservation of crops, in converting plant raw materials into more valuable products and for utilizing the waste products of production.

At the Institute of Microbiology and at the Latvian Scientific Research Institute of Animal Husbandry and Veterinary Science, data have been accumulated on the leavening of fodder residues during its mechanical fractionation. Participants in the program entitled "Transformation of the Products of Photosynthesis," following 5 years of testing in scientific laboratories and thereafter tests carried out under production conditions at the Uzvara Kolkhoz in Bauskiy Rayon, drew the conclusion that fodder grass processed using the suggested technology could serve as a source for high protein feeds for the Baltic region. The fermentive juice thus obtained could be used for feeding to hogs or young bulls and the sediment -- a protein coagulant suitable for extended storage. Leavened, preserved or dried out feed can be obtained from the pulp residue.

Such biological conversion of plant raw materials is very profitable. It makes it possible to raise the protein content in forage meal, bran, straw and other agricultural raw materials and also in the waste products of the processing industry.

Straw constitutes a colossal reserve for obtaining valuable substances and products. Thermochemical treatment improves its digestibility by animals and also raises its nutritional value. Further biological preservation of the treated straw in trenches together with fodder and feed additives is also effective. Generally speaking, straw is equivalent to grain in terms of its energy value and the task of the scientists is to find optimum methods for releasing this energy for feeding to the animals. We have strains of micro-organisms at our institute which are capable, following 3-5 days of fermentation, of enriching pre-treated straw with protein. However, as yet no special equipment is available for accomplishing this and this is delaying to a considerable degree the introduction of this method into operations.

Up until now, a serious problem in animal husbandry has been that of making proper use of farmyard manure which accumulates on the hog farms. At the present time, workers at the Institute of Microbiology are studying a mechanism for the fermentation of liquid farmyard manure. Work has commenced on the planning for a bioenergetic unit at the Ogre Sovkhoz. Such a unit must process waste products into organic fertilizers and biogas, which contains 60 percent methane and 35 percent carbonic acid. This gas can be used for the heating of hothouses. The carbon dioxide included in its structure is a fine feed preservative.

The advantages of biotechnology in agricultural production are manifested at those times when the economic tasks are solved for the entire agroindustrial complex as a whole rather than for just purely local interests. Thus the republic's Ministry of Agriculture must realistically take into account the role played by biotechnology and its potential for the processing of primary products, such that the final result will be more high quality food products with minimal expenditures of labor, energy and material resources.

7026
CSO: 1824/351

ENRICHING ANIMAL FODDER

Various Methods for Obtaining Feed Protein Discussed

Tallinn SOVETSKAYA ESTONIYA in Russian 25 Feb 83 p 2

/Article by A. Kestner, doctor of technical sciences and department head at Tallinn Polytechnical Institute: "Fodder Protein Factories"/

/Text/ The food program calls for a substantial increase in the production of meat and milk. Their principal value -- a high content of food protein considered to be irreplaceable for man. However the protein found in the organisms of agricultural animals, with only a few exceptions, is not created but only improved. In such instances, the animals work as "units" which cleanse the feed protein obtained of ballast and convert it into a form which is digestible and considered customary for our organism.

Just as in any chemical-technological process, the law of substance conservation performs here in a ruthless manner. That is, in order to obtain the required amount of products we must ensure that animal husbandry is supplied with an equivalent amount of feed proteing and even more so as to cover the inevitable natural expenditures. And these expenditures are rather considerable, such that the protein yield in milk and eggs is on the average 10-30 percent and only in milk -- up to 40 percent. It is almost impossible to raise this yield and yet it is very easy to lower it -- through inefficient management.

Hence it is completely clear that an increase in the production of feed protein is absolutely necessary as the material foundation for increasing the production of animal husbandry products.

The deficit in feed protein or protein proper is a reality for our entire country and for our republic in particular.

Since olden days, the feed protein required for animal husbandry has accumulated out on the fields and meadows. However, computations indicate that in our republic, for example, these lands, even assuming the introduction of leading agrotechnical methods, are incapable of supplying animal husbandry with all of the feed protein required for carrying out the food program. In addition, the protein obtained with plant feed by no means always conforms, in terms of its chemical properties, to the physiological requirements of the

animals. The number of essential amino acids in plant feed is low and the amount of indigestible ballast (cellulose) -- high. For example, hog farming requires more concentrated feeds. Feed animal protein can be obtained -- it is furnished by skimmed milk, whey and fish meal. However, these resources are limited. In addition, it is economically more advisable to use all milk for the benefit of man and not to use it in animal husbandry.

The question concerning feed protein on the whole and also its components which are in short supply (essential amino acids, lysine and others) can be solved completely only through the introduction of modern biotechnological methods for producing protein with the aid of single-cell organisms. Many microorganisms, bacteria and microscopic funguses are capable of developing in nutrient mediums consisting of cheap and accessible materials. In multiplying, they form a so-called biomass that is rich in proteins and vitamins, which can be employed successfully as an additive in the feed for agricultural animals.

The Soviet Union plays a leading role throughout the world in the production of microbe protein. Nor does this derive solely from the fact that, given our climatic conditions, it is impossible to grow adequate quantities of soybeans -- the most productive and valuable source of feed protein. The intense development of our microbiological industry should be viewed as the result of carefully thought out planning for scientific-technical progress.

At the present time, Estonia continues to be the country's only republic in which the microbiological industry is not developed. Today, with the use of biotechnologies in various branches gaining in popularity throughout the world, we must not postpone but rather we must define the future trends for biotechnological production operations in our republic.

Many variants for the production of microbe feed protein have been developed, tested and introduced into operations. Here we would like to examine some of them as they apply to our conditions.

The simplest method is that of producing feed protein from sugar raw materials. For example, from the waste product of the sugar industry -- molasses. The production of nutrient yeasts from molasses is a simpler operation than other technological systems and it has been introduced successfully into operational practice. But we do not have a sugar industry in our republic and hence we lack local sources of molasses. If the republic was to be supplied with adequate quantities of this raw material, then the production of nutrient yeasts could become a reality in the near future. True, molasses is itself an excellent feed for dairy cattle and thus a judgement regarding the advisability of converting it into nutrient yeasts can be made only following thorough analysis of the problem by agricultural specialists.

The production of nutrient yeasts based upon sugars has already been underway for some time at the Pulp and Paper Combine imeni V. Kingisepp in Tallinn. However the production volume for cellulose (the waste products of which are used for producing the yeasts) in our republic is low and thus an expansion of this production effort does not appear to be too promising.

The conversion of whey -- a waste product of the dairy industry -- into a feed protein concentrate is quite feasible. However, there are other more

promising methods for utilizing whey -- in the food industry. Thus, even on this basis it is impossible to solve completely the feed protein problem.

There is however another accessible and concentrated source -- malt residue -- which is formed during the process of obtaining ethyl alcohol. Alcohol is produced in our republic and the Ministry of the Food Industry for the ESSR must select and complete, from among the well known processes for obtaining protein from alcohol malt residue, that process considered to be most suitable for our conditions. The appropriate production operation must obviously be created within the framework of the capabilities for the principal operation.

During the course of planning and creating the appropriate enterprises, solutions must be found for an entire series of difficult problems -- volume of capital investments, supplying the enterprises with modern and reliable equipment, raw materials and so forth. Under our conditions, a most urgent problem is that of ensuring that production is supplied with adequate quantities of clean water, the creation of a recycling system and the purification of sewage waters. Preliminary computations and estimates reveal that the creation in the republic of enterprises for the production of nutrient yeasts based upon the preliminary chemical treatment (acid hydrolysis) of plant materials is fully realistic. Estimates also indicate that for a capability of approximately 5,000 tons annually, the enterprises ensure adequate labor productivity and acceptable output production costs and in the process no damage is inflicted upon nature's ecological balance.

The author of this article initially associated himself with the problems of feed protein 2 years ago in accordance with a suggestion received from the Vyru Sovkhoz. The information accumulated since that time and the analysis carried out have fostered the belief that the initiative displayed by the director of the sovkhoz G. L'yuken, supported by the rayon's leadership and the republic's Minsel'khoz, has proven its worth; the creation of the above-mentioned hydrolytic yeast production effort in this region is feasible beyond any doubt.

In addition to biological sources, feed protein can also be obtained from petroleum-chemical and gas raw materials. In particular, the use for this purpose of natural gas is extremely tempting. A biomass of microbes cultivated on methanol, in terms of its feed value, is almost equivalent to fish meal and does not contain harmful impurities. The raw materials required for the production of such protein can be supplied very easily and the production can be carried out in an automatic regime with a high level of labor productivity (according to the data supplied by some foreign firms, the productivity can reach 1,000 tons of net output annually per worker). Moreover, very little clean water is expended and the runoff is relatively harmless. On the other hand, this process is extremely complicated from a technological standpoint and requires modern equipment and a high culture of labor. In all probability it would be rather difficult to create such a production effort today and yet the forecasts indicate that during the coming decade it will begin to play a considerable role both in our country and abroad.

The acute deficit in feed protein requires maneuverability: from a large spectrum of variants, use should be made of those which are suitable for use

today. Initially, low-power experimental units should be employed on the farms. The next stage should be that of a small plant. And finally -- modern, highly productive and automated production of feed protein based upon methanol.

Regardless of whether or not these are small or large-scale biotechnological processes being carried out within the framework of the agroindustrial complex or other branches, a requirement will exist for highly skilled scientific and technical personnel and for solving the problems of environmental protection. Here all of the efforts of the Academy of Sciences, the VUZ's and the branch design-technological subunits must be combined.

The Chemical Faculty of the Tallinn Polytechnical Institute, where scientific-research work on the biotechnology (involving large-scale introductions) has already been underway for a number of years, could become the base for further development of both the technical science and the training of technologists in this area.

Use of Bacteria for Enriching Feed

Vilnius SOVETSKAYA LITVA in Russian 19 Jan 83 p 4

/Article by V. Girbauskene, candidate of biological sciences and head of the Laboratory for Pure Microbe Cultures of the All-Union Scientific Research Institute of Applied Enzymology: "Bacteria Are Enriching the Feed"/

> /Text/ The successful solving of the food program is dependent to a considerable degree upon ensuring that agriculture is supplied with high quality feed, particularly silage, the feed value of which was established long ago by both the scientists and practical workers.

Silage making is a complicated microbiological process. Large quantities of diverse types of microorganisms find their way into a silage storehouse together with the plant bulk. These microorganisms commence to develop in a rapid manner on the dead plants. One of the principal tasks of the technique of silage making consists of regulating the development of these microorganisms, or to be more exact -- creating favorable conditions for the vital activities of useful lactic acid bacteria. In recent years, biological preparations based upon lactic acid bacteria and highly effective biological catalyst-enzymes, proposed by workers at the Vilnius All-Union Scientific Research Institute of Applied Enzymology, have been used for this purpose in silage making. Their use raises considerably the quality of the silage: increases take place in the amounts of lactic and acetic acid and also protein. When such silage is fed to livestock, the average daily increase in weight is raised substantially.

During the spring of last year, at the Vilnius Experimental-Industrial Plant for Enzyme Preparations, specimens of a culture liquid of lactic acid bacteria were obtained in an experimental department for the purpose of ensiling mixed grasses. These specimens were turned over for testing purposes to the Radvilishkis Experimental Station. An inspection was carried out on

the operational practice and the positive results obtained made it possible to commence work on a new preparation known as Litosil. It was produced in the Experimental Department of the Plant for Enzyme Preparations and last autumn it was employed on an extensive scale on farms throughout the republic. This new preparation was employed for the ensiling of 15,000 tons of fodder. The minimal annual economic effect anticipated from the use of Litosil is roughly 30,000-50,000 rubles.

This year we have commenced the development of a technology for obtaining lactic acid bacteria concentrates and for treating silage plants with them. This represents a specific contribution by the scientists of our institute towards solving the food program.

7026
CSO: 1840/336

ACHIEVEMENTS OF THE SHCHELKOVO BIOLOGICAL COMBINE

Moscow VETERINARIYA in Russian No 3, Mar 83 inside front cover

[Article]

[Text] The Shchelkovo [or Shchelkovskiy, in Moscow Oblast] Biocombine is a real giant of the biological industry; its employees were the victors of the All-Union socialist competition in honor of the 60th anniversary of formation of the USSR, and the challenge Red Banner of the USSR Ministry of Agriculture and Central Committee of Agricultural Workers' Trade Union was bestowed upon them.

Modern equipment is used there to produce vaccines, serum and diagnostic agents.

The team of workers at this combine, in cooperation with scientists, are refining the technology for production of products, improving their quality, refining optimum modes for cultivating, preserving and inactivating viruses and microbes.

The specialists at this combine, many of whom are the recipients of orders and medals for their creative work, devote much attention to mastering new types of biological production, improving the effectiveness of production and introduction of progressive working methods.

PHOTO CAPTIONS

Inside front cover — Combine specialists V. V. Taskayeva, L. V. Chekineva, L. S. Dutkina and S. A. Nochevnaya

Outside front cover — A. V. Kostina, honored veterinarian of RSFSR, a veteran worker at the Shchelkovo Biocombine.

Photos by L. Makarov.

10,657
CSO: 1849/708

LABORATORIES FOR INDUSTRY

Moscow VETERINARIYA in Russian No 3, Mar 83 p 19

[Article by V. A. Krutskikh, head of Veterinary Science Department, Kh. M. Baram'yan, director of Oblast Veterinary Laboratory and R. A. Razdorkina, director of Don Veterinary Laboratory, Rostov Oblast]

[Text] Two industrial laboratories have been created to supply farms with medical and preventive agents in Rostov Oblast; there are shops at interrayon laboratories and a production department in the North Caucasus Zonal Veterinary Scientific Research Institute. They produce para-aminobenzoic acid, an emulsion of activated streptocid [sulfanilamide], a medicinal mixture according to Sharabrin, regidraltan, hemodes [detoxyfying agent], poly salts of trace elements and feed yeast.

Para-aminobenzoic acid (PABA) is produced in reactors, where the process of loading and unloading is mechanized. In addition to PABA, a bacterial silage starter is produced in the reactors and, since 1981, there has been refinement of production of an agent for prevention of fowl salmonellosis. Most of these products are sent to poultry plants. Use of these agents increases chick survival rate. Farms in Azovskiy, Myasnikovskiy, Oktyabrskiy and Millerovskiy Rayons are regular customers for PABA and they annually overfulfill the plans and socialistic obligations referable to egg and poultry meat production.

The production of iodobismuth sulfamide in the form of emulsion and foam-producing tampons ["rods"] has been worked out for the prevention of gynecological diseases in animals. Use of this agent reduces to one-half the period between calving and insemination, and it prevents sterility.

Agents against gastrointestinal diseases are prominent in the items produced by the laboratories and shops. They include coliprotectan, duodenum extract, immune serum, lactolysate, medicinal mixture of Sharabrin, hemodese, regidraltan and others. The workers in a number of laboratories of the Don Agricultural Institute have organized production of lactolysate and spelact, which are products of hydrolysis of whey. They contain amino acids, enzymes, lactose, minerals and other constituents of milk and gastric juice. These agents improve the digestion of milk (colostrum), prevent formation of dense clots of casein in calves' abomasus, normalize mineral metabolism, reduce dehydration in animals. According to the farm physicians, the therapeutic efficacy of these agents constitutes 93-98%.

Leukocyte plasma has high preventive and therapeutic efficacy for gastro-intestinal diseases, bronchopneumonia and ovarian hypofunction.

Hemodese, which was proposed by the scientists at the Don Agricultural Institute, has been produced since 1980. This agent is purchased by many farms in the oblast. It is given by mouth in a dosage of 150-200 mℓ for preventive purposes, in colostrum or milk, for 2-3 days; it is injected intravenously in a dosage of 5-7 mℓ/kg weight for treatment of toxic dyspepsia.

Use of hemodese combined with antimicrobial agents, enzymes, vitamins and cholagogues, as well as bitters and general stimulating agents reduces drastically calf deaths, and diminishes to one-half to one-third the incidence of dyspepsia among them; when given intravenously or intraabdominally, this agent has high therapeutic efficacy (92-96%).

Production of lers, which has antimicrobial action, has been mastered. It is also used to prevent diseases of young animals. Regidraltan is used extensively at the farms. The production laboratories and shop produce the required amounts of poly salts of trace elements for all animal species.

Farm specialists have praised the therapeutic and preventive agents, which make it possible to effectively prevent animal diseases.

PHOTO CAPTION

p 19 The quality of preventive agents is one of the main concerns of workers at the Don Veterinary Production Laboratory; the photo shows specialists inspecting products.

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UDC: 619:614.9.002.51:621:628.32:614.48

UNIT FOR DECONTAMINATION OF DRAINAGE WATER

Moscow VETERINARIYA in Russian No 3, May 83 pp 28-30 and inside back cover

[Article by I. A. Bakulov, V. A. Kokurin, V. M. Kotlyarov and A. F. Yermakov, All-Union Scientific Research Institute of Veterinary Virology and Microbiology]

[Text] In spite of the great advances made in this area, control of infectious diseases of animals occupies, as before, the principal place in the work of scientific and practical veterinary specialists. In order to succeed in controlling infections, one must be ready for this in the scientific and technical respects, i.e., one must have developed these questions sufficiently, in the scientific respect, and have the necessary material and technical resources.

All infectious diseases of animals are manifested in the form of an epizootic process, this is a general epizootiological pattern. Herein lies the main difference between communicable and noncommunicable diseases. The epizootic process is a complex phenomenon, which has a biological basis, but it is attributable to social (management and economic) and natural factors.

Experience in controlling infectious diseases of animals made it possible to elaborate special principles for implementation of epizootic-control measures with the strength of a law--epizootic-control measures must be combined and address themselves to all elements of the epizootic chain: eradication (isolation, decontamination) of the source of the pathogen of infection; disruption of the mechanism of transmission of the pathogen; producing insusceptibility to infectious diseases in animals.

In each individual instance, determination is made of the principal measures, i.e., the prime element is singled out, by treating which one can obtain the best and fastest effect. Of course, everything depends on the epizootic situation and nature of disease.

Sick animals (carriers of microorganisms) release pathogenic microflora into the environment via different routes, including feces and urine. These substrates naturally reach drainage water, manure liquid, manure and cause them to become factors in transmission of the pathogen of an infection. At the present time, when enormous amounts of manure and drainage water accumulate in large farms and industrial complexes, the question of their decontamination and subsequent utilization presents a large problem.

Even at industrial complexes which have no problem with infectious diseases, drainage water [liquid sewage] contains pathogenic and conditionally pathogenic microflora, as well as helminth eggs. This has been reported by I. D. Grishayev et al. (1972), Ye. S. Tsoy et al. (1973) and V. D. Barannikov (1976). Drainage water in such farms presents a great danger to the environment, people and animals. It cannot be used in agriculture without decontamination.

The hazard increases when acute infectious diseases appear at a livestock complex (farm). There are numerous instances indicative of the dissemination of pathogens in drainage water and manure, and there is only one conclusion: drainage water and manure must be decontaminated. In problem-free farms, one must constantly monitor the microflora of drainage water and decontaminate it if necessary, depending on the nature of microflora and degree of contamination; in farms which are stricken with infectious diseases, decontamination must be a strictly mandatory measure in the overall set of epizootic-control measures for the entire period of the problem situation (quarantine) in ways that correspond to the resistance of the pathogen.

It should be noted that various methods have presently been tested for decontamination of drainage water at livestock facilities: chemical, physical and biological. Occasionally, experiments yielded positive and encouraging results. However, in most cases, these studies were not carried through to practical introduction.

Only chemical methods of decontaminating drainage water are recommended for epizootic control purposes. Calcium hypochlorite is used the most often for this purpose. It has been suggested, for example, to mix manure liquid in a liquid collector with dry calcium hypochlorite containing at least 25% active chlorine with 1 kg lime for every 20 liters of liquid manure. However, calcium hypochlorite is not very effective, since the presence of a large amount of proteins in drainage water attenuates its activity. Moreover, after such treatment, this fluid cannot be dumped either in the fields or natural water reservoirs.

Yu. I. Boykov (1976) proposes that drainage water treated in the above manner be disposed of at animal refuse burial grounds. This is not realistic, if only because it would be virtually impossible to implement such a recommendation at a swine-raising complex with 108,000 head of animals, where the daily volume of sewage constitutes 2000 m^3.

Units have also been tested, with use of which decontamination is obtained as a result of the effect of fast electrons and penetrating radiation. The idea itself is attractive, but it is far from being used in practice, since there are negative aspects and debatable questions about the use of these methods: maintenance difficulties; need for special shielding of buildings; low efficacy, as a result of which contamination is only diminished but complete sterilization is not obtained; possibility of induced radioactivity and intensification of processes of variability of microorganisms; possibility of repair processes in microorganisms.

The accumulated knowhow and results of comparative experiments indicate that high temperature is the most effective decontamination (sterilization) method. Heating in an autoclave, where high temperature at high pressure is created, is particularly effective.

For this reason, enormous autoclaves--montejus [force pumps]--with a capacity of 10-25 m^3 or more started to be used for sterilization of drainage water. Operation of such units under industrial conditions immediately revealed that they had several substantial flaws: the great hazard when working with enormous pressurized containers; difficulty involved in exchanging the montejus in case of corrosion and formation of pits [or bubbles] on the inner surface of the containers; large premises needed to accommodate these autoclaves and, finally, the nonuniform (peak) loads on the boiler rooms. But the most substantial flaw is that there is uneven heating of the water in these autoclaves and there are "dead zones" in the diverse connecting pipes, valves and other devices, with which the montejuses are equipped. The temperature does not rise above 60°C in such "dead zones," whereas in the center of a montejus it reaches 130°C. For this reason, it was necessary to search for more effective methods of heat treatment of drainage water.

As a result, it was proposed to develop a continuous-action autoclave, an in-flow autoclave (I. A. Bakulov, V. A. Kokurin, V. M. Kotlyarov, 1971). This was used with success in the unit for decontamination of drainage water of the All-Union Scientific Research Institute of Veterinary Virology and Microbiology (VNIIVViM) which works on steam. It is mixed under pressure with the liquid sewage in jet blowers and results in virtually instantaneous decontamination of drainage water. Such water, under pressure of up to 2 atm and at high temperature (up to 130°C) circulates for 30 min in a coiled pipe (holding unit) then emits heat to the next batch of water in the heat exchanger. This completes the decontamination process (Figure 2).

It must be noted that use of this unit is possible in both its stationary and portable variants. The former should be installed at large farms and industrial complexes with a large volume of drainage. It would apply to swine-raising complexes. Standard designs have already been developed for complexes that handle 54,000 and 108,000 animals.

In our opinion, these permanent units should serve a dual purpose. In so-called uneventful periods, when there are no epizootics, but pathogenic (or conditionally pathogenic) microorganisms and helminth eggs are present in drainage water, they should be used at 90-100°C. If, however, there is an epizootic outbreak, during the period of a problem situation, particularly when a sporulating microorganism is involved, decontamination should be performed at 110-130°C. This mode provides for complete and reliable sterilization of drainage water. One should be governed by the heat-resistance of the microorganism that caused the epizootic in determining the temperature for sterilization of liquid sewage.

The same stationary units should be installed at biofactories, scientific research institutions and veterinary sanitary (scrap reprocessing) plants, i.e., where there are pathogenic microorganisms.

At the present time, individual designs of stationary units have been developed for scientific research institutes, biofactories, laboratories and other enterprises and institutions, as well as standard designs of units for decontamination of sewage in plants that produce meat and bone meal, with output of 0.36 to 5 tons/day.

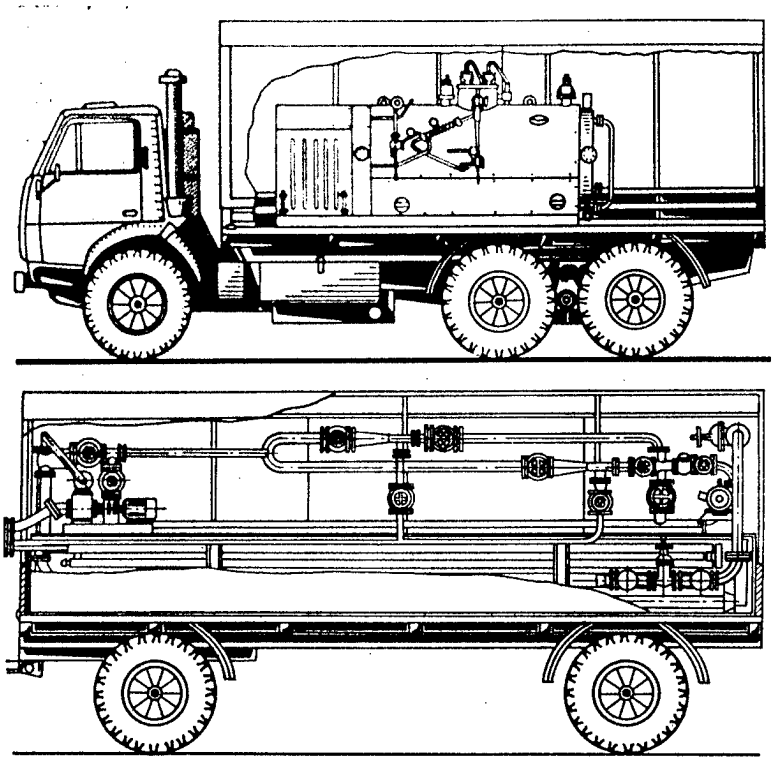

Figure 1. Mobile unit for decontamination of sewage; top--self-contained steam maker; bottom--unit installed on trailer

The units are manufactured from domestic materials (output of 1 to 100 m^3/h); they have been constructed and are used at several institutions in our country and abroad (Ulan-Bator, Mongolian People's Republic). It is particularly beneficial to use such units in complexes where a recirculation system for removing manure is installed, which provides for repeated use of sewage for "hydrowashing" [?] purposes. In this case decontamination of drainage water is mandatory. I. M. Golosov et al. (1982) report that the recirculation systems can be used only on farms that have no problems with infectious or parasitic diseases. In theory, they are right, but even on farms with no problems, drainage water contains microflora that is hazardous to animals (I. D. Grishayev et al., 1972). For this reason, it is inadmissible to use drainage water for repeated hydrowashing without decontamination.

Decontamination can be performed only by the heat method, and no chemical treatment is acceptable in this instance. In such cases, we recommend the use of the VNIIVViM unit.

In addition to the stationary version, it is possible to use mobile units as a means of decontaminating liquid sewage right at the epizootic sites. Veterinary science is not yet adequately equipped with apparatus for the control of epizootics. Only disinfecting machines are used. There are no devices as yet for decontamination of drainage water. The mobile unit of VNIIVViM can

fill this gap. At the present time, state testing of the OSP-20 unit (mobile sewage decontaminator) is being concluded at livestock complexes; it provides for 100% decontamination of drainage water from pathogens of infectious diseases, helminths, as well as complete sterilization of weed seeds. Sporulating microorganisms perish at temperatures of 120-130° within 10 min, and nonsporulating ones at 100-110°C within 7-10 min.

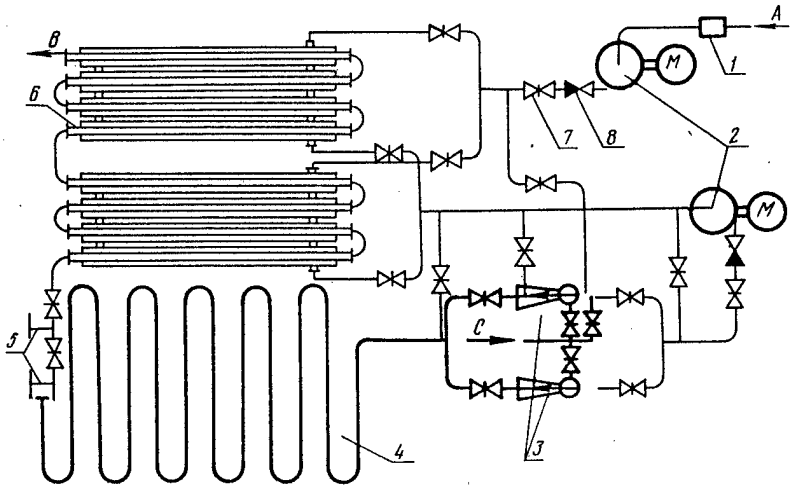

Figure 2. Schematic diagram of mobile unit for decontamination of sewage

A) nonsterile drainage water [sewage]
B) outflow of sterile drainage water into external pipe system
C) steam
1) grinder
2) pumps
3) jet blowers
4) holding unit
5) offsets
6) heat exchanger
7) gate [bolt]
8) check valve

This unit is produced in two versions, with a self-contained steam generator and without it (with supply from local boiler room). The unit is installed on a 2-axle trailer. Its output is up to 15 m^3/h. It is operated by two men, the driver (who also operates the steam generator) and the operator of the unit proper. The cost to decontaminate 1 ton of sewage does not exceed 50 kopeks (Figure 1).

We believe that oblast (kray) disinfection brigades [teams] should be supplied with mobile units, which can be used to treat drainage water during routine disinfection of premises, as well as to decontaminate sewage in epizootic sites.

The area of application of sewage decontamination units is quite broad. They are needed by infectious hospitals and other medical institutions. These units

should acquire much importance for decontaminating drainage water and food waste on seagoing ships. There are also plans to use the units to decontaminate sewage in aircraft at airports, as well as for heat-treatment of drainage water as part of the treatment equipment at disinfection and washing facilities.

Thus, a method and units have been developed at the VNIIVViM for decontamination of sewage with heat, which guarantee sterilization of drainage water containing pathogenic microflora.

10,657
CSO: 1840/708

UDC: 541.144.7+630:551.521

LOW RADIATION ADAPTATION AS A PREREQUISITE FOR FORMATION OF PHYTOCENOSES AND ASSURANCE OF HIGH PRODUCTIVITY

Moscow FIZIOLOGIYA RASTENIY in Russian Vol 30, No 1, Jan-Feb 83
(manuscript received 13 Apr 82) pp 5-13

TOOMING, Kh. G., All-Union Scientific Research Institute of Agricultural Meteorology, Tallinn, Saku

[Abstract] The radiation adaptation intensity, the density of photosynthetically active radiation flux at which gas metabolic intensity in leaves is optimal and gas metabolism efficiency is maximal, was found to be surprisingly low, frequently 1/10 the mean radiation flux density striking the plant. This article utilizes numerical experiments in which mathematical models of the production process are analyzed to demonstrate that low radiation adaptation intensity is a necessary prerequisite for the development of phytocenoses and achievement of high productivity in them. Essentially, low values of this characteristic assure that no plants in the phytocenosis will experience a radiation deficit. In fields where the RAI of the leaves is low, there may be an excess of radiation in the upper levels and leaf efficiency may decrease. Proper selection can provide plants at the higher level adapted to greater amounts of radiation, with leaves in the lower levels adapted to lesser levels of radiation, thus maximizing efficiency of the entire system. Figures 5; references 29: 24 Russian, 5 Western.
[407-6508]

UDC: 615.285.7.025.1;615-099-08

GENERAL PRINCIPLES OF TREATMENT IN LONG-TERM EXPOSURE TO PESTICIDES

Kiev VRACHEBNOYE DELO in Russian No 12, Dec 82
(manuscript received 5 Apr 82) pp 84-86

BEZUGLIY, V. P., Kiev, All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers and Plastics, USSR Ministry of Health

[Abstract] Clinical manifestations of pesticide exposure at low intensity are undergoing constant evolution. Both occupationally and casually exposed persons in long-term contact with low pesticide levels manifest increased frequency and severity of nonspecific cardiovascular, nervous, hepatobiliary, gastrointestinal, female reproductive and eye disease and allergic phenomena. Such diseases are frequently not recognized as pesticide induced or complicated. The authors have developed a system of therapeutic measures designed to improve the health of pesticide workers, including particularly the use of medication primarily of plant and animal origin with minimal use of synthetic preparations. The therapy is intended to improve drainage of the biliary system. Physical therapy and balneologic treatment are widely used. Antidotes are administered if heavy metals are found in the blood and urine to bond and promote excretion of these metals. Symptomatic therapy (antispastic, vasodilation, hypotensive, cardiac, diuretic, sedative, general fortifying, hemostimulating and other substances) is also used. The therapeutic effectiveness of the course of treatment has been confirmed by experience.
[371-6508]

UDC: 614.7

HYGIENIC SIGNIFICANCE OF UNIVERSAL BIOCHEMICAL CRITERIA SYSTEM FOR EVALUATION OF UNFAVORABLE EFFECTS OF CHEMICAL ENVIRONMENTAL FACTORS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 82
(manuscript received 12 Jan 82) pp 7-9

TSAPKOVA, N. N., Scientific Research Institute of General and Communal Hygiene imeni A. N. Sysin, USSR Academy of Medical Sciences, Moscow

[Abstract] Results are presented from an experimental search for additional and universal biochemical criteria for evaluating the hepato- and neurotoxic effect

of environmental chemical factors based on comparative studies of the status of organelle-specific intracellular enzymes and syaloglycoprotein metabolism with subsequent evaluation of the most informative tests under natural conditions. Additional biochemical criteria for early manifestations of hepatotoxic effects were determined using models of isolated chemical carcinogen application. The degree of hepatotoxic effect was judged by morphologic studies, neurotoxic effect by neurophysiologic studies. The accumulation of M-acetylneuraminic acid in the blood serum is a universal biochemical criterion for evaluating hepato- and neurotoxic effects, since it is a characteristic sign regardless of the type of chemical substance studied. Changes in the activity of the key enzyme of glycolysis-lactate dehydrogenase in the blood serum is another universal criterion. The authors also demonstrated the universality of such biochemical criteria of hepatotoxic effects as acetylesterase and β-glucuronidase. References 15 (Russian).
[384-6508]

UDC: 613.632:669.063.4

HYGIENIC REGULATION OF SELECTIVE ORGANOPHOSPHORUS EXTRACTION AGENTS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 82
(manuscript received 27 Nov 81) pp 27-31

SHTANNUKOV, Ye. V., KOCHKIN, V. P. and LAMIKHOV, B. Yu.

[Abstract] Development of a new industrial process required sanitary-toxicologic evaluation of triisopentylphosphineoxide and dioctylisopentylphosphineoxide. The toxicologic studies involved 1076 mongrel white rats, 400 white mice, 70 guinea pigs and 12 rabbits. The influence of the two substances on acetylcholinesterase and butylcholinesterase activity was studied both in vivo and in vitro. Rabbits were used to study the effect of the selective extraction agents on the ophthalmic mucosa. The skin resorptive effect was studied on white rats by immersion of the tails of the animals into the substance for 4 hours a day for 10 days. The possible embryotropic effects of the agents were studied in the white rats. Chronic sanitary-toxicologic experiments to determine threshold concentrations for inhalation were performed on male white rats over the course of 4 months (5 or 6 days per week). The two substances were found to be highly dangerous for inhalation, less dangerous for intragastric administration. They have clear cumulative properties, increasing with decreasing dose fractionation. They can penetrate through the skin, have slight irritant effect and do not cause sensitization. They inhibit cholinesterase. Chronic administration of threshold doses causes functional changes in the central nervous system and parenchymatous organs, but no embryotropic or mutagenic effect. The two substances are almost soluble and are highly stable in water. Threshold concentrations for bodies of water are 20 mg/l for dioctylisopentylphosphineoxide, 30 mg/l for triisopentylphosphineoxide. Minimum quantities which can be detected by water users are 1.0 mg/l (odor) for DIPO, 3.5 mg/l (taste) for TIPO. The recommended MPC at the workplace is 1.0 mg/m^3 for TIPO,

2.0 mg/m^3 for DIPO. The recommended MPC in bodies of water is 0.3 mg/l for TIPO, 1.0 mg/l for DIPO. References 11 (Russian).
[384-6508]

UDC 579.852.11: 615.9.9]: 614.449.57

DETECTION OF THERMOLABILE EXOTOXIN IN B. THURINGIENSIS AND ITS ISOLATION FROM PHOSPHOLIPASE C

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 81 (manuscript received 10 Jul 80) pp 81-85

FLUER, F. S., IVINSKENE, V. L. and ZAYACHKAUSKAS, Institute of Epidemiology and Microbiology imeni Gamaleya, USSR Academy of Medical Sciences, Moscow; Institute of Zoology and Parasitology, Lithuanian Academy of Sciences, Vilnius.

[Abstract] As part of the continuing study of the role of B. thuringiensis enzymes and toxins in causing bacterial pathogenicity for insects, thermolabile exotoxin was demonstrated in B. thuringiensis and isolated from phospholipase C and its biological activity investigated. Berliner strain was cultured, centrifuged and purified and the phospholipase and protein content determined and analyzed. A thermolabile exotoxin was isolated from the phospholipase C by affinity chromatography using Sepharose 4B; details of the method are described. It was established that the final fraction is very toxic in mice and insects. The exotoxin was destroyed by the action of trypsin and 8M urea and at pH values above 10.0 and below 3.5, thus demonstrating that it is a separate fraction from the phospholipase C, which is resistant to the action of trypsin and 8m urea and is nontoxic in mice. References 15: 1 Russian, 14 Western.
[400-9642]

UDC 612.419.014.2:612.2]-085.23-063

COMPARATIVE EVALUATION OF XENOFEEDERS IN CLONING HUMAN BONE MARROW STROMAL FIBROBLASTS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 94, No 10, Oct 82 (manuscript received 19 Feb 82) pp 111-113

ASTAKHOVA, V. S., Immunology Laboratory, Kiev Scientific Research Institute of Orthopedics, Ukrainian SSR Ministry of Health

[Abstract] Evaluations were conducted on the effectiveness of rat and rabbit irradiated (5000 r) bone marrow cells in promoting cloning of bone marrow stromal fibroblasts derived from 3 to 12 year old children with congenital hip dislocation. Under the conditions employed, the cloning efficiency with the rabbit

xenofeeder was on the order of 3.7×10^{-5}, which was 2.5-fold greater than with the rat cells and 37-fold greater than the figure obtained in the absence of xenofeeders. Structural differences in the resultant colonies were also apparent: in the absence of feeder or with the rat cells, small (1.5 mm diameter) monolayer colonies were formed which were alkaline phosphatase negative. With the rabbit cells multilayered, large (5 mm or greater) colonies were obtained, 60-80% of which were positive for alkaline phosphatase. Figures 3; references 6 (Russian).
[381-12172]

UDC 576.858

PROPERTIES OF MONOCLONAL ANTIBODIES TO VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS

Moscow DOKLADY NAUK SSSR in Russian Vol 267, No 2, Nov 82
(manuscript received 11 Jun 82) pp 466-468

GAYDAMOVICH, S. Ya., NOVOKHATSKIY, A. S., MEL'NIKOVA, Ye. E., KUSH, A. A., SVESHNIKOVA, N. A., and ZHDANOV, V. M., corresponding member, USSR Academy of Medical Sciences Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Antibodies to Venezuelan equine encephalomyelitis (MAK 14-7 strain) virus were characterized in serological reactions and the protective effect of the antibodies were determined in experiments on tissue culture. Monoclonal antibodies were used in the form of a culture fluid in which hybridoms (MAK 14-7) were grown and in the form of mouse ascitic fluid. The capacities of the antibodies to MAK 14-7 to react in the different serological reactions both with Venezuelan equine encephalomyelitis virus and with other related viruses of this complex indicate that they are directed against a group antigenic determinant which is common for Venezuelan equine encephalomyelitis viruses and the other viruses of the complex. Group specific monoclonal antibodies to MAK 14-7 may be used to prepare diagnostic preparations with a broad spectrum of activity. Data obtained indicate the real prospect of using monoclonal antibodies as a means of passive protection of the organism from virus infection. References 6: 1 Russian, 5 Western.
[368-2791]

LYSOSOMAL ENZYMES ACTIVITY IN BLOOD SERUM OF PHOSPHORUS PRODUCTION WORKERS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 11, Nov 12, pp 14-16

AYTBEMBETOV, B. N. and PLESHKOVA, S. M., Scientific Research Institute of Regional Pathology

[Abstract] The activity of acid phosphatase, acid proteinase and DNAase in blood serum of 155 Chimkent phosphorus plant workers with length of service ranging from one to 15 or more years and with various physical complaints was compared with the activity of these enzymes in 63 healthy workers ranging in age from 20 to 50 years (control group). Acid phosphatase activity and acid proteinase activity were higher for workers in all length-of-service categories than those for control group members. Acid phosphatase activity increased with length of service, reaching peaks around the 5th and 10th years, then decreasing until the 15th year but still remaining above control levels. Acid proteinase activity also remained above control levels, decreasing somewhat between the 10th and 15th year and the increasing again. DNAase activity increased pronouncedly in the 1st year of service and then decreased with the increase of length of service. The significance of these figures in early diagnosis, prevention and treatment of chronic phosphorus intoxication was discussed. References 4 (Russian).
[406-2791]

UDC 616.28-085.837.3

USE OF FOCUSED MEGAHERTZ ULTRASOUND IN OTOLOGY

Moscow VESTNIK OTORINOLARINGOLOGII in Russian No 2, Mar-Apr 83
(manuscript received 11 Aug 82) pp 3-8

GAVRILOV, L. R., doctor of technical sciences, corresponding member USSR Academy of Sciences, GERSHUNI, G. V., PUDOV, V. I. and ROZENBLYUM, A. S. and TSIRUL'NIKOV, Ye. M., candidates in medical sciences, Laboratory of Hearing Physiology and Pathology with Anechoic Chambers, Leningrad Scientific Research Institute of Ear, Throat, Nose and Speech Diseases; Laboratory of Comparative Physiology of the Sensory Organs, Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences; Acoustic Institute imeni N. N. Andreyev

[Abstract] A new method for study of hearing, using focused ultrasound with frequencies higher than 225 kHz, generated by a spherical piezoceramic source, was studied in more than 350 patients. The source was placed in a polyethylene bag of distilled water in contact with the patient and the radiation focused on the labyrinth with the aid of a special pillow. Square wave or sinusoidal modulated 2.47 MHz ultrasound was used for most investigations. Preliminary experiments on healthy and hearing-impaired individuals demonstrated that displacement of the ultrasound focus more than 5 mm away from the projected labyrinth point in the direction of the external auditory canal or 10 mm in other directions increased the perception threshold by 20-50 dB or more. In 46 healthy subjects frequency threshold curves for sinusoidal modulation converged between 1000 and 4000 Hz and diverged above 8000 Hz and below 500 Hz. Square wave modulated ultrasound was perceived as clicks. The frequency threshold curves for 23 patients with neurosensory hearing impairment were similar in form to those of the normals, while the curves for 83 patients with otosclerosis were not. Frequency "gaps" where ultrasound could not be perceived were observed in these patients, but not in 49 patients with chronic middle otitis. In 28 patients with sudden, unilateral hearing impairment or deafness, ultrasound gave hearing sensations in the deaf ear, with threshold 3-50 dB above those for good ear. The frequency threshold curves for the two ears had different forms. The wide frequency range of ultrasound makes it especially useful for differential diagnosis in various types of hearing impairment. Figures 1; references 30: 20 Russian, 10 Western.
[361-12126]

SPECIFIC AND NONSPECIFIC REACTIONS OF HUMANS AND ANIMALS TO SHIPBOARD NOISE

Moscow VESTNIK OTORINOLARINGOLOGII in Russian No 2, Mar-Apr 83 (manuscript received 27 Jul 82) pp 8-11

MARKARYAN, S. S., professor, VOLKOV, A. A. and SYSOYEV, A. B., Scientific Research Institute of Marine Transport Hygiene, USSR Ministry of Health

[Abstract] In order to study the effect of shipboard noise on personnel, two series of experiments were conducted by exposing male white rats to constant 55 or 85 dB noise for three months. In addition, experiments at similar levels were performed on young naval cadets and experienced seamen. In the laboratory studies on rats, phasic changes in central nervous system excitability, accelerated catabolism, increased anaerobic and decreased aerobic pyruvic acid oxidation, imparied spermatozoal functional state and decreased resistance to acute hypoxia were observed. The magnitude of the changes depended on noise intensity. Similar rat studies conducted aboard ship elicited changes which were twice as high as those seen in the laboratory, due to low-frequency noise components and vibration. With the naval cadets changes seen included increased tonal hearing threshold, changes in speed of free association and laterations in various blood chemistries. Exposure to vibration of 8 Hz with 7-11 dB modulation during rest periods intensified the effects observed. Seasoned seamen exhibited pre-existing alterations in hearing threshold, speed of associative reaction, subthreshold sensitivity and functional state of the central nervous and cardiovascular systems. During the experiment the experienced seamen were affected by the 94 dB noise, but not by the 64 dB noise. Figures 2; references 9 (Russian). [361-12126]

UDC 612.815.015.31:546.41]-063

STATISTICAL ANALYSIS OF CALCIUM ACCUMULATION IN NERVE ENDINGS IN RESPONSE TO REPETITIVE STIMULATION

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 94, No 10, Oct 82 (manuscript received 8 Jun 82) pp 3-5

ZEFIROV, A. L. and STOLOV, Ye. L., Chair of Normal Physiology, Kazan Medical Institute imeni S. V. Kurashov

[Abstract] A statistical analysis was performed on the frog sartorius neuromuscular preparation to determine Ca^{++} accumulation in the nerve endings in response to paired or repetitive electrical stimulation of the nerve and the level of acetylcholine (ACh) release. Statistical data indicated that the probability of ACh release in the case of paired and a series of repetitive stimulations diminishes if the preceding stimulus or stimuli were sufficient to induce ACh release. Furthermore, the number of quanta of ACh released varied directly with the concentration of intracellular Ca^{++}. Low levels of ACh release involved less Ca^{++} loss and

favored an increase in ACh release on subsequent stimulation due to the retention of higher intracellular Ca^{++} concentration. Conversely, release of a larger number of quanta of ACh resulted in greater depletion of Ca^{++} and a smaller ACh release on subsequent stimulation. Two mechanisms underlie intracellular Ca^{++} concentration: utilization by various cellular structures (mitochondria, endoplasmic reticulum, etc.) and loss incurred as a result of the secretion of a quantum of ACh. Figures 1, references 8: 2 Russian, 6 Western.
[381-12172]

UDC 612.173.1.014.462.2

INACTIVATION OF RAPID SODIUM CURRENT ACROSS MEMBRANE OF ISOLATED RAT HEART CELLS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian
Vol 94, No 10, Oct 82 (manuscript received 28 May 82) pp 5-7

ZIL'BERTER, Yu. I. and TIMIN, Ye. N., Biophysics Research Laboratory, Institute of Surgery imeni A. V. Vishnevskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Voltage-clamp technique was employed in studies on the inactivation of rapid sodium current across membranes of isolated rat heart cells following blocking of calcium and potassium channels by, respectively, manganese chloride and 4-aminopyridine. In the two-pulse method sodium channel inactivation was characterized by a double exponential plot of the descending phase of the sodium current, with both time constants showing potential-dependence. Recovery of sodium conductance was recorded at resting potentials ranging from -30 to -80 mV, which yielded an S-shaped plot with lag time of 0.5 to 11 msec. Although a theoretical analysis of these observations was not attempted, it is obvious that they do not fit the Hodkin-Huxley model but are quantitatively similar to observations previously reported for the node of Ranvier and the isolated heart cell. Figures 3; references 9: 1 Russian, 8 Western.
[381-12172]

UDC 616.125.4-008.3-02:615.84.6

EFFECTS OF HIGH FREQUENCY ATRIAL STIMULATION ON SINUS RHYTHM

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian
Vol 94, No 10, Oct 82 (manuscript received 7 Apr 82) pp 7-10

VINOGRADOVA, T. M., BOGDANOVA, E. A., SUKHOVA, G. S. and UDEL'NOV, M. G., First Moscow Medical Institute imeni I. M. Sechenov; Moscow State University imeni M. V. Lomonosov

[Abstract] An isolated preparation of Rana temporaria atria and sinus venosus was used to investigate sinus function during high frequency, suprathreshold, electrical stimulation of the atria. Stimulation of the atria at a rate 20% greater than the normal sinus rhythm led to an increase in the sinus rhythm to the pacing level; however, sinus arrhythmia set in if the pacing rate was increased to 40-50% greater than the normal sinus rhythm, while an increase in atrial pacing to 100% over the normal sinus rhythm reduced the sinus rhythm to half its normal value. Variations in the sinus rhythm were also noted after retrograde conduction was blocked by placing a strip (1 mm x 2 cm) of necrotic tissue across the sinoatrial boundary. Therefore, alterations in sinus rhythm were predicated on the frequency of atrial stimulation and, perhaps, mechanical activity of the atria. The fact that electrical stimulation of the atria may alter sinus activity may have clinical repercussions. Figures 2; references 6: 2 Russian, 4 Western. [381-12172]

UDC 612.815.2:612.816].014.46:615.277.3:547.944.6

NONQUANTUM RELEASE OF ACETYLCHOLINE IN FROG MYONEURAL JUNCTION AFTER COLCHICINE BLOCKING OF AXONAL TRANSPORT

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian
Vol 94, No 10, Oct 82 (manuscript received 15 Apr 82) pp 18-20

VOLKOV, Ye. M. and POLETAYEV, G. I., Chair of Biology and Biophysics, Kazan Medical Institute

[Abstract] Microelectrode studies were conducted on myoneural junction of the frog (Rana ridibunda) sartorius muscle to evaluate the role of axoplasmic transport in the appearance of denervation-like electrical membrane phenomena in the muscle. Analysis of the juntional and extra-junctional muscle membrane in d-tubocurarine-treated preparation in the face of acetylcholinesterase inhibition showed that tubocurarine resulted in hyperpolarization of the junctional membrane only. Hyperpolarization was not affected by blockage of axonal transport by colchicine, but diminished the resting potential of the membrane and enhanced extrajunctional sensitivity to acetylcholine. It appears, therefore, that the denervation-like changes in muscle fiber membranes of the frog after application of

colchicine are due to depletion of substances transported to the muslce by the axon, and not to alterations in quantal or nonquantal acetylcholine release. References 11: 4 Russian, 7 Western.
[381-12172]

UDC 616.24-005.980-02:616-001.12-092.9]-092-02:65.217.34:547.944.3

EFFECTS OF ATROPINE PRETREATMENT ON DEVELOPMENT OF EXPERIMENTAL ACUTE HIGH-ALTITUDE PULMONARY EDEMA

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian
Vol 94, No 10, Oct 82 (manuscript received 17 Nov 81) pp 39-41

ISMAILOV, E. M., Joint Laboratory of Experimental Cardiology, Kirghiz Scientific Research Institute of Cardiology; Central Scientific Research Laboratory, Kirghiz Medical Institute, Frunze

[Abstract] Pulmonary function, blood gases, hemodynamics, and cardiac function were evaluated in chinchilla rabbits for 360 min in a pressure chamber set to correspond to an altitude of 6000 m. Analysis of these parameters in atropine-pretreated (1.5 mg/kg) and untreated rabbits was correlated with the incidence of acute high-altitude pulmonary edema (HAPE). HAPE developed in 4 of the 10 untreated rabbits anddin one of the 12 atropinized rabbits. The difference in the incidence of HAPE appears to have been due to vagal blockage by atropine which maintained bronchial patency and favored a steady level of blood oxygenation saturation (56 to 64.2% over the entire 360 min). In the untreated control animals bronchial patency was reduced by more than 50% and blood oxygen saturation showed a gradual decline to ca. 39.9% by 360 min and served, evidently, as a key factor in precipitating the onset of HAPE.
References 5 (Russian).
[381-12172]

UDC: 612.816.018:577.175.82].014.46:615.277.3].014.421.7

ELECTROPHYSIOLOGICAL STUDY OF MEDIATOR SECRETION AT FROG NERVE-MUSCLE SYNAPSE WITH AXOPLASMIC TRANSPORT BLOCK BY COLCHICIN

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian
Vol 94, No 8, Aug 82 (manuscript received 1 Mar 82) pp 6-8

VALITOV, I. S., Department of Physiology (Headed by Professor I. N. Volkov) and Department of Biology and Biophysics (Headed by Professor G. I. Poletayev), Kazan' Medical Institute

[Abstract] A study is presented of the nature of the evoked and spontaneous secretions of acetylcholine at the myoneural synapse after disruption of axoplasmic transport in a motor nerve by means of cochicine over times such that denervation-like changes in the muscle fiber membrane are clearly manifested. Experiments were performed on R. ridibunda preparations in the fall and winter. The control consisted of frog muscles in which the nerves were treated with Ringer's solution without colchicine. End-plate potentials were recorded by standard microelectrode techniques. Two weeks after application of colchicine the muscle failed to respond to nerve stimulation in half the frogs. In most cases the nerve retained its ability to transmit excitation. However, the end-plate potential did not respond. The experimental data indicate that the manifestation of denervation-like signs in muscle fibers with evoked and spontaneous electrical activity, present after axoplasmic transport is blocked, can hardly be related to a change in acetylcholine secretion. Axoplasmic transport, probably its rapid phase, apparently maintains a certain level of presynaptic membrane rest potential, thus regulating the nature of evoked and spontaneous acetylcholine secretions. Figute 1; references 9: 6 Russian, 3 Western.
[380-6508]

UDC: 577.3;578.087.8

STUDIES OF ELECTROCONDUCTIVITY OF BIOLOGICAL SYSTEMS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 94, No 6, Nov-Dec 82 pp 404-420

ZHUCHKOV, A. V., Leningrad Technological Institute of the Refrigeration Industry

[Abstract] This is a review. Improvement in the accuracy of bioelectric studies will require further development of the theory of conductivity of biological systems, creation of a unified method for experimentation with clearly defined requirements for measurement instruments and sensors used. Absolute electrical characteristics of biological objects must be measured to allow the establishment of physiological constants related to the conductivity of various tissues so as to permit comparison of studies by different authors. Biological materials are placed between electrodes to which an emf is applied to study their electrophysical characteristics. The emf causes polarization in the object, manifested as displacement of negative charges toward the higher potential. The influence of polarization on electrical characteristics is analyzed. The components of electrode impedance and necessary measures to eliminate it during impedance measurements in biological tissues are discussed. Effective measurement instrument designs are studied. The data presented in this review indicate that more research is needed on the methods to be used in the title studies. Figures 3; references 86: 57 Russian, 29 Western.
[404-6508]

UDC 576.895.771.01(571.5)

MOSQUITOS (DIPTERA, CULICIDAE) OF THE EASTERN PART OF THE BAYKAL-AMUR RAILWAY

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian Vol 60, No 5, Sep-Oct 82 (manuscript received 23 Sep 80) pp 76-79

DANILOV, V. N. and FILIPPOVA, V. V., Institute of Medical Parasitology and Tropical Medicine imeni Ye. M. Martsinovskiy, Moscow; USSR Ministry of Health, Zoological Institute, USSR Academy of Sciences, Leningrad

[Abstract] Fauna and biology of mosquitos were studied in 1976-1977 in the eastern section of the Baykal-Amur Railway from Komsomolsk-on-the-Amur to Berezovka. Nearly 31,500 mosquitoes were trapped and identified in 1976 and more than 12,000 were trapped and identified in 1977. The species composition included representatives of 26 species belonging to one of four genera: Aedes (21 species), Culiseta (3 species), Culex (1 species) and Anopheles (1 species). Only species of the Aedes genus, making up 99 percent of the mosquitoes biting humans, were important as massive blood suckers. The size of mosquito populations in different sections studied differed greatly with a maximum of 42 to 201 insects being trapped on human bait in a five-minute count, using a Kryshtal trap. Light traps yielded only 1-2 dozens of insects in a 1-2 hour collection period because the low night temperature in the areas studied evidently impeded mosquito activity but these traps could be helpful in collecting species (including Cx. vagans and Csochroptera) which do not attack man. References 3 (Russian). [378-2791]

UDC 616.98:578.833.26]-036.21:625.1(57t.5)

CONTACTS OF HUMAN POPULATION WITH NATURAL FOCI OF TICK-BORNE ENCEPHALITIS IN THE FIRST YEARS OF DEVELOPMENT OF THE EASTERN PART OF THE BAYKAL-AMUR RAILROAD

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian Vol 60, No 5, Sep-Oct 82 (manuscript received 8 Feb 82) pp 71-75

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[Abstract] Epidemiological and serological studies by a random sampling method involving 60-80 percent of the population of previously existing settlements (studied from 1975-1977) and inhabitants of new settlements (studied from 1978-1980) along the Baykal-Amur Railway in Khabarovsk Kray were used to determine the degree of contact with the taiga and with carriers of tick-borne encephalitis and the size of the immune populations because of these contacts. These studies showed that inhabitants of settlements in their second and third year of existence were in higher risk of tick-borne encephalitis infection than were inhabitants of the older settlements in analogous natural settings but there is a rapid formation of an immune segment of the population similar to that for the older settlements. Antibody titers to tick-borne encephalitis virus were low in most seropositive subjects. The number of persons attacked by encephalitis-carrier ticks is still quite small in each settlement--in the hundreds or even only dozens. References 10 (Russian).
[378-2791]

UDC: 615.471.03:[614.72:656]-074

ASPIRATION DEVICE FOR SAMPLING AEROSOLS FROM AIR BEHIND MOVING VEHICLES

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 83
(manuscript received 23 Mar 82) pp 47-49

MASLOVSKIY, R. Ya.

[Abstract] The device described, based on an 8TsS-24 fan with a D-4 motor and a closed cylindrical filter holder meets the requirements of mobility, independence, good productivity and isokinetic sampling required to determine the concentration of aerosols in the air behind a moving vehicle. The device is mounted ahead of the front bumper of a laboratory truck and is equipped with its own D-4 gasoline motor. The fan used can move 800 m^3 of air per hour. Use of the device assures production of representative samples, allowing objective evaluation of the degree of atmospheric pollution with toxic wastes during transportation of wastes. Figures 3; references 2 (Russian).
[365-6508]

UDC: 628.322

IMPROVING INDICATION OF ENTEROVIRUSES IN SOIL WITH ULTRASOUND

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 83
(manuscript received 2 Aug 82) pp 61-62

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[Abstract] Sensitive methods for locating enteroviruses in soil are needed for virologic monitoring of soils in areas used for decontamination of domestic wastes. The most important stage of separation of viruses from the soil is preliminary treatment to desorb viruses from soil particles and disaggregate complex soil-viral complexes, virus-virus and virus-protein

aggregates. The authors utilized low frequency ultrasound for this purpose. The influence of ultrasound on the viral population was studied using the RNA-containing bacteriophage MS2 and the UZDN-1 ultrasonic installation. The disaggregation effect was calculated as a percent with respect to a control group. The optimal conditions, yielding the maximum increase in bacteriophage titer, were 0.44A, 44 KHz, 22 W/cm^2, 15 minutes. References 4: 1 Russian, 3 Western.
[365-6508]

UDC: 613.68+614.777]:628.33/.34:628.191:656.812

HYGIENIC EVALUATION OF SHIP WASTE WATER TREATMENT SYSTEMS AND ORGANIZATION OF SANITARY MONITORING OF THEIR EFFECTIVENESS

Moscow GIGIYENA I SANITARIYA in Russian No 12, Dec 82
(manuscript received 6 Apr 82) pp 69-71

GUCHEL', Yu. I., KOLODENKO, V. A., MALOMAN, P. N., MOTORNAYA, T. V., PLISOV, G. A. and BOGOLYUBOVA, N. M., Basin Sanitary-Epidemiologic Station for Water Transport, Odessa

[Abstract] Many shipboard water treatment devices have been approved by the International Marine Consultative Organization and are widely used on ships. Field testing of these devices to determine their actual influence on bodies of water is necessary. The possible influence of purified water on the sanitary status of ports was studied by comparing sea water quality in two regions with identical hydrogeologic characteristics and bacteriologic background, one of which always had ships present, the other had very few episodic visits by ships. BOD_5, suspended matter, salts of ammonia, surface-active agents, coli index and salinity were determined. It was found that ships equipped with these devices are still a significant source of water pollution in ports. Regression equations and methods of calculating water discharge by ships equipped with these devices are presented and can be used in practice by sanitary-epidemiologic stations in water transport. References 6 (Russian).
[388-6508]

UDC 616.98: 579.843.95]-036.21-078: 579.843.95.083.12

ISOLATION OF L-FORM PLAGUE AGENT FROM WILD RODENTS IN NATURAL FOCAL SPOTS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 8, Aug 82 (manuscript received 13 Jan 82) pp 50-53

DUNAYEV, G. S., ZYKIN, L. F., CHERCHENKO, I. I., KLASSOVSKIY, L. N., PROZOROVSKIY, S. V., METLIN, V..N., RYBKIN, V. S., KURILOV, V. Ya., KOSTYUKOVSKIY, V. M., SAYAMOV, S. R., KULAKOV, M. Ya., ZHUKOVA, S. I., VOLOSIVETS, S. I., SOKOLOV, P. N., BURDELOV, V. A., VAL'KOVA, Ye. R. and MELEKHINA, A. F., Vologograd Scientific Research Antiplague Institute; Central Asian Scientific Research Antiplague Institute, Alma-ata; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Culture methods were developed to grow atypical strains of Yersinia pestis as part of an attempt to test the hypothesis that such strains play a major role in maintaining the epizootic nature of plague. The culture medium used was a 0.3% semiliquid agar based on a beef heart broth containing 10% normal horse serum; details of the culture procedure are given. Cultures were grown from the internal organs of 345 gerbils trapped during 1979-1980 in the area south of Balkhash, a natural focus of infection in Central Asia. The culture medium yielded eight rodlike and 19 unstable L-forms of Y. pestis. Morphologically the L-forms were finely granulated spheroblastlike formations with filaments, showing specific luminescence in staining and positive hemagglutination reaction; 13 of the L-forms reverted to the rod form during culturing. The findings show that the method developed is adequate for identifying unbalanced L-form growth in plague agent isolated from wild rodent at natural sites of infection. References 10 (Russian).
[357-9642]

PRODUCTION OF PROTEIN FEEDS FROM GREEN PLANTS IN LATVIA

Riga NAUKA I TEKHNIKA in Russian No 2, Feb 83

[Article by Yanis Latviyetis, doctor of agricultural sciences: "Protein Feeds from Green Plants"]

> [Text] The problem of a protein deficit in nutrition is world wide. Its solution is being attempted in many nations. In our republic, in particular, a method for obtaining feed products rich in proteins from the green mass of plants is under study and is being transferred to an industrial basis.

A human menu is virtually unthinkable without milk, meat and eggs. But the production of these products is impossible unless there is a sufficient quantity of protein, and especially true protein, in the diet of animals. An acute protein deficiency is fatal for the organism.

Where to find the resources that might fill a protein deficit? One possible solution is to produce a protein concentrate and certain other feed products from grass or other green mass in the process of its mechanical fractionation (pulverization).

The means for pulverizing green plants, the production of juice and pomaces and the methods for their further processing are varied. But the basic steps can be distinguished: the pulverization of the green mass with the most complete possible disruption of the plant cellular structure; the squeezing of the juice; the partitioning of the juice (coagulation of protein to a paste-like consistency and the separation of the serum or so-called brown juice); evaporation of the protein-vitamin paste to a powder-like state; concentration of the brown juice; its fermentation and leavening.

The advantages of this technology by comparison with the traditional means for preparing hay or silage is that here the losses of nutrient matter are smaller (by approximately 15%), there is no direct dependence upon weather conditions and transport costs are negligible. The mechanical fractionation of grasses is much chaper than the means for preparing grass meal and chop. A major advantage is fuel economy: fuel is required to a threefold lesser extent, and if the pomaces are not dried the expenditures are still smaller.

At the same time, the preparation of 600 tons of grass meal (typical seasonal norm of one average-size unit) requires 180-210 tons fuel--as much as is used in the course of a year by an entire machine-tractor park on an average farm!

And what is more, the range of application of the products of mechanical grass fractionation is much wider than for hay, silage, grass meal and chop. Grass juice can be fed in fresh form to pigs and cattle. Substitutes for whole and defatted milk can be prepared from the protein paste and concentrated brown juice (grass serum) after its enrichment with amino acids, mineral elements and other substances. Brown juice can be used to leaven difficult-to-ensile fodders, for example straw. Grass silage or silage is prepared from the squeezed green mass--a pulp containing up to 50-65% moisture--or else the pulp is dried by passage through a drier to a chop or a grass meal.

It should be stated that the production of grass juice and its use for preparing nutritional products and animal feeds is not new. An artificial milk from soy was known many centuries ago in ancient China, Japan and other countries in the Far East. And in 1772 the demonstrator (today, an assistant) of the French Royal Garden (I. Rouelle) produced a mechanical fractionation of green plants completely by accident under primitive conditions. Moreover, he went through all stages that are known to modern technology.

I. Rouelle conducted experiments with flowering hemlock and later with certain other green plants. He converted the plants to a thick "soup", placed them in a linen sack and squeezed out the juice. The juice was heated, and floating dark-green flocks formed on its surface. After the liquid was filtered there remained a greenish-brown serum and a dark-green gelatinous mass of a consistency of cottage cheese with a pleasant taste and an aroma of grass. After "frying" the mass on a typical griddle, something similar to a homogenized dark and thick cheese was obtained.

This description of the first "technological line" for the mechanized fractionation of green plants is given by Yu. F. Novikov in his book "Razgovor o sel'skom khozyaystve" [Conversation on Agriculture] (Riga, Zvaygzne, 1981).

The first commercial method for producing artificial milk was developed by a professor at (Kolozsvar) University (Hungary), (Gustav Rigler). And the first patent known to us for a process for mechanically fractionating green feeds was also issued to a Hungarian--(K. Ereki) in 1927. Although since the end of the 1930s the problems of fractionating green plants and commercially producing artificial milk have been seriously studied also in England and the United States of America and, in recent time, in India, Hungarian scientists even today are some of the most authoritative in this area.

In the RSFSR in the 1940s and 1950s under the management of Professor A. Zubrilin the possibility was studied of using as a product for human nutrition a paste prepared on the basis of green mass and, also, of producing complete feeds (protein-vitamin concentrate) from grass juice in a quantity sufficient for use in pig farming and poultry production.

In Latvia, mechanical fractionation was studied at the end of the 1970s, when the problem "Transformation of Photosynthetic Products" (now usually termed "Bioconservation") began being developed in the nation. A special shop for fractionating green plants and a laboratory where chemical and microbiological analyses are conducted have been created by the initiative of the scientific manager and coordinator of this problem in the republic, Deputy Director of the Latvian SSR Academy of Sciences Microbiology Institute imeni A. Kirkhenshteyn, Academician M. Beker at Uzvara Koklhoz in Bauskiy Rayon.

Several dozen of the nation's scientific research institutions and enterprises work according to a comprehensive program. In our republic, for example, the Cultivation and Agricultural Economy Institute developed and tested a structure for plantings and crop rotations to assure a powerful green-mass biounit. The Latvian Agricultural Mechanization and Electrification Institute assisted in preparing nonstandard equipment and worked out a fractionation technology. The Latvian Animal Raising and Veterinary Medicine Scientific Research Institute is involved in searching for the optimal preservatives and means for storing fractionation products, organizes the zootechnical monitoring of pomaces and so on. Also participating in the work are the wood chemistry and biology institutes of the republic's Academy of Sciences and Adazhi Kolkhoz in Riga Rayon.

The scientists of the Latvian Agricultural Academy perform the biological verification of the final products--the juice, protein-vitamin paste and brown juice. Are they suitable for feeding animals (swine, calves, cows)? It was determined that the juice should be fed partially in fresh form in addition to other feeds and partially stored for the winter. And it is economically more advantageous not to heat but to ferment, leaven and store protein paste in tanks until the winter in order to then feed calves, enriching their basic feed with protein, carotene and vitamin E. It is also recommended that condensed leavened brown juice be used. Grass silage or silage are more suitably prepared from pomaces rather than passing the pomaces through driers in which many useful substances are lost due to the high temperature.

Also studied was the possibility of replacing defatted milk in the winter diet of calves with a green-plant protein-vitamin paste and a condensed, previously-enriched brown juice. The results here are as follows. When, in addition to a green mixture, swine were fed a supplemental 0.7, 1.4 and 2.1 liters lucerne juice each, their daily gain in live mass comprised respectively 559, 571 and 600 g instead of 538 g (weight gain of control swine, whose diet did not include lucerne juice). When juice, protein paste, and brown juice (serum) obtained from lucerne and sugar-beet leaves were fed in equivalent quantities (with respect to the weight of the product's dry mass), swine showed an increase in live mass that was 13.3, 20.1 and 5.3% greater, respectively, than in the control animals.

Also successful was the partial replacement of defatted milk (1.5-3 liters) in the calf ration by an artificial "milk" prepared on the basis of grass

juice, a protein coagulate or condensed leavened brown juice enriched with a lysine feed concentrate. The experimental calves of all age groups grew and developed normally. There can thus be saved 150-200 liters of defatted milk in raising each calf to six months of age. The new technology for preparing feeds is winning increasing recognition. Not only the Uzvara Khokhoz, but also the Adazhi Kolkhoz, the Ogre Sovkhoz and other farms in the republic are interested in it and have begun introducing it.

9942
CSO: 1840/331

PRODUCTION OF ANTIBIOTICS FOR USE IN ANIMAL FEEDS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Feb 83 p 2

[Article by E. Leont'yeva, SOTSIALISTICHESKAYA INDUSTRIYA special correspondent in the column "Economic Review": "How to Raise a Giant"]

[Text] This was a banquet, and the refreshments were abundant. The guests could taste chicken tabak, all-possible cuts of veal, beef and pork and roast and baked turkey, duck and other poultry. All these foods were prepared by highly-qualified cooks. And only they knew the secret of the dishes.

It must immediately be pointed out that the banquet was a tasting. The guests--specialists in the field of nutritional hygiene, medicine, veterinary medicine and microbiology--were required to state their opinions concerning the gustatory qualities of each of the meat dishes. Later, when all "doubles" and "fives", all "for" and "against" were separated into trays it was found that a higher number of votes was gained by dishes prepared from the meat of animals and birds whose diets had been supplemented with feed antibiotics. Such meat, it was found, is distinguished by a subtle aroma, submits readily to processing. looks very appetizing in a prepared form and, which is most important, possesses high nutritional qualities.

What explains this? Feed antibiotics, entering the animal organism wit the food, stimulate the activity of the gastrointestinal tract, promoting a better assimilation of nutrient substances. All this affects the quality of the meat.

Addition of feed antibiotics to animal food in the form of biostimulators began comparatively recently. One ton of food products requires special nonmedical antibiotics in negligible amounts--from 0.5 to 20 grams. But the result obtained is quite significant. After the addition to feed, say, of kormogrizin, animals gain in weight by more than 15 percent compared with the typical diet. Measured in terms of 1 kilogram of chemically-pure material, antibiotic consumption in animal raising yields an economic effect of up to 185,000 rubles.

The use of antibiotics increases poultry egg production sevenfold. The fertility of swine, sheep and fur animals increases by nearly 20 percent. Scientists recently tested these preparations on fish. Carp and sturgeon fry increased their weight gain by 75 percent during the experimental year!

As recently as several years ago our industry produced no more than 200 tons of such preparations per year. And for agriculture this would have been more than enough: their miraculous properties were not as well known as they should have been and were treated with skepticism.

Now, when production has been increased by sixfold, antibiotics, by contrast, are in acute shortage. The USSR Ministry of Agriculture ordered 4,513 tons, while industry promises to deliver only 1,800 tons.

This can largely be explained by the fact that the production of antibiotics for animal raising was organized comparatively recently in our nation. The fact of the matter is that in one and one half decades a subbranch was created, which in terms of production volume emerged in first place in Europe. It grew on the basis of alcohol factores. Characteristically, these enterprises did not have an adequately strong energy service necessary for the production of such preparations, but they nevertheless managed the new load.

The first biostimulator was biovit--a biological vitamin. Since that time the scientists of the Laboratory of Antibiotics, All-Union Bacterial Preparations Scientific Research Institute, have developed ten new biostimulators, four of which have been introduced. However, the existing capacities have not permitted an increase in the production of these preparations in the necessary volumes. A new technical base must be created for the subbranch.

A modern, highly-effective production of feed antibiotics is possible only when special equipment is installed in the factories--tube-compressors and fermenters with stirrers, which, in turn, require a greater energy supply. Chemical Machine Construction supplies the enterprises of the Main Microbiological Industry the necessary equipment in the required quantity. At Talitsa Biochemical Factory, for example, about 20 tube-compressors have been accumulated. But in order for them to be installed a new electrical transmission line must be provided or else a substation must be constructed at the factory. The enterprise must do all this with its own money.

At most factories, because of the inadequate means, the path of least resistance is taken--the construction of the fermenters is simplified. This was done at Nemeshayevo, Novograd-Volynskiy and Verkhnekhortitskiy factories of the Main Microbiological Industry. As a result the available energy capacities are, of course, sufficient, but, firstly, a part of the equipment is lost and, secondly, it runs at one third idle after such an alteration. In this case the losses of such antibiotics as kormogrizin, bacitracin and talazin already amount to as much as 20 percent during preparation due to the obsolete construction of the vacuum-evaporator apparatus. But now, because of the requirements of the Ministry of Agriculture, biostimulator production must be increased by several fold in the immediate future! With today's state of production that is hardly possible.

At the CPSU Central Committee November (1982) Plenum it was especially emphasized that the fulfillment of the Food Program cannot be put off until tomorrow. The production of antibiotics of a nonmedical designation directly "works" for the fulfillment of plans stipulated by this program. Therefore,

it has become acutely necessary to solve the question of how further to increase antibiotic volume: whether to install additional but ineffective equipment or quickly to commence the modernization of enterprises, their radical technical re-equipping on a modern basis. The first option, we are convinced, is unprofitable.

There is experience which, with boldness, can be used as a guide. A Soviet strain is used at the biochemical factory in the Bulgarian city of Peshtera. But tube-compressors and full-capacity fermenters operate there, and a high-quality raw material is used. As a result, a preparation is produced in Bulgaria on the basis of the Soviet strain at twice the quantity as is produced here. While a Bulgarian strain under the conditions of the Ungeny Biochemical Factory yields a production nearly threefold less than the anticipated.

Specialists have calculated that an intensification and technical re-equipping may result in a doubling of the production volume as early as by 1985. True, capital investments are required at a sum of 43 million rubles. That is a lot of money. But, because of the additional production obtained, the national-economic effect will amount to about seven million rubles. One ruble spent will bring 152 rubles profit!

And so, the logic of economic calculations suggests that the reconstruction of enterprises producing antibiotics for animal raising is necessary and warranted. However, among the supervisors of the VPO [not further identified--All-Union Production Association?] Soyuzbakpreparat the point of view is somewhat different. The head of the association A. Yudin and the chief engineer V. Udovchenko, for example, believe that the reconstruction of these enterprises is now disadvantageous.

Such a point of view is warranted in such case where the question runs up against capital investments. But here the situation is otherwise. The deputy head of the USSR Gosplan Microbiological and Combined-Feeds Industry Department, G. Yegorov reported that sufficient money for the development of the branch has been allocated to meet the requirements of the volume of the Five-Year Plan, and that reconstruction in this subbranch today is a question of first-order importance. It cannot be stated more clearly!

The backwardness of the industry producing antibiotics for agriculture is also explained by the fact that only one small laboratory numbering 24 persons is engaged in this very vast and promising science; moreover, three of these people are engaged in questions of the primary evaluation of preparations in animal raising. It may seem strange that the subbranch has virtually no experimental base; there is no modern scientific apparatus and equipment. And, as a result, new preparations are introduced into production and agriculture at slow rates.

The fraction of expenditures for scientific research is still very small--it comprises less than one percent of the market value of the preparations.

All these large and small details suggest that the Main Microbiological Industry is still inadequately purposefully engaged in developing the research and production of feed antibiotics for animal raising.

9942
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NEW HANDBOOK ON STRUCTURAL AND MECHANICAL CHARACTERISTICS OF FOODS REVIEWED

Moscow RYBNOYE KHOZYAYSTVO in Russian No 1, Jan 83 p 79

[Review by Prof I. P. Levanidov, doctor of engineering sciences, TINRO (Pacific Ocean Scientific Research Institute of Fisheries and Oceanography)] of book "Strukturno-mekhanicheskiye kharakteristiki pishchevykh produktov" (Structural and Mechanical Characteristics of Foodstuffs) by A. V. Gorbatov, A. M. Maslov, Yu. A. Machikhin et al., edited by A. V. Gorbatov, Moscow, Izdatel'stvo "Legkaya i pishchevaya promyshlennost'", 1982, 296 pages]

[Text] Processing of fish both on commercial ships and at plants is related to processes of moving whole fish, chopping its meat, mechanical processing of whole tissues, with transportation of chopped fish over pipes [ducts], etc. For this reason, the handbook published by "Legkaya i pishchevaya promyshlennost'" [Light and Food Industry] Publishing House is of definite value to the designers of equipment, scientific and practical workers, instructors and students at VUZ's. The fundamental value of the book is that it examines the presence of characteristics of virtually all foodstuffs, indication of their significance and applicability for planning the working units of machinery and apparatus, as well as to assess the quality of products. It is noted that fish and products of its processing are similar in characteristics to meat products, so that they can be put in the same section.

The first part of the handbook contains general theses, bases of theory, describes methods and instruments for determining structural and mechanical characteristics. It should be noted that this brief information enables the reader to orient himself in all of the other parts of the book.

The second part offers factual information on structural and mechanical characteristics of foodstuffs. Of the diversity of existing data, the authors have submitted the most reliable ones and, in a number of instances, have analyzed them, which enables the reader to select what he requires.

The third part deals with the possibility of using factual data both for planning the operating units of machinery and checking a number of industrial processes, as well as assessing product quality. This part is also notable for the fact that it submits in concise form extensive information, many of the conceptions being original.

The entire material in this handbook is submitted on a high scientific level. There is every justification to maintain that the relevance of this work exceeds the limits of a narrowly specialized guide and, in addition, has elements of a monograph and textbook, being the most complete publication of this kind, not only in the USSR, but abroad.

Nevertheless, in spite of the high quality of presentation of material as a whole, the book also has some flaws.

In the theoretical part (Section 1), there should have been more detailed demonstration of the general methods of integrating the main differential equations and methods of using integral functions, with greater details about experimental methods and processing of experimental data. In the subsection dealing with structural and mechanical characteristics of fish products, facts are submitted in sufficient detail about the friction characteristics, but for the submitted shear characteristics material published in the periodic press was not taken into full consideration. In the third section, in addition to the theoretically validated but complicated mathematical functions, the reader should have been provided with simple, tentative computing formulas and some tabulated information. There are also some inaccuracies in formulations and dimensions, as well as typographic errors. However, these flaws do not minimize the great importance of the book.

10,657
CSO: 1840/325

FOOD PROGRAM AND TASKS FOR FISH INDUSTRY SCIENCE

Moscow RYBNOYE KHOZYAYSTVO in Russian No 1, Jan 83 pp 3-6

[Article by S. A. Studenetskiy, candidate of economic sciences, All-Union Scientific Research Institute of Sea Fisheries and Oceanography]

[Text] The goal of the Food Program was distinctly defined at the 26th CPSU Congress: "To solve the problem of uninterrupted supply of foods to the public as quickly as possible."

The production of foodstuffs should provide for a well-balanced and optimum diet for the entire Soviet people. For this reason, it can be stated that the ultimate goal of the Food Program is to meet the requirements of the public with regard to the most important nutrients--protein, fat, carbohydrates, minerals and trace elements. Since there are concrete types of products that contain nutrients, scientist-economists suggest that several subprograms of utmost importance be singled out in the Food Program, which correspond to the basic forms of end foodstuffs (meat-dairy, fruit and vegetables, oil and fat, fish, etc.).

In the period that has elapsed since the March (1965) Plenum of the CPSU Central Committee, the rate of increase in agricultural production exceeded population growth, which made it possible to improve significantly the level and quality of the diet of Soviet people. Our country has advanced to the level of the best developed nations in the world with regard to caloric value of nutrition.

But in the Food Program the goal has been set of providing the public with foods on the level of optimum norms of consumption per capita.

The development in our country of food production in the 1965-1980 period was characterized by progressive approximation to the level of optimum consumption (see Table).

The distinctive feature of the decisions at the May (1982) Plenum of the CPSU Central Committee is that it formulated the objective of reaching a new level of public consumption of foodstuffs, including those of greatest value to the human body.

Proteins of animal origin are very important to organization of optimum nutrition. The body's daily protein requirement (plant and animal origin) has been set by science at 80-100 g.

Market group	Consumption, kg/year per capita					
	recommended standards	1965	1970	1975	1980	1990 (tentative plan)
Meat and meat products	82	41	48	57	58	70
Milk and dairy products	405	251	307	316	314	330-340
Eggs, quantity	292	124	159	216	239	260-266
Vegetables and cucurbits	146	72	82	89	93	126-135
Fruit	113	28	35	37	34	66-70
Vegetable oil & margarine	9	7.1	6.8	7.7	8.8	13.2
Fish and fish products	18.2	12.6	15.4	16.8	17.6	19
Grain products	110	156	149	141	139	135
Potatoes	97	142	130	120	112	110
Sugar	40	34.2	38	40.9	44.4	45.5

It is known that proteins consist of different amino acids, about half of which the human body cannot synthesize. Consequently, these amino acids should be taken in foodstuffs. Since amino acids are contained in large quantities and optimum proportions only in animal protein, such products are the most important and essential element of the diet.

Animal protein should constitute 50-60% of the entire daily protein requirements of man, i.e., 50-60 g. A high concentration of animal proteins per unit mass with the proper set of amino acids is the reason for the high nutritional value of fish. Therefore, a large part is attributed to the nation's fish industry in solving the problems of further increasing food production set forth in the Food Program.

At the present time, fish production constitutes one-fourth of the meat and fish balance of our country. Such production is referable to 58 sectors of the national economy. Large-scale animal, poultry and fur farming industries of our country make active use of fish products serving as feed.

Fish production for human food purposes has high national economic effectiveness. The state's expenses to produce 1 kg fish protein are almost one-third the amount needed to produce 1 kg of meat protein. The capital-output ratio for fish production is considerably lower than for meat.

The specific indicators of the Food Program referable to the fish industry are the volumes of end product furnished for personal use by the public and extent to which the optimum [rational] consumption norm has been reached. Implementation measures are an element of any food subprogram. For the fish product subprogram (in other words, for the fish sector), this refers primarily to questions of raw material base, which are, of course, of paramount importance.

An increase in production of edible fish products to volumes that would assure consumption thereof, starting in 1984, in accordance with the optimum consumption norm, i.e., 18.2 kg, as well as further improvement of its quality and expansion of assortment of items, are the main direction of development of our sector in the next few years.

It is planned to bring edible fish production up to 4.2 million tons and canned fish items to 3000 mub [expansion unknown] by 1985, to 4.3-4.5 million tons and at least 3200 mub, respectively, by 1990.

One of the distinctive features of the Food Program is that it includes a broad system of measures to intensify the role of science in implementing it.

If we examine from this vantage point problems of raw materials base of the Soviet commercial sea and ocean fishing, we shall find that our fishing industry is quite "scientific": almost 70% of all expenses on sea fishing science are referable to providing a stable raw materials base for the fishing fleet.

The entire route of development of sea fishing science is distinguished by the fact that its achievements were rapidly adopted by practice which, in turn, constantly posed new problems to science. Thus, there was feedback, which helped solve the problems put by the fishing industry, which often went beyond the limits of the original formulation of the problem. It is expressly in this way that our oceanological and ichthyological research is developing, and scientific problems are constantly growing more complex, which means so are the plans for solving them in accordance with the logic of research.

There has been much development of research on quantitative determination of biological resources and forecasting overall available catches, which are the basic strategy for development of this sector in the future. Studies, the results of which provide the basis for forecasting the distribution and behavior of fish, i.e., the basis for organizing large-scale fishing, require expansion and reinforcement with personnel. This is all the more important since expressly such investigations are urgent within the limits of the Food Program and, as noted at the May (1982) Plenum of the CPSU Central Committee, we should concentrate our concerns on them.

Current knowledge about the world oceans warrants the belief that their biological products amount to hundreds of billions of tons. Yet mankind is using only a negligible part, 75 millions tons, which is the volume of worldwide fishing yield at the present time.

Use of phytoplankton and zooplankton, with the exception of antarctic shrimp (krill), which yield the bulk of biological products, is unlikely at the present level of development of technological progress. For example, it has been estimated that 1 million cubic meters of ocean water would have to be filtered to recover raw [crude] plankton, and this would require quite a lot of energy.

The conception prevails among scientist-oceanologists that the biological resources of the oceans are limited. However, this is relative limitation, which cannot be equated with already existing depletion of bioresources of the oceans. The possible annual catch of fish and other objects on a worldwide scale is estimated by different scientists at 70-240 million tons. It should be borne in mind that scientists concerned with estimating fish productivity of the oceans do not all use the same methodological approach to the problem. Should one proceed from overall biological productivity of the ocean or productivity referable to objects that are economically valuable from today's vantage

point? Should one take into consideration or not the possible yield of antarctic shrimp? Sometimes, fish productivity is determined on the basis of actual catch in some region or other, erroneously classifying highly productive zones in the "blue desert" category.

It is known that analysis of commercial fishing results in some region or other yields information required to assess its fish productivity. Nevertheless, in assessing fish productivity, the level of development of the material and technical base of commercial fishing and its inevitable progress are often not taken into consideration. For this reason, the present volume of worldwide catch of 75 million tons can be considered, to some extent, as the maximum with the existing level of productive forces in worldwide fishing and socioeconomic relations, within the framework of which biological resources are being recovered. This thesis can be backed up by the following data of FAO [WHO Food and Agriculture Organization]: In 1980, about 30 million tons of shelf biological resources were not utilized, the breakdown for different continents being as follows: 17 million tons for America, 5 million tons for Asia, 5 million tons for Africa, 3 million tons each for Australia and Oceania.

At the present time, the USSR catch constitutes 12-13% of worldwide fishing yield. There is no equal to our country with regard to abundance and diversity of marine bioresources. Our inland seas and fresh waters are unique in productivity. The results of studies of waters of the North Atlantic adjacent to our shores and northwestern part of the Pacific, as well as several open regions of the world oceans, and assessment of potential catches there enable us to state with confidence that the objectives of the Food Program in the area of volume of production of edible fish products are generally provided with a raw materials base, and this is vivid confirmation of the fact that our studies of oceanic raw material are definitely on the right road.

However, it should be borne in mind that the main reserves for augmenting both the worldwide and USSR catches in the future are referable to use of mesopelagic fish species and commercial objects on the lowest trophic level.

At the present time, the most important task for our industry is utmost processing of raw material for food purposes.

In the worldwide fishing industry, use of catches to produce foodstuffs has demonstrated a visible tendency toward decline in the last 3 decades. While 85.8% of the world catch had been used for food purposes in 1950, this applied to only 70.0% in 1980.

In 1980, in our industry more than 70% of all fish caught was used to produce foodstuffs. The goal for the end of the five-year plan is to utilize 76% of the entire catch for food production.

Of the entire diversity of tasks pertaining to food production that are confronting science and practice, there is one that we must single out, upon which the problem of building up edible fish products largely depends. As we have indicated above, the future build-up of worldwide (and Soviet) catches will most probably occur by means of including mesopelagic fish and objects on the

lowest trophic level as resources. Because of the innate distinctions of these objects, it is impossible to make broad use of them directly for food purposes without profound chemical and technological processing, and this has not been typical to date of fish product industry.

The research and investigations pursued in this direction lead to the conclusion that we are faced with the need to change to a qualitatively different level of processing animal raw material of marine origin. This will require development of new technological processes of waste-free production, basically new, highly productive industrial equipment and, of course, training qualified personnel in technological specialties that are new to our industry. At the same time, use of new methods and means of food production could result in a significant increase in production and consumption of fish products in the future.

By 1990, it is planned to bring edible fish production up to volumes that would provide 19 kg per capita, which will exceed the norms recommended by the Institute of Nutrition, USSR Academy of Medical Sciences and make it possible to equalize, to some extent, the balance of consumption of protein of animal origin in our country.

10,657
CSO: 1840/325

UDC 639.2.053.8.001.2

PRINCIPLES AND METHODS OF DETERMINING COMMERCIAL FISH RESERVES AND HARVEST PREDICTIONS

Moscow RYBNOYE KHOZYAYSTVO in Russian No 1, Jan 83 pp 28-32

ZEMSKAYA, K. A., BORISOV, V. M. and MALKIN, Ye. M., All-Union Scientific Institute of Sea Fisheries and Oceanography

[Abstract] Considerationis given to the techniques used in estimating marine fish reserves on short-term (quarterly, monthly, biweekly) and long-term (1-2 years) bases. Although quite similar considerations enter into both estimates, the former relies more on actual observations and mapping of fish grounds, control expeditions, visual and hydroacoustic scanning and environmental factors at a given point in time. Long-term estimates are more statistical in nature and pay particular attention to population characteristics of the commercial fishes of interest, the reproductive rate, migration patterns and cyclical nature of food supply, as well as long-term climatological predictions. The various factors taken together determine the fishing strategy, such as the number and disposition of vessels and the targeting of particular species. More recently, sophisticated mathematical methods have come to be employed in predicting long-term reserves, in particular the use of virtual population analysis. Many of the foundations for the mathematical estimation of fish reserves had been laid by Soviet scientists in the twenties and thirties.
[326-12172]

UDC 664.951.014:577.115

CHANGES IN THE LIPIDS OF THE PACIFIC OCEAN HERRING DURING SALTING AND STORAGE OF LIGHTLY SALTED SPECIMENS

Moscow RYBNOYE KHOZYAYSTVO in Russian No 1, Jan 83 pp 69-72

LEVANIDOV, I. P., professor, doctor of technical sciences,
POVALYAYEVA, N. T. and GERASIMOVA, N. A., Pacific Ocean Scientific and Research Institute of Fisheries and Oceanography

[Abstract] Biochemical studies on salted herring harvested from the Pacific Ocean showed that during curing and storage at low temperatures, lipases retain their activity. As a consequence, lipids undergo hydrolysis with the release of free fatty acids that form lipoprotein complexes as a result of interaction with the amino groups of free amino acids, peptides and other compounds formed during proteolysis. During the first 1.5 months of storage, lipolysis inovlves primarily phospholipids, and thereafter neutral lipids. Lipolysis is greater in whole fish than in eviscerated specimens, with the formation of lipid-protein complexes being particularly strong at temperatures around 10°C. The quality of herring products can be markedly improved by storage at 0 to 4°C during the first one to 1.5 months. Figures 2.
[326-12172]

GENETIC ENGINEERING

Kiev RADYANS'KA UKRAYINA in Ukrainian 8 Feb 83 p 3

[Article by T. Tykhonenko, doctor of biological sciences, Associate Director, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Text] The scientific and technical revolution which is occurring today is characterized by intimate bonds between science and industry. Biology has not escaped this type of association.This is evidenced by the development of a microbiological industry, the extensive industrial application of biological catalysts, advances in the breeding of antibiotic-producing and other useful microorganisms, and the implementation of biological control methods for agricultural pests. However, this trend is most apparent in the newly developed applied field of biotechnology, which represents an organic synthesis of industrial biochemistry, microbiology, and genetic (gene) engineering.

The last named field is particularly active. Having separated recently from molecular biology and genetics, genetic engineering has exercised a tremendous influence on biology, medicine, and industrial microbiology. It can be characterized as a system of experimental methods that makes it possible to create, in the laboratory, artificial genetic structures -- the so-called recombinant (hybrid) DNA molecules. In distinction to classical genetics and breeding,a number of key genetic processes are recreated at the molecular level. What in nature is within the scope of an entire organism has, in the laboratory, become an operation carried out with cells or molecules. Recombination, a process which results in the new association of certain genes, is carried out in a test tube at the will of a researcher.

In our country genetic engineering has found practical applications. Considering how young this branch of science is, it has happened very rapidly. We now have results on the basis of which we can talk about the practical effects of genetic engineering. And that's just the beginning.

Obviously, the initial changes to be expected will occur in medicine. Genetic engineering will make it possible to greatly improve the quality of vaccines and sera. At the present time vaccines are produced from killed or attenuated microbes or viruses. The microorganisms which are utilized in a vaccine cannot multiply but can induce specific antibodies in humans.

However, this traditional method has its shortcomings. In addition, vaccines obtained in this manner are sometimes very expensive. A more reliable and safer approach consists of utilizing purified viral envelope proteins. They cannot multiple in the body as can whole microorganisms, but they do induce antibody formation. By incorporating genes for viral envelope proteins into plasmids (genetic elements that exist independently of chromosomes) large quantities of pure viral antigen can be obtained, which constitutes an ideal material for vaccination.

During the last two years Soviet scientists have created recombinant plasmids that carry genes for a number of influenza and adenovirus proteins, and have obtained complete or partial DNA copies of genomes (totality of chromosomes) for such viruses as poliomyelitis, foot-and-mouth disease, tick-borne encephalitis, and others. Particular attention has been accorded to influenza because of the serious economic consequences that this entity entails.

Yet another application of genetic engineering in medicine consists of preparation of recombinant DNA capable of being incorporated into animal genomes. By introducing fully functional genes into the genome of a defective cell we can expect to correct genetic defects, particularly human hereditary diseases. The therapeutic perspectives for such diseases are very bright if we take into account the encouraging results obtained by Soviet scientists during the last two years in studying thalassemia-type blood diseases and the Wilson-Konovalov type of diseases.

Soviet scientists also expect to achieve success in solving problems pertaining to nitrogen fertilizers in agriculture. Converting such crops as wheat or corn to nitrogen fixers would be of great significance. Nitrogen fertilizers are expensive and poorly assimilated by plants. A significant portion of such fertilizers is decomposed by soil microorganisms or carried off by water into reservoir where dangerous nitrates and nitrites are formed; the latter are known to be carcinogenic in large quantities.

A solution is suggested by the legumes that exist in symbiosis with nitrogen-fixing bacteria that assimilate nitrogen directly from the atmosphere. Consequently, extensive studies are being conducted on transfering groups of genes responsible for nitrogen fixation into other bacterial species. There is also a project for transferring such genes directly into plants. Obviously, any solution that would replace the need for nitrogen fertilizers would have a tremendous economic impact.

The methods of genetic engineering can also be used in industrial microbiology to solve the problem of shortage of animal proteins, including food and feed proteins. It would be possible to arrange for the synthesis of certain amino acids that are present in limited quantities in plant products.

Environmental protection could benefit greatly by using genetic engineering to construct microorganisms efficient in transforming industrial and domestic waste products. At the present time recombinant DNA technology has already provided us with bacterial strains that efficiently degrade oil

and may find use in cleaning up oil pollution. Experiments are being conducted on the formation of new types of recombinant microorganisms capable of decomposing synthetic polymers that are nonbiodegradable under natural conditions.

Other facets of genetic engineering deal with research that may have far-reaching consequences in the future but at the present may appear to be pure phantasy. An example of such research is a project concerned with the industrial production of hydrogen by photosynthesizing bacteria, the creation of a microbiologically derived molecular diode that may serve as elementary cell in supraminiature EOM [expansion unknown] of the future, etc. At this point genetic engineering impinges on traditionally nonbiological spheres of human endeavor.

12172
CSO: 1840/327

UDC 577.155

ISOLATION, PURIFICATION AND CHARACTERISTICS OF Eco RII RESTRICTION ENDONUCLEASE

Moscow BIOKHIMIYA in Russian Vol 47, No 4, Apr 82
(manuscript received 12 Mar 81) pp 619-625

KOSYKH, V. G., PUNTEZHIS, S. A., BUR'YANOV, Ya. I. and BAYEV, A. A., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] A method is described for the isolation and full purification of Eco RII restriction endonuclease and data are presented on the subunit structure and molecular weight of the enzyme. The work was done with E. coli strain B834/pSK323, containing recombinant pSK323 plasmid, which insures a high rate of Eco RII enzyme synthesis. Medium, reagents, methods for determination of R. Eco RII activity and molecular weights, and protein concentrations are fully described. After purification of the R. Eco RII to an electrophoretic homogeneous condition it was demonstrated, by polyacrylamide gel electrophoresis and confirmed by DS-Na electrophoresis, that the enzyme is a protein consisting of two subunits each having a molecular weight of 44,000; the enzyme retains its initial activity for at least 6 months when stored in 50% glycerin at -20°C. The use of R. Eco RII in DNA studies is discussed in light of the findings. Figures 7; references 21: 3 Russian, 18 Western.
[354-9642]

UDC 577.159

USE OF AFFINITY CHROMATOGRAPHY FOR PURIFYING Eco RI and Bgl II SPECIFIC ENDONUCLEASES

Moscow BIOKHIMIYA in Russian Vol 47, No 4, Apr 82
(manuscript received 25 May 81) pp 686-694

MIROSHNICHENKO, O. I., NARODITSKIY, B. S., KHIL'KO, S. N., PLATONOVA, T. N., GRUBER, I. M. and TIKHONENKO, T. I., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences (AMS), Moscow; Institute of Vaccines and Sera imeni I. I. Mechnikov, USSR AMS, Moscow

[Abstract] Methods are described for obtaining highly active Eco RI and Bgl II by chromatography on sorbents with covalently-added active groups. Cultures of E. coli K-12 1100 182 and Bac. globiggii were used to obtain the endonucleases. Isolation procedures, which included cell disruption by ultrasound, centrifugation and chromatography, are fully described. The synthesis and use of blue dextran-Sepharose, folate-Sepharose and phenyl-Sepharose as the affinity adsorbents are characterized in detail. The experimental procedures described make it possible to eliminate the intermediate stages of dialysis and concentration in the optimal conditions as described. The findings indicate that phenyl-Sepharose purification with appropriate conditions for sorption and elution makes it possible to obtain Bgl II and Eco RI restrictases 3-5 times purer in terms of specific activity even after preliminary chromatography on more specific sorbents; and that Bgl II and Eco RI possess quite marked hydrophobic properties. The procedures described enabled the authors to obtain Eco RI and Bgl II fractions that did not contain nonspecific nucleases or phosphatases, thus making them suitable for physical mapping and cloning. Figures 7; references: 15 Western. [354-9642]

UDC 577.157.6 + 547.963.32

USE OF DNA-METHYLASES AS REAGENTS FOR OBTAINING ISOTOPE-TAGGED DNA

Moscow BIOKHIMIYA in Russian Vol 47, No 4, Apr 82
(manuscript received 6 Aug 81) pp 695-697

BUR'YANOV, Ya. I., BOGDARINA, I. G., NESTERENKO, V. F. and BAYEV, A. A., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] The use of bacterial DNA-methylases is proposed as reagents for obtaining isotope-tagged DNA; such a method would eliminate some of the difficulties inherent in other chemical and enzymatic methods of labeling DNA in vitro. Experimental work was done using Eco RII, Eco dam and Eco MRE600 dcm I; experimental conditions are described. It was found that both methylated and nonmethylated DNA lambda phage show the same degree of infectiosity in the

E. coli indicator strain, indicating no DNA degradation in the DNA-methylase reaction. When 1 microgram S-ademosylmethionine at 15 Cu/mmol was used, average activity was $1 \cdot 10^5$ cpm. Specific activity of tagged DNA can be altered by varying the DNA-methylases used in the reaction. It is suggested that it will be possible to methylate DNA in conditions of relaxed site specificity for the DNA-methylase, which will enable the DNA methyl groups to be included with greater frequency; a high rate of inclusion of the methyl groups in the DNA is also possible by using a broad selection of DNA-methylases having different site specificity. Experimental findings that inclusion of the methyl groups made up 30 percent of free duplex DNA justifies the expectation that the DNA-methylases can be used in protein-nucleotide reaction experiments. No references.
[354-9642]

SOVIET PHYSICOCHEMICAL BIOLOGY EXPERIENCE IN INVESTIGATING BIOLOGICAL ROLE OF MEMBRANE LIPIDS

Moscow BIOKHIMIYA in Russian Vol 47, No 4, Apr 82 pp 698-700

BODYREV, A. A.

[Abstract] The author reviews the following books on lipid studies: "Cell-Membrane Lipids" by Ye. M. Kreps, Leningrad, "Nauka" publishing house, 1981; "Functional Biochemistry of Synapses" by R. N. Glebov and G. N. Kryzhanovskiy, Moscow, "Meditsina" publishing house, 1978; "Structure and Function of Biological Membranes" by P. G. Bogach (deceased), M. D. Kurskiy et al., Kiev, "Vysshaya shkola" publishing house, 1981. "Cell-Membrane Lipids" is divided into two parts: the first presents a short summary on the general properties of lipids, and the second and larger part of the book contains material gathered by its author during his long-time lipid studies, enabling the conclusions first, that the general structure of membranes in neural tissue was formed at an early evolutionary stage, and second, that the initial structure was selectively reinforced by the range of lipids included in it. The Glebov-Kryzhanovskiy book deals with basic metabolic processes in synapses, specific mechanisms of the synaptic transmission, and the biochemistry of the mediator systems, reviewing much of the published work on these subjects. The "Structure and Function of Biological Membranes" is one of the first general textbooks on the subject. No references.
[354-9642]

UDC 579.842.11: 579.252.5

GENETIC TRANSFER OF PLASMIDS pAP38, pAP39 AND pAP41 TO STRAINS OF E. COLI, ERWINIA AND HAFNIA

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 8, Aug 82 (manuscript received 13 Jan 82) pp 59-63

ABDIYENKO, I. D., SHCHIPKOVA, N. I., CHEMLEVA, N. G., KHOKHLOVA, T. A. and PEKHOV, A. P., Institute of General Genetics, USSR Academy of Sciences, Moscow

[Abstract] A study was made of the ability of Tn1 and Tn9 transposon-marked plasmids pAP38, pAP39 and pAP41 for transfer conjugative transmission in typed and untyped E. coli and in Erwinia and Hafnia; the feasibility of mobilizing chromosome transfer using these plasmids, their stability in bacteria of other species, and their ability to suppress F-plasmid function were investigated. Experimental procedures are described. Findings showed that transfer varied between 10^{-2} and 10^{-8} for E. coli K-12 (AP106, AP114, AP 115); frequency for Erwinia and Hafnia was within the same range. Chromosome transfer was effected only in pAP41; mobilization of chromosomal genes is determined both by the nature of the plasmid and of the donor strain. Transferred factors remained stable for up to 10 days. Elevated temperature and treatment with ethylidene bromide resulted in elimination of the factors. Studies showed that pAP38, pAP39 and pAP41 and f^+ plasmids. References 5: 3 Russian, 2 Western.
[357-9642]

UDC 547.963.32.07;577.113.6

CHEMICAL-ENZYMATIC SYNTHESIS OF STRUCTURAL GENE CODING FOR YEAST $tRNA_1^{Val}$

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 9, No 1, Jan 83 (manuscript received 2 Aug 82) pp 43-51

BERLIN, Yu. A., LEBEDENKO, Ye. N., KAYUSHIN, A. L., KARPOV, V. A. and KOLOSOV, M. N., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow

[Abstract] The structural gene, coding for yeast $tRNA_1^{Val}$, was synthesized by a chemical-enzymatic method. Two oligonucleotides were synthesized by the phosphotriester method and combined with gene fragments to yield a binary chain 82-membered polynucleotide--the structural gene tRNA containing EcoRI and HindIII sites at its terminals. Then the gene was inserted into plasmid pBR322 and cloned. The primary structure was identified by a modified Maxam-Gilbert method. This synthesis makes it possible to study biosynthesis and functions of eukaryotic $tRNA^{Val}$, including comparative investigation of the expression of synthetic and natural genes in bacterial and yeast cells. Figures 5; references 15: 6 Russian, 9 Western.
[401-7813]

UDC 577.112.5

PRIMARY STRUCTURE OF CALMODULIN FROM HUMAN BRAIN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 9, No 1, Jan 83
(manuscript received 4 Aug 82) pp 123-126

ALAKHOV, V. Yu. and SEVERIN, Ye. S., Institute of Molecular Biology, USSR Academy of Sciences, Moscow; VINOKUROV, L. M., Institute of Protein Research, USSR Academy of Sciences, Pushchino, Moskovskaya Oblast; and DUDKIN, S. M., Institute of Organic Chemistry imeni N. D. Zelinskyy, USSR Academy of Sciences, Moscow

[Abstract] Complete aminoacid sequence of calmodulin obtained from a single human brain was obtained. In comparison to the structure of calmodulin from bovine brain it showed three amide→acid changes at positions 24, 60 and 129 and two acid→amide changes at 104 and 135 positions. All of them occurred at Ca binding domains; however no functional meaning could be ascribed to these substitutions at this time. After completion of this work, Titani et al, reported the same findings except that those authors observed no changes at the positions 60 and 104. This difference could not be due to inaccuracies in the determinations but possibly due to physiological modification of the molecule. References 26: 1 Russian, 25 Western.
[401-7813]

UDC 577.152.314'1

SITE-SPECIFIC ENDONUCLEASE BmeI FROM BACILLUS MEGATERIUM 216

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 9, No 1, Jan 83
(manuscript received 29 Jul 82) pp 127-129

PACHKUNOV, D. M., KRAMAROV, V. M., DOBRITSA, A. P. and MATVIYENKO, N. I., Institute of Protein Research, USSR Academy of Sciences, Pushchino, Moskovskaya Oblast

[Abstract] A novel site-specific endonuclease BmeI was isolated from Bacillus megaterium strain 216. It was established that the restrictase BmeI recognized the following sequence on the double stranded DNA:

5'-GG↓(A)CC-3'

3'-CC(T)↑GG-5'

and hydrolyzed it at the intermolecular bonds marked by the arrows. The central base pair (in parentheses) could be in any orientation. This endonuclease was related to AvaII type isoschisomers, differing from them by the fact that during DNA hydrolysis at the 5' terminal only one nucleotide appeared and not three. Figure 1; references 7; 1 Russian, 6 Western.
[401-7813]

UDC: 579.842.11:579.252.5

GENETIC SPECIFICS OF TRANSFER-FUNCTION DEPRESSED pAP53 PLASMIDS FOUND IN PATHOGENIC E. COLI CELLS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 94, No 8, Aug 82 (manuscript received 17 Feb 82) pp 92-95

BUYANOVA, N. I., SHCHIPKOV, V. P. and PEKHOV, A. P., Department of Biology and General Genetics, People's Friendship University imeni Patrice Lumumba, Moscow

[Abstract] A study is presented of genetic specifics of transfer-function depressed F-like pAP53 plasmids defining the synthesis of colicine found by the authors in the cells of opportunistically-pathogenic E. coli, serogroup 0128. Conjugation transmission of plasmids was performed in standard 2-hour crossings using the K-12 strain of E. coli which is resistant to nalidixic acid or streptomycin as the donor or recipient. Plasmid transmission frequency was determined from the number of plasmid transconjugates per donor strain cell from the conjugation mixture. Sensitivity of the bacteria to donor specific phage MS2 was determined by the agar layer method. The results produced indicate that pAP53 has no functionally active Tra-function inhibition system. However, this plasmid is sensitive to another type of inhibitor system, carried by the plasmid pAP41. This indicates that pAP53 could be used as an additional test system in the classification of new plasmids based on the characteristics of their genetic transfer-function regulation system. References 12: 8 Russian, 4 Western.
[380-6508]

UDC 577.1

ISOLATION AND CHARACTERISTICS OF RECOMBINANT CLONES OF HUMAN DNA, CODING 35 kD POLYPEPTIDE OF THE FROG CRYSTALLINE LENS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 268, No 5, Feb 83 (manuscript received 13 Dec 82) pp 1260-1263

NGUYEN, NGOK K'YUNG, TOMAREV, S. I., ARUTYUNYAN, K. G. and GAUZE, G. G., Institute of Developmental Biology imeni N. K. Kol'tsov, USSR Academy of Sciences, Moscow

[Abstract] [^{32}P] kDNA synthesized on mRNA of frog crystalline lens, and which codes polypeptides of crystallins was used to screen the human genome bank in order to isolate genes coding crystallins. DNA sequences coding homologous parts of the gene for 35 kD of the polypeptide of frog beta-crystallin are present in the human genome. These sequences were isolated in three non-identical recombinant phages. It was assumed that the isolated clones contain genes or pseudo-genes of human beta-crystallins. It was proposed that identification of polypeptides which may be coded by recombinant

clones isolated from the human genes bank may be used to explain problems concerning the evolution and interrelationships of beta-crystallines in vertebrates. Figures 2; references 10: 3 Russian, 7 Western.
[408-2791]

UDC 612.014.24.576.315.42:577.213.3]-088.1:681.31

COMPUTER ANALYSIS OF DATA CONCERNING CHROMATIN FRAGMENTATION BY NUCLEASES

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 95, No 1, Jan 83 (manuscript received 20 Apr 82) pp 117-119

KHODAREV, N. N., SOKOLOVA, I. A., SOKOLOV, A. A., BERMAN, Ya. Z. and VOTRIN, I. I., Laboratory of Enzymology, USSR Academy of Medical Sciences, Moscow

[Abstract] A method of computer analysis of densitograms, used to compute individual peaks from the overall plot of DNA distribution on gels and a comparison of the dynamics of accumulation of nucleosomes and their oligomers in the course of fragmentation of chromatin were described and discussed. Comparison of experimental data with a computer model of the breakdown of 500-nucleosome chromatin segments showed that the yield of dinucleosomes and trinucleosomes for the given number of mononucleosomes is less than that predicted by the model, indicating a restriction of action of the endogenous nuclease (in comparison with the stochastic version) which increases the probability of formation of mononucleosomes during a single two-chain rupture of the DNA. Figures 3; references 8: 2 Russian, 6 Western.
[369-2791]

UDC: 678.245.08

COMPARATIVE STUDY OF PLASMID AND NATURAL HUMAN INTERFERON BIOLOGIC PROPERTIES

Moscow VOPROSY VIRUSOLOGII in Russian No 1, Jan-Feb 83 (manuscript received 30 Sep 82) pp 14-20

OVCHINNIKOV, Yu. A., ZHDANOV, V. M., SOLOV'EV, V. D., NOVOKHATSKIY, A. S., ASPETOV, R. D., SHAYKHINOVA, T. B., SAVITSKIY, G. K., SVERDLOV, Ye. D., TSAREV, S. A., MONASTYRSKAYA, G. S., KHODKOVA, Ye. M., YEFIMOV, V. A., CHAKHMAKHCHEVA, O. G. and KUZNETSOV, V. P., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences; Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Interferon has not been broadly used due to the difficulty of producing it from donor blood lymphocytes and diploid human fibroblasts. Gene

engineering has now solved this problem. Recombinant bacteria clones synthesizing human α, β and γ interferon have been obtained. Recombinant bacteria clones synthesizing human αF and αF/D (hybrid) interferons were recently produced in the USSR by inserting interferon genes into E. coli with subsequent direct expression of the functionally active protein interferon. This article presents the results of a comparative study of the biologic properties of human plasmid and natural interferons. The plasmid and natural human interferons both induced antiviral resistance not only in homologous but also in some heterologous cells. Plasmid interferons also had a clear protective effect in L_{929} muscles cells which were insensitive to natural α interferon. Sensitivity levels of the viruses tested are noted. No potentiation of antiviral activity was observed upon combined use of plasmid and natural α interferon with human γ interferon. The immune interferon has a greater anticellular activity than the leucocytic and fibroblast interferons, indicating that it is a promising preparation for treatment of neoplastic disease. References 29: 7 Russian, 22 Western.
[702-6508]

UDC 612.017.1(47 + 57)"1981-1985"

DEVELOPMENT OF GENERAL AND APPLIED IMMUNOLOGY IN THE USSR DURING 11TH FIVE-YEAR PLAN (GOAL-ORIENTED PROGRAM TO SOLVE THE MOST IMPORTANT SCIENTIFIC AND TECHNICAL PROBLEMS: 0,67,07. IMMUNOLOGY AND MEDICAL GENETICS)

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 82 pp 79-81

PANTELEYEV, E. I., Scientific Secretary of the program

[Abstract] The efforts of Soviet scientists in development of immunology are guided by comprehensive program No 0,69,07 entitle "The study of genetic and molecular mechanism impairing immunity and responsible for hereditary diseases, and the development on this basis of methods and means to prevent, diagnose and treat them." About 60 scientific establishments are involved in the immunology section of this program, including the Second Moscow Medical Institute imeni Pirogov (48 tasks), the USSR Ministry of Health Institute of Biophysics (40 tasks), the Institute of Epidemiology and Microbiology imeni Gamaleya (23 tasks), the Central Scientific Research Institute of Hematology and Blood Transfusion (19 tasks), the Moscow Institute of Vaccines and Sera imeni Mechnikov (19), and the All-Union Oncological Center (19). More than R70 million have been allocated for the program, including R45 million for immunology. The program chief is USSR Academy of Medical Sciences academician R. V. Petrov; other major scientists involved in the program are named. The program is divided into three sections: the molecular and cellular bases of the immune response; clinical immunology; and new principles for developing vaccines; details are provided of the work being done in each section. No references.
[374-9642]

UDC 612.017.1 + 616.9-097.3]: 00..8: [579 + 616.9-036.2]: 061.22

RESEARCH ON GENERAL AND INFECTIOUS IMMUNOLOGY AT THE USSR ACADEMY OF MEDICAL SCIENCES INSTITUTE OF EPIDEMIOLOGY AND MICROBIOLOGY IMENI GAMALEYA

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 82 pp 25-30

KAULEN, D. R. (deceased)

[Abstract] The history of research conducted at the USSR Academy of Medical Sciences Institute of Epidemiology and Microbiology imeni Gamaleya since the Sixties is reviewed. Since the establishment of the institute, work has been done on immune chemistry of antibodies, antibody synthesis, the development of new immunologic methods and immune chemistry in cancer; tumor specific antigens; cell mechanisms in immune processes; natural immunity; immunologic tolerance; function of T- and B-cells; immunodiagnosis and immunoprophylaxis and studies of the antigen structure of the agents involved in immunopathology; infectious diseases; vaccines; autoimmune diseases; gnotobiotics; viral immunity; and interferon. Laboratory chiefs are named and their work summarized. The institute has worked with the Academy of Sciences Institute of Bioorganic Chemistry to reconstruct the interferon gene and induce E. coli to express it, thus offering the possibility of large-scale interferon production. No references.
[374-9642]

UDC 616.9-092: 612.017.1 + 615.37.015:46: 612.017.1

WORK ON QUESTIONS OF IMMUNOLOGY OF INFECTIOUS DISEASES AND POSTVACCINAL IMMUNITY AT THE MOSCOW SCIENTIFIC RESEARCH INSTITUTE OF VACCINES AND SERA IMENI MECHNIKOV

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 82
(manuscript received 10 Aug 82) pp 30-34

PERSHIN, B. B., Moscow Scientific Research Institute of Vaccines and Sera imeni Mechnikov

[Abstract] The history of work done at the Moscow Scientific Research Institute of Vaccines and Sera imeni Mechnikov is reviewed. Research questions dealt with have included cell mediators in immunotherapy and immunodiagnostics; lymphocyte chemistry; the immune response in viral infections; evaluation of the immune response; correction of immune defects (with the USSR Academy of Medical Sciences Institute of Poliomyelitis and Viral Encephalitides); vaccines; production of vaccine strains; human gamma-globulin; microbiology and genetic engineering; allergies; radioimmune and enzyme research methods. The most promising areas of research at the institute are listed: development of pure stable vaccines; vaccines based on

antigen material; synthetic vaccines based on high-molecular highly immunogenic complexes; regulation of the immune response; development of new therapeutic and prophylactic drugs; development of immunodiagnostic methods for bacterial and viral infections; the human immune response. References: 59 (Russian).
[374-9642]

UDC 615.37: 001.8

SUMMARY OF AND PROSPECTS FOR DEVELOPMENT OF ARTIFICIAL VACCINES

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 82 (manuscript received 1 Jul 82) pp 35-40

KHAITOV, R. M.

[Abstract] This is a review article. The most important problem at the present stage of research on artificial vaccines is to find ways of making a phenotypic correction to gene control of immunogenesis, insuring an immune response even if an individual does not respond to a given antigen. One way of doing this is to construct macromolecular complexes that include the necessary antigen determinants and stimulate the structure carriers, thus providing phenotypic correction. A number of synthetic polyelectrolytes have been found to possess such properties; they include polyacrylic acid, poly-4-vinylpyridine, poly-2-methyl-5-vinylpyridine, poly-4-vinyl-N-ethylpyridine bromide, and the betaine derivatives of heterocyclic aliphatic polymer N-oxides. Studies of these substances in the context of stimulating an immune response are reviewed in detail, comparing their chemical structures with the immunologic effects they produce. References 36: 29 Russian, 7 Western.
[374-9642]

UDC 616.72-002-022.6: 576.858.74]-022.1-092.9

PROLONGED PERSISTENCE OF M. ARTHRITIDIS AND M. FERMENTANS IN BODIES OF EXPERIMENTALLY INFECTED RATS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 81 (manuscript received 5 Nov 79) pp 14-17

VUL'FOVICH, Yu. V., ZIL'FYAN, A. V., ZHEVERZHEYEVA, I. V., GAMOVA, N. A. and KAGAN, G. Ya., Institute of Epidemiology and Microbiology imeni Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Persistence and localization of Mycoplasma arthritidis and M. fermentans were studied experimentally in an attempt to clarify the

etiology of chronic mycoplasmal pathologies and the autoimmune response in mycoplasmal persistence. Studies were conducted in 160 Wistar rats administered a single dose of $5 \cdot 10^7$-$1 \cdot 10^8$ colony forming units of mycoplasma culture prepared from M. arthitidis strain Pg^{-6} (a known pathogen in rats and mice causing acute suppurative arthritis), and two strains of M. fermentans that are saprophytes in the human urogenital tract, namely the reference strain obtained by Dr. Edward (London) and strain M-1 isolated at the Gamaleya Institute in Moscow from the synovial fluid of a patient with rheumatoid arthritis. In subjects administered M. arthritidis positive results were obtained after 1 day, when the mycoplasm could be isolated from the blood, liver and spleen; M. fermentans was isolated from the blood 4 days and 1 and 3 weeks after infection. Mycoplasma antigen was isolated in the form of granules found mainly in the cell membrane; intracellular antigen was rare. Antigens for both mycoplasmas were found in the peripheral blood up to 6 months after infection. M. fermentans antigen was found in the bone marrow and other immunocompetent organs up to 1 year after infection. References 7: 3 Russian, 4 Western.
[399-9642]

UDC 576.851.47.097.2

PROTECTIVE PROPERTIES OF PROTEUS ANTIGEN COMPLEXES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 81 (manuscript received 5 Nov 79) pp 60-64

KREYNIN, L. S., KAVERINA, K. G., AKSENOVA, Ye. V. and BUMAKOVA, L. Yu.,
Moscow Scientific Research Institute of Vaccines and Sera imeni Mechnikov

[Abstract] Antigen complexes of Proteus mirabilis were prepared and their ability to protect experimental animals from Proteus infections was studied. Antigen from Pr. mirabilis serotype 03:H2 isolated from human burn wounds was administered subcutaneously 2 hours and 3 and 7 days following experimental infection; the degree of infection was assessed from the resulting hyperemia and abscessing infiltration. The ability of the antigen complexes to protect subjects from subsequent Proteus infection was also studied by infecting subjects 2 hours after administration of the antigen complexes. The findings showed that a single vaccination dose of 50 and 5 micrograms protected at least 50% of subjects from infection; lower doses had less effect. Therapeutic administration of the antigens in Proteus-infected rabbits mitigated the course of the disease. Rabbits receiving immune therapy displayed enhanced ability to resist the challenge of Proteus infection. References 14: 6 Russian, 8 Western.
[399-9642]

UDC 615.371;[576.851.45 + 576.858.13].076.9

EXPERIMENTAL BASIS FOR COMBINED SUBCUTANEOUS JET IMMUNIZATION AGAINST PLAGUE AND SMALLPOX

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 81 (manuscript received 3 Sep 79) pp 65-69

GAPOCHKO, K. G., GAMLESHKO, Kh, P., GERASYUK, L. G., YEMEL'YANOVA, O. V., LITVINOVA, A. P., TITOVA, T. S. and ZYABLITSEV, I. F., Military Medical Academy imeni Kirov, Leningrad

[Abstract] Experimental findings are presented from work demonstrating the feasibility of combined jet subcutaneous vaccination using a mixture of plague and smallpox vaccine. Experiments were conducted in guinea pigs using live dry plague and smallpox vaccines dissolved in physiological solution, administered by jet injection using a BI-3 injector in volumes of 0.5 milliliter containing one human dose of each of the vaccines. Reactogenicity and the immune effectiveness of the combined vaccination were studied for plague in guinea pigs and smallpox in rabbits. Details of experimental protocols are described. Histomorphologic and serologic studies done on the organs and tissue of experimental animals confirmed that this form of combined vaccination is both effective and safe and only slightly reactogenic. Immunity in experimental subjects was high. These preliminary experiments make it possible to recommend further studies of its use in humans. References: 4 (Russian).
[399-9642]

UDC 615.371: 576.858.51].065

SAFETY, ANTIGEN ACTIVITY AND EPIDEMIOLOGIC EFFECTIVENESS OF LIVE PAROTITIS VACCINE FROM LENINGRAD-3 STRAIN. REPORT I. REACTOGENIC, ALLERGENIC AND MUTAGENIC PROPERTIES OF THE VACCINE AND ITS EFFECT ON RESISTANCE TO INTERCURRENT DISEASES

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 1, Jan 81 (manuscript received 6 Feb 79) pp 69-74

GRAZHDANOV, N. P., POPOV, V. F., SOKHIN, A. A., SALMIN, L. V., FROLOV, A. K., YEKTOVA, L. I. and SLEPUSHKINA, V. T., State Institute of Standardization and Monitoring of Medical Biological Preparations imeni Tarasevich, Moscow; Donetsk Medical Institute imeni Gorkiy; Donetsk Oblast Sanitary-Epidemiological Station

[Abstract] Findings are presented from one of a series of experiments devoted to a study of the effect of parotitis vaccine in children. A total of 3,247 children aged 3-7 years (2,536 in experimental group, 711 controls) was studied in vaccination against parotitis using vaccination doses containing 40,000, 20,000 or 5,000 viral particles of the Leningrad-3 strain.

Reactogenicity was slight: generalized reactions were observed in 0.8% of subjects and local reactions in 7.8%; reactions included elevated temperature and local hyperemia lasting 2-4 days. Allergic reactions against the parotitis vaccine were seen in 27.5% of vaccinated children, and enhanced staphylococcal allergy in 32.5%. No significant increases were seen in lymphocyte aberration or immediate or long-term intercurrent disease. The parotitis vaccine did not affect humoral immunity against whooping cough, diptheria or tetanus. Local and generalized reactions were more frequent and intercurrent diseases less frequent in children immunized with the vaccine containing 20,000 viral particles. References 12 (Russian).
[399-9642]

UDC 614.2:312(571.1/5)

SOCIO-DEMOGRAPHIC PROBLEMS IN PROTECTING THE HEALTH OF THE POPULATION IN SOME AREAS OF SIBERIA

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 2 1983 pp 14-17

[Article by V. V. Bessonenko, V. I. Vetkov and Yu. P. Doshchitsin, of the Scientific Research Institute for Complex Problems of Hygiene and Occupational Diseases of the Siberian Department of the USSR Academy of Medical Sciences, Novokuznetsk]

[Text] Resolution of a number of social and national economic problems involved in the development of the industrial and economic potential of eastern regions of the country, which are problems of primary importance to the state, is impossible without intensive study of the health status of the native and incoming population in connection with the peculiarities of the living conditions. Throughout the immense territory of Siberia there are regions with different natural environmental conditions, from the most favorable to the extreme; there is a substantial difference among the long-occupied regions and those that have been recently developed in the degree to which the production, and especially social infrastructures have been developed. One can consider areas of Siberia in terms of climatic zones divided latitudinally, as was suggested by N. N. Nekrasov (1973), which includes the Southern region, the Near North and the Far North. The practicality of this approach is obvious; there is no doubt that the climatic and geographical conditions in these regions are substantially different and determine to a significant degree the population distribution in Siberia. However, one must also take into account the degree of urbanization of an area, as well as the stage of its development. Academician N. N. Nekrasov is justified in emphasizing the need to expand significantly the scientific research work in the field of ecology here, confirming that the environmental problem has a marked regional character.

Up until recently, the majority of the population of Siberia lived in the Southern region, concentrated along the railroad lines and large rivers. The character of the settlement typical for Siberia is represented by large agglomerations around large towns and cities, which are usually administrative and industrial centers and perform the role of a center.

Scientific and technical progress brought on a need for accelerated development of Siberia's production forces and rapid development of production is being observed in both the long-occupied areas and in regions of new industrial development. Growth is proceeding on the basis of territorial production complexes, however the leading type of settlement is the town and town-like settlement and the time period for new towns growing from small to medium-sized or large is minimal here and does not exceed 15-25 years.

When comparing the rate of growth of the population in the RSFSR and in its eastern part, one should note that the rates in Siberia and the Far East are significantly higher than the average rates for the republic. The average increase in the population throughout the republic between 1970 and 1979 was 5.8 percent; in Western Siberia it was 7.4 percent; in Eastern Siberia it was 9.3 percent; and in the Far East it was 17.2 percent. At the same time, the relative intensity of the settling here is significantly lower than in the Central region of the RSFSR: in Western Siberia--0.65; in Eastern Siberia--0.24; in the Far East--0.13; in the Central region--7.4.

In studying the living conditions and health of people in Siberia, we took into account the latitudinal division of the territory, as well as the degree of development and urbanization. Therefore, to describe Siberia's characteristics we chose: Novosibirsk Oblast, a typical administrative-territorial unit in the Southern region, a long-occupied area with developed production and social infrastructures; Tuva ASSR, or the Tuva territorial-production complex, which although located in the Southern region, is distinguished by climatic and geographical conditions that are close to extreme (in terms of the degree of development, this complex can be included in the regions of pioneer development, when the creation of the production infrastructure has been essentially completed); Tyumen Oblast, which is located in part in the Near North and in part in the Far North (in terms of development here there are both long-occupied regions, for example Tyumen, Tobolsk, Ishim, and regions of recent industrial development, such as Surgut, Nizhnevartovsk, and so on.)

The health status of different population groups in the territories listed was evaluated in terms of losses, classified as medical (morbidity, including morbidity with temporary and persistent loss of ability to work), semi-medical (alcoholism), social (trauma, negative migration) and demographic (mortality for the total population, infants and those of working age). In view of the fact that demographic losses are the leading ones and they are accounted for very accurately, we analyzed precisely these losses, with the aim of determining the primary medical and demographic problems in protecting the health of the population.

The long-occupied and developed regions differ substantially in terms of the age composition of the population, which creates a number of peculiarities of a socio-demographic nature.

In Tuva ASSR, the proportion of the population made up by children, working-age people and elderly people almost did not change. In Novosibirsk Oblast we observe an intensive aging of the population, the territory is moving to a condition of "actual demographic old age". In Tyumen Oblast, due to regions

of recent industrial development, the age pattern is changing substantially, there is an increase in the proportion of people of working age and a relative decline in the proportion of elderly people. The differences in the priority of solving problems of social and medical services for different population groups in these administrative and territorial units are obvious. There are also differences in the indicators of natural reproduction here (table 1).

Table 1 Indicators of Natural Reproduction in Novosibirsk and Tyumen Oblasts in 1970 and 1979 Compared to Tuva ASSR (indicators for Tuva ASSR are taken as 1.00)

Administrative Territory	Year	Birth Rate	Mortality	Natural Growth
Tuva ASSR	1970	1.00	1.00	1.00
	1979	1.00	1.00	1.00
Novosibirsk Oblast	1970	0.50	0.94	0.32
	1979	0.62	1.02	0.39
Tyumen Oblast	1970	0.62	1.01	0.45
	1979	0.72	0.89	0.62

As is shown in table 1, the birth rate indicators in Novosibirsk and Tyumen Oblasts are significantly lower than in Tuva ASSR, and their relative increase in 1979 is explained by a decline in the birth rate in Tuva ASSR.

The mortality levels in Tuva ASSR and Novosibirsk Oblast are approximately equal, and in Tyumen Oblast there is a relative decline in mortality in 1979 due to the fact that the population became substantially younger as a result of the migratory influx of young people into the Tyumen territorial-production complex. This explains the relatively higher indicators for natural growth in Tyumen Oblast compared to those for Novosibirsk Oblast. It should be noted that in both 1970 and 1979, the total mortality indicator for all three territories was lower than the average for the RSFSR. It should also be noted that in Tuva ASSR, as well as in Novosibirsk and Tyumen Oblasts, the total mortality was somewhat higher in rural areas than in towns, which cannot be explained by age differences alone, since the rural population is not "older" in terms of age composition than the town population in all the territories.

Infant mortality is one of the important losses in public health. Losses in connection with infant mortality in the Siberian territories being compared differ substantially. And in connection with this there are differences in the average life expectancy.

An analysis shows that in all three territories a significant part of the losses caused by infant mortality during the first year of life can be attributed to clearly avoidable causes, that is, causes of an exogenous nature. In other words, there is a substantial health reserve in strategic labor resources which can be realized with a contemporary level of development of medical science and practice in protecting the health of the population. Measures of social prevention are especially important here. We should recall the true

words of S. A. Tomilin (1931): "The entire problem of preventing early infant mortality is a problem of pre-natal hygiene." In our opinion, this applies primarily to the organization of a dispensary system for women of child-bearing age, and the existing approaches to this issue should be reconsidered.

One possible path is to develop a set of measures for social prevention for women and children, differentiated on the basis of how long they have lived in the given locality. Staff members of the Scientific Research Institute for Complex Problems of Hygiene and Occupational Diseases of the Siberian Department of the USSR Academy of Medical Sciences (V. I. Vetkov and coauthors, 1981) showed, for example, that in Novokuznetsk the health indicators for newborns and their mothers were better among the group of women who were natives of the city. So, if we take the risk of perinatal death among newborns in this group as 1.00, then the level among those living in the city for various periods of time ranged from 1.25 to 1.77 (table 2).

Table 2 Some Indicators of Health Losses Among Newborns and their Mothers in Relation to the Women's Length of Residence in Novokuznetsk Compared to Native Residents (Indicators of this group taken as 1.00)

Indicator	Length of Residence in Years				
	up to 3	3-5	6-9	10 and over	Native Residents
Risk of perinatal death	1.49	1.77	1.62	1.25	1.00
Infant mortality	2.20	3.00	2.40	1.60	1.00
Women with complicated pregnancies	1.20	1.93	1.61	1.43	1.00

The demographic health losses of real manpower resources are substantial. In accordance with a method developed by Yu. A. Korchak-Chepurkovskiy (1970), the following indicators have been determined: average decrease in lifespan during working age, the number of lives lost during working age (per 100,000 people), the average number of years of life lost before reaching working age, and the average age at death during working age. On the whole, favorable trends were revealed, however losses are still substantial and varied in different administrative and territorial units. Health losses of real manpower resources are somewhat lower in Novosibirsk Oblast than in Tyumen Oblast. Reasons for health losses among the working age population in these administrative and territorial units include diseases of the circulatory system, accidents, neoplasms and respiratory diseases. In other words, here too the reserves of manpower resources are tied to health. A significant portion of the losses can be attributed to causes that could undoubtedly be eliminated with the help of social prevention measures.

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Summary

Health impairments in the population of various areas of Siberia are dealt with. The age-sex characteristics of the population in these communities throughout the period of 1970-1979 are presented; the analyses of birth, mortality and population growth rates are made. Particular emphasis is laid on the validation of perinatal death risk in newborns in relation to the period of time their mothers have lived in a certain territory.

9967
CSO: 8144/1029

UDC 616-001.45-053.2

GUNSHOT WOUNDS IN CHILDREN

Leningrad VESTNIK KHIRURGII IMENI I. I. GREKOVA in Russian Vol 130, No 1, Jan 82 (manuscript received 7 Jun 82) pp 86-89

PULATOV, A. T., professor, KHAN, I. B., candidate of medical sciences, and FETISOV, V. N., candidate of medical sciences

[Abstract] Although relatively rare in peacetime, gunshot wounds in children require special attention because of their serious nature. Over a 10-year period 51 patients aged 3 to 14 with gunshot wounds were observed; 26 were wounded by homemade guns, 19 as the result of explosions of various kinds of cartridges and shells, and 6 had received wounds from rifles or shotguns when hunting. Single penetrating wounds occurred in 7 children in the chest, 11 in the abdomen, and 2 in the head, and combined wounds of the chest and abdomen in 4 and of the skull and eye in 4; penetrating wounds usually resulted in multiple organ injuries. Shock was treated by therapeutic analgesia with nitrous oxide and oxygen (1:1) or sodium oxybate or diazepam, combined with neurovegetative block and infusion therapy. In chest wounds, surgery was concentrated first on the heart and lung roots and then on the pulmonary parenchyma; wounds were drained at the 7th intercostal space; management was conservative in the absence of valvular pneumothorax or continued bleeding. Abdominal wounds were treated by extensive laparotomy, organ resection and lavage of the abdominal cavity. In patients with head wounds, surgery was performed after 1-1.5 hours of infusion and hydration therapy under endotracheal anesthesia to effect decompression, remove foreign bodies and detritus and halt bleeding. In nonpenetrating wounds (22 patients), treatment consisted of surgical management of wounds and measures aimed at enhancing the body's resistance. A total of 49 of the patients described recovered fully; the other 2 died. References 3 (Russian). [370-9642]

UDC 615.332.017; 615.277.3].015.4: 577.2

RESEARCH ON MOLECULAR MECHANISMS IN ACTION OF ANTINEOPLASTIC ANTIBIOTICS AND THEIR USE IN USSR

Moscow ANTIBIOTIKI in Russian Vol 27, No 12, Dec 82 pp 889-898

GAUZE, G. F. and DUDNIK, Yu. V., All-Union Scientific Research Institute of New Antibiotics, USSR Academy of Medical Sciences, Moscow

[Abstract] A review article. Antineoplastic antibiotics produced in the USSR include dactinomycin, rubinomycin, olivomycin, bruneomycin, karminomycin and bleomycin. Preclinical studies of adriamycin are underway. In addition, within the USSR a large number of unique antibiotics have been developed that inhibit tumor development in animals; these include echinomycin 6270, the benzodiazepine antibiotic sibiromycin, variamycin (similar to mitramycin), the polyene antibiotic lienomycin, the anthracyclics, beromycin, tavromycetin and tavromycin, reumycin (similar to xanthtrycin), mutomycin, nokamycin, antibiotic 1719 (azotomycin) and actinoxanthine. The development, biochemistry and antineoplastic action of olivomycin and similar antibiotics, bruneomycin, the anthracyclics, actinomycin D, antibiotic 6270, sibiromycin and the semisynthetic derivatives of rubomycin and karminomycin are described. References 127 (Russian).
[392-9642]

UDC 616.99-08:001.8

TREATMENT OF PARASITIC DISEASES--ACHIEVEMENTS, DIFFICULTIES, NEW APPROACHES

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian Vol 60, No 5, Sep-Oct 82 (manuscript received 6 May 82) pp 3-11

OZERETSKOVSKAYA, N. N., Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] Data from the literature confirm the improvement of treatment of practically all acute parasitic infections as a result of recent research and production of antiparasitic drugs. One of the major remaining problems (treatment of drug-resistant tropical malaria and malignant malaria) is described and discussed with presentation of aspects of case histories of these diseases. The dangers from side effects from high initial doses of schizontocides in treatment of falciparum malaria and intensive parasite infestation are discussed and the benefits of the use of glucocorticoids in such cases are discussed. Treatment of chronic parasitic diseases is impeded by a shortage of effective chemotherapy agents and by the complexity of pathogenesis of the diseases, often involving factors not directly related to the primary agent of infection only. Steps to improve this situation are presented. Further

improvement in the control of parasitic diseases requires thorough fundamental pathogenetic and immunological studies and carefully planned clinical work in foci of infection with well organized mass treatment procedures. Specialists in molecular biology, immunology and long-range biotechnology must become involved in the control and treatment of parasitic diseases. Figures 4; references 89: 34 Russian, 55 Western.
[378-2791]

UDC: 578.8.664:339]:008(47+57)

VIROLOGY IN THE THIRD YEAR OF THE 11th FIVE YEAR PLAN

Moscow VOPROSY VIRUSOLOGII in Russian No 1, Jan-Feb 83 pp 4-6

[Abstract] Virology is cooperating with all other branches of the economy of the Soviet motherland to complete its assigned tasks in the 3rd year of the 11th Five Year Plan. Problems being addressed include improved methods of diagnosis, treatment and prophylaxis of viral diseases such as influenza and acute respiratory disease, and viral hepatitis. The successes achieved in the struggle against poliomyelitis and measles must be carried forward to the eventual goal of elimination of these diseases. The problem of herpes is also attracting great attention in the glorious motherland and abroad. The second group of problems relates to fulfilling the Food Program set forth at the 26th Party Congress on the initiative of Comrade L. I. Brezhnev. This will require improvement in the prophylaxis of viral disease among domestic animals. The third group of problems before virologists is related to the development of genetic engineering, involving a partnership of molecular biology, virology and microbiology. The tasks before virology in the complex world in which we live today are great, but virologists in the Soviet motherland are coping with them.
[702-6508]

UDC: 615.371:579.843.1].076

BIOCHEMICAL AND IMMUNOCHEMICAL CHARACTERISTICS OF NEW ORAL CHOLERA CHEMICAL BIVALENT VACCINE AND RESULTS OF TESTING ON VOLUNTEERS

Moscow ZHURNAL MIKROBIOLOGII EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 11, Nov 82 (manuscript received 14 Apr 82) pp 29-33

DZHAPARIDZE, M. N., NIKITINA, G. P., IVANOV, N. R., RYSTSOVA, Ye. A., UDALOVA, I. B., KARAYEVA, L. T., POPOV, A. A., NAUMOV, A. V., KOTKINA, T. A., TROPINA, G. V. and PAVLOVA, L. P., All-Union Scientific Research Antiplague Institute "Mikrob", Saratov

[Abstract] Information is presented on the composition of the tabletted bivalent chemical oral cholera vaccine plus results of its testing on

volunteers. Results of the testing showed that the specific portion of the tabletted preparation contained 55±5.6% protein, 22±3.1% reducing sugars, 9±1.2% lipids and 5±0.8% nucleic acids. Study of 9 series of the vaccine established that 60% of the protein consisted of the cholera antitoxin. Reaction and immunologic effectiveness were studied in 19 volunteers 18 years old and older with no counterindications to inoculation who had previously not had cholera. Six doses were tested. No changes in state of health or body temperature were noted. Laboratory studies one to two days after vaccination revealed no pathology in blood or urine. Liver studies revealed no significant changes. Titration of specific antitoxins and vibriocidal antibodies indicate immunologic effectiveness of the vaccine. References 18: 10 Russian, 8 Western.
[712-6508]

UDC: 612.017.1-06:612.822.1:547.95

COMPARISON OF NEURO- AND IMMUNOMODULATOR PROPERTIES OF LOW MOLECULAR WEIGHT NEUROPEPTIDES

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 94, No 8, Aug 82 (manuscript received 13 Jan 81) pp 79-82

KUKAYN, E. M., MUTSENIYETSE, R. K. and KLUSHA, V. Ye., Laboratory of Molecular Biology and Pharmacology of Peptides (headed by candidate of medical sciences V. Ye. Klush), Institute of Organic Synthesis, Latvian Academy of Sciences, Riga

[Abstract] Results are presented from a study and comparison of neuro- and immunomodulating effects of low molecular weight neuropeptides, Leu- and Met-enkephalins, thyroliberin, C-terminal tripeptides of gastrin and oxytocin on the content of biogenous brain monoamines and their metabolites and the production of humoral antibodies to sheep erythrocytes. The experiments were performed on BALB/c mice and Wistar rats. Low molecular weight peptides which have neuromodulating effect were found to influence the nature and intensity of the immune response. This influence may be partially determined by neuromediators, specific receptors for which have been found on the cell membrane of immunocompentent cells. There is, however, no direct correlation between immunopharmacologic characteristics and neurochemical activation indiees in monoaminoergic brain systems by neuropeptides. Each peptide apparently changes the paths of synthesis and metabolism of biogenous brain monoamines differently and influences cellular processes included in the regulation of the organism's immune response. Figures 2; references 10: 6 Russian, 4 Western.
[380-6508]

UDC 615.277.3.036.8:616.155.392-08

COMPARISON OF SOVIET AND JAPANESE CYCLOCYTIDINE PREPARATIONS IN LEUKEMICS

Moscow PROBLEMY GEMATOLOGII I PERELIVANIYA KROVI in Russian Vol 27, No 7, Jul 82 (manuscript received 27 Mar 81) pp 35-42

KONDART'YEVA, N. A., VOROB'YEV, A. I., BRILLIANT, M. D., ABDULKADYROV, K. M., USHAKOVA, Ye. A., RAKITANSKAYA, A. A., ROMANOVA, A. F. and BABENKO, V. G., All-Union Oncological Scientific Center, USSR Academy of Medical Sciences, Moscow

[Abstract] Phase 2 clinical trials were conducted on the efficacy of a Soviet preparation of a depot form of cytarabine (Cyclocytidine) in pediatric and adult cases of leukemia. The cohort consisted of 16 children and 53 adults treated with 8-15 mg/kg at various intervals usually for 5-15 days with cytarabine alone or in combination with 6-thioguanine, cyclophosphamide, or rubomycin. In general, the results with the Soviet preparation were identical to those obtained with Japanese products; however, hypotension and salivary gland pain were usually more pronounced with the Japanese preparation, while hemorrhagic complications were more pronounced with the Soviet drug. These findings warrant undertaking phase 3 studies with the Soviet cytarabine in view of its moderate effectiveness when used alone and more pronounced effectiveness in combination chemotherapy. References 4: 1 Russian, 3 Western. [304-12172]

UDC 613.633: 621.921

PHYSICAL AND CHEMICAL PROPERTIES OF AEROSOLS AND THEIR FIBROGENICITY IN MANUFACTURE AND USE OF ABRASIVES AND SUPERHARD MATERIALS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSR in Russian No 10, Oct 82 (manuscript received 7 Jan 82) pp 51-59

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[Abstract] A study was made of the physical and chemical properties and pathogenetic nature of 24 samples of dust aerosols in order to clarify the etiology and individual aspects of the pathogenesis of pneumoconiosis. Materials studied included the oxides of aluminum and chromium, silicon dioxide, boron, various kinds of iron oxides, aluminum and magnesium silicates, and so forth, and mixtures and compounds of these substances. Investigations included pulmonary ventilation and oxygen demand. The role of lipids is discussed and the results of histologic studies are shown. Most of the substances studied are insoluble and all of them are fibrogenic; the degree of fibrogenicity depends on the properties of the material and the duration of exposure. Maximum permissible concentrations were established for 20 of

the substances studied. In addition, dusts were classified in groups according to their fibrogenicity, and the groups manifesting a particularly special threat in terms of fibrogenicity in aerosols were distinguished. References 46: 35 Russian, 11 Western.
[704-9642]

UDC 613.632: 669.85/.86]-07: 616.1-057

STATUS OF CARDIOVASCULAR SYSTEM WHEN AFFECTED BY CERTAIN METALS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSR in Russian No 10, Oct 82 (manuscript received 15 Dec 81) pp 59-63

TARASENKO, N. Yu., VOROB'YEVA, R. S. and AKINFIYEVA, T. A., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] The effect of compounds of cadmium, cesium, barium, zinc, rubidium, ruthenium and the chloride salts of various alkali metals on the cardiovascular system was studied in rats during the course of a 4-month experiment in which the subject animals inhaled these substances at doses above the maximum permissible levels. Systolic pressure, the EKG, and the function of adrenoreactive structures were investigated. Determination of myocardial epinephrine and norepinephrine was used to characterize neurohumoral regulation. EKG studies showed that all the compounds studied, except sodium chloride, caused various degrees of change in cardiac activity; cadmium and cesium chloride exerted the greatest cholinomimetic effect. Lipid studies showed that cesium arsenate increased the amount of phospholipids (61%). Neurohumoral regulation was affected most by cesium arsenate and ruthenium dioxide, which also altered cholinergic regulation of circulation. Biochemical findings were generally confirmed by morphologic studies. It is concluded that metals in high concentrations are capable of causing cardiovascular disease, thus highlighting the importance of further research along this avenue and the implementation of hygiene and prophylactic measures. References 16: 15 Russian, 1 Western.
[704-9642]

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COMBINED AND JOINT EFFECTS OF PHYSICAL FACTORS OF GASES LIBERATED FROM POLYMER MATERIALS ON SHIPS

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 82 (manuscript received 27 Jan 82) pp 17-20

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[Abstract] A study is made of the combined effect of gas liberated from the polymer materials commonly used on ships plus elevated air temperature

(28±2°C) and noise (45 dB, 55 dB, 85 dB). Each factor is evaluated individually and the nature and mechanism of action of chemical and physical factors at low intensity are studied. Studies were performed on white rats in experiments performed around the clock for 90 days. Noise and temperature were maintained constant around the clock. The studies indicated that the mechanism of action of the factors studied on the organism consisted of response reactions of various functions. Physical factors predominated in experiments involving exposure to polymer material gases at low levels with air temperature 28°C and noise 85 dBA. The combined effects of polymer materials and high air temperature, polymer materials and high noise level (85 dBA) were primarily simply summation of independent effects. However, studies of the content of polymer gases in the air must be based on studies of the effects of the gases in combination rather than studies of the effects of each individual gas. References 2: 1 Russian, 1 Western.
[384-6508]

PEDIATRIC HEALTH PROBLEMS

Children's Traumas

Kiev PRAVDA UKRAINY in Russian 25 Feb 83 p 4

[Article by N. Yerko, head of the trauma center, and L. Bergovoy, surgeon, in the column "The Health Faculty, under the direction of Professor O. A. Pyatak, chairman of the academic medical council of the UkSSR Ministry of Health, Honored Scientist of the UkSSR and winner of the State Prize of the UkSSR": "Preventing Problems"]

[Text] Children's traumas...Physicians deal with them everyday. Last year at the trauma center of the children's clinical specialized hospital no 14 in Kiev, many cases of injuries of this type were registered. We cannot regard children's traumas as something accidental or unforeseen. Knowing their causes, we can and must avert these problems.

The first years of a child's life are years of rapid development and increasing complexity of his nervous activity, the brain is doing immense investigative work in the absence of any experience. Five and six month-old children put into their mouths any object that they can hold in their hands. This explains why foreign bodies are found fairly often in the respiratory passages. Therefore small parts from toys should be thrown out. Do not allow small children even in your presence to play with sharp objects, such as scissors, knives and forks, and gradually teach older children how to use these things properly. Another area of attention should be fire and hot water. Small children often burn themselves since they simply do not know the danger of the flames.

Now when a child gets a bit older, he begins to show some of his own initiative and tries to pick up a toy that has fallen, or reaches for a bright light. He does not have adequate coordination for these movements, and it is characteristic to fall from the bed or chair. We would like to advise you not to put children under three years old in a bed without side netting or bars. And when a child has already begun to sit or stand up by himself, do not leave him unattended.

Motor skills of pre-school children become more sure. And at the same time, their extraordinary curiosity and emotional and restless nature sometimes lead to

traumas. Most often we see falls from high places, such as windowsills, stairs, and so on, and burns are also not uncommon.

We remember a story of a mother leaving a small infant with a four year old boy. The boy set the infant on the window, and then wanted to pick something up himself. He suddenly noticed that the infant was crawling out the window. The boy want to catch him but wasn't able to and fell out the window after the infant. Fortunately, this case turned out all right.

But it doesn't always happen that way.

Children's attention is focused entirely on whatever interests them at a given moment and they do not notice danger. If a child sees his mother on the other side of the street, he runs to her across the street, not thinking about the traffic.

Children and traffic...Street traumas are especially characteristic for school-age children. Strict observance of the traffic rules, not only by children but by adults in the first place, since children follow our example, is one of the chief points in the safety code.

Sports traumas also arise sometimes. There are reasons here too, such as lack of discipline, inadequate organization of the activities and faulty sports equipment.

Nothing we have said here is new, but it should be repeated frequently as a reminder. The requirements for preventing traumas are not complicated, they simply need to be remembered at all times and strictly observed.

Respiratory Diseases in Children

Kiev PRAVDA UKRAINY in Russian 12 Jan 83 p 4

[Article by T. Motuz, chief children's pulmonary specialist of the UkSSR Ministry of Health, director of the division of respiratory diseases at the Kiev Pediatrics, Obstetrics and Gynecology Scientific Research Institute, and doctor of medical sciences: "From the Position of a Pulmonary Specialist", A. Zonenko, editor]

[Text] During the fall and winter many children suffer from acute respiratory diseases. As a rule, these diseases are caused by viruses--flu, flu-like, adenoviruses, and a number of other organisms with many subspecies. Respiratory viral infections are distinguished by their rapid spreading. When a virus enters a child's respiratory passages along with air, it penetrates the cells of the mucous membrane of the nose, larynx and the bronchi and alters their vital functions. Soon the virus is carried by the blood to other cells of the lungs, nervous system and vessels. It is during this period that the signs of the disease appear, which depend to a great extent on the type of virus.

Acute respiratory diseases represent a clear threat to children's health. An especially serious complication is pneumonia. But repeated acute respiratory diseases can also "strike blows" at the lungs. The reactivity of this important organ can be altered, which decreases the efficiency of breathing and disrupts the cleaning and defense functions of the respiratory passages, and also creates a predisposition to the development of allergies.

How can acute respiratory diseases be prevented? Prevention should begin during the intrauterine period of the infant's development. Deviations from the norm in terms of the term of pregnancy and birth contribute to children having delayed formation of the immune system and reduced adaptation. These hypoimmune conditions provide fertile soil for the development of acute respiratory diseases.

However, proper protection of the fetus is only one of the prerequisites for health. Also leading to weakened defense systems are an early transition to artificial feeding, improper feeding during the first months of life, inadequate motor activity of the child, which sharply reduces his tone, and excessive cold, especially if the child is not used to it. The incidence of acute respiratory diseases and bronchitis among children is clearly increased by insufficient time being spent out in the fresh air and by being in enclosed areas where people are smoking.

So it is necessary to establish a system of measures to prevent these diseases, starting with strict observance of a regime of aeration (airing out the living areas), walking children outside, unrestrictive clothing and blankets, proper feeding, and prevention of rickets and diathesis. There is no doubt that a beneficial role in strengthening children and in the battle against hypokinesis is played by organization of systematic swimming in covered, and later open pools, and walking children outside, preferably in any weather. Another point is that for children with recurring bronchitis and especially bronchospasms, it is important to maintain a calm psychological atmosphere in the family, since psychological tension can bring on attacks.

Problems of lung diseases among children are being studied persistently at the Pediatrics, Obstetrics and Gynecology Institute in Kiev. Special recommendations have been published whose application will make it possible to reduce significantly the incidence of the diseases, especially in pre-school institutions.

It should be emphasized that in oblast and large city children's hospitals in the republic pulmonary and allergy consulting offices and centers have been created, and there are a number of specialized sanatoriums. It is important that no time be wasted. The majority of the children can be fully cured with an early enough diagnosis and systematic, complex treatment.

9967
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MEDICAL EQUIPMENT DEFICIENCIES

Soviet Inhalers Inadequate

Moscow IZVESTIYA in Russian 18 Mar 83 p 3

[Article by V. Pavlenko and S. Tutorskaya in the column "Notes That Are to the Point": "Aerosol from Promises"]

[Text] D. Khasler, an invalid from the Great Patriotic War living in Kiev, wrote a letter to the editor. He writes that a strange situation has developed recently with pocket inhalers for people suffering from asthma. Up until recently they were purchased abroad. Several years ago it was decided to start production of domestic inhalers. The assignment was given to the Khar'kov Medical Plastics and Stomatological Materials Plant. Test models soon appeared and then the first batches. The tests were successful and then counting on imminent mass production, the USSR Ministry of Health stopped buying the equipment abroad. However, the Khar'kov inhalers turned out to have some real defects in series production.

This is how our reader describes their quality: "The Khar'kov inhaler is unreliable. It is difficult to regulate the force of the aerosol spray and the medication leaks out into your pocket where you are carrying the inhaler. You have to agree that this is inconvenient. The body of the inhaler containing the medication is not transparent, so you can't see how much is left. And this little item is not very durable."

When our reader approached the manufacturer, the "Soyuzmedpolimersteklo" [All-Union Medical Polymers and Glass] Association of the USSR Ministry of Medical Industry and the "Soyuzmedtekhnika" [All-Union Medical Equipment] Association of the USSR Ministry of Health, he received quick responses from everyone. From the factory, he received a letter from A. Pavlov, the chief engineer, stating that the claims were fully justified. And that inhalers with an improved design will be produced...in 1984.

"And now what are those of us suffering from asthma supposed to do?", the reader asks. We addressed this question to the plant's workers. Here is what we found out.

The new model has a transparent body made of polypropylene and the equipment necessary for its production has already been developed. Comprehensive testing will be completed this fall. Work is now being done on a new type of stopper. It is small in diameter, which complicates matters. But the improved model will soon be ready. It has been decided that preparations for series production of the new inhaler will be completed by the end of the year.

So, work is being done and progress is being made. Even though, to be frank, it is not moving ahead at an extremely rapid rate. Why is there such a grand, leisurely pace? After all, the defects in the series inhaler were discovered very quickly and work on eliminating them started only several months later, when the plant was literally swamped with complaints. And isn't it really possible to work on the body of the inhaler and the stopper at the same time?

B. Varlamov, deputy director of the "Soyuzmedtekhnika" Association, to whom we addressed the concerns expressed in Khasler's letter, said contritely, "All the inhalers worked faultlessly in the tests. Now we are thinking of how to correct the situation. When we will succeed, we don't know..."

We know something else--that asthmatics need good inhalers like they need air, and this is not an exaggeration, but the literal situation. The question "Will I breathe or not?" that arises with the use of the Khar'kov unit, is a question that must be resolved quickly and simply. It must be resolved in favor of those who are seriously ill and not in favor of those doing shoddy work.

Prosthesis Parts Lacking

Moscow MOSKOVSKAYA PRAVDA in Russian 26 Jan 83 p 2

[Article by E. Timofeyeva in the column "Problems in Health Services": "When Everyone is 'For'"]

[Text] It is not easy to discuss this topic because it is the pain and suffering of many people who live right next to us, but are different from those of us who are healthy and therefore do not think about what happiness health is.

We are talking about those who have suffered some severe injury, either at the front or from some illness, and cannot get around without a prosthesis. Or, more specifically, we are not talking about the people themselves, but about what must be done so that they can live and work normally and feel like valuable members of society.

It would be wrong to say that little has been done. At the Central Scientific Research Institute for Prosthetics and Prosthetic Design (TsNIIPP), various prosthetic devices with different functional purposes have been developed for adults and children, that are light, durable and comfortable. There are prostheses that pick up the biological currents of the person wearing the device, which can be considered a fundamentally new biomedical approach to prosthetics.

At the TsNIIPP they could probably also tell about the special materials used to make the devices lighter and to expand the functional possibilities, and

about the original technical solutions that have been patented (after all, a good prosthesis is a complex engineering task). In other words, science is doing its part...And now, reader, I will present an excerpt from a letter.

A father whose nine-year old son is confined to a bed is writing. One small part is required for the prosthesis that the boy needs, but the prosthesis and orthopedics enterprise in the city hasn't had it for several months. "I beg you, send me at least a drawing of the part and I'll make it myself...My son cannot live like this any longer!" This letter was shown to me at the Metal Processing Plant imeni N. A. Semashko. I will explain why the letter was sent there. This is the only enterprise in the country that produces all the metal finishing joints and parts for all the prosthesis and orthopedics enterprises (of which there are over 100 in the Soviet Union). Frankly, this is not an easy task for the enterprise's workers or directors. And still a great deal is being done by the engineering and technical personnel at the plant to improve the industrial process and product quality.

I leafed through a thick volume in the office of V. G. Brusin, the plant's director and candidate of technical sciences (he has been working there just a year and a half), which contains a products list of over 400 different items that they manufacture. Another volume, no less impressive, contained numerous requests which the plant is not yet able to satisfy completely. It seemed that cooperation would be the only solution, but since the orders are as a rule for small series items (such are the specifics of this kind of production), they have to get by using their own forces. None of the cooperating enterprises want to sacrifice notorious volume for the production of parts, when only several dozen or several hundred are needed, and local industry simply does not have available the technical or technological possibilities.

Therefore the plant has all the equipment for metal processing--from forging to casting and assembly and mechanical machining. There would be nothing unusual about this, except for one point: this plant, which will mark its 70th anniversary in 4 years, has never undergone reconstruction during that entire time, although it was discussed at the time of its 10th anniversary. As one can easily guess, the enterprise needs more than a simple cosmetic renovation of its old walls; it also needs at least one new wing to replace an old one that is in a state of emergency (this would be of course within the limits of the available territory). Here they could locate the power section, the mechanical assembly shop and personal facilities. And then the problem, which sounds so dry and unexpressive in the 10 years of departmental correspondence, of "supplying prosthesis plants with the necessary quantity of metal finishing parts" would be solved to a significant degree.

In addition to this, the wing, which the plant is seeking permission to build, should be considered as part of the plant's overall development plan. And one needs only look in the window to get a life-size picture of the other wing that is in a state of emergency; it should have been torn down long ago. Workers from that wing are already being transferred to other shops.

No, I don't envy the director who has to take care of all this. But it is just this type of bureaucratic red tape that has led to the fact that the only (I

repeat!) metal processing plant in the country for the production of metal joints for prostheses can neither industrially or organizationally accomodate, equip and mechanize production as it should. One does not need to look far for examples. A 630-ton press went out of operation after serving for 25 years. Industry no longer produces this type of press, and the plant simply has no room to install a 1000-ton press. I will not try to guess how the management will get out of this situation. By the way, there are tasks that are more important, but just as difficult to carry out under the current conditions, for example, creation of a waste-free technology, specifically, converting from forging to casting. Without reconstruction, it will be impossible to do this.

There is not one person at the plant who doesn't understand that the improved technology and construction of a new wing are not goals in themselves, but rather the only possibility for saving hundreds of people from wasting time searching in vain for the necessary parts, and from the spiritual traumas that even healthy people do not always pass through unmarked...

But what is surprising is that over the entire time of the correspondence, not one of the parties involved came out as a clear opponent of reconstruction. Furthermore, the RSFSR Ministry of Social Security, that has authority over the plant, is ready at any time to allocate the money for construction and to find a contractor to begin the work. It is necessary only to obtain the formal papers authorizing construction, and this should be done as an exception, which in this particular case is completely justified, since it is an exceptional situation.

But if everyone involved, the ministry, the Moscow city council of workers' deputies, the Oktyabr'skiy CPSU raykom, the ispolkom of the Oktyabr'skiy rayon soviet, is "for" it, we can only ask when will the Metal Processing Plant imeni N. A. Semashko feel the real force of their support?

9967
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WORK OF HEALTH UNIVERSITIES FOR THE PEOPLE REVIEWED

Tallinn SOVETSKAYA ESTONIYA in Russian 20 Feb 83 p 2

[Article by M, Kivilo, Secretary of the republic Soviet on Public Health Universities for the People: "In Health Universities"]

[Text] The republic Soviet on Health Universities for the People discussed the summary of work for the fall semester of this school year. The conference was chaired by Deputy Minister O. Tamm of the republic Ministry of Health. First of all he noted the growth in the number of students at the popular health universities. This year, 1.8 percent of the republic's population is being educated, which significantly exceeds the all-union average indicator of 0.45 percent. Over half the listeners are young people and students.

The conference noted the successful work of the Vil'yandisk Health University of the People, which this year was in first place in the republic in bringing education to the population.

The conference participants also discussed the problem of selecting instructor cadres for the health universities. After, all, the quality of educational work is directly dependent on the qualifications of the lecturers. As of the fall of 1982, the Peoples University for Improving the Qualifications of Hygiene Instruction Workers has been operating in conjunction with the Republic House for Hygiene Instruction. Mandatory instruction is given to specialists from all regions of Estonia, as well as assistant chief physicians from the central rayon hospitals. Some of these are directly responsible for the organization of on-site hygiene instruction. Such preparation helps to raise the level of work of the peoples health universities.

12322
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STATE OF MEDICAL SERVICES IN AZERBAIJAN SSR

Moscow IZVESTIYA in Russian 3 Mar 83 p 3

[Article by T. Kasumov, Minister of Health, Azerbaijan SSR: "In a Word--Organization of the Matter"]

[Text] In June of 1981 a brigade of the USSR Committee for People's Monitoring [Kontrol], in conjunction with workers from organs of the republic people's monitoring, found serious shortcomings in investigating the organization of the treatment and prophylactic aid to the population of the Azerbaijan SSR. Some outpatient polyclinic institutions did not render medical aid during evening hours, pre-holidays or holidays. The situation with patient appointment scheduling and issuance of appointment time tickets was poor. Even in the polyclinics of such large cities as Baku and Sumgait the pre-physician reception offices and information desks did not operate regularly.

The monitors paid particular attention to the inadequate work in conducting prophylactic examinations and dispensarization of the population. Often this work bore a formal character, and continuity was not always observed in examining and treating patients between the polyclinics and the hospitals. Laboratory, x-ray, functional and other tests were insufficiently utilized for diagnostic purposes.

The results of this inquiry were discussed at a meeting of the Activists of medical workers in Baku and Sumgait, and then at the meeting of the republic Activists, where scientists and health practioners who participated in the inquiry presented papers. The collegium of the Ministry of Health also examined the results of the inquiry. The chief physicians at the Kedabek and Tauz Central Rayon Hospitals were dismissed from their duties for unsatisfactory management of the medical institutions. The management of the Republic Stomatological Polyclinic was strengthened. The Baku Pharmacological Administration was approved.

Slightly over a year-and-a-half has passed from the time of the inquiry. Concrete measures have been taken for regulating the regimen of operation of the outpatient-polyclinic institutions and for implementing the widespread availability of medical aid in the necessary volume and during all

days of the week. Physician's-appointment scheduling by telephone is being introduced. Information on the operating hours at medical diagnostic and treatment offices is being expanded. In many polyclinics, prephysician screening offices are being organized, which frees the physician's time for more in-depth examination and treatment of patients.

Reserves have also been found for breaking up therapeutic and pediatric uchastoks into smaller units, and their number has increased. The efforts of the ministry in improving treatment-prophylactic work are encountering full support of party and soviet organs.

The problems of further improvement in the activity of outpatient-polyclinical health services in the republic were discussed at the 1-st Congress of Azerbaijan Uchastok Physicians, which was held on October 23, 1982 in the republic's capital. It noted the concrete means for developing the primary links in medical service to the population.

Assimilation of capital investments for the development and strengthening of the material base for health institutions has improved. In the past year, the network of institutions rendering outpatient-polyclinic aid to the population alone increased by 40 units. Introduced into operation were the Republic Stomatological Center, the laboratory unit of the Scientific-Research Institute for Roentgenology, Radiology and Oncology, a psychiatric hospital with 500 beds in the city of Agdam, a unit with 160 beds at the Clinical Hospital No. 1 imeni Semashko in the city of Baku, a center for hygienic training of preschool age children, a pharmacological warehouse in the city of Lenkoran', and pharmacies in Barda, Dzhalilabad, and Dzhebrail. Many other objects are in the stage of completion. The supply of water, linens and table ware to hospitals has improved.

There have been changes in the development of specialized medical aid. Today in the republic there are functioning 54 cardiological, over 180 neurological, and over 200 rheumatological and ophthalmological offices. About a third of these are affiliated with central rayon hospitals, i.e., in essence they are in the thick of the rural population. In the past year alone, 34 rural physician-manned outpatient clinics have been organized in the republic, and 60 more will be opened in the current year. Moreover, 27 inter-rayon specialized departments with 1,225 beds are being created.

A complex plan for basic measures for the further improvement in the quality and effectiveness of medical aid to women and children is being developed. and implemented.

All has not been favorable for us in providing the population with medications through pharmacies as well as in hospitals. In the recent past, the number of pharmacy kiosks for selling medications in polyclinics has been increased, and their assortment has been expanded.

The monitors focused their attention on the need for increasing the role of the scientific-research and the teaching medical institutes in treatment-prophylactic work, particularly in the rayons. How are matters today? The

rayons of the republic have been attached to leading clinics, scientific-research institutes and to departments of medical institutes. Scientific-practical conferences are being held on actual problems of health in various regions of the republic. In one year alone, there were 10 such conferences.

Of course, by far not all problems have been solved. The work of several of our treatment institutions still does not meet modern requirements.

At the recent plenum of the Azerbaijan Communist Party Central Committee it was noted that, although medical service to the population has improved in recent years, there are nevertheless numerous serious shortcomings in the work of the republic's health organs and institutions. The facts of inattentive, callous attitude toward patients still persist. There are still cases of extortion and payoffs. It was stressed at the plenum that the Ministry of Health must react more sharply to such facts, to strengthen its control over examining every such signal. It is necessary henceforth to increase efforts in strengthening the material-technical base, in rationally and effectively utilizing existing capabilities. Particular attention will be given to the proper distribution of cadres, and to increasing the responsibility of medical workers for their assigned task.

In light of the decisions of the 26-th CPSU Congress and the May and November (1982) Plenums of the CPSU Central Committee, the health workers of Azerbaijan will put forth every effort to unconditionally implement the decrees of the CPSU Central Committee and the USSR Council of Ministers, "On Measures for the Further Improvement of Public Health", "On Additional Measures for Improving the Safeguarding of Public Health", and will do everything possible to see that timely and qualified medical aid is provided in the republic.

12322
CSO: 1840/350

CAUTION URGED IN TAKING PHARMACEUTICAL PRODUCTS

Moscow PRAVDA in Russian 20 Feb 83 p 3

[Article by T. Samolis: "Do No Harm"]

> [Text] Health Service: PRAVDA's mail contains many letters with medical themes, and questions about pharmaceutical products are seen more and more often. Readers are looking for a middle ground between treatment and self-treatment; they are interested in the potential of pharmacology; they are expressing dismay in connection with the spread of so-called medicinal disease, and are asking for clarification.

A letter from M. Gritsenko of Kiev comes to our attention: "Not long ago I was reading in a youth journal about a certain sports trainer: 'Even the number of pills that she takes for headaches deserves respect. I have never met a person who could take so many pills at the same time.' It was like a boast. And I thought to myself, is this good or bad? Does a person involved in such a self-treatment course deserve respect or pity? And can health really be found in pills?"

Reasonable questions. They have crossed my mind more than once, as they have the author of the letter. But I confess that this didn't stop me at all from treating the same headache by the aforementioned method--"pocket" pills. The readers' questions, then, fall in with my own, which is what brought me to the Department of the Clinic for Pharmaceutical Pathology Research.

Ye. Severova, doctor of medical sciences, has been the scientific head of this one-of-a-kind department for many years. We spoke for a long time with Yelena Yakovlevna, both at the department and in her office as chief therapist of the Main Public Health Administration of the Moscow Gorispolkom.

One of the first questions posed in the interview was a frequently-encountered readers' question: Is there a cure for medicinal disease?

"There is a cure--an extremely effective one," was the answer.

Letus not get ahead of ourselves, however. Let us begin at the beginning by clarifying the terminology.

The concept of "medicinal disease" was introduced in 1901 by the Russian physician Ye. Arkin. This, however, does not mean at all that the symptoms it reflects did not exist earlier. Even Seneca noted that certain medicines were more dangerous than the diseases themsleves. Still, ancient centuries contain only the past history of medicinal disease; the disease itself is the acquired product of our age of enlightment, or more precisely of pharmacological rearmament on a chemical basis.

In order to visualize this, let us try to mentally condense the history of mankind into one 24-hour period. What will we see? For more than 23 hours our forefathers treated themselves with herbs and incantations. For example, at the beginning of the current era (or at 23 hours, 57 minutes, according to our chosen calendar), a physician in Pliny the Elder's time might prescribe something such as this to someone suffering from headache: "Place the bones of a black bird under the neck...,lock yourself up all night with a chicken, and then pluck it and apply the feathers and comb to the affected area. Drink some water previously drunk by a bull or donkey..." Naive? Of course. And also unsanitary.

Later on, the past history of medicinal disease quickens its pace. Fourteen seconds before the end of our chosen 24-hour period, people obtained agents against cholera, smallpox, and the plague. Quite recently, five seconds ago, Fleming made penicillin available to mankind. Many diseases were conquered with antibiotics.

This appeared to be one more effort of medicine and pharmacology--and all diseases prostrated themselves in front of the miracle drugs.

But the full miracle did not come to pass. It is true that today very many diseases are cured or their course alleviated thanks to pharmaceutical products. It is true that drugs have become a great blessing for millions. It is true that they play an important role in improving human life expectancy. At the same time, however, an increasingly large number of people have begun to have heightened sensitivity to the drugs and a tendency to get sick from them.

"What is the essence of medicinal disease?" asks N. Chesnyk from Minsk and other readers.

It is a "defense against what is not me", from a biological point of view. In other words, the organism protects itself from drugs as a foreign substance.

"Which drugs cause medicinal disease?" asks S. Volkov from Sverdlovsk.

"Any of them do when used without controls," answers Severov. They seem to fulfill a trigger-like function, causing an avalanche type of effect by turning on the defense systems of an organism.

There are currently more than 400,000 different named drugs in existence. This should only be cause for rejoicing, but nevertheless...Previously there were fewer drugs, but they were treated very, very carefully, even by the specialists. For example, it is known that even fairly recently, doses of more than 4 grains of quinine were prescribed by treating physicians only after collective evaluation. And in our day? Who does not know of a case where a clinic physician prescribes a whole packet of prescriptions for you with the best of intentions. It seems convenient to the patient, who is a busy man; he swallows one pill, and then another, and, see, he is cured.

Firmly convinced of the power of the pills, and fluently pronouncing the most difficult Latin names, the man runs to the pharmacy, already bypassing the physician. "Why, is this forbidden?", says reader A. Yashchenko from Istra, a city near Moscow, ironically in this regard. "We even have uneducated old people gossiping outside about their ailments, nodding their heads contentedly and saying, "Today isn't like it used to be--you can get any drug..."

"Getting" a drug is actually possible agrees Yelena Yakovlevna. I would note, however, that more and more drugs are sold by prescription only. I feel that this must be emphasized with absolute deliberation: they can and should be bought only with a physician's advice, and not on one's own initiative. A certain man might read an ad for pharmaceutical novelties and right away attempt to try out the unfamiliar drug on himself. And somehow the idea does not occur to him that this harmless-looking pill contains a harmful load of unexpected effects along with its curative properties, which only a physician can predict.

How does one protect oneself from such problems? Where is the cure for medicinal disease?

"The cure is our culture. The culture of using drugs in our lives." There is deep meaning in these words uttered by Ye. Severov with particular emphasis. Where, we ask, did the oldest generations begin? With "Egyptian darkness," as Mikhail Bulgakov, an author and physician called one of his stories. [Tr. note: "Egyptian" labor in Russian means uphill, backbreaking work--the inference here is probably that the lack of medical knowledge in the old days was staggering.] This is how he described a typical December day in 1917: "Yesterday I prescribed a fair amount of belladonna for an old woman and today--the old woman returned with an empty bottle and a request for a refill." In a word, instead of five drops per day she gulped the whole bottle at once. Another of Bulgakov's patients applied mustard plasters--over a sheepskin.

We have made such progress that we chuckle at the curiosities of his medical practice when reading Bulgakov. Such things are impossible in our time, we say.

"Unfortunately, they are possible," notes Ye. Severova. Actions bordering on medical ignorance can sometimes be observed even in highly-educated people. After skimming a report in the journal "ZDOROV'E" we consider that this has made us experts on medicine and think nothing of undertaking treatment for ourselves or our loved ones.

But, nonetheless, people couldn't get along without self-treatment--I am trying to stand my shaky ground.

Of course, to avoid it entirely is difficult. You don't run to the clinic every time that you sneeze. Who would object to learning how to apply a mustard plaster, for instance, or a compress or a bandage. This is all easily done with cooperation between patients and physicians. The matter is a different one: self-treatment should not be understood as just using medicine. In general, it is best not to go sailing the stormy pharmaceutical sea without a compass or a navigator. Knowledge is the compass and the physician is the navigator.

What do medical personnel consider the pharmaceutical culture to be? It is an integral part of the total human culture. One must accept the axiom that the physician, and only the physician, can cure. This is such a simple and easily-understood truth. But it is for this reason that certain people don't want to admit it. These people diagnose themselves. They prescribe their own treatment. What does this sometimes lead to? They stubbornly keep pills with 3-5 year prescriptions in their own medicine cabinets. The expiration date on them has long since passed, and they have become more harmful than useful. They take them.

A strict and thoughtful approach to medicine cabinets is also a sign of culture. What should be in them? This varies. For example, the well-known American pediatrician Dr. B. Spock advises that in the young mother's medicine cabinet there should be bandages, wide and narrow, sterile cotton, gauze patches, antiseptic, a box of baking soda, ointment form occasional burns--and that is all. Of course, a person with a serious disease can have the appropriate drugs prescribed by his physician in his home.

In general, medicinal culture certainly proposes a very careful approach to therapeutic drugs. Uncontrolled and irrational use, particular of antibiotics, causes a number of undesirable consequences. And sometimes the person is not just running a risk to himself alone. Generations of microbes have developed which have become sensitized to the action of those agents that have been extensively and capriciously used by people. For this reason physicians must choose another drug or increase the dosage of the first to attain the desired therapeutic effect. Some 30 years ago, 200,000 units of penicillin had a therapeutic effect, whereas now millions ofuunits must be sometimes administered in analogous circumstances. Lack of knowledge--or ignorance--on the part of the general public of a long-known medical fact also causes many problems: many drugs, particularly the tranquilizers (relaxants) are completely incompatible with even small doses of alcohol.

Many medical personnel apparently find it useful to keep in mind the wise advice of the well-known Russian therapist G. Zakhar'in: "The practicing physician is at his most mature when he understands the power of hygiene and the relative weakness of drug therapy." More values must be given to such natural physiological regulators as a work and leisure schedule, nutrition, recreation, fresh-air walks. This must be understood not just by

the physician, but by each citizen of the government where concern for the health of the people has become public business for the first time in history.

These are only a few of the developments in medicine. Probably everyone is familiar with its long-time emblem: the scale with a serpent--a wise, cautious, yet dangerous creation of nature.

The first commandment instilled into a physician back in his student days calls upon him to be careful: "Above, all do no harm!"

This commandment has become the physicians' rule. It must become the rule of every many who throws himself into the arms of drugs.

12262
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STEPS TO INCREASE THE QUALITY OF MEDICAL EDUCATION

Moscow PRAVDA in Russian 26 Mar 83 p 3

[Article by T. Zhuravleva, department chief, Second Moscow Medical Institute, and S. Balyakin, candidate of medical sciences: "The Art of the Physician. Problems and Judgements"]

> [Text] It is known that there are more physicians in the Soviet Union than in any other nation in the world. Also high is their "specific weight" in the general mass of the population. We have an average of one physician per 260 persons. Are the problems of training these specialists so urgent? They are urgent. And not only because the nation's population is increasing.

The decisions of the party and government stipulate a considerable improvement in medical care. In accordance with these decisions, the break up of the polyclinic uchastoks, for example, is being undertaken, while the number of hospital beds is to be increased by 300,000 in the current Five-Year Plan.

Another matter, which is no longer, as before, a necessity, is the continued expansion of admission into the medical VUZ's. Thus, 300,000 new hospital beds require 15,000 new physicians, which is equivalent to the annual output of the RSFSR medical institutes. We are convinced that admission can be reduced painlessly. If, of course, we learn to use the trained physicians rationally. Otherwise many of them will not remain in practical health care, and the others will be unevenly distributed throughout the nation.

Thus, the extensive stage of medical-cadre training with its preferred orientation towards quantitative increase is becoming a thing of the past. The intensification stage has arrived, permitting increasing attention to be given to quality. Not a little remains to be done here. The objective of increasing the quality of specialist training, posed by the CPSU 26th Congress, is fully applicable to physicians. It should be recognized that the qualification of graduates from certain of our medical institutes is not always consistent with modern requirements.

The selection of future students is undoubtedly in need of improvement. The present system "passes" to the VUZ's, unfortunately, not only poorly prepared

people but even people simply unsuited for such a responsible occupation as patient care. Some of those accepted manage to cross the numerous examinational barriers and receive a diploma. There thus arise poor physicians, incapable of even an elementary senstivity to the patient. The words are recalled of the famous therapeutist and teacher Professor M. P. Konchalovskiy: "One can be a poor writer, a weak artist, an untalented actor, but it is criminal to be a poor physician".

Of great importance is a more objective evaluation of both the preparation and desire for entrance into the VUZ's. Much can be revealed by a heart-to-heart talk with an experienced educator. Yes, and the responsibility of the foremost educators is increased here. But that is how it is. If the VUZ makes a wrong choice then it is better to find out before the start of training than after it. It is better both for the institute, for the young person himself and for the future patients. A well-thought-out, scientific testing can also contribute. In conjunction with the further use of computer technology in the work of admissions commissions, it could promote a still stricter selection.

The weakest link in the educational process itself is clinical training proper. It is no secret that students consider the third course a staging post, after which everything is easy street: the sessions, practical training and even the state examinations. The present system of group clinical studies and short educational cycles frequently permits average students to ride on the backs of active comrades. The demands on each student must be increased: beginning with bed-side practical work and ending with the state exams. A grade "3" should not give the right to a physician's diploma.

The medical VUZ's use modern teaching techniques, including computer technology, too little and as yet ineffectively. A thought-out, planned application of automated systems promotes the educational process and raises its quality. Technology permits the utilization of such masses of information that would be impossible to assimilate by normal means in the educational time allotted. At the same time, it must not be forgotten that the application of automated teaching methods is a complex matter, especially when it is a question of clinical disciplines. The principal role here, undoubtedly, remains that of the experienced educator who knows how to transmit the art of medicine to others. Direct contact with the patients cannot be replaced by any kind of electronic devices. Technology--yes; technological infatuation in education--no!

It is also necessary to raise the effectiveness of health-care worker retraining. For the progress of medical science literally every few years makes marked changes in our knowledge. But the available institutes and faculties for advanced training are insufficient. The search for new forms of work with practical training merits support. Of particular interest are the mobile advanced-training cycles conducted in distant regions of the nation by brigades of highly-qualified specialists from leading medical institutions. However, such measures do not solve the problem as a whole.

But it can and must be solved; moreover, it by no means requires additional expenditures. Some reduction in student admission would permit the organization in medical VUZ's of specialization and advanced-training faculties using the available staffs.

It must also be considered whether we correctly select and prepare those who will teach future practioners. The main crucible of the scientific-educational cadres in our nation is post-graduate study.

Thus it came about that in recent decades the main objective of post-graduate study came to be regarded as the "production" of candidates of science. And here the physician-clinician frequently devotes all his time to dissertational research on a narrow theme. What will he teach his students, once having become an educator: the art of medicine or the particular scientific information he found in the course of three years?

Of course, the VUZ educator must have a good command of the methodology of scientific work. First, so that he can supervise the research of students, developing in them an inquisitive, creative relationship to their work. Second, he himself must be an active scientist. For great returns are expected from science in VUZ's. But must a candidate educator so deeply immerse himself in a narrow subject that this hinders his development as an educator?

True, the situation was improved considerably after the appearance of the "two plus three" system, when post-graduate study came to be preceeded by two years of clinical studies, during which the specialist develops and accumulates experience worthy of transmission. However, this system is by no means used everywhere and, furthermore, is also insufficiently enriched by purely pedagogic skills. Matters have got to the point where an occasional newly-minted educator cannot evaluate the mood of the auditorium, does not know whether the students are taking in his words or have "tuned out".

Undoubtedly, the assistant, who plays an important role in the development of future physicians, must make a good impression on students, knowing well both his own subject and teaching methods and research techniques. Should he not concentrate on specifically this during the training period and become involved in more intensive scientific work while teaching? At the same time, in this case he will begin teaching activity earlier.

Thus, the question is one of either changing the educational conditions in the post-graduate study of future medical-VUZ educators or of organizing their effective training in addition to post-graduate study.

Of course, it is also important not to be in error in the selection of teaching candidates, to limit the selection to those who are worthy. The maximum publicity in the evaluation of the candidate's qualities is beneficial here. In this connection, selection is usefully conducted not during the senior courses, as is common, but by the results of a year's internship, during which the clinical, scientific and pedagogic potential of the young

physician, comprehensively evaluated by the collective, will become readily apparent. The best of the interns will enter clinical studies [the "ordinatura"], that is to say will continue work in compensated physician appointments. The clinical students ["ordinatury"] recognized as the most talented (once again under conditions of full social publicity) will become a faculty reserve for filling assistant appointments.

We also will not lose sight of such a splendid reserve as the distinguished medical scientists from scientific research institutes, especially those in the systems of the USSR Academy of Medical Sciences. Many of them feel the need to transmit their rich experience, their valuable knowledge. They are drawn to students and become their mentors. Professor R. Petrov, for example, academician of the USSR Academy of Medical Sciences, became an excellent mentor for students of the Second Moscow Medical Institute. More such scientists must be attracted to physician training, eliminating the organizational barriers to this.

One more thing. The potentials of the VUZ's are uneven. At one place, solid teaching and scientific forces are concentrated, and, at another, professors can't be found to head a department. Clearly: the weak VUZ's must be helped by the strong institutes, including not only educational but also scientific research institutes under the jurisdiction of republic and union health-care ministries and the USSR Academy of Medical Sciences. An example can be provided by the assistance rendered Siberian and Far Eastern medical VUZ's by the Second Moscow State Order of Lenin Medical Institute imeni N. I. Pirogov.

Thus, by combined efforts the result can and must be attained that the medical VUZ's send to large cities, rayon centers and to the village knowledgeable specialists true to the high calling of the Soviet physician.

9942
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SHORTAGE OF EYEGLASS LENSES DISCUSSED

Moscow IZVESTIYA in Russian 23 Mar 83 p 2

[Article by V. Komov, IZVESTIYA correspondent, Tambov-Rasskazovo: "What Does it Cost to Get Glasses..."]

[Text] Dear editor: Almost a year-and-a-half ago the physician prescribed glasses for me--plus 1.75. I took the prescription to the 11-th pharmacy. They told me that they don't have such lenses now. They put me on a waiting list and said that they would call me. But as yet I have been unable to get the glasses. Maybe they will turn up when I need different lenses. And then it will be the same thing all over again.

B. Grushin, welder.

Rasskazovo, Tambovsk Oblast.

Truthfully, I went to Rasskazovo with the thought that the worker's request had been treated with elementary indifference. After all, the lenses needed were the most common, standard type. However, things turned out to be different. Almost fifteen years ago the co-workers of the pharmacy headed by L. Ryazanova (she has occupied this post for slightly under thirty years) earned the title of Collective of Communist Labor, and have borne it proudly all these years. But nevertheless the complaints about the "super marathon" distances between formulation and filling of orders are warranted. I looked through three boxes containing pre-addressed envelopes to be sent to customers as soon as the long-awaited lenses cane into stock. (By the way, B. Grushin's order had already been filled). But the list of those waiting, like Grushin, numbered over 800 people, including invalids of the Patriotic War. Many of them, of course, have inquired several times and have given reminders.

In the cozy modern commercial hall of the pharmacy, these words remain unchanged for many months on the bulletin board: "Today we are out of lenses...", followed by a list of about twenty lenses, specifically those which consumers request most frequently. And the accounting here is flawless. The saying applies directly to them, "exact, as in the pharmacy". And the workers here are not at fault. Their quarterly and annual orders are usually filled to 25-30 percent. But this is so hard to explain to the people!

In the oblast pharmacy management it was immediately confirmed that the workers of the Rasskazovo pharmacy were right, but unfortunately there have been no changes as yet. The director of the department for organization of supply and trade V. Andrianova pointed to thick folders containing correspondence with the Main Pharmacy Management of the RSFSR Ministry of Health and with suppliers. For several years now, the requests of Tambov residents are being filled by only two-thirds. At the same time, plants are producing only half the lenses in accordance with these cut funds. Translated into the "language of numbers", this means that last year, for example, the oblast did not receive almost fifty thousand lenses. Among the most stable debtors are numerous plants--the Izyumsk Optical-Mechanical Plant, the Rybinsk Eyeglass Optical, etc. The record holder among them is the Suksunskiy Plant in Perm Oblast, headed by V. Babyakin. Here, as to other enterprises, dozens of letters and telegrams are being sent: "Send lenses urgently, situation intolerable".

However, the suppliers have not honored a single telegram with a reply. The one-sided correspondence has been going on for several years. It is true that the Main Administration and its department "Roskhimfarmtorg" is responding correctly to the "input". However, unfortunately, their papers, to say the least, are ineffective. Moreover, it happens that directives are received in response..,take necessary measures for suppliers. And as a result there are over seven and a half thousand Tambov residents currently on the waiting list for glasses.

From the department of Letters to IZVESTIYA

"Is it possible to urgently send out lenses to Tambov?" we asked the workers of the All-Union Association "Soyuzmedtekhnika" of the USSR Ministry of Health. Unfortunately not, they concluded. There is indeed a shortage of lenses up to plus 5, and those are the ones discussed above. For the past three years, the All-Union Production Association "Soyuzmedinstrument" (Ministry of the Medical Industry) has not fulfilled its plans for supply. An alarming figure: in the past two years there has been a shortage of these lenses amounting to 7.9 million. In other words, almost four million people in the country have been left without glasses and are engaged in seeking them. "Soyuzmedtekhnika" is conducting extensive correspondence with the "Soyuzmedinstrument" association, but this does not produce more lenses.

In response to the question of why there is a shortage year after year, the All-Union Production Association "Soyuzmedinstrument" responded that the equipment for manufacturing these lenses was not received in time--only in the fourth quarter of the past year. It will be installed in the first quarter of the present year. Other objections were also addressed at the suppliers: "Soyuzmedtekhnika" poorly analyzes the needs of the population. Thus, in 1981 there were 34.5 million lenses of plus refractions and 21.9 million minus refraction lenses ordered. In the present year the orders have changed sharply--43 and 21.7 million units.

Although we may somehow understand the reproaches addressed to the equipment suppliers, the objections regarding poor analysis of the population's needs

are unconvincing to say the least. After all, the plan for the output of plus lenses is not fulfilled from year to year, and their deficit constantly increases. This is reflected in the growing figures of the orders.

But the main thing is that unfortunately we received no consolation from the workers of "Soyuzmedinstrument". In the present year, they told us, the order for the output of lenses will not be fully filled. The association will only be able to do this in 1985. This is disturbing. A person needs glasses. Without them he cannot work or rest normally, he cannot live normally. This is a product whose deficit cannot be justified by any reasons or circumstances. And moreover, satisfaction of the demand for such products cannot be planned only for the next five-year period.

Our readers expect the management of "Soyuzmedinstrument" to take urgent measures for correcting the existing situation.

12322
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UPGRADING UKRAINIAN RURAL HEALTH CARE

Moscow SEL'SKAYA ZHIZN in Russian 22 Mar 83 p 4

[Interview with the UkSSR Minister of Health A. Ye. Romanenko by "Sel'skaya Zhizn" correspondent S. Luzgan; "Our Chief Resource, the Health Service"; date of interview not given]

[Text] Strengthening the health of rural inhabitants, increasing the level ofttheir medical service--is an important social task of our society. Our own "Sel'skaya Zhizn" correspondent, S. Luzgan, was told by the UkSSR Minister of Health A. Ye. Romanenko. How it is being resolved in the Ukraine, and its prospective development.

[Question] Specific villages complicate the work of medical personnel: the dispersion of populated areas, remoteness of dwellings, and sometimes also impassable roads. What is being done in these conditions to increase the effectiveness of public health in rural localities?

[Answer] Our primary responsibility is to draw medical aid nearer to residents of villages. Frequently it is so that now the physician himself goes on a call to a patient, but not the contrary. To rebuild the service of mercy in this direction is called for by us and the recently adopted USSR Council of Ministers decree on the problem, connected with the regulation of the work regime of enterprises, organizations, and establishments, engaged in serving the population.

Without a strong material-technical base, health service is out of the question. We are undertaking its strengthening jointly with party committees, executive committees of local Soviets of people's deputies, and the public. Ivano-Frankovsk, Dnepropetrovsk, Lvov, Kiev and other oblasts can serve as examples in this affair. Huge aid is rendered also by the state: on construction of medical facilities in villages of the republic for the years of the 10th Five-Year Plan, 213 million rubles were expended. And this means--opening of hundreds of modern hospitals, dispensaries and polyclinics. Now it is not rare, when, the central rayon hospitals are developed with 400-500 beds, and excellently supplied therapeutic, surgical, pediatric and other specialized divisions are built therein.

Mother and child...what concern and warmth surrounds them universally! In almost all central rayon hospitals the obstetrical, gynecological divisions have been strengthened and bright comfortable quarters have been furnished for pediatrics.

Achievements in the field of medicine can be noted with satisfaction, if such is possible to say; worker collectives of establishments of public health of the republic persistently continue to search for new ways of further improvement of the organization and management of health services, especially its primary links--the central rayon hospitals, the rural ambulatoria and the feldsher-midwife points.

[Question] What, in your opinion, is the most rational path of their development, from the viewpoint of maximally attracting qualified medical aid to patients?

[Answer] The chief link in rendering medical aid to the rural population, undoubtedly, has become the large central rayon hospitals. Now, practically all of them are manned by physicians, and reception is conducted in 18-20 specialties. Forms of out-of-town, off-site aid are being improved, especially such mass units as pediatric, stomatological and therapeutic. At large rayon hospitals round-the-clock medical brigades for rapid and emergency aid are organized, and, in the remaining there are not less than two around-the-clock feldsher brigades.

A bottleneck in the health services at villages still remains the organization of polyclinics which is revealed by an analysis of their activities and letters from patients. Basic deficiencies are a low level of diagnosis, late and inadequate therapy.

Along with adoption of a number of organizational and administrative measures for elimination of waste the medical servicing of the rural population, we reviewed the principles of determining priorities of medical personnel in socialist competition. Neither the capacity of hospitals and polyclinics, nor degree of their equipping, nor smooth numbers of the records, but a real uplift in the level of health of the population--in other words the final results--today determine the success of the work of the collectives. Thus, it is clear why our requirements are high for professional qualities of specialists at the rayon link of public health.

Colleagues at oblast and republic prophylactic establishments and scientific-research institutes help to advance their rural physicians. They teach them to assimilate new modern methods of treatment, diagnostics and prophylaxis of illnesses. Thus, after raising their qualifications at the Kiev Scientific-Research Institute of Clinical and Experimental Surgery, nundreds of rayon specialists successfully apply in their work tested methods of conducting many operations. It should be noted that, along with systematic and constant work in this direction, many establishments still face a struggle in increasing the professional level of rural physicians. We are reminded about this constantly.

Great concern about the health of the population in villages is manifested by worker collectives in physician-manned ambulatoria. As a rule, they are opened for servicing two or three populated localities with approximately five thousand inhabitants. Ambulatoriya have available clinical laboratories, diagnostic and physiotherapeutic offices and pharmacy points. A therapeutists, a pediatrician and a stomatologist work there. Before the end of the Five-Year Plan it is projected to open, with available funds, 200 additional dispensaries and to complete equipping clinico-diagnostic laboratories and physiotherapeutic offices.

Success in strengthening the health of rural inhabitants and the effectiveness of initial pre-physician aid is determined very much also by feldsher-midwife points. Their workers--are very close assistants of the physician. In Ivano-Frankovsk, Kiev, Rovno, Vinnitsa and other oblasts their material-technical base is being strengthened constantly, they are being equipped with telephones and placed in good quality accommodations.

[Question] And what is the role of rural prophylactoria in the rayon link of public health?

[Answer]--Prophylactoriya are a great help in improvement of medical service. Their popularity and necessity is bespoken by the fact that their network is steadily being expanded. In Cherkassy Oblast alone there are almost 200 prophylactoria. Kolkhozes and sovkhozes out of their own funds supply them with physiotherapeutic equipment. For example, the prophylactorium at the livestock breeding kolkhoz "Progress" of Tarashchanskiy Rayon, Kiev Oblast has been set up on the second floor of the spacious house of the livestock breeders. Everything is there, as in a municipal polyclinic. In its offices for patients regularly take part workers of the rural ambulatorium--the therapeutist and stomatologist. A surgeon and gynecologist from the central rayon hospital arrive here according to a schedule, by agreement with the management of the kolkhoz or the board of directors of the sovkhoz. In the rayon such prophylactoria function at all farms.

It is pertinent to turn attention to the fact that the development of health care at a village, the character and sophistication of medical service to the population--is a complex, multiplan problem. And it is being resolved successfully there, where the health of livestock breeders and farmers is taken care not only by medical workers, but also by the leaders of kolkhozes and sovkhozes, as in Tarashchanskiy Rayon.

Ivan-Frankovsk Oblast serves as an example of the complex approach to resolution of the problem of health care. There it was learned, that the operability and quality of medical aid to inhabitants of all villages in great measure depends on the condition of the roads. Less than one year was devoted to them in the oblast, in return now routes with hard covering connect all populated points and are laid out to remote livestock breeding farms.

In rural health care, regrettably, there are large problems. First of all there is a shortage of special dependable machines with increased mobility, of travelling ambulatoria, x-ray and stomatological offices on wheels. The

decree of the CPSU Central Committee and the USSR council of Ministers "Concerning Supplementary Measures for Improvement of the Protection of Health of the Population" obliges the pertinent departments to resolve those in problems, in order to raise to a still higher level the medical servicing of the rural population.

It is hoped, that in this Five-Year Plan we will achieve a definite shift in all directions, securing responsive, qualified servicing of the inhabitants of villages, which will aid them in saving their health and their working time.

12321
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ROLE OF SENSITIVITY IN PHYSICIANS' WORK

Moscow SOVETSKAYA KUL'TURA in Russian 19 Mar 83 p 8

[Article by Andrey Mikhaylovich Serdyuk, deputy chief of the section on science and educational institutions of the CPUk Central Committee and doctor of medical sciences, in the column "A Party Worker Comments": "You Should Know How to Treat People Well--On the Honor of the Physician and the Feelings of the Patient"]

[Text] "To the editors: From the example of our family, or more specifically, the illnesses of our children, we have become convinced that there is a wide range in the attitudes of medical workers toward their duties, and that a great deal depends on this attitude. When our little son, Sasha, was two months old, he became seriously ill: he had double pneumonia and asthma with arrested breathing. At children's hospital no 6, where Sashen'ka was first treated, they left us with no hope for his recovery. The physicians said: 'Your child is without hope'.

"They behaved quite differently at children's hospital no 14, where he was moved later. For more than a year there they treated our little boy persistently, fighting against all the complications of the illness. Now Sasha is a happy, strong little boy. But our older son, six-year old Olezhka, got into trouble: he broke the glass in a bookcase and severely injured his face. Fortunately, the ambulance took Olezhka to the same hospital no 14, and we were once again convinced that everyone there, from the nurses to the chief physician, Tat'yana Petrovna Novikova, treats every little patient exactly as if it were their own only child who had fallen ill.

"Why isn't it like that everywhere? They say that the way a physician treats his patients isn't the main thing, as long as he is a competent specialist. But it is difficult for us to agree with this, when we remember how much grief the physicians caused us with their words: 'Your son is without hope.' Signed, Galina and Anatoliy Oleshchenko, Kiev"

At the request of SOVETSKAYA KUL'TURA correspondent L. Virina, this letter will be commented on by Andrey Mikhaylovich Serdyuk, deputy chief of the section on science and educational institutions of the CPUk Central Committee and doctor of medical sciences.

I will say right off that these young people from Kiev who wrote to the newspaper have touched on a problem that is of extreme importance not only in medicine, but in the life of our society as a whole. A person's indifference, his internal isolation from the interests at hand, and lack of concern for someone else's misfortunes are detrimental no matter where they appear.

Children's hospital no 14 is a large hospital and it is constantly expanding. Last year the hospital treated about 25,000 children and a fifth of them were under one year old. Working at the hospital are doctors and candidates of medical sciences, and many of the staff have received government awards and the majority of them are outstanding workers of communist labor. The hospital has the title of model enterprise of the capital of the Ukraine, and is a school for progressive methods of the USSR Ministry of Health.

Unfortunately, the critical words in the letter of G. and A. Oleshchenko about hospital no 6 are also just. Transferring a child with complicated illnesses to a medical institution with broader and more effective possibilities is justified in itself. But there is no justification for the prognosis that it would have been useless to fight for the child's life. This is a result of laziness and tactlessness, qualities that should be forbidden in medical personnel. Who was it that dealt the parents such a cruel blow, when they were already shaken by grief? It is difficult now that so much time has passed to establish the specific guilty parties. But since there were other complaints about the work of this medical institution, the situation at hospital no 6 will be immediately and thoroughly analyzed.

I would like to emphasize here that any instance of a physician's callousness can give rise to an extreme reaction in the patient.

I will give an everyday example, which I encountered recently in one of the city hospitals. In the lobby where convalescing patients were gathered around a television, a loud conversation suddenly arose. A new patient angrily informed the physician on duty that the television was standing on only three legs--the fourth had been replaced by a plastic cork from a pharmaceutical bottle, the first thing that anyone could find.

The physician responded indignantly, "What nonsense. Do you think your recovery depends on that?" The patient insisted, "It depends on this too!" The next morning she complained to the administration. To the credit of the directors of the medical institution, they did not consider the patient's complaint to be nonsense, understanding that behind a little detail like a broken leg on the television, there is hidden a lack of concern for the patient on the part of those who are responsible for comfort in the department.

There are no trivial details in the operations of hospitals and polyclinics. Gloomy or excessively bright colors in the furniture upholstery can also indicate lack of concern on the part of the administration for the aesthetics of their institution. A predilection on the part of the physicians or nurses to use excessively bright cosmetics is also contraindicated since this could upset the patient.

Incidentally, the experience of specialized children's hospital no 14, about whose personnel the Oleshchenko couple wrote such kind words, provides evidence of the fact that everything is important in the everyday operation of a medical institution. The staff at this hospital look smart and neat. The wards and consulting rooms shine with pleasant colors and the cleanliness that comes from a sincere concern for people. And it is no simple matter to maintain the facilities of this medical institution so faultlessly.

Deontology is the science of the ethics of the physician-patient relationship and considers not only the external aspects of the behavior of the health-care worker. A physician can speak with a patient in a refined and polite manner, and still remain a callous person. This hidden callousness is even more dangerous, but sooner or later it will make itself known, destroy someone's hopes or cause someone grief. As a rule, a physician with the necessary level of professionalism also has strong spiritual qualities. This is what most of the republic residents write about to party and soviet organs and to the UkSSR Ministry of Health.

I will quote a letter that came from Lyudmila Mikhaylovna Sidorovich in the city of Kolomyya in Ivano-Frankovo Oblast: "The world really is a good place. I was convinced of this once again when fate introduced me to our rural physician and bearer of the Order of Lenin, Bogdan Ivanovich Kraynik. He directs the hospital in the little village of Tsenava in Ivano-Frankovo Oblast. He has brought many people back to health and has saved lives. His simplicity and sensitivity are striking. Bogdan Ivanovich is at the hospital morning and night, year in and year out, with no days off. He dedicates himself to people and receives inspiration and strength from the contact with those he helps. Bogdan Ivanovich does a great deal of public work: he is secretary of the kolkhoz party organization and propagandist at the school for the fundamentals of Marxism-Leninism. I learned about this from his signature under his portrait on the board of honor in Kolomyya."

We get a very clear picture of the physician-communist from the letter. But after saying all this about Doctor Kraynik, L. Sidorovich remarks bitterly: "It must be confessed that far from all of us are treated by such physicians." Again the theme of kindness is touched upon, just as it was by the people from Kiev.

Why is it that among physicians we still encounter people who are unkind, sometimes rude, or even worse, greedy? Why is it that the encroachment of some of these individuals into the sanctum of Soviet medicine--its great humanism--sometimes distorts the idea that patients and their families have about the undeniable achievements of our health care? Why is it that there is a slow decline in the number of letters concerning unsatisfactory organization of medical services?

Recently, at the initiative of the section on science and educational institutions of the CPUk Central Committee, this question was subject to thorough examination at a joint session of the board and party committee of the UkSSR Ministry of Health. There was a principled discussion of developing in

medical personnel a business-like attitude, an intolerance for shortcomings, an ability to consider people's opinions and to put into practice the party line. Concrete measures were outlined and are being realized for eliminating the causes of people's complaints.

Many of the serious shortcomings in the activities of medical and preventive institutions, in my opinion, can be explained to a great extent by errors in the professional orientation of future physicians. After all, the young people as a rule know about the merits and difficulties of their future work only by hearsay.

We know that hundreds of students are screened out of the republic's medical VUZes every year. Life has forced us to introduce a new system of orientation for school pupils in medical professions. Now thousands of pupils in the upper grades begin to gain a real familiarity with the essence of the medical profession over the last two years of their schooling. The result is that almost half of the young men and women aspiring to enter a medical VUZ, having worked in the wards of medical institutions, have changed their plans. This indicates that they made their choice for a profession without giving it much thought.

Should we be distressed about this? I think that we should be glad. The joint order from the republic's Ministries of Health and Education, in accordance with which the school pupils were working in the hospitals, has saved them from bitter disappointments, and future patients from the trouble that a physician who doesn't love his profession inevitably brings to his patients. But screening out the casual ones is only part of the issue. It is even more important to train properly those who remain loyal to the profession and who are striving to master it.

Considering the gigantic scope of Soviet health care, the problem of the physician's moral development and enrichment of his spiritual nature is quite pressing. It is our task to awaken the hearts and minds of every health-care worker and direct them toward lofty goals. Many medical institutions have initiated "letter days", during which there is an open discussion of workers' requests. Reports from hospital administrations to the labor collectives are also having effective results. Courts of medical honor are in operation. And everywhere this important work is being directed by party organizations.

In conclusion I would like to repeat an important point: the concept of professionalism of the Soviet physician includes spiritual generosity and a sensitive nature as necessary qualities. This does not mean that "the physician must die with every patient", but the nature of his calling does not allow him to forgive mistakes, be they his own or those of his comrades; and he must always be ready to give people his knowledge and all the warmth of his heart.

In connection with this, I cannot help but recall the book by the surgeon Fedor Uglov, "Chelovek sredi lyudey" [A Man Among Men], which just came out in its third printing from "Molodaya gvardiya". In it the physician is viewed as the leading man of our time and on him are made, justifiably, the highest

moral demands. In the book's original afterword which contains reflections on readers' letters, we read: "Kindness! We are talking about its healing role, its role in recovery, about a quality of the soul without which a person cannot really think, especially people of our socialist world." I think that these emotional and accurate words best summarize the answer to the timely questions raised in the readers' letter.

9967
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COMPREHENSIVE EVALUATION OF INCIDENCE OF DISEASE WITH TEMPORARY LOSS OF WORK CAPACITY

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, 1983 (manuscript received 15 Feb 82) pp 20 -22

[Article by I.G. Nizamov, Department of Social Hygiene and Public Health Administration, Kazan' State Institute of Advanced Training of Physicians imeni V.I. Lenin]

[Text] The incidence of disease involving temporary loss of work capacity is now usually analyzed and evaluated by proceeding from the level and dynamics of the indexes for the numbers of cases and days per 100 average annual workers, and also by proceeding from the mean duration of one case of illness. These figures make it possible to evaluate temporary loss of work capacity both from the medical and the socioeconomic viewpoints. And the physician's attention is directed primarily to its level in cases, since the primary element in the problem is the case of the disease. But the level of incidence of disease expressed in days provides an idea of national economic losses and for this reason it attracts the attention not only of medical workers but also enterprise and farm managers, trade unions and other organs, as a very important economic factor.

In recent years a trend has been noted toward a decreased incidence of disease expressed in cases, and an increase in the number of lost days. This is occurring as a result of the increase in prolonged, chronic diseases in the structure of pathology, and is leading to growing national economic losses. Very important indexes of workers' health such as invalidism, mortality, the number of people released from enterprises for health reasons and so forth are closely connected with the incidence of disease.

The above testifies to the need to develop and introduce into practice comprehensive indexes characterizing workers' health from different positions. The need for comprehensive evaluations is becoming increasingly urgent; it should be emphasized that individual authors are already using an integral coefficient for deep analysis of the incidence of disease, making it possible simultaneously to evaluate the incidence of disease expressed both in cases and in days. Use of this index is an important step in improving methods for studying temporary loss of work capacity.

The medical-sanitary units and sector trade unions, and also the public health organs, often face the problem of making an aggregate evaluation of the incidence of disease in the form of a relative scale of incidence, and also of correctly evaluating changes in the health status of workers. We propose the following simple and generally accessible method for calculating a comprehensive index for the incidence of disease. Its essence is a comparison of the most informative indexes characterizing the health of workers at a given enterprise, with corresponding indexes for the oblast (or republic). The latter are taken as the reference. The calculation is done using the formula

$$K = \frac{1}{5} \sum_{i=1}^{5} \frac{P_i}{P_i \text{ reference}} \times 100\,\%.$$

The sequence for the calculations is shown in table 1 below.

In our example,

$$K = \frac{1{,}04 + 0{,}94 + 1{,}67 + 1{,}45 + 1{,}5}{5} \times 100 = 132\,\%.$$

Table 1. Comprehensive Evaluation of Incidence of Disease with Temporary Loss of Work Capacity for Enterprise X, 1981

Index	Level of indexes for enterprise (P)	Mean oblast (or republic) indexes for sector (P reference)	$\frac{K = P}{P \text{ reference}}$
Level of incidence of disease per 100 workers:			
expressed in cases	85.0	82.0	1.04
expressed in days	900.0	950.0	0.94
Index for primary invalidism expressed in cases per 1,000 workers	5.0	3.0	1.67
Mortality per 1,000 workers	4.2	2.9	1.45
Number released from enterprise for health reasons per 1,000 workers	12.0	8	1.50

Thus, this index is 32 percent higher for the enterprise than for the corresponding mean oblast level.

Using the proposed method it is possible to analyze the dynamics of the incidence of disease over a number of years within an enterprise (or oblast). This makes it possible to evaluate prevailing trends more fully and to correct them effectively.

Given the considerable differences in the structure of collectives compared (sex, age, occupation and so forth), in the calculations it is possible also to make use of standardized indexes. If necessary, the number of indexes analyzed can be increased.

We realize that this index would be substantially more informative if weighted coefficients were used for the component phenomena. Unfortunately, as applied to this problem, determination of the "weights" encounters serious methodological difficulties. This extremely urgent problem requires deep analysis from the philosophical, medical and socioeconomic standpoints.

Conclusions

1. One comprehensive index for the incidence of disease is an integral index making it possible to evaluate the health status of workers in the national economy.

2. Thanks to its informative nature, objectivity and comprehensiveness, and also the accessibility and simplicity of the calculation, it can be used extensively in everyday practice.

9642
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UDC 362.17 + 362.7]:008(47 + 57)"1922-1982"

DEVELOPMENT OF CARE FOR MOTHERS AND CHILDREN IN USSR

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 1, 1983 (manuscript received 26 May 82) pp 61-64

[Article by Ye.I. Danilishina, Moscow]

[Text] Since the first days of the existence of the Soviet state health care for mothers and children has been part of the health measures implemented by the CPSU and Soviet government. The establishment and development of health care for mothers and children in our country is closely linked with the name of V.I. Lenin. Decrees signed by V.I. Lenin--"on Improving Infant Diet," "On the Establishment of a Council for Infant Welfare," "On Free Food for Infants," "On Procedure for Supplying Food for Infants," "On the Holding of an 'Infants' Week'" and others--defined the problems of health care for mothers and children in those days that were so difficult for our state.

A.M. Kollontay, N.K. Krupskaya, V.M. Bonch-Bruyevich and others played an important role in implementing measures to provide health care for mothers and children.

Already on 1 January 1918 the Department of Maternity and Infant Welfare had begun to function within the system of the People's Commissariat of State Aid. The activity of the department was developed following the transfer of the government to Moscow in March, when the bolshevik physician V.P. Lebedev became department chief. The department succeeded in recruiting major specialists for its work--G.L. Grauerman, A.A. Kisel', A.N. Rakhmanov, G.N. Speranskiy. S.I. Fedynskiy and others.

The heavy legacy of the bourgeois order, economic ruin, hunger and poor living conditions all promoted the spread of tuberculosis. When the People's Commisariat of Health and its apparatus were set up, a section was created to deal with tuberculosis in children, headed by one of our country's most eminent pediatricians, A.A. Kisel'. Steps were taken to organize antituberculosis dispensaries engaged not only in treatment but also the organization of prophylactic measures.

New types of medical establishments began to be created in the country to provide therapeutic and prophylactic care. Pediatric consulting offices and outpatient departments were organized in the cities.

One brilliant manifestation of the party's concern for the children was the All-Russian Central Executive Committee presidium decree of 27 January 1921 on the organization of "a commission to improve the lives of children and deal with homeless children" (the All-Russian Central Executive Committee Children's Commission), whose work was led by F.E. Dzerzhinskiy, and, after his death, by N.A. Semashko. The commission did great work in saving many thousands of children and liquidating homelessness in the country. On 15 September 1921 the "Decree on Medical Welfare for Teenagers and Children in the RSFSR" was published. This laid upon the People's Commissariat of Health the function of providing welfare for teenagers and children. Within it a Department for Teenage and Infant Welfare was organized, and this existed for many years until it was merged with the Department of Health Care for Mothers and Children and the formation in 1940 of a single Administration for Therapeutic and Prophylactic Aid to Children and Mothers.

At the fourth session of the All-Russian Central Executive Committee ninth convocation on 30 October 1922, a new Code of Labor Laws for the RSFSR was adopted, in which protection of labor by women was given a special chapter.

In order to deal with the scientific problems concerning questions of health care for women and children and to train personnel, in 1922 an institute for maternity and child protection was set up in Moscow, and later in other cities.

Solving the crucial problems of providing health care for women and children was based on the principle of the preventive emphasis in Soviet public health developed by the theoreticians of Soviet public health N.A. Semashko and Z.P. Solov'yev. Forms of work such as home visits, maternity classes, correspondence courses for training women in sanitation standards, the use of public organizations and self-help by the public (domestic sections in the councils of workers, peasants and Red Army deputies, commissions on maternity and infant protection and so forth) played an enormous role during this period.

During the first 10 years of Soviet power, social hygiene studies on the health of women and children in various parts of our country played an important role in solving the problems of providing health care for mothers and children At first, social hygiene studies were conducted in the major cities,* and later in the former outlying districts of Russia.

In the fall of 1924 the government of the Yakutsk ASSR asked the USSR Academy of Sciences for help in organizing measures in the field of standards. In response to this request, from 24 May 1925 an expedition led by professor P.V. Vittenburg worked in Yakutia for several years. The medical research team for the expedition included hygienist S.Ye. Shreyber, microbiologist T.A. Kalpakova, gynecologist N.P. Afanas'yeva and other specialists. One of the team's most important tasks was to clarify the reasons for high infant and maternity mortality. Findings from the study were reported to the Yakutsk ASSR Council of People's Commissars and the People's Commissariat of Health and were used as the basis for drawing up measures to improve living conditions, develop medical care for women and so forth.

* AKUSHERSTVO I GINEKOLOGIYA, No 12, 1972 pp 25-28.

In 1928-1929 medical teams were also dispatched to other regions of the Yakutsk ASSR. They offered a number of recommendations on grants for women giving birth in maternity homes and medical point departments, and the opening of homes for mothers and infants and so forth.

Because of the high infant mortality in Siberia and the Far East during the Twenties social hygiene studies were conducted in organized populations of children in these regions.* The studies clarified the causes of the high infant mortality. Questions of improving health care for young pioneers were discussed at the 2nd Far East Kray Congress of the RSFSR Red Cross Society in 1926 and at the 2nd Congress of Health Departments of Siberian Kray in the same year. The urgent need was noted for improvement in the health of children; the important role of pioneer camps, summer camps, health excursions, summer sanatoria, forestry schools and children's homes for those leaving the cities in the summer was pointed out. At the first kray conference of pediatric health an important role in the organization of pediatric health care was given to the Russian Red Cross Society and the commissions on labor and domestic welfare.

The broad recruitment of women into production resulted in the rapid development of health care establishments for mothers and infants, especially in the cities and workers' settlements. For example, in Belorussia, in 1924 there were only 6 creches; in 1925 there were 45, and in 1928, there were 295.** In 1922 there were 125 creches in the RSFSR and 123 in the Ukraine; in 1923 the corresponding figures were 209 and 266, and in 1924, they were 584 and 426.***

The People's Commissiariat of Health provided planned aid for the union republics in the organization of health care for mothers and children, each year sending special teams of physicians and scientific workers from the medical and scientific research institutes of obstetrics and pediatrics.

During the Great Patriotic War children remained almost completely in the care of state organizations. During the early days of the war it was necessary to organize medical services for children evacuated from regions where military actions had commenced. In those difficult years, when many physicians were working at the fronts and in the hospitals in the rear, the number of pediatricians in the republics where the children had been evacuated not only did not decrease in number but even increased.

The question of what to do with orphaned children required an urgent decision. On 2 August 1943 the USSR Council of People's Commissars and the All-Union Communist Party (bolsheviks) Central Committee adopted a decree "On the

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* SOVETSKOYE ZDRAVOOKHRANENIYE No 4, 1981 pp 63-66

** Program and Theses of Reports to the 4th All-Union Congress on Maternity and Infant Protection, Moscow, Leningrad, 1929, p 29.

*** N.V. Manannikova. "Okhrana zdorov'ye detey v SSSR" [Protection of Child Health in the USSR], Moscow, "Meditsina", 1973 p 35.

Organization of Special Children's Homes and Reception and Dispersal Points for Children of Soldiers in the Red Army and Patriotic War Partisans, and also Orphans Whose Parents Have Been Killed by the German Occupiers." In the implementation of this decree on the territory of the RSFSR alone the number of beds in children's homes was increased 80 percent. The state allocated more funds for the free distribution of milk and milk formulas for suckling babies. On 23 January 1942 the USSR Council of People's Commissars decree "On the Care of Children Left without Parents" was published.*

Among the measures aimed at safeguarding the health of women and children, an important place is occupied by the USSR Supreme Soviet Presidium Ukase (1944) "On Increasing State Aid for Pregnant Women, Mothers with Many Children and Only Children, Increasing Safeguards for Mothers and Children, and Establishing the Honored Title of 'Heroine-Mother' and Establishing the 'Order of Maternal Glory.'"

During the postwar years the task was set of intensively developing medical establishments, particularly pediatric and obstetric-gynecologic establishments, and of carrying out extensive mass health measures. In accordance with the directives of the 20th CPSU Congress, the USSR Supreme Soviet Presidium Ukase "On Increasing the Duration of Time Off in Connection with Pregnancy and Birth" was issued on 26 March 1956. In accordance with this ukase, female workers and employees were given 112 days off for these purposes. In the event of a pathologic pregnancy or birth, and also in the event of multiple births, time off was increased.

The USSR Council of Ministers decree "On Further Measures To Help Mothers Working at Enterprises and Institutions," dated 13 October 1956, made provision for additional time off (up to 3 months) without pay following time off for pregnancy and birth. As a result, total time off was increased to 1 year.

The CPSU program provided for further development of the situation regarding health care for women and children. In particular, it noted that "special attention should be given to developing in the cities and countryside a network of health care facilities for women and children (maternity homes, consulting facilities, pediatric sanatoria and hospitals, forest schools and so forth).**

The legislative acts aimed at improving health care for women and children testify to the concern of the party and government to protect the health of mothers and infants. The state system of health protection for mothers and infants was strengthened by the "bases of legislation of the USSR and union republics on public health," and ways were outlined for further improving medical care for mothers and infants. In 1973, pregnancy and birth grants were established equal to full wages, regardless of the work seniority of all working women; and the number of days off with pay for child care was increased. In November 1974 grants were established for children in the families of workers with low incomes.

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* "Collection of Decrees and Dispositions of the USSR Government," Moscow, 1942, Vol 2, p 24.

** "The CPSU Program," Moscow, "Politizdat" 1974 p 96.

The "Listing of Especially Heavy and Harmful Work and Occupations Barred to Women" compiled for the various sectors of the national economy operates for the purpose of restricting labor by women in the various industral sectors. The list of occupations in which it is not allowed to employ women is being constantly reviewed and enlarged. The USSR Academy of Medical Sciences Scientific Research Institute (SRI) of Obstetrics and Gynecology, the Sverdlovsk SRI of Maternity and Child protection and other obstetric and gynecologic institutes and faculties are now engaged in a study of the effect of production factors on specific functions in the female body. Researchers are paying special attention to questions of professional selection, optimization of labor and leisure conditions, and the organization of working places.

The public health establishments are doing much work to provide specialized medical care for women and children. Pediatric surgery, orthopedics, ophthalmology, psychoneurology and so forth have been developed. Obstetricians and gynecologists organize specialized consulting services whose aim is to prevent and treat incomplete pregnancies, infertility, gynecologic diseases in women of child-bearing age and so forth. Great importance is now attached to the organization of specialized hospital care.

In the CPSU Central Committee and USSR Council of Ministers decree "On Further Improving Public Health" the need was pointed out to expand the network of pediatric polyclinics, hospitals and sanatoria and specialized year-round sanatorium pioneer camps, and to break down the pediatric sectors into smaller units. Work is now continuing to implement this decree; it is aimed at further improving outpatient polyclinic facilities for women and children and improving the quality of work at gynecologic and pediatric consulting facilities.

In accordance with this decree, in 1979 the USSR Ministry of Health All-Union Scientific Research Center for Mother and Child Protection was organized. It is designed to carry out the function of head establishment in the country for the problem "Scientific Bases for Protecting the Health of Mothers and Neonates," provide organizational, methodological and consultative help for public health organs and establishments, deal with questions of improving physician qualifications for obstetricians and gynecologists, neonatologists and middle-echelon medical personnel, and broadly introduce into public health practice the achievements of science.

Recently, the basic directions in improving the network of obstetrics and gynecologic and pediatric establishments have been increasing their numbers, creating favorable sanitation and hygiene conditions in hospitals, and locating them rationally and improving their structure.

With each passing year the number of gynecologic consulting facilities and pediatric polyclinics and outpatient departments (both independent and as part of other establishments) is increasing. At the end of 1980 they numbered 24,300*

* "The USSR National Economy, 1980" Moscow, "Finansy i statistiki" 1981 p 495

The preschool establishments provide enormous help in the education of children. At the end of 1980 some 14,339,000 places were available at these establishments. In addition to the permanent preschool establishments, during the summer period seasonal preschool establishments and children's playgrounds are organized; in 1980 they served 4.7 million children.*

In 1979 state budget expenditures to maintain general education day schools, including boarding schools, increased by a factor of 10 compared with 1940, and expenditures on kindergartens, kindergarten-creches and creches by a factor of 22.3**

The problem of protecting the health of mothers and children is numbered among the most important scientific and technical problems of the "Main Directions in the Economic and Social Development of the USSR for 1981-1985 and for the Period through 1990."

In accordance with the directives of the 26th CPSU Congress, the CPSU Central Committee and USSR Council of Ministers adopted the decrees "On Measures To Improve State Aid for Families with Children" and "On Measures To Further Improve Social Security." The decrees provide for a series of measures aimed at improving everyday conditions and labor and strengthening family relationships. Costs of vacations for children aged up to 1 year will be partially reimbursed to parents, and leave without pay is available for parents with children up to one-and-half years. During the 11th and 12th five-year plans demand for permanent and seasonal creches should be fully satisfied.

Improvements in the well-being of Soviet people, improvements in their labor and domestic conditions, strengthening the material base of the obstetric and pediatric services, raising the qualifications of obstetricians and pediatricians. and the development and deepening of research in the field of obstetrics, gynecology and pediatrics are all aimed at further improving the health of mothers and children.

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* "Women in the USSR" Moscow, "Finansy i statistiki" 1981 p 18

** "The USSR National Economy, 1980" Moscow "Finansy i statistiki" 1981 p 409

9642
CSO: 1840/269

CHIATURA OBSTETRICS-GYNECOLOGY CONFERENCE HELD

Tbilisi KOMUNISTI in Georgian 5 Jan 83 p 4

[Article by Ch. Mamiseishvili: "Thinking About Tomorrow"]

[Text] You hardly ever meet anyone these days who is not deeply concerned about one of the prime problems confronting our people--population growth. And it has been stated authoritatively from high rostrums that the republic's demographic situation is very disturbing. Numerous letters that have been published in the press reflect this thinking about tomorrow, and practical steps have been taken.

One event among many such measures was the recent Inter-Rayon Obstetrics-Gynecology Conference-Seminar held in Chiatura, participated in by obstetricians, gynecologists, and pediatricians from Chiatura, Zestafoni, Tkibuli, Sachkhere, Terzhola, and Ordzhonikidze rayons.

The participants, assembled in the auditorium of the Magaroeli Movie Theater, held serious discussions concerning improvement of medical services and living conditions for mothers of large families, factors hampering population growth, and the health of mothers-to-be. It was also stated that, unfortunately, we still encounter those who are in no hurry to have children; it is essential to have well-argued and convincing talks with such persons and provide counseling.

On the second day, mothers of large families assembled in the Silazhvarde Youth Club along with representatives of the public. They were counseled and advised by Prof P. Kintraia, director of the K. Chachava Scientific-Research Institute of Prenatal Medicine and Obstetrics-Gynecology, who answered their questions.

In the "Comments" book we read the following: "The family plays a vital role in bringing up the next generation. If the family is diligently concerned for the child's upbringing, the results are always gratifying. It is the parents who set an example for the youngsters to emulate. They must, therefore, be especially careful of their own behavior. The best citizens are raised in families that love labor, where children are taught to work when they are very small and are not pampered.

"Remember that your child's future depends on you, and try to ensure that it is a future which will gladden you, your children, and society as well."

Staff members of the institute--Dr of Medical Sciences L. Gegia and Senior Scientific Associates Ts. Didia, N. Dzhikia, M. Bakradze, D. Sanikidze, N. Sharia, and N. Zhorzholiani--received patients, made diagnoses, instructed them in the symptoms of certain disorders, and gave consultations.

Participants in the conference-seminar expressed their thanks to the organizers of this valuable undertaking.

6854
CSO: 1813/18

CHILD MORTALITY (UP TO AGE 3) BASED ON A THREE YEAR PERIOD IN SUMGAIT: 1970-1972

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Azerbaijani No 4 April 1975 pp 72-76

[Article by K. Ya. Farayova, T. A. Listengarten, Z. H. Abdullayeva, G. B. Filatova, A. N. Eyvasova and R. G. Gasymova, N. K. Krupskaya, Scientific Research Institute for the Protection of Mothers and Children of the Azerbaijan SSR Ministry of Health]

[Text] The city of Sumgait has been equipped with an adequate network of childrens' health-treatment institutions and guaranteed medical staffs. Sickness and death among children here is dimishing from year to year. In order to decrease child mortality even further we have established the goal for ourselves the study of causes of child mortality by age in the city of Sumgait. We have done research on the basis of information culled from developmental and sickness records of children at the 2 childrens' polyclinics in the city of Sumgait and of children who died either at home or in a childrens' hospital between 1970-1972. Along with this we have also analyzed the mortality rate of newborns in 2 maternity wards.

Charts (514) have been prepared which reflect the development and sickness of children who have died.

The number of those dying has been lower in every calendar year, i.e.; 1970, 190; 1971, 163; 1972, 161.

Thus, the maximum mortality rate for children up to one year of age shows that 80% of these occurrences took place among children in the first half year. The curve of child mortality statistics was dropping from year to year (29.6% in 1972 relative to 1970); hence, mortality statistics per 1000 children aged between 2-3 years in 1970 are 6 and 1; these are, correspondingly in 1972, 2.9 and 1.2. Among the 514 children who died male children predominate (5.7%).

Chart One

Age of children dying: 1970-1972

Patients' age	Number	Percentage (%)
Up to 10 days	92	18
10 days-1 month	33	6.4
1-3 months	111	21.6
3-6 months	141	27
6-12 months	85	17
1-2 years	40	7.8
2-3 years	12	2.2

Grouping according to the place of death showed, that, in 1970, 31 died in the home of birth, 111 in a hospital and 48 in a house. In subsequent years (1971-1972) 29 and 32 died in the home of birth, 100 and 105 in the hospital and 34 and 24 in a house.

Chart Two

Place where death occurred

Years	House of birth		Hospital		House	
	Number	%	Number	%	Number	%
1970	31	16	111	58	48	26
1971	29	18	100	61	34	21
1972	32	20	105	65	24	15

Thus, the rate of mortality in the house of birth in the first years of life have not changed. The number of children dying in a house has decreased; it was 15% in 1972 and 26% in 1970. This demonstrates the more complete hospitalization of sick children.

Eighty-six (23%) of 370 children in the polyclinic records died in a house; however, 20 (38.5%) of 52 children aged between 2 and 3 died in a house. One can hypothesize that this demonstrates a complacency on the part of parent and physician with regard to the time of illness of older children and, as a result, less effort is expended on the question of hospitalization.

We have grouped, according to age and type of work, women who have lost children in the first three years according to the role of the mother in caring for the child.

Our conclusions demonstrate a relationship between the age of the mother and the child's death within different periods of childhood. In more than half the cases the age of a mother who has lost a child in the maternity ward is over 30 (45 of 92). In another grouping, more children of women under 25 die--198 of 422 (47%). If a fundamental role in the first group is attributed to biological factors, one must consider the lack of personal experience of mothers in the second group.

We did not find any special difference in the level of child mortality of working or non-working mothers. According to polyclinic records the mothers of 202 of 422 children who died up to the age of 3 (48%) were housewives; as for the deaths of children of working mothers, it was 52%. It appears that this slight difference between these groups can be explained by the long-term leaves of absence taken by them in the first, most critical year in a child's life.

In order to analyze in depth the reasons for a child's death, we evaluated the physician's attendance on both healthy and sick children and studied the histories of children who had died according to polyclinic records which, in turn, made it possible to expose a number of shortcomings.

Observations of children (especially up to the age of one year) have been conducted basically through the family physician and visiting nurse. However, systematic observations have been conducted on only 230 (62%) children of whom 110 (30.6%) were observed irregularly. They were not continuously observed and not enough thought was given to them. No observation was conducted on 30 children because they lived outside the boundaries of Sumgait. It is a pity that in a number of cases insufficient attention was given to the question of the formal nature of the observation of healthy and sick children, and not enough attention was paid to their care and nourishment. Very often the local pediatrician was confused or uninformed about administering artificial nourishment to the children. Supplemental nourishment prescribed for the child is neither quantitatively nor qualitatively changed over a long period. When the situation of the child is being evaluated or illegal medicines in the house are given without regard for the severity or form of illness, age is not taken into consideration. Doses of medicine are often decreased; the period over which they have been administered has been increased without basis.

As an example, we give an excerpt from a medical history below:

> Sick child D. After the first actual examination, he was not examined for 3.5 months. On the second examination a prescription was made out for respiratory illness. Treatment was done at home and, although the condition worsened significantly a number of days later, the medication was unchanged. A few hours later the child died.
>
> The infant M. was treated at home for 14 days. At birth it weighed 1,900 grams. In its developmental history advice necessary for the treatment of the infant was not taken note of. Ionized [ionit] milk was prescribed which was neither appropriate to the age nor weight of the child. A few days later the child was brought to the hospital in a critical condition.

There is no doubt that evaluation of a premorbid situation depends on the physical development of the child. Despite this, based on polyclinic documents, the height and weight of 120 (37%) of the children was not even examined once. On the basis of this data, the lack of necessary evaluation of the importance of observation has resulted in 2nd and even 3rd degree hypertrophy escaping control.

For example a 1.5 month old child was hospitalized for pneumonia. The child's weight was 2,600 grams but while in the ward it dropped to 2,300. Two days prior to hospitalization the local pediatrician considered its condition satisfactory.

Chronologically, in the years 1970-1972 the number of children up to age 2, dying of different degrees of dystrophy, oscillated between 12-17%.

In 106 children up to age 1 rachitis (especially 2nd degree) was diagnosed. One must bear in mind that, as Professor A. F. Turun has written, "children do not die from rachitis but it causes the advancement of some diseases and one has to say it increases child mortality." In our material, the presence of weight retardance and rachitis is first determined in a ward. Along with both of these diagnoses among diseased children being noted as an ongoing illness, they also have a destructive influence on the progress of the basic illness.

One must note that local pediatricians do not give enough thought to the question of effective nourishment; however, "of external factors necessary for the correct development of the child up to 1 year of age, nutrition, without a doubt, takes first place." (G. N. Speranskiy)

According to documents, the administration of alternative feeding is not always fundamental. A total of 45% of diseased children up to the age of 1 year have had mixed or artificial feeding earlier.

Analysis of the material collected has shown that the association of parents to the local physician is inadequate; the fact that emergency physicians on call are frequently summoned confirms this. Thus, in the course of 3 years, only 150 (47%) of 316 children up to age 3 were sent by local physicians; 139 (44%) by emergency physicians and 27 (9%) were brought in by parents without admission documents.

Often the children were brought to the hospital in a severe or incurable condition; the high mortality rate in the course of 24 hours is a consequence of this.

Of the 316 children who died in the hospital in the course of 3 years, 182 (57.5%) died within 24 hours, of whom 157 were one year old or younger and 25 between 1 and 3.

Chart Three

Mortality rate within 24 hours according to years

1970 Total	Up to 1 year	1971 Total	Up to 1 year	1972 Total	Up to 1 year
57	48	55	47	70	62
51%	84%	55%	85%	66%	88%

The length of time the other 134 deceased children were in the hospital was as follows: up to 3 days--30 children; 3-7 days--49; more than 7 days--55.

Forty-three percent of the children were hospitalized within the first 3 days of illness; in general the period of hospitalization varies between 25-30 days after the beginning of illness.

Analysis of the documentary history of 92 children who died in the maternity ward has shown that newborns most often die within 3 days of birth; 10.8% of premature children and 8.7% of one of twins also die.

The reason for the frequency of death in the first days of life was internal abdominal asphyxiation accompanied by brain trauma (41 cases--45%). The death of 10 children (11%) was caused by a lack of development and atelectasis (incomplete expansion of a lung). In 7 cases the cause of death was hemolytic anemia and in 15 (16%) pneumonia. Among causes of death of the remaining 422 children (370 in the first year and 52 in the second and third) pneumonia--noted in 282 cases (67%)--holds first place; of these 25 were older than 1 year.

Among various pneumonia symptoms the most dangerous were hypothermia and neurologic abnormality. Finally, severe asthma, discomfort of movement emerging with encephalitic tremors and convulsions. High temperature did not play a small role in the sudden worsening and bad prognosis of the sickness.

The cause of death of 67 children (16%) in the first weeks and months of life was different variants of staphylococcal infection. Gastrointestinal illnesses hold third place (30 children--7%). Severe infections were noted in 14 cases (3.3%) among reasons for death; of these, suppurative meningitis in 10 cases, Botkin's disease in 2 cases and measles in 2 cases.

Birth defects were observed in 15 children (3.4%). A total of 14 children (3.3%) constituted a group in which death was caused by diseases of the blood and kidney, brain tumor, poisoning and trauma.

One of the factors influencing the development of disease was the late application of medication as a result of not making a diagnosis on time, or its lack of effect. Some mistakes were made as a result of the poor compilation of medical history, a lack of diagnostic evaluation of valid symptoms, or their not being noted.

In some cases, because lumbar puncture was not done on time, suppurative meningitis was revealed late.

Below we give a brief summary from day-to-day medical histories:

> The nine-month-old child D. was born with whooping cough. However, the local pediatrician considered the serious abnormalities in psychomotor development to be the result of rachitis. The neuropathology of the child was not analyzed and only rachitis medication was given.
>
> The nine-month-old female child F. was hospitalized 3 weeks after becoming sick. She was treated for pneumonia at home. Despite frequent convulsions and a high temperature, lumbar puncture took place only 2 weeks later. Suppurative meningitis was diagnosed much later.

Analysis of causes of infant mortality up to 3 years old in Sumgait city has made it possible to note a number of shortcomings and demonstrate possibilities for reducing sickness and death even further. Along with improving medical services for children in treatment institutions, it is also necessary to pay more attention to the period of pregnancy, to perfect methods of fighting birth trauma, improve service to newborns--especially premature babies--at the home of birth and conduct more work on sanitation among mothers. Motherhood schools for young mothers should be established under the purview of pediatric clinics.

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UDC 613.486: 677.494

HYGIENE ASSESSMENT OF CLOTHING MADE FROM CHEMICAL FIBERS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSR in Russian No 10, Oct 82 (manuscript received 8 Jun 81) pp 40-45

RAPOPORT, K. A., IONKINA, S. F. and MINKH, A. A., Moscow

[Abstract] The inadequacies of clothing made from artificial chemical fibers, including migration of caprolactam, acrylonitrile and chlorine-bearing substances leading to skin irritations and general toxic effects, are discussed. Fabrication and finishing technologies are inadequate, particularly for flame-resistant and antistatic fibers. Studies have shown that the hydrophobic and electrical properties of chemical fibers exert an adverse effect in regard to hygiene: details of these studies are presented. Better combinations of natural and chemical fibers used in clothing would improve the hygiene situation: the closer to the body the clothing, the less should be the amount of chemical fibers used in it. It has been demonstrated that bacterial growth on the skin when underwear made from synthetic fibers is used is three times greater than when this clothing is made from natural fibers; the proper care of clothing is discussed in this regard. A scheme now worked out for effective hygiene monitoring of the production of clothing made from chemical fibers must now be tested by appropriate specialists, including hygienists and dermatologists, using questionnaire and statistical methods, before large-scale production of particular items of clothing is permitted. References 4 (Russian).
[704-9642]

UDC 615.371:[579.871.1 + 579.841.94 + 579.852.11]-053.3

DATA ON IMMUNIZATION OF CHILDREN AGAINST DIPHTHERIA, WHOOPING COUGH, TETANUS AND MEASLES DURING FIRST 3 YEARS OF LIFE, FROM RECORDS OF MOSCOW POLYCLINICS

Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian
No 8, Aug 82 (manuscript received 21 Oct 81) pp 112-116

SUKHORUKOVA, N. L., KORZHENKOVA, M. P., SIGAYEVA, L. A., ZYBINA, T. M., MAKSIMOVA, N. M., IGNET'YEVA, G. V., PETROVA, M. S., KHOKHLOVA, G. A., ISPOLATOVSKAYA, E. O. and KOSTYUCHENKO, G. I., Moscow Scientific Research Institute of Epidemiology and Microbiology imeni Gabrichevskiy; Moscow City Sanitary-Epidemiological Station

[Abstract] Immunization of young children (up to age 3 years) in the Moscow area against diphtheria, whooping cough, tetanus and measles is analyzed from the records of the four Moscow city rayons of Kuybyshevskiy, Leningradskiy, Babushinskiy and Krasnopresnenskiy, and its epidemiological significance discussed. Percentage of immunization in the opulation contingent analyzed is as follows: the mean for diphtheria, whooping cough and tetanus varies between 58.6% and 85.9% (average 71.7%), and for measles from 24.1% to 51.2% (average 41.8%); immunization is being done generally later than the times advised. The reasons for nonimmunization or late immunization are analyzed and it is shown that the main causes include medical contraindications (40.8% to 86.4%; average 69.1%), move of residence (5.6%), parental refusal for vaccination (2.5%) and unsubstantiated reasons (3.0%); in 19.7% of cases two or more of these causes were present. Analysis of the medical reasons for nonimmunization or late immunization indicated that in 40.4% of cases it was contraindicated on neuropathological grounds, in 16.2 percent of cases because of acute respiratory viral infection, and in 19.4% of cases because of exudative diathesis and eczema; unjustified medical reasons made up 12.1% of cases. It is concluded that immunization of young children can be improved mainly through stricter observance of recommended contraindications by physicians, particularly neuropathologists and pediatricians. References 5 (Russian).
[357-9642]

OBLAST PUBLIC HEALTH MEASURES REPORTED

[Editorial Report] Tashkent SOVET OZBEKISTONI in Uzbek 2 October 1982
An article "Field Polyclinics by A. Akbarov, Chief of the Kashkadarya Oblast Health Department describes measures taken to provide medical services to cotton harvesters. Rayon center hospitals have created 30 mobile dispensaries with surgeons, obstetricians, gynecologists, therapists, and stomatologists. Field polyclinics, seven of which have been set up in recent years, are staffed with therapists, surgeons, specialists in ear, nose, and throat diseases, obstetricians, and gynecologists. Drugstores have also been set up near fields to supply necessary drugs and sanitation and hygiene supplies. Seasonal nurseries and child-care facilities have been placed under the strict supervision of physicians. Lectures and talks on sanitation and hygiene principles are given to the workers.

BRIEFS

PUBLIC HEALTH CONFERENCE IN VORONEZH--Today marks the beginning of an All-RSFSR conference in Voronezh devoted to problems of further improving public health. There will be discussion of problems of medical services, preventive work, spa and sanatorium treatment and the pharmacy. The participants will hear L. P. Lykova, deputy chairman of the RSFSR Council of Ministers, S. P. Burenkov, USSR minister of health, N. T. Trubilin, deputy minister of health for the RSFSR and other responsible officials of All-Union and republic ministries and departments. [Text] [Moscow SOVETSKAYA ROSSIYA 12 Jan 83 p 2] 9582

LENINGRAD MEDICAL SERVICE IMPROVED--In recent years, medical services to the population of Leningrad have achieved definite successes: extending the network of therapeutic institutions and improving their activities. Construction is underway for a hospital with 1200 beds in Kalininskiy Rayon, three stomatological polyclinics equipped for 2000 visits per shift and a pediatric polyclinic in Moscow Rayon. Now, 55 units are under construction. The appropriation for public health in Leningrad has increased by 38%, compared to 1976. These facts became known at a meeting of the most active members among health professionals in Leningrad, which took place yesterday at the Leningrad CP's obkom House of Political Enlightenment. Participants discussed the results of the work carried on by public health organizations and institutions in 1982 and the tasks of health professionals in implementing the resolutions of the 26th CPSU Congress, the November (1982) Plenum of the CPSU Central Committee and the decrees of the CPSU Central Committee and the USSR Council of Ministers "On Additional Measures for Improving Public Health." A speech was made by V. R. Prokof'yev, official of the Main Public Health Administration of the Leningrad Council's ispolkom. In estimating what has been accomplished at its true worth, the meeting participants gave most attention to reserves and to ways to further improve health services to the population. There was mention of more rapid introduction of new diagnostic and therapeutic methods and of expanding preventive work carried on by medical institutions. Much attention was given to improving the style of medical services to Leningrad citizens, to increasing the medical personnel's sense of responsibility to assigned work and strengthening of labor and administrative discipline. It was found especially necessary to improve "First Aid" activity, home visitations and conditions of labor, recreation and medical services for workers, the latter by continuing joint work with

branches of trade union organizations and managers of enterprises. The further reduction of general and occupational morbidity was also emphasized. The importance of improving the training of medical cadres was stressed as well. The conference participants heard I. M. Safronov, head of the Vyborg Rayon health department, G. P. Donchenko, district pediatrician at Pediatric Polyclinic No. 10, Kalininskiy Rayon and Yu. D. Ignatov, prorector, 1st Medical Institute, as well as others. The meeting participants were given socialist obligations for 1983. An appearance was made at the meeting by V. G. Zakharov, secretary, Leningrad obkom, Communist Party. [Text] [Leningrad LENINGRADSKAYA PRAVDA 19 Feb 83 p 3]

CSO: 1840/323

NEED FOR CHILD AND ADOLESCENT PSYCHOTHERAPISTS CITED

Moscow PRAVDA in Russian 6 Feb 83 p 3

[Article by M. Vasin: "We are sensitive echoes of one another"]

[Text] And the Day doesn't end...
How little we seem to know of our sons and our daughters!
And what problems this can sometimes cause.

Let us consider how much trouble we go to so that our children might grow up healthy, developed, well-bred, and well educated. We have the right--who disagrees?--to expect their gratitude and, more importantly, to expect them to embark sincerely and happily on the paths that have been laid out for them, so that they might become our worthy successors. But suddenly, and these are not just rare occurrences--they begin to "object," these same ones we are doing our best for and losing sleep over, without thinking of ourselves.

A 14-year old schoolgirl: "Mama created some sort of image of a good girl for herself and she demands that I conform point by point to that image. And I am quite different."

A 12-year old: "My parents worry about me too much and are always giving advice, giving advice. It's worse than shouting and bossing me around."

A 10-year old girl: "I am very bad; I have absolutely stopped loving my mother. And so I feel like crying all the time."

No, this is not what we expected of them. And what makes it worse is that these confessions were not made to a mother or a father ("They wouldn't understand") but to a stranger, the physician.

What has happened at home? While looking for the answer to this question, the physician invites us to ponder together why good parental intentions in excessive concentrations turn into contradictions. The struggle for a plan turns into pushing the child ahead; concern for health, upbringing, learning, etc., turns into constant anxiety and nervousness, putting things in order turns into protecting the child from life (either from the wind or from his contemporaries). And because we are busy and impatient we then

become easily disillusioned with our children; we become irritable. An atmosphere of tension rules the family. Instead of being close to our child we have "child rearing at a distance": demands, reprimands, threats. Instead of attracting him with the proper example, or teaching him, we try to teach him a lesson. Instead of restraining parental ambition and acting in accordance with the abilities and personalities of a son or a daughter we belittle them and try to force them to the limits of some abstract ideal...

It should be explained at this point that this anonymous physician is not a fictional character, but a "general specialist" at the psychotherapy department of the Leningrad Pediatric Polyclinic No. 26. He is backed up by many years of the most intensive collective research and practical work (The department was created on the initiative of the Leningrad Municipal Health Department and leading Leningrad scientists in 1969.), several monographs, thousand of families followed and children cured, and an extensive, sometimes excessive, popularity among pediatricians and parents. And the request of those working at this collective "not to give him publicity" but to deal with the subject is completely understandable.

Let us then continue on the subject--on children and how they interpret the conditions of their existence in many "learning-oriented" families.

Seven-year old: "I don't like to tell Mama and Papa about what I've done wrong, because they won't understand it properly, and that, too, is like a wrong for me."

Six-year old children: "Nobody loves me; everyone shouts at me." (Girl) "She tortured me, beat me, and then complained that I was a crybaby." (Boy)

And one more statement: "The day is very long, and somehow this is bad; it drags and drags and seems that it will never end. I am sick to death of the long day--let it get dark."

These are the words of a 5-year old boy. How has he stood such a long, long 5-year-old life? But then again, he couldn't stand it, and that is why he was brought to the physicians. Everyone certainly does not stand it--those who are a little weaker physically, sensitive and unsophisticated, with an early feeling of their own worth, and up in an extremely unenviable position.

Imagine: Papa and Mama, who are the closest and safest people in the world ("aboslute protection" in the language of the institute) are constantly tense, do not protect but attack, shout and beat, demand the impossible, and make it clear to the child that he is certainly not the child he should be. He feels bad; he would be glad to be someone else, but he cannot. There is no way out.

This is approximately how it goes with "hothouse" children when they are brought to the nursery or to school: the strictness and demands made there often prove to be too much for them.

And these little children are plunged into a world of contradictory experiences, where respect for adults and the desire to please them is destroyed by fear of them and their own pride, where the feeling of their inferiority collides with growing egocentrism and an uncontrollable striving for asserting their "me-ness" by any means, including hysterics.

Inner conflict has developed. Now comes the psychological trauma: fright, anger, pain--and illness will come. Neurosis. "Problems of the heart," as they used to call them in the old days. "Constant stress, unresolved spiritual conflict, a sensation of loss"--these are how the causes of the disease are defined today.

Neurosis--unjustifiably strong reactions to a casual remark, troubled sleep, headaches, lessening of ability to work, vague fears. But because parents and teachers do not pick up on these foci immediately the rough course continues with unexplained jumps in temperature, malfunctioning of the gastrointestinal tract and gall bladder and excretory systems, etc., added to the neurosis. Seeing a physician and vigorous therapeutic measures end up having only a temporary effect.

And if only someone would see the light and bring the sick child or adolescent to a psychotherapist it would suddenly become clear that all of these "somatic" ailments such as whims, irascibility, and rudeness--are a distorted cry for help, love, and tenderness.

Family = Seven "I's" [Translator's note: The Russian word for family is sem'ya, which can be divided into the two smaller words sem' (seven) and ya (I)]

The disease has been established--it must be cured. The parents are ready for anything--they have recognized their guilt, and the child, having sensed this, uses his illness to hold them as peculiar hostages, orders them about and terrorizes them. These conditions are intolerable. But the physician is in no hurry to either set procedures or recognize the parents' guilt. He even calms them: "Wait a little while; we still have to get an understanding of this. Maybe things aren't going well at school? Maybe he saw a scary movie? Someone close to him died? Nothing like this has happened? Well, then, we must look for the cause at home." Spencer wrote that those bad tendencies that parents try to eliminate in their children are found within themselves, and modern science adds that many childhood diseases have their origins in the parents. But to blame all mothers of neurotic children is nonetheless impossible. Because, let us say, the maternal instinct develops slowly in them and it is not sufficient while the child matures. From this it is understandable why they don't trust their son or daughter's experience, why they are overprotective and attempt to live for them rather than with them. How are you doing in this respect?

The physician interviews the patient and his parents over and over, and even calls in the grandmothers and grandfathers. He gives the adults multi-point questinnaires and he has the children draw their families,

their everyday fears, and their nocturnal bad dreams. None of them suspect that treatment has already begun: the special natures of their characters and interrelationships are gradually being revealed to them. The sources of the illness are here somewhere, and recognizing them is like seeing the enemy in battle.

The roots of childhood illness are many. They can be protracted conflicts in the parents' work, domestic quarrels, nervousness on the part of the mother during the child's first year of life or during pregnancy, lack of acceptance of a child who was not wanted, was too early, or was not the child of their dreams (sexwise), hidden neuroses of the mother and father, unrestrained solicitude and kindness, and also despotism and peevishness on the part of the grandmothers and grandfathers--even if they haven't been in their world a long time.

They find out that in the span of three generations unfavorable neuro-psychiatric factors accumulate and become concentrated. The culmination of this process is the child. If the grandmother was bossy and cruel but did not have any health complaints, then the grandson is almost bound to suffer from an assortment of neurosis-related problems.

This is why the physician cannot rush to get the child cured. There are seven "I's" in family and any of them is connected closely to the others. This rule must be followed for lasting success: "When a child is neurotic the whole family must be cured." Carefully, step by step, the psycho-therapist will help all of the members extricate themselves from the labyrinth of irrationality and anger, depression and trouble and come to faith in themselves, in those who are close to them, and in the future.

In evaluating the problems of their domestic conflict, he takes each one's point of view, does not speak a word of reproach to anyone, for he is not a judge, but a mediator in their most important task--to establish peace in their family. He will step into the complicated role of teacher and comrade, physician and fairy-tale character, tutor and sorcerer. And marvelous things will happen. A first-grade pupil, playing Aibolit, pulls a sliver out of the mouth of a stuttering elephant and stops stuttering herself. A schoolboy, somewhat older, who fears his strict math teacher as he does fire, will sometimes be the "teacher," scolding his menacing father (the "pupil" today) for his stupidity, and the witch who used to follow behind him out of a dark room will cease to exist. After conversations with the physician, youths will call him by the following day to tell him that the warts on their hands are growing smaller, and some even disappear...

Some, however, don't start to get better immediately. The majority will have to come for consultation again and again to the playrooms and classrooms of the polyclinic. They will draw their nightmares and make masks of horrible monsters. Then they will learn how to play, along with their parents (it appears that most of them don't know how).

Each play is a unique performance, a complex psychodrama--an irreplaceable education, character training, and therapeutic method. It enables the smallest children as well as their bearded fathers to better understand their own problems, to learn to stand in someone else's shoes. By "acting out" their tensions and antipathies, by spending some time in the hide of a wolf or Baba Yaga, the children will be able to get rid of and survive the accumulated negative emotions, aggression, or timidity and be convinced of their own strengths and of the fact that they are no worse than anyone else.

Besides this, the oldest ones will evaluate their complications and problems with contemporaries, read books, and see films about heroes and people with difficult but beautiful lives.

All of this is interspered with interviews with the physician, in which he unfailingly supports each success of parent and child, and presents variations in the solutions to remaining problems for family analysis. He will conduct waking hypnosis sessions and will use music under hypnosis to train the person to learn to defuse "stressful situations." There are too many to count--in the arsenal of child and adolescent psychotherapy, this combination of medicine and teaching--dozens of effective methods.

Whom to Call for Help

Unfortunately, pediatricians, neuropathologists, and psychologists do not usually use these methods. They are presently used by only a few child psychotherapists, a relatively small group of researchers and practicing physicians in the aforementioned department for neuroses in Pediatric Polyclinic No. 26 in Leningrad, in the Moscow Pediatric Psychoneurological Hospital No. 6, in the Central Institute for the Advanced Training of Physicians and several other therapeutic institutions in Moscow. In the last few years there have been individual physicians in Baku, Voroshilovgrad, Kishinev, Riga, Stavropol, Khabarovsk and Kharkov who are enthusiastically using these currently unfamiliar methods, even non-staff chief child psychologists of municipal health departments. The Central Institute for the Advanced Training of Physicians not long ago trained an additional group, and now there are specialists in Vilnius, Grozny, Karaganda, Kustanai, Magadan, Minsk, Odessa, Sverdlovsk, Tashkent, Frunze, Chelyabinsk, and Yakutsk.

But the available forces are insufficient for therapeutic help, even though the families of the region are in dire need. And the demand for them is high. The shortage of specialists results in the fact that people with insufficient training are trying to cure complex ailments--all sorts of quacks. This is extremely undesirable: child psychotherapy is a serious science and a fine art.

Specialists working in this field dream of the time when each rayon will have a bureau for pediatric and adolescent psychotherapy. Its capacity, as the experience of the Leningrad staff has shown, will be large, because a good deal of time will be given to families and large groups of patients.

The physicians are convinced that it is absolutely necessary to offer outpatient rather than inpatient care. For parents will avoid bringing their problems into psychiatric hospitals in any possible way.

The question of prevention is no less important. Problems in the area of pediatric neuropsychiatry are not always given a great deal of significance by parents and teachers, nor is education, the eradication of psychoneurological illiteracy, being handled adequately at the present time. Schools of mental health currently in operation (on a public basis) can be counted on the fingers.

There is an obvious need for treatment centers where qualified work would be done with children, and particularly with parents, teachers, and preschool personnel, and where therapeutic re-education of nervous children would be done. In particular, all adults having contact with children would have to master the easily-managed and powerful prophylactic method of playing. The solution to the problems of troubled adolescents depends to a great degree on the broad dissemination of psychotherapeutic knowledge and opinion.

In short, the time has come for the creation of a branch of pediatric and adolescent pscyhotherapeutic service in our country. Of course, it must be admitted that realistically this cannot possibly be accomplished right away. It will take time to train the personnel. Of course, this can be speeded up if psychotherapists are trained from the ranks of pediatricians (A great many of them are in favor of this). This is completely within the power of the Central and Leningrad Institutes fot the Advanced Training of Physicians. Moscow and the city on the Neva have at their disposal highly qualified specialists who can share their total experience with the novices. The question of including psychotherapy fundamentals in the programs of medical and pedagogical VUZes and of secondary schools for training teachers of preschool children also arises.

Another problem is that of the availability of reference material--specialized as well as popular. Thanks to the efforts of the Leningrad Department of the publishing press "Medicine", several books have already appeared on psychiatry, psychology and psychotherapy for children and adolescents. Other publishers should also have to be included in this task.

The particular complexity of certain manifestations of a child's mind demand that new methods be devised to protect the nervous system from too many stresses by eliminating them.

There must be cooperation from the Academies of Medical and Pedagogical Sciences and the ministries of health and education for the solution to these and many other problems. However, the effort and expense required, as submitted, will not be too much, since they will pay for themselves with interest by decreasing expenditures for maintaining the neuropsychiatric health of adults and will increase the labor effectiveness of thousands and thousands of young people starting out in life, who will be free of the painful consequences of childhood neuroses.

12262
CSO: 1840/320

UDC 613.648 + 614.876

NUCLEAR POWER ENGINEERING AND RADIATION HYGIENE

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSR in Russian No 10, Oct 82 (manuscript received 13 Apr 81) pp 16-23

VOROB'YEV, Ye. I., Moscow

[Abstract] The search for new energy sources that can be used on an industrial scale is one of today's most urgent problems. The limited amounts of fossil fuels available and their negative effects on the biosphere renders them unsuitable for meeting the increasing energy demands. Since studies have shown that the amounts of energy available from wind, geothermal, solar and other sources are totally inadequate to meet demand, the conclusion is reached that nuclear power is the only source available that is economically feasible. Breeder reactors will be able to provide adequate power for mankind in the future. Further development of nuclear power engineering will depend largely on its environmental safety and the absence of any threat to human life. Proceeding from ICRP publication No. 26 on ra iation safety, the author discusses the problems of environmental safety, drawing examples from various countries in the world. Special attention is given to the problems of radioactive waste disposal and heat contamination of the environment. The USSR Ministry of Health National Commission on Radiation Safety regulations on radiation safety are briefly reviewed. References 4 (Russian). [704-9642]

UDC: 579.842.11.04:615.849.114.07

FUNDAMENTAL ASPECTS OF PHOTOREACTIVATION AFTER EXPOSURE OF CELLS TO IONIZING RADIATION

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 27, No 9, Sep 82 (manuscript received 5 Feb 82) pp 17-21

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[Abstract] The fact that visible light can reduce the damage caused in E. coli cells by gamma radiation confirms that a part of the radiation damage accompanying gamma irradiation is caused by Vavilov-Cherenkov radiation, the "accompanying ultraviolet-like" radiation of gamma radiation. In other words, all methods of dissipating absorbed energy in matter, no matter how insignificant they might seem at first glance, produce biological effects. Furthermore, the phenomenon of photoreactivation, partial recovery from gamma irradiation or ultraviolet irradiation as a result of exposure to visible light, is not the only example in which electron excitation has a biological role to play in the damage caused by ionizing radiation. There are other photosensitive targets, damage to which contributes to the biological effects of ionizing radiation. One such system is the so-called SOS-repair system, effectively induced by ultraviolet light. Since ionization and molecular excitation occur in the cells simultaneously, it is difficult to distinguish the contribution of electron excitation in the overall lethal or mutagenic effect of ionizing radiation. This difficult experimental task can probably be solved by sharply decreasing the yield of radiation-chemical reactions resulting from ionization without influencing processes of formation of damage caused by electron excitation. References 24: 7 Russian, 17 Western. [402-6508]

UDC: 616-001.28-092.9-07:616-008,939.633.2-074

ANALYSIS OF DAMAGE, REPAIR AND DEGRADATION OF DNA IN IRRADIATED ANIMAL TISSUES

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 27, No 9, Sep 82 (manuscript received 25 Feb 82) pp 21-24

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[Abstract] Studies performed by the authors led them to formulate the concept of radiation disruption of the macromolecular organization of DNA, according to which DNA breaks lead to the appearance of locally-denatured sectors in its secondary structure and therefore to disruption of the interaction of protein with DNA in the irradiated nucleoprotein complex. A

viscosimmetric method has been developed for determining the molecular mass of single filament high polymer DNA not requiring preliminary introduction of a radioactive label. The use of the method allowed systematic analysis of the regularities of repair and degradation of DNA in the tissues of irradiated animals. Analysis of the variation in frequency of single filament DNA sections as a function of dose indicates that one type of cells such as the liver, spleen, lymph nodes and type 180 solid carcinoma are two to three times more radiosensitive than cells of such tissues as the thymus, bone marrow, white blood cells and Erlich's tumors. A study has shown that reduced effectiveness of DNA repair in the second group of tissues results from the functioning of alkaline endonucleases contantly synthesized in the liver, lymph nodes and spleen. Inhibition of this synthesis by cyclohexamide leads to more effective DNA repair. The ability of protein synthesis inhibitors to block the radiation elevation in alkaline endonuclease activity indicates that the increase in this activity involves the synthesis of additional active enzyme. The tissue specificity of repair system enzymes and systems leading to post-radiation DNA degradation depends on the activity of the endonuclease synthesized in the cell both under normal conditions and when synthesis is induced by the effects of radiation. References 24: 20 Russian, 4 Western.
[402-6508]

UDC: 613.648

ANNUAL INDIVIDUAL RADIATION DOSES OF PERSONNEL WORKING WITH SOURCES OF IONIZING RADIATION

Moscow GIGIYENA I SANITARIYA in Russian No 8, Aug 82
(manuscript received 3 Feb 82) pp 74-75

POPLAVSKIY, K. K., Leningrad Scientific Research Institute of Radiation Hygiene, RSFSR Ministry of Health

[Abstract] The annual individual doses of radiation received by personnel working with sources of ionizing radiation were determined by the radiation safety service of the RSFSR during 1979 using KID-2, DK-92 and IFK-2.3 instruments. Computation methods were used for some types of work, for example work with x-ray installations, on the basis of measurement of radiation levels in the workplace, timing of operations and consideration of the total number of operations performed. The mean doses were found to depend significantly on the type of ionizing radiation source used at work. Significant fluctuations of minimal and maximal individual doses are observed for each group. The highest individual doses are observed for gamma defectoscope operators. Maintenance of radioisotope automation instruments involves high radiation doses. The use of electronic equipment generating long wave x-rays, x-ray structural and x-ray spectral analysis installations and sealed radionuclide sources produce much lower radiation doses. Radiology department workers performing radiation therapy receive the greatest radiation doses among medical personnel. Nurses receive the highest doses. The level of radiation received by personnel represents only a fraction of the

established maximum standards. This indicates a favorable radiation situation in the workplace. References 4 (Russian).
[384-6508]

UDC 615.472:615.849.1]:616-082.4

EQUIPPING MEDICAL INSTITUTIONS WITH RADIATION CONTROL APPARATUS

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 28, No 1, Jan 83 (manuscript received 12 Oct 81) pp 59-62

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[Abstract] It was proposed that implementation of radiation control which meets the requirements of standard documents of recent years on radiation safety should proceed with consideration of the sources of possible radiation hazards in the institution involved; the forms of monitoring required to assess the radiation setting properly; the type of apparatus required, their purpose and the degree to which they meet safety requirements and the devices required by a given institution in order for it to exercise radiation control. Dosimetric equipment produced by the All-Union Association "Isotop" is recommended as the most suitable for these purposes. References 4.
[372-2791]

CONTROL OF ARBOVIRUSES

Kishinev SOVETSKAYA MOLDAVIYA in Russian 6 Jan 83 p 4

[Article by ZAYTSEV, N., expert epidemiologist, Laboratory of Parasitology, Institute of Zoology and Physiology, MoSSR Academy of Sciences: "The Most Important Thing--Prophylaxis"]

[Text] In recent years a number of natural foci were discovered in Moldavia of human and animal diseases caused by arboviruses (viruses transmitted by ticks, mosquitoes and gnats as well as other parasites). In this group of infections the spring-summer tick encephalitis and Crimean hemorrhagic fewer are among the best studied problems. Much less is known about the foci of febrile diseases caused by arboviruses "Western Nile", "Bhandja" or "Batai-Chalovo" named after the sites of first isolations of these promoters from the carriers in West Africa, India and Malaysia respectively.

In veterinary practice, these infections (because of their exotic nature and for other reasons) often are not distinguished from similar diseases of nonarboviral origin, such as infectious rhinotracheitis, parainfluenza and other acute respiratory diseases of animals.

Luckily, arbovirus infections found in our Republic have not as yet manifested themselves as aggressively as they are capable. But some results of scientific observations on isolated arbovirus foci have to put us on the alert. Milk production from cows found in regions where such foci were noted remain at low level in spite of favorable periods for lactation and adequate feed.

It is generally accepted that wild animals are continuous hosts of such parasites as ticks and mosquitoes, and all agricultural animals (regardless of the method of feeding and ownership) are additional donors. However, objectively, these classical relationships between the virus vectors and their hosts must have changed substantially under conditions of modern cultivation of the territory of this Republic, relative decrease of wild fauna, intensified animal breeding, etc. These changed conditions caused the virus carriers to transfer from traditional hosts to new ones, to the agricultural animals. Thus the arboviruses of a particular focus found a chance for intensified circulation and expansion of the zone of their destructive activity.

A special note must be made of the fact that the drop in productivity of agricultural animals occurs not only as a result of infections with arboviruses, but also because of the so called "mechanical" action of the carriers of this disease. During certain seasons, mosquitoes make grazing impossible. These parasites can pursue their victims round the clock, attacking them in the fields and in the barns. The ticks often cause inflammatory skin reactions on the sites of their attachments which lead to nonhealing sores.

Upon infection and disease of an animal, its productivity drops even further. The weakened animals, particularly the young ones, are destined to death.

Whenever we start talking about control of arboviral disease in other economic areas, the veterinarians state: "What kind of arboviruses? What does it have to do with tick and mosquitoes?" In other words, we face obvious incompetence of many specialists. As a rule, they refer to the predominance of the stall condition of these animals, to their feed supply. Incidentally, sufficient fodder for animals in an arbovirus focus does not space them from the pernicious action of either the vector or the virus itself. As far as the advantage of keeping them in the stall, is concerned, it should be noted that some of the animals kept in isolation (especially the milkers) still remain on field grazing feed. And they represent a quite considerable group of animals.

In order to minimize the obvious loss from arboviral infections, the following is recommended:

--During the periods of March-May and again September-November, grazing animals should be inspected every 7-10 days, all ticks should be removed and burned. Various exterminative measures should be undertaken against mosquitoes. Rayon veterinary stations for animal protection should organize diagnostic laboratory registry of all cases of the infectious diseases related to arboviruses.

Success in controlling arboviruses will be facilitated by a wide information network directed at the rural population of this Republic.
[201-7813]

UDC 615.33.012:061.3(47+57]"1982"

ALL-UNION CONFERENCE "PROBLEMS OF THE SEARCH FOR AND THE BIOTECHNOLOGY OF NEW ANTIBIOTICS"

Moscow ANTIBIOTIKI in Russian Vol 28 No 1, Jan 83, pp 52-74

SAZYKIN, Yu. O., Moscow

[Abstract] This is an extended detailed report on the title conference which was held in Moscow from 22-24 June 1982. Representatives of eight institutes of the USSR Academy of Sciences and republic academies, five universities, three plants of the Ministry of the Medical Industry, five institutes of the USSR Ministry of Health and the USSR Academy of Medical Sciences and three institutes of the Main Administration of the Microbiology Industry participated in the sessions. Addresses concerning the major areas discussed at the conferences are summarized in some detail. The areas convered include: problems of genetic engineering and biotechnology in the area of antibiotics, the mechanism of action and possibilities of developing new antitumoral antibiotics, the biological role of antibiotics in the vital activity of natural producers, Pseudomonas bacteria as producers of new antibiotics, problems of chemical identification of antibiotics and development of antibiotics for non-medical uses. More than 100 exhibits were displayed in sections: "Genetics and Metabolism of Antibiotics Producers" (57), "Search For New Antibiotics" (30) and "Mechanism of Action of Antibiotics" (31).
[391-2791]

HYPERBARIC DIVING OPERATIONS AT 787.4 FEET

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 12 Mar 83 p 4

[Article by Nikolay Khlebodarov in column "Event": "240 below the surface of the Sea" Words used in the manner of communication callsigns in the source are rendered in all capital letters by the translator to increase clarity]

> [Text] For the first time, six divers have worked for two hours and five minutes at a depth of 240 meters [787.4 feet]. Yesterday they came out of the pressure chamber after their record dive. Our correspondent, Nikolay Khlebodarov, reports aboard the "Sprut".

"FIRST this is 'SPRUT'. The depth of the diving bell platform is 240 meters. Stand by for exit from the bell." Such an unusual command for these places [waters] resounded in the hyperbaric system of the ship, which was located in the Barents Sea.

The platform appeared on the screen of the television monitor in a cloud of shrimp and fish, which were swimming by in the light. Details of oil industry equipment and instruments could be made out clearly. The heavy and unbelievably slow breathing of the aquanauts splashed out of the loudspeaker above the control panel of the hyperbaric system.

"This is FIRST. Ready for exit," squealed diver Vladimir Arseniy with the voice of Buratino [not further identified]; literally squealed, because even a speech corrector sometimes cannot correct the voice at such a depth.

"Exit authorized," rang out clearly the command of diving director Aleksandr Grigor'evich Klepatskiy, a most experienced diver, who has spent more than 8,000 hours under water.

The television camera anew picked out of the gloom of the sea abyss the profile of the diver and the slender "umbilical cord" of life-support hoses. Had it not been for the streams of myriad bubbles coming out of the mask, and the cloud of various life forms flashing before the television camera, the diver might have been taken for a cosmonaut going out into empty space.

Around the diver there is icy water and terrifying darkness outside the tiny [five-kopeck-piece] diving bell. But he has gone out to work, to do very delicate and complicated work, which cannot be entrusted to the most "intelligent" robot or automatic device.

"SECOND this is 'SPRUT'. You are authorized to exit from the diving bell and commence execution of the program."

Thus began the unusual work of the first divers Vladimir Arseniy and Vadim Kondrabayev, along with the operator of the diving bell, Viktor Moskalenko.

Afterwards, divers Viktor Litvinov and Grigoriy Matveyenko exited the diving bell. The television camera caught every movement. Then a special photographic apparatus was lowered to the divers from aboard the "Sprut", and they took pictures of specific working moments with it and, naturally, souvenir photographs of themselves.

"'SPRUT' this is OPERATOR," reported Moskalenko. "The divers are in the bell. Helmet-masks are removed. The divers feel good."

"This is 'SPRUT'. I understood you. We shall begin raising the diving bell."

In all, the divers had worked underwater for two hours and five minutes. The skittering life forms flashed on the television monitor, and the peculiar underwater elevator came up. It was received on deck and joined to a pressure chamber. The aquanauts transferred to its living quarters, where they will undergo lengthy decompression. There is nowhere to go in a hurry, and one of the divers, Vadim Kondrabayev, willingly gives his first interview: "The abundance of life forms at the depth amazed me. I even wondered how I could keep from hurting them--the cloud of shrimp. In the past, I worked on rivers and lakes--almost in pitch darkness, groping. Here I saw much, both in the water itself and on the bottom. The colors are especially pleasing..."

Scientists maintain that by the end of the century half of the world's oil production will be extracted from beneath the sea bottom.

And the most complicated problem, which they [the scientists] are solving in all maritime oil and gas producing countries, is that of diving operations at great depths. These must be effective.

It is precisely for this reason that, on the ship, 'Sprut', tests of a hyperbaric system were carried out, and the whole life-support system thoroughly checked, during the work of a diver on the bottom," says the deputy chairman of the Interdepartmental Commission Anatoliy Aleksandrovich Smirnov. "The people and the equipment were ready for the subjugation of these depths. I think that the ocean world ['hydrocosmos'] will be mastered very soon for the needs of the national economy..."

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CSO: 1840/409

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EFFECT OF DEGREE OF STREAM TURBULENCE ON FISH BEHAVIOR

Moscow VOPROSY IKHTIOLOGII in Russian Vol 23, No 2, Mar-Apr 83
(manuscript received 29 Jul 81) pp 307-317

SHTAF, L. G. (deceased), PAVLOV, D. S., SKOROBOGATOV, M. A. and
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Animals imeni A. N. Severtsov, Moscow; Kalinin Polytechnical Institute

[Abstract] Study methods and experimental results are reported of the effect of stream turbulence on behavior of roach (Rutilus rutilus) and Phoxinus phoxinus. The following aspects were studied: horizontal distribution of fish in the stream with uneven turbulence in plane; determination of zones preferred by fish in turbulent streams; fish swimming ability related to the degree of turbulence and adaptation time and orientation in turbulent streams approaching maximum tolerated flow rates. It was determined that the fish preferred zones of high turbulence; with increasing turbulence fish concentration shifted downstream. The swimming ability depended also on the degree of turbulence, dropping considerably with higher turbulence. In general, groups of fish staying in less turbulent water were smaller. The orientation of fish with respect to speed vector direction was better in the turbulent situation than in a laminar flow.
Figures 6; references 9: 8 Russian, 1 Western.
[413-7813]

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