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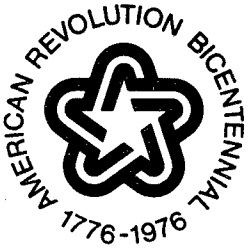
USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 60



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USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 60

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CONTENTS

USSR

MOKRONOSOV, A. T., NEKRASOVA, G. F., POYARKOVA, N. M.

FORMATION OF A CHLORELLA PHOTOSYNTHETIC APPARATUS FOR VARIOUS CO_2 CONCENTRATIONS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian
Novosibirsk, Nauka Press 1975 pp 73-79

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R595 from the resume]

[Text] A complete evaluation is presented of the Pyrenoidosa-82 chlorella photosynthetic apparatus following preliminary cultivation for 4-6 months at high (2%) and low (0.02%) CO_2 concentrations. It is shown that the adaptation of the chlorella to the increased concentrations induces the formation of ribulosodiphosphate-carboxylase, which determines the main path of fixation of CO_2 during photosynthesis to a greater extent than the formation of PEP-carboxylase, which determines the heterotrophic fixation of CO_2. The photosynthetic metabolism of carbon is characterized by predominance of carbohydrate synthesis in the cells grown with 2% CO_2, and suppression of this pathway and reinforcement of the synthesis of acids by alternative

1/2

USSR

MOKRONOSOV, A. T., NEKRASOVA, G. F., POYARKOVA, N. M., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 73-79

pathways by the chlorella adapted to the 0.02% CO_2. With a shortage of CO_2, the autotrophicity of the chlorella is reduced. 7 references.

2/2

USSR

RUSAKOVA, G. G., LEBEDEVA, YE. V., SMOLYANOVA, YE. V., VIL'YAMS, M. V., ALEKHINA, T. P., SIMONOV, V. M.

EDIBLE BEETS FOR THE AUTOTROPHIC LINK IN A BIOLOGICAL LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 19-24

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R586 from the resume]

[Text] Results are presented from studies of a promising edible beet for a life support system (high food value, wastes not over 10%), with a broad range of photosynthetic activity conditions and good compatibility with other vegetable crops. When grown by aeroponic methods in Chesnokov solution, the productivity of the beet is 19-24 kg/m^2. 10 references.

1/1

USSR

MILOV, M. A., NOVIKOVA, G. M.

GAS METABOLISM AND TRANSPIRATION OF HIGHER PLANTS WHEN GROWN UNDER ARTIFICIAL CONDITIONS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 24-28

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R587 from the resume]

[Text] A study was made of the gas metabolism and transpiration of certain higher plants suitable for life support systems when grown under artificial conditions. The experiments were performed with a CO_2 concentration of 0.2-0.4%, radiation power of xenon-arc lamps 100-150 w/m^2 and 12 hour light period. The highest gas metabolism rate was observed for carrots (30-40 l), tomatoes (25-30 l), radishes (22-25 l) and potatoes (12-20 l $O_2/m^2 \cdot day$), while the other crops showed rates of 2-10 l $O_2/m^2 \cdot day$. 4 references.

1/1

USSR

AL'SHIN, V. M., SKRIPETS, A. V., ONISHENKO, V. F.

SYNTHESIS OF AN ALGORITHM FOR DISTRIBUTION AND SWITCHING OF ATTENTION IN BANK AND COURSE CONTROL SYSTEMS WITH RANDOM PERTURBATIONS AND RANDOM INITIAL CONDITIONS

AVIATS. ERGONOMIKA in Russian No. 1 Kiev, 1975 pp 140-152

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R578 from the resume]

[Text] A study is made of the question of the possibility of synthesis of the working activity of a pilot as concerns distribution and switching of attention. The initial data used are structural plans of the ergatic bank and course control systems; the mean square deviations of parameters of these structural systems; the operative and dynamic operative detection thresholds; n records of random action with the required spectral characteristics. 8 references.

1/1

USSR

UPITIS, V. V., NOLLENDORFA, A. F., PAKALNE, Dz. S.

THE RANGE OF COPPER CONCENTRATIONS OPTIMAL FOR CHLORELLA AS A FUNCTION OF CERTAIN CULTIVATION CONDITIONS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press, 1975 pp 97-101

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R581 from the resume]

[Text] The conditions and factors changing the range of copper concentrations optimal for the growth of chlorella were studied under laboratory conditions with the algae Chlorella purenoidosa-82 in an accumulating culture. It is established that with a certain combination of conditions, the range of copper concentration having no toxic influence on the chlorella can be expanded by a factor of 5-10. Based on the data produced, the contradictions encountered in the literature in determination of the optimal concentration of copper for the growth of the algae are explained. 10 references.

1/1

USSR

IVANOVA, N. S., MELENT'YEVA, I. A., BORZENKOVA, A. YA.

THE PROBLEM OF THE TOXICITY OF RUBBERS FOR CHLORELLA (Chlorella sp. K.)

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 189-198

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R617 from the resume]

[Text] A study is made of the relationship between the formulas for rubber mixtures and the toxicity of their ingredients. It is shown that the presence of thiuram, captax, altax, sulfenamide C, santoflex AW, neosone D, aldol-α-napthylamine, diphenylguanidine causes stronger inhibition of chlorella growth, the greater the ratio of the surface of the specimen to the number of cells in the entire volume of the suspension at the beginning of the experiment. A list of typical rubbers is presented, neutral with respect to chlorella. In order to reduce the toxicity of other rubbers, it is recommended that they be preliminarily stored in Tamia medium. 8 references.

1/1

USSR

BLOKHIN, L. N., GUZIY, A. N.

THE TASK OF SYNTHESIS OF AN OPTIMALLY ACCURATE SYSTEM FOR SEMIAUTOMATIC CONTROL OF THE BANK OF AN AIRCRAFT

AVIATS. ERGONOMIKA in Russian No. 1, Kiev 1975 pp 117-123

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R577 from the resume]

[Text] A study is made of the problem of synthesis of an optimal correction structure in the control loop for banking an aircraft, providing the minimum integral quadratic control error considering limitations on the dispersion of bank and its rate. Examples are solved illustrating the effectiveness of the optimal correction. 5 references.

1/1

USSR

SKOTNIKOVA, G. S., ZADORIN, N. N.

MORPHOLOGICAL AND PHYSIOLOGICAL CHANGES IN A CHLORELLA CULTURE UNDER EXTREME CONDITIONS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 79-82

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R598 from the resume]

[Text] A study is made of the influence of elevated temperature, irradiation and their combined influence on the nature of the reaction of a culture of Chlorella vulgaris st. "LARG-3" in various stages of development. The survival rate of the culture with a daily increase in temperature to 45-50 C, and also in an experiment with continuous maintenance of the temperature, was retained at the 85-89% level. Irradiation of the culture with doses of 1-10 kr did not cause death, the survival rate being close to that of the control culture. With combined application of radiation and elevated temperature, the survival rate of the chlorella fluctuated between 96 and 99%.

1/1

USSR

SIGALEVICH, D. A., KLYAVS, P. YA.

METHOD OF EXPERIMENTAL INVESTIGATION OF THE NERVE APPARATUS OF NERVE ENVELOPES UNDER GRAVITATIONAL ACCELERATION

SB NAUCH. TR. KHAR'KOV MED. IN-T in Russian No. 125, 1975 pp 68-69

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R541 from the resume]

[Text] An analysis is presented of the results of the influence of various conditions of gravitational acceleration on the status of the nerve apparatus of the nerve envelopes in gravitational acceleration. 2 references.

1/1

USSR

TRUBACHEV, I. N., BAZANOVA, M. I., MEL'NIKOVA, L. P.

PRODUCTS OF AEROBIC PROCESSING OF HUMAN SOLID WASTE AS A SOURCE OF ELEMENTS FOR NUTRITION OF CHLORELLA

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 116-122

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R603 from the resume]

[Text] The processing of the daily quantity of solid waste of one person, suspended in a recycled algae culture (chlorella) centrifugate was performed by an aerobic non-flow method of processing with polyculture active silt in a microbial cultivator (MC). The MC received an average of 24 g organic matter, of which 20 g entered with the solid waste, the remaining quantity with the centrifugate. In an 8 hour processing cycle, 40-50% of the organic matter was oxidized. This process is accompanied by conversion of the elements to forms which can be utilized by plants. The products of conversion of the human solid wastes and chlorella metabolites, when added to the nutrient

USSR

TRUBACHEV, I. N., BAZANOVA, M. I., MEL'NIKOVA, L. P., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 116-122

solution, caused no drop in the productivity of the chlorella and had no significant influence on its biochemical composition. Calculations are performed of the quantity of chlorella which can be grown from the content of elements in human solid waste. 13 references.

USSR

CHUCHKIN, V. G., KOSTETSKIY, A. V., GOLOVIN, V. N., ARBUZOVA, K. S., ROZHDESTVENSKIY, V. I., TSVETKOVA, I. V., USHAKOV, A. S.

ESTIMATION OF THE EXPEDIENCY OF INCLUDING A HIGHER PLANT STAGE IN A CLOSED LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 5-13

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R584 from the resume]

[Text] A method is described for comparative evaluation of the effectiveness of a higher plant stage in a biological-technical life support system. Values of the main parameters of the stage are presented, calculation for a functioning period of five years on the moon and with artificial illumination. 15 references.

1/1

USSR

MILOV, M. A., BALAKIREVA, K. A.

THE PROBLEM OF SELECTION OF HIGHER PLANTS FOR A BIOLOGICAL LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH, CHELOVEKA in Russian Novosibirsk, Nauka Press, 1975 pp 13-19

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R585 from the resume]

[Text] Results are reported from studies on the selection of a complex of higher plant crops with high photosynthesizing capability for continuous growth under artificial conditions. The necessary vegetation area and power consumption are determined for the higher plant stage in the life support system for one man. It is established that to support completely one man with 550-600 l oxygen, 1200 kcal vegetable food and water, the vegetation area of the higher plant stage must be 16 m^2. 5 references.

1/1

USSR

MILOV, M. A.

METHOD OF ROOT NUTRITION OF A COMPLEX OF HIGHER PLANTS WITH CONTINUOUS GROWTH

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 32-36

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R589 from the resume]

[Text] A method of root nutrition involving capillary saturation of a porous filler with a nutrient solution is suggested for a combination of higher plants to be grown continually in biological life support systems. The influence of the salts remaining and accumulated in the substrate on the growth, development and biochemical composition of the plants is determined, the allelopathic properties of individual types of plants are studied. It is established that the composition of the common nutrient solution for the entire complex of plants can be balanced with the total utilization of nutrient elements by periodic crop rotation.

1/1

USSR

LISOVSKIY, G. M., KOVROV, B. G., TERSKOV, I. A., GITEL'ZON, I. I.

METHOD AND TECHNIQUES OF CONTINUOUS GROWING OF WHEAT AS A LINK IN A LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 28-32

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R588 from the resume]

[Text] A method, technique and technology are described for continuous air subirrigation growing of wheat, developed for an experimental closed life support system. Results are presented from growing of wheat by this method. 5 references.

1/1

USSR

GERTSUSKIY, D. F., ALEKSEYENKO, L. V.

RADIOSENSITIVITY OF CERTAIN PLANTS AS A POSSIBLE LINK IN AN ECOLOGICAL LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 45-51

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R591 from the resume]

[Text] A study is made of the quantitative dependence between dose and effect of proton and gamma radiation for radio resistant plants (such as peking cabbage) and radiosensitive plants (such as lettuce) for irradiation of the seeds and the plants during the period of vegetation. The radiosensitivity of vegetating plants increases by more than 10 times in comparison to dry seeds. Thus, the LD_{100} of gamma radiation for cabbage for irradiation of air-dry seeds moistened for 12 hours, for one, two and three-day old sprouts is slightly over 200, 25, 20 and 8 krad respectively. The radiosensitivity of cabbage increases somewhat beginning with the 7th day of

1/2

USSR

GERTSUSKIY, D. F., ALEKSEYENKO, L. V., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 45-51

growth, though 10-13 day old sprouts once more show a drop in radiosensitivity. Only beginning on the 14th day of growth does the radio resistance of the plants increase again. Irradiation of seeds as well as sprouts with protons is twice or more as effective as gamma radiation. Sprouts of the radiosensitive plant -- lettuce -- are some 4 to 5 times more sensitive to gamma radiation and to protons than sprouts of cabbage. Even relatively low doses (0.5-1 krad) acting on vegetating plants can significantly suppress the growth of the plants. 7 references.

2/2

USSR

BOKOVAYA, M. M., NILOVSKAYA, N. T.

ENDOGENOUS RHYTHMS OF PHOTOSYNTHESIS OF PLANTINGS OF CERTAIN VEGETABLE CROPS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 37-45

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R590 from the resume]

[Text] A self-oscillating mode of photosynthesis of beets, tomatoes, carrots, radishes, leaf cabbage and white cabbage is established in plantings, manifested as a two-peak curve for plants grown in an 18 hour "day," and a sine wave for plants grown under continuous illumination. As the power of the radiant flux is increased from 50 to 260 w/m^2, the amplitude of oscillations in photosynthesis increases from ±3-4 to 12-15% of the zero level and the length of the cycle of oscillations increases. 34 references.

1/1

USSR

YAKUBOVSKIY, V. V., MEL'NIKOV, YE. S., DEGTYAREVA, T. V., ZUB, YU. P.

APPARATUS FOR AUTOMATIC TESTING AND REGULATION OF THE GROWING CONDITIONS OF HIGHER PLANTS IN A BIOLOGICAL LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 55-59

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R592 from the resume]

[Text] A description is presented of the peculiarities of devices for testing and regulation of the main parameters of the conditions of cultivation of higher plants in a sealed chamber -- a phytotron.

1/1

USSR

ROZHDESTVENSKIY, V. I., CHUCHKIN, V. G., LEGKOV, S. YE.

AUTOMATIC PROGRAMMING OF REGULATION OF THE INTENSITY OF PHOTOSYNTHESIS OF POPULATIONS OF HIGHER PLANTS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 60-63

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R593 from the resume]

[Text] Results are presented from experiments on automatic programming of the control of the intensity of photosynthesis of a population of higher plants. The object of the investigation is Chinese leaf cabbage (30 days in age), placed in a sealed, airtight system. The regulator of intensity of photosynthesis used was a change in the radiant flux from the artificial light source (a xenon-arc lamp and an incandescent lamp). A description is presented of the system of automatic regulation, consisting of series-produced automatic control units. 6 references.

1/1

USSR

LAVROV, I. V., MEL'NIK, A. V.

CERTAIN SPECIAL REQUIREMENTS FOR CONTINUOUS GROWTH OF ALGAE USED IN BIOLOGICAL SYSTEMS FOR REGENERATION OF OXYGEN AND WATER

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 68-73

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R594 from the resume]

[Text] A study is made of means of improving the weight and power characteristics of biological systems based on the use of single-celled algae. An analysis is presented and a number of special requirements are formulated to facilitate solution of the problem of creation of highly effective biological systems. 9 references.

1/1

USSR

KOSTLAN, N. V.

GROWTH OF CHLORELLA ON AN ORGANIC MINERAL MEDIUM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 82-85

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R599 from the resume]

[Text] The possibility is demonstrated of using the wastes of fermentative processes, particularly mash, as a substrate for the growth of chlorella. However, in a number of cases, the development of the algae on this medium is not intensive enough. Chemical analysis indicates that although the mash has all of the necessary elements for mineral nutrition, the content of phosphorus in it is very low, which is one of the main factors limiting the development of the algae. It is established that the yeast cells remaining in the mash after separation of the yeast milk in most cases have a depressing effect on the development of chlorella, a competitor for the nutrient substances used. Exogenous products of the metabolism of the yeast and organic substances

USSR

KOSTLAN, N. V., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 82-85

entering the medium after breakdown of the yeast cells can have a stimulating influence on the development of chlorella in certain concentrations. 4 references.

USSR

KURAPOVA, O. A.

DYNAMICS OF ACCUMULATION OF ORGANIC MATTER IN A CULTURE FLUID WITH LONG-TERM CULTIVATION OF CHLORELLA WITH RECYCLING OF THE MEDIUM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 110-116

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R602 from the resume]

[Text] A study was made of the dynamics of accumulation of noncellular organic matter in a nutrient medium and the nitrogen compounds included in its composition during cultivation of Chlorella sp. under nonsterile conditions in a reactor with a closed air cycle. The method of cultivation was long growth of the algae with recirculation of the nutrient medium. The sources of nitrogen included nitrates and urea. The highest level of stabilization of the noncellular organic matter was observed in versions of independent cultivation of the algae with nitrates as the source of N_2, while the lowest level was observed with cultivation in a system with animals.

1/2

USSR

KURAPOVA, O. A., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 110-116

The change in content of nitrogenous organic substances in the medium is similar to the change in content of total organic matter. 19 references.

2/2

USSR

REDIKUL'TSEV, YU. V., ZADORIN, N. N., MISKILEV, V. F.

INSTALLATION FOR REGENERATION OF AIR USING PHOTOSYNTHESIS OF ALGAE

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 152-154

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R609 from the resume]

[Text] A design is suggested for an installation, intended for regeneration of air using photosynthesis of algae with low CO_2 concentration in the air to be regenerated. In contrast to widely known installations with bubbling cultivation of the algae, this installation has a closed circulation loop of the cellular suspension in a light receiver and two centrifugal gas exchange apparatus. The organization of intensive gas exchange is achieved by selecting the corresponding rate of circulation of the suspension and flow rate of the gas mixture. The installation allows intensive biosynthesis at a low CO_2 concentration in the gas mixture and thus eliminates the need for a CO_2 concentrator. The installation is equipped with an automatic system

1/2

USSR

REDIKUL'TSEV, YU. V., ZADORIN, N. N., MISKILEV, V. F., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 152-154

for maintaining the assigned concentration of cells and composition of the nutrient solution.

2/2

USSR

DADYKIN, V. P.

THE WATER CYCLE IN ARTIFICIAL CLOSED ECOLOGICAL SYSTEMS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 247-256

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R626 from the resume]

[Text] A discussion is presented of the principle of organization of a human life support system designed to create conditions for life of humans in a medium completely unsuitable for their existence: in long space voyages, at the floor of the sea, etc. The author considers that one of the most promising means for creation of this type of system is the use of a biological cycle of matter similar to that utilized in natural biogeocenoses. The greatest specific share of the matter in life support systems is that of water, which makes up about 92% of the weight of all matter necessary for the maintenance of human life. The author has suggested water balance equations for the phytoautotrophic organisms for prospective methods of

USSR

DADYKIN, V. P., PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA 1975 pp 247-256

cultivation of plants in closed systems: hydroponics, aeroponics, the wick method, as well as an equation to determine the total quantity of water necessary to support the cycle in the system. This last equation allows analysis of the entire system and comparative evaluation of competing plans for this type of system. 12 references.

USSR

LENOVA, L. I., SHEVCHENKO, N. S.

INFLUENCE OF THE VOLATILE PRODUCTS OF BACTERIA ON THE ACCUMULATION OF BIOMASS BY CERTAIN STRAINS OF CHLORELLA

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 123-127

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R604 from the resume]

[Text] A study is made of the influence of the volatile products of bacteria on the accumulation of biomass by certain strains of chlorella, and the quantity of CO_2 accumulated when certain bacteria are grown is determined. It is established that under the influence of the volatile products of the accompanying bacteria, the biomass of the chlorella increases sharply. The contribution of CO_2 to the total effect of action on the chlorella is studied, showing that the liberation of CO_2 is not the only factor in the influence of the volatile products of the bacteria on the algae. 11 references.

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USSR

OKLADNIKOV, YU. N., KASAYEVA, G. YE.

AN ALGAE CULTURE AS A UTILIZER OF CARBON MONOXIDE AND AMMONIA IN A BIOLOGICAL LIFE SUPPORT SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 133-135

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R605 from the resume]

[Text] Experimental data are presented showing that an algae culture has the property of purifying the atmosphere of a biological life support system by removing CO and ammonia. This factor determines the equilibrium concentration of these gases in the atmosphere upon long-term functioning of the system. 3 references.

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USSR

TERESHKOVA, G. M., BELYANIN, V. N.

LONG-TERM STORAGE OF VIABLE CHLORELLA CELLS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 139-142

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R606 from the resume]

[Text] The storage of chlorella cells in the form of a suspension with varying content (40, 100, 300, 500 g) of crude biomass per liter medium has shown that in 12-15 days at 5-6 C, the concentration of the suspension has no significant influence on the viability of the chlorella cells. However, after this period of time in dense suspensions a sharp drop in the percentage of living cells is observed. The conservation of the cells at the same temperature in the form of a paste (moisture content 72.3%) protected from drying out by polyethylene or a thin layer of vaseline is more effective: the viability of the cells is retained for 30 days in this case, and at a temperature of 2 C -- for 50 days. 6 references.

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USSR

RODICHEVA, E. K., SHAPIRO, V. YE.

THE RELAXATION OF THE SPECIFIC GROWTH RATE IN A DENSISTAT WITH EXTERNAL PERTURBATION

PROBL. SOZDANIYA BIOLOG-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 142-146

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R607 from the resume]

[Text] After eliminating the influence of an unfavorable factor under conditions of continuous densistat cultivation of a population of microorganisms, the culture returns to its initial growth rate. The nature of change in specific growth rate after the application of the damaging factor is expressed analytically. A comparison of the mathematical model produced with experimental data shows good agreement. The model suggested can be used to describe processes of restoration of the stable state after the application of various types of perturbations. 3 references.

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USSR

LAVROV, I. V., MEL'NIK, A. V.

THE USE OF A HOLLOW MIXING CULTIVATOR WITH SEPARATE GAS EXCHANGE FOR RESEARCH PURPOSES

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 147-152

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R608 from the resume]

[Text] A laboratory installation is suggested for the performance of certain tasks involved with the investigation of the gas metabolism of an intensive culture of algae. The data from quantitative dependences helped to determine the qualitative and quantitative composition of the gas components at equilibrium with their content in the suspension. The latter are characteristic of the metabolism of the culture under the conditions in question. 4 references.

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USSR

NESTEROV, B. F.

A BIOLOGICAL REACTOR WITH WEDGE-SHAPED LIGHT GUIDES

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 160-164

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R610 from the resume]

[Text] The schematic diagram is described for a reactor with wedge-shaped light guides, the equation for calculation of the profile of the wedge, its dimensions and the experimental characteristics are given. 3 references.

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USSR

KOVROV, B. G., SHTOL', A. A.

DESIGN OF ALGAE CULTIVATORS WITH CURVED LIGHT RECEIVING SURFACES

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 164-169

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R611 from the resume]

[Text] A study is made of problems of the theoretical calculation of the productivity of the process of continuous cultivation of algae and the efficiency of photosynthesis for reactors with cylindrical light sources, immersed in a suspension of the algae cells. It is shown that the efficiency of photosynthesis in reactors of this type reaches 14%. The equations produced allow calculation of the optimal parameters of the reactor itself, as well as the optimal concentration of biomass of algae cells and illumination of the culture. 5 references.

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USSR

LAVROV, I. V., MEL'NIK, A. V.

THE PROBLEM OF CALCULATION OF THE CARBON NUTRITION OF ALGAE IN FULL EXTRACTION CULTIVATORS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 169-174

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R612 from the resume]

[Text] An analysis is presented of the peculiarities of carbon nutrition of algae. Quantitative dependences are established between the productivity of the algae, technological and test parameters of the full extraction cultivators. A method is suggested for design of these cultivators. 7 references.

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USSR

MESHCHERYAKOVA, A. L., AL'BITSKAYA, O. N.

A METHOD OF MEASURING pCO_2 IN A SUSPENSION OF SINGLE-CELLED ALGAE

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 178-182

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R614 from the resume]

[Text] A sensor is described which allows measurement of the concentration gradient of dissolved CO_2 in a cellular suspension entering and leaving a light receiver, and also constant testing of the CO_2 concentration of the cellular suspension throughout the entire illuminated circuit. The use of this instrument allows dynamic changes in the culture accompanied by absorption or liberation of CO_2 to be recorded.

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USSR

MEL'NIK, A. V., KOVROV, B. G.

THE PROBLEM OF CALCULATING THE CARBON NUTRITION OF ALGAE CULTIVATED IN BUBBLER TYPE REACTORS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 175-178

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R613 from the resume]

[Text] A nomogram is suggested, based on an equation for calculation of the productivity of an algae cultivator as a function of CO_2 concentration in the gas mixture fed to the culture. The nomogram allows significant simplification and abbreviation of calculations. 3 references.

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USSR

OKLADNIKOV, YU. N., KOVROV, B. G.

THE POSSIBILITY OF CONTINUOUS CULTIVATION OF CHLORELLA IN A BIOLOGICAL LIFE SUPPORT SYSTEM WITHOUT ANALYSIS OF NITROGEN IN THE MEDIUM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 182-185

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R615 from the resume]

[Text] A study is made of one possible version of an algae cultivator eliminating urea analysis in the liquid media of the biological system. A formula is presented for calculation of the concentration of urea in the culture medium from which the algae culture is harvested. The calculation is based on the matching of the metabolic requirements of man and chlorella.

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USSR

MEL'NIKOV, YE. S., PETRUKHINA, L. N.

STUDY OF DISTORTIONS OF THE SIGNAL OF OPTICAL DENSITY OF A CONTINUOUS ALGAE CULTURE

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 185-189

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R616 from the resume]

[Text] A study is made of the dependence of the distortions of a signal from an optical density sensor in a microorganism suspension on the mode of operation of the cultivator. It is found that the distortions are determined by the concentration of the gas phase in the suspension. The results of the work can be used to develop a system for automatic regulation of the basic parameters of the process of microbiosynthesis.

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USSR

MELESHKO, G. I., LEBEDEVA, YE. K., GALKINA, T. B., KAZAKOV, A. I.

STABILIZATION OF THE pH OF A MEDIUM AND THE MATERIAL BALANCE IN A CHLORELLA CULTIVATION SYSTEM

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 199-206

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R618 from the resume]

[Text] During long-term cultivation of chlorella on nitrites, as the age of the medium increases, the pH depends on the quantity of mineral N, allowing adjustment of the medium with nitrogen and elements bonded with it, or use of the pH as an additional check of the N concentration. When urea is used as the N source for chlorella with long-term cultivation, the pH does not become stable, and results primarily from the quantity of ammonia formed as a result of bacterial decomposition of urea. This process cannot be regulated, which creates additional difficulties upon long-term cultivation of chlorella using urea. 21 references.
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USSR

RERBERG, M. S., OVCHARENKO, N. A., POPOVA, M. N.

THE PROBLEM OF THE MICROFLORA OF ACTIVE SILT, MINERALIZING HUMAN WASTE AND ORGANIC CHLORELLA METABOLITES

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 213-218

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R619 from the resume]

[Text] A study was made of the composition of active silt and the basic functional groups of bacteria mineralizing a medium consisting of human waste and chlorella metabolites. It was shown that the microorganisms of the active silt have various functions transforming proteins, carbohydrates, fats and other organic and mineral compounds. The prevailing functional groups are the ammonating bacteria, the primary process -- ammonization of nitrogen-containing organic matter. 8 reference.

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USSR

ROGOVSKAYA, TS. I., LAZAREVA, M. F., KOSTINA, L. M.

THE INFLUENCE OF ELEVATED TEMPERATURE (30-40 C) ON THE MICROFLORA, MICROFAUNA OF ACTIVE SILT AND ON THE RATE OF BIOCHEMICAL PROCESSES IN AN AIRTANK-MIXER

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 218-225

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R620 from the resume]

[Text] This work was performed on a laboratory model of an airtank-mixer. Artificial wastes were purified, containing individual organic pollutants: formaldehyde, acetone, phenol, in concentrations averaging 500 mg/l, plus biogenic elements: N, P, K. The active silt was preliminarily adapted to these substances. Purification was performed with various periods of aeration. A control airtank operated at 20 C and its indicators were taken as 100%. 29 references.

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USSR

RUBENCHIK, L. I., KORDYUM, V. A., LAZURKEVICH, Z. V., CHERNYKH, S. I.

AEROMICROBIOLOGY AND CLOSED ECOLOGICAL SYSTEMS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 225-230

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R621 from the resume]

[Text] In order to determine the possibility of development of microorganisms on neutral surfaces with volatile organic matter, experiments were performed under greenhouse and natural conditions. It was shown that the dust in the air contains microorganisms capable of active growth utilizing the volatile products of plants, some of which are distinguished by their high oligotrophicity and xerotolerance. 4 references.

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USSR

NESTEROV, B. F., VERSHKOV, D. S., SMOLIN, B. I.

THE PROBLEM OF CONSTRUCTION OF A SYSTEM FOR LABORATORY CULTIVATION OF HYDROGEN BACTERIA

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 237-241

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R622 from the resume]

[Text] A brief review is presented of existing laboratory systems for cultivation of hydrogen bacteria. The basic characteristics of the object are determined and technical conditions for the construction of a complex of apparatus for automatically controlled cultivation of hydrogen bacteria formulated. A plan is developed and described for a test stand apparatus containing a 25 l reactor equipped with mixing, aerating, separating and thermostabilizing devices, suspension and gas mixture recirculator; a system is provided for protection from the danger of explosion. Brief conditions for use of the apparatus for cultivation of methane-oxidizing bacteria are presented. 10 references.

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USSR

VEDENINA, I. YA., ZAVARZIN, G. A., ROMANOVA, A. K.

ASSIMILATION OF CARBON DIOXIDE IN AN AUTOTROPICALLY GROWING CULTURE OF HYDROGEN BACTERIA Hydrogenomonas eutropha Z-I

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 234-237

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R623 from the resume]

[Text] The rates of assimilation of carbon in noncellular extract, washed cells in isolated samples and in a developing culture were compared. It was shown that the rate of autotrophic assimilation of CO_2 by the cells of H. eutropha Z-I in a stationary culture is closely related to the rate of their growth, which in turn depends on gas nutrition. 8 references.

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USSR

KOTELEV, V. V., SHAKUN, L. A., KRASILYA, I. I.

DESIGN OF APPARATUS FOR CULTIVATION OF AUTOTROPHIC MICROORGANISMS WITH ELECTROLYTIC FEED OF ELEMENTS OF GAS NUTRITION

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 241-244

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R624 from the resume]

[Text] A description is presented of the design for an apparatus for growing of hydrogen-oxidizing microorganisms with internal electrolysis of the culture medium and an adjustable system for feeding the gas mixture into the apparatus. Preliminary analysis of the biomass of the hydrogen-oxidizing bacteria cells produced is performed.

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USSR

TERSKOV, I. A., VOYTOVICH, YA. V., PONOMAREV, P. I.

PROSPECTS FOR UTILIZATION OF A CULTURE OF HYDROGEN BACTERIA AS A BIO-REGENERATIVE AGENT IN AN LSS

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 244-247

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R625 from the resume]

[Text] The gas and water balance are calculated in a life support system based on the use of hydrogen bacteria for utilization of the CO_2 liberated by man and the process of electrolysis of water as a source of O_2.

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USSR

UPITIS, V. V., PAKALNE, Dz. S.

DOSAGE OF MICROELEMENTS IN AN INTENSIVE CHLORELLA CULTURE

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 101-109

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R596 from the resume]

[Text] In an accumulating culture, the limits of concentration of microelements providing the best chlorella growth are determined. The optimal relationship between microelements are Cu, Mo, Zn, Mn, Fe = 1:05:2:10:100 respectively. The specifics of supplying of microelements are discussed when chlorella is grown as a link in a closed ecological system. 29 references.

1/1

USSR

TRUBACHEV, I. N., ANDREYEVA, R. I., MIN, Z. V., KALACHEVA, G. S.

BIOCHEMICAL COMPOSITION OF CHLORELLA AND CULTURE MEDIUM USING LIQUID WASTE AND PRODUCTS OF THE PROCESSING OF HUMAN SOLID WASTE

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 86-92

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R600 from the resume]

[Text] The level of content of organic matter in a medium and the growth of the content of organic matter during cultivation of chlorella in a recycled medium consisting of acids, alkalis, urea, liquid and microbe-cultivator-processed solid human waste are determined. The liquid waste and products of processing of solid waste introduced to the nutrient medium have no significant influence on the biochemical composition of the chlorella. The possibility is shown of utilization of certain metabolites of human liquid waste by the algobacterial community. 16 references.

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USSR

SID'KO, F. YA., BERESNEV, G. F., GEVEL', L. M., YEROSHIN, N. S., ZAKHAROVA, V. A.

EFFECTIVENESS OF PHOTOSYNTHESIS OF LIQUID ALGAE CULTURES AS A FUNCTION OF TEMPERATURE AND ILLUMINATION

PROBL. SOZDANIYA BIOLOGO-TEKHN. SISTEM ZHIZNEOBESPECH. CHELOVEKA in Russian Novosibirsk, Nauka Press 1975 pp 92-96

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No. 4 (III) 1976 Abstract No. 4R601 from the resume]

[Text] It is shown that the effectiveness of photosynthesis of algae depends essentially on the temperature of the culture and the correspondence of the photosynthetic apparatus to the conditions of irradiation of the cells. The possibility is discussed of increasing the efficiency of photosynthesis of dense cultures by efficient illumination of the algae and creation of optimal temperature conditions. 5 references.

1/1

USSR UDC 632.4:633.11

KOTOVA, V. V., All-Union Institute of Plant Protection, Leningrad

EXPERIMENTAL EVALUATION OF HARMFULNESS OF ROOT ROT IN SPRING WHEAT

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 9 Mar 76 pp 436-441

[Abstract] Root rot caused by Helminthospotium sativum Pamm. King et Bakke causes extensive damage (15-18% and sometimes up to 30%) in regions with insufficient moisture. New methods of agriculture are conducive to soil sanitization procedures. The damage caused by root rot of spring in northern Kazakhstan, in particular Kustanayskaya Oblast during 1973-1975, is studied, using the method of comparing yields of diseased plants to those of healthy ones. Root rot affects plants throughout the growing season. Soft wheats (Saratovskaya 29 and Bezenchuskaya 98) and duram wheat (Khar'kovskaya 46) were planted on 100 hectare fields divided into numerous small sections. In addition to study under natural conditions, small section experiments and experiments using lysimeters were used to study responses to artifically induced infections. Differing doses were applied and the method of Ledingham

1/4

and Chinn (1955) was used to calculate infection. A four point scale was used to evaluate damage. The disease is difficult to evaluate precisely as it is scattered throughout the field and increased yields of healthy plants sometimes compensate for reduced yields of diseased plants. The disease attacks weakened plants and develops in microsections of the field where conditions are less favorable to growth. A table gives incidence of infection during the stages of sprouting, tillering and the preharvest period for the three varieties following several predecessors in the crop rotation (strip fallow, corn, wheat, wheat grass). The greatest increase in infection is during the sprouting stage (32.6 to 57%) and the intensity of development ranges from 4 to 13.2%. The epicotyle and primary roots are the most intensively damaged. Plant loss during the sprouting-tillering stage does not exceed 2-7%. A table gives data on the yield structure as affected by the disease. The factors evaluated include productivity, length of stalk, size of head, quantity and weight of grain per head and weight of 1000 grains. For all three varieties there were marked decreases in grain weight per head (60-90%). This was due to the decreased number of grains per head. The weight of 1000 grains did not

2/4

USSR

KOTOVA, V. V., NIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 436-441

decrease as much (from 32.8 to 20.0 for Saratovskaya 29, 30.0 to 15.0 Bezenchuskaya 98). The threshold of damage is a 15% infection rate for better cropping conditions and 10% for poorer conditions. Evaluation of the data showed that there is about a 5-7 mg reduction in grain weight for each percent increase in the development of the disease. This amounts to a 1.1-1.4% loss for each percent of disease development for Saratovskaya 29 and a 1.3-1.7% loss for each percent increase for the other two varieties. Regression equations are given. Yields of Khar'kovskaya 46 and Saratovskaya 29 grown on control plots with no intentional infection were compared to yields of plots with such infection of H. sativum. For Khar'kovskaya 46, grain loss amounted to 39.1% for infected plots and 28.4% for control; for Saratovskaya 29 the figures were 17.3% for infected plots and 17.5 for control. This lack of marked difference was due to the fact that the controls were naturally infected and had quantities of H. sativum sufficient to infect the plants. In the tests using lysimeters there were five variants. The intensity of infection ranged from 9.2% for the control to 51.9% for garden soil infected with 500 conidia per gram of soil. Grain weight per plant was .505 g for the

USSR

KOTOVA, V. V., NIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 436-441

former and .371 for the latter. Regressions were run on this data and the correlation between yield and root rot development was r= -.74. Tables 4; references 9: 8 Russian 1 Western.

USSR

UDC 006.3:632.4

KRIVCHENKO, V. I., All-Union Horticultural Institute imeni N. I. Vavilov

GENETIC HOMOGENEITY OF CULTIVATED PLANTS AND EPIPHYTOTICS OF DISEASES (CONCLUSIONS OF A CONFERENCE)

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3, 1976 signed to press 21 Nov 75 pp 243-244

[Abstract] In the meeting of "Organization of Territorial depots of Sources of Stability for Selection and Immunity" 58 reports were given. Subjects included: problems of genetic homogeneity of corn varieties in relation to development of epiphytotics; methods of organizing large scale development of rust, smut and powdery mildew fungi; donors of immunity with well-known genetics; problems on receiving information on the relation of natural populations of parasites to the utilization and prospects of gene selection for resistance; the latent gene reserve in wheat, barley and oats with their characteristic stability to most important diseases; a critical analysis of certain aspects of racial differentiation of disease agents, especially rust fungi; the recognized but still unidentified genes for stability in corn used for selection in the USSR and abroad. Many participants dealt with the

1/2

problem of theoretical and practical questions for utilization of sources of stability for selection toward immunity and achieving varieties with a heterogeneous genetic constitution. Possible means were discussed for broadening the genetic diversity of corn varieties. Means are needed for providing information about: donors being used for stability in regions of the selection centers; methods of studying the variability of natural populations of parasites and their interrelations with the sources of stability being used; studying practical aspects of racial differentiation; the problems of epiphytotics in USSR in relation to homogeneous varieties; the timeliness and reality of the problem of territorial disposition of sources of stability for selection of resistant and weakly susceptible varieties developed by the Department of Immunity of the All-Union Horticultural Institute imeni N. I. Vavilov. A charge to coordinate research in USSR so that the information would be available was given to the institute. The major conclusion of the conference was that the current phytopathological problems are the consequence of genetically homogeneous varieties of plants developed by man.

2/2

USSR

UDC 581.52:582.285.12(470.65)

POLYAKOV, I. M., VLADIMIRSKAYA, M. YE., and BELAONOVA, L. I., All-Union Institute of Plant Protection, Leningrad

EFFECTS OF ENVIRONMENTS ON THE INCIDENCE OF SMUT ON MAIZE CROPS IN NORTH OSSETIA

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3, 1976 signed to press 6 Aug 75 pp 208-210

[Abstract] Data on smut disease incidence in hybrid corn was gathered for four regions. Information included amount of precipitation, average air temperature, and altitude in June and July of 1973-74. Disease incidence was greater on irrigated land than on dry farm, but smut became more significant with increased rainfall. The data show that there is a lower incidence of smut disease as altitude increases and suggests that light conditions are an important factor. Since corn had its phylogenetic development under conditions of high air and soil temperatures at high altitudes, resistance probably stems from compliance with physiological demands of corn in response to accumulated and consolidated resistance factors in the gene centers of its origin. Tables 1; References 8: 7 Russian, 1 Western.
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USSR

UDC 632.914:532.4:582.285.12:633.11(571.1)

MINKEVICH, I. I., and FILIPPOVA, T. N., All-Union Institute of Plant Protection, Leningrad

BIOECOLOGICAL AND LONG-TERM FORECASTS ON LOOSE SMUT OF SPRING WHEAT IN WEST SIBERIA

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3, 1976 signed to press 22 Jul 74 pp 202-206

[Abstract] Long-term predictions of loose smut of wheat, based on a determination of a combination of weather elements during plant growth and flowering stages, have proved accurate. Three regions of west Siberia were grouped according to synchronization of disease development from 1962-1973. Mathematical models were then devised for each of the three regions based on reserve infection (infected seed); seed germination; soil moisture, humidity and air temperature during plant development and during head and seed formation; seed storage. Models based on the data were then applied in retrospect to 1962-1972 and used to accurately forecast disease incidence for 1973. Tables 3; figures 1; references: 9 Russian.
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USSR UDC 582.288.42:632.938:633.511

GOL'DSHTEYN, L. YE. and ACHILOVA, G. SH., Tashkent State University imeni V. I. Lenin

IDENTIFICATION OF PHENOTYPES OF VERTICULLIUM DAHLIAE KLEB IN COTTON BREEDING FOR WILT RESISTANCE

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 29 May 73 pp 420-421

[Abstract] During 1968-1971 research on wilt resistance using the varieties Tashkent-1 and its relative, wild Mexican cotton and variety S-4727 was carried out at the Institute of Experimental Biology and Plants (INEBR) of the Academy of Sciences of the Uzbek SSR. The causal organisms were isolated, the morphology of the conidial apparatus were studied directly on plant cuttings while the other structures were studied in Petri dishes in Chapek agar. The cultures of fungi found on various varieties of cotton were subjected to population analysis in order to find stable dominant phenotypes. Suspensions of 30-40 spores per ml were put in 10 Petri dishes and after 48 hours each colony was put in the center of a Petri dish. The following characteristics were compared: average diameter, color of colony, and size of
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USSR

COL'DSHTEYN, L. YE. and ACHILOVA, G. SH., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 420-421

conidia, These were the characteristics which were the easiest to verify. Cotton shoots were used to make a comparative study of the virulence of various phenotypes. This test is widely used. A four point scale for evaluating the intoxication of plants by various concentrations of chemical or biological intoxicants is given. In testing isolated phenotypes by this method, the highest virulence (1) was shown only by phenotype 1 isolated from wild Mexican cotton at the INEBR wilt test area and the wilt testing soil of NIISSKh [Scientific Research Institute for Cotton Breeding and Seed Raising]. Phenotype 2 (from the wilt testing at NIISSKh) and 3 (from Tashkent 1) and 1 from Mexican cotton of the INEBR) as well as 1 (from soil at this institution) had strong toxicity. Tables 1; references: 4 Russian.

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USSR

UDC 581.141:582.285.22:632.4:633.11

ALEKSEYEVA, T. P.

SPECIAL CHARACTERISTICS OF THE SPORULATION OF SOME RACES OF PUCCINIA TRITICINA ERIKS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 11 Sep 75 pp 419-420

[Abstract] The survival rate of various species of fungi causing wheat depends on several of their biological characteristics, such as sporulation capability, infectiousness of the spores, and environmental factors. Various races Puccinia graminis Persff. sp. tritici have been studied by Katsuya, Green (1967); and Clen (1971). The sporulation capabilities of races Puccinia trit triticina predominant in the northern Caucasus population (77, 58, 57, 21, 20) are studied. There are two biotypes of race 77 which differ in their virulence depending upon the regionalized varieties of wheat. The experiments were carried out in hothouses using potted plants (Yubileynaya 1 and the regionalized varieties Bezostaya 1, Avrora, and Kavkaz). The races 20, 21, 57, 58, and two biotypes of 77 (77/1 and 77/1,2,3,5,6) were studied. The uredspores were

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USSR

ALEKSEYEVA, T. P., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 419-420

scraped into a test tube and counted after a sporulation period of 15 days. During the first half of this period there was an increase in spore output, reaching a maximum of 9,000 in variant having a small number pustules per leaf (this was in race 20). Race 57 had the lowest sporulation (3,000 per pustul per day). The same pattern was observed in the total output for the entire period, with race 20 having the highest and race 57 the lowest. Sporulation varied for the different regionalized varieties of wheat. A table shows this data. The high sporulation of race 20 ensures its survival even when resistant varieties are planted. It can live in wild conditions. Race 57, on the other hand does not have such capabilities. The high rate of infection of the Avrora and Kavkaz is due to the capability of biotype 77/1,2,3,5,6 to produce high numbers of spores on these varieties. Tables 1; references 3: 1 Russian, 2 Western.

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USSR UDC 581.14:582.287.237

NEGRUTSKIY, S. F., BOYKO, M. I., and LOGASHEV, YU. YE., Donets State University

EFFECTS OF MAGNETOSTATIC FIELDS ON THE GROWTH OF THE FUNGUS FOMITOPSIS ANNOSA (FR.) KARST

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 4 Jan 76 pp 411-414

[Abstract] In recent years the study of the electromagnetic field effect in specific reactions of organisms has become widespread. Prausnitz (1961) has advanced the idea that these effects are due to the resonance effect on the distribution of protons in enzyme molecules. The studies of A. V. Krylov and G. A. Tarakanova (1967) discovered the phenomenon of magnetotropism in plants. Other authors suggest that a magnetic field of 20-60 Oersteds stimulates roots and seeds. Strains of the fungus F. Annosa, parasitic on pines in nurseries in Voronezhskaya Oblast (strain I), Zhitomirskaya Oblast (strain I), Zhitomirskaya Oblast (2-1Zh), Donetskaya (SK-2), and parasitic on spruce in Moscow Oblast (IB) were used. There were seven variants to each experiment: control, medium exposed, and fungi exposed for 5, 10, 15, 20, and 30 minutes. The results are presented in a table. There was no definite trend to the results,
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in some cases growth increased, and in some it decreased: I decreased, IB increased, 2-1Zh decreased, SK-2 decreased. These reflect different physiological and morphological characteristics of the various strains and differences in the environment, especially local geomagnetic effects. As the fruiting body in the majority of cases formed on the north side of the main stalk, an experiment was conducted to determine if there were any differences in the north and south poles. It was shown that the south pole had a relatively more stimulating effect. This is not thought to contradict the fact that under normal natural conditions the northern side of the fungi show more pronounced growth, as this is due to more suitable environmental conditions on the north side of trees. A table gives data on the pole experiments. Tables 2; references 9: 7 Russian, 2 Western.

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USSR UDC 632.914

CHUMAKOV, A. YE., All-Union Institute for Plant Protection, Leningrad

PROSPECTS FOR LONG TERM FORECASTS OF FUNGAL DISEASES OF PLANTS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 15 Sep 75 pp 402-406

[Abstract] An examination of meteopathological methods developed by K. M. Stepanov (1958) (1962) and applied to more than 16 types of diseases. Long term phytopathological forecasts should predict disease 3-10 months ahead with an accuracy of 85-95% and formulas and correlations should maintain their accuracy for 2-3 years. The various causal factors in summary indexes sometimes have interrelationships of their own and the effect of each individual factor is not distinguished. In such cases the biological significance of factors is not revealed. Vol'vach (1947a) used four formulas to establish the relationship of the seasonal development of brown rust to environmental factors. His correlation for the steppes of the Ukraine and the Northern Caucasus was lower (r=.75 -.80) than that of Stepanov's (1958) method. In addition Vol'vach's predictions did not have sufficient lead time. Weather
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factors used to predict disease in a given year often correlate to weather in previous years. Those having a good correlation with rust development also have high correlations with weather of the previous year. A table gives an example of the predictive power of two models using different factors to predict brown rust of winter wheat at the Kuban Station of the All Union Institute of Plant Raising. One variant had a correlation of .926 while the other was .868. It is thus necessary to improve the selection of causal factors. There are also difficulties in the use of short series of observations and changes of varieties, changes in the species composition of parasites and in crop raising methods. It is thus necessary to find new methods of forecasting and to refine present ones. It is important to avoid averaging the incidence of disease for various varieties of crops. Allowance should be made for testing on mono variety sections as their range is wider than that of production fields. Weather factors should not be aggregated by month but by growing season and square roots of variables should be used. A distinction is made between inertial (direct) and inductive (indirect mediated effects) factors. An example of the latter factor is given. Prediction of a disease
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USSR

CHUMAKOV, A. YE., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 402-406

for a given area depends on relief and climatic conditions. Prediction for an administrative region usually requires forecasts for 5-10 points. Tables 1; references: 16 Russian.

3/3

USSR UDC 632.25:633.11

POPUSHOY, I. S., GRINBERG, Sh. M., PROSTAKOVA, Zh. G., KOGAN, E. D. and KHRIPUNOVA, E. F., Department of Biological and Chemical Sciences, Moldavian SSR

SPECIES COMPOSITION OF FUNGI ASSOCIATED WITH ROOT ROTS OF WINTER WHEAT CROPS DURING TILLERING

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 2 Sep 75 pp 365-367

[Abstract] Root rot has been observed only comparatively recently in the Moldavian SSR and information about species composition is not available. During the time up to tillering of winter wheat there are two infections; during sprouting there are losses and during tillering there are necroses on the internodes and roots (the latter is illustrated). The dry weight of 100 healthy plants during tillering amounted to 22.2 grams while for damaged plants the figure was 14.2 grams (63.9%). During 1974-1975 wheat in the republic was surveyed and a table gives data on the areas studied and the development of the disease. The latter figure has wide ranges for all but the southeast region (the region with the lowest figure, and no figure for 1975). The procedure for calculating species composition is given. Eighteen

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USSR

POPUSHOY, I. S., GRINBERG, Sh. M., PROSTAKOVA, Zh. G., KOGAN, E. D. and KHRIPUNOVA, E. F., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 365-367

species of fungi were found. The most common were two species of Fusarium avenaceum with a total of 29.47% of total population Gloeosporium sp. (13.68%), Fusarium heterosporum (13.16), and Alternaria tenius (11.05). This species composition is presented in a table. Half of the article is devoted to detailed discussion of the data in the table. Figure 1, tables 3, references 9: 8 Russian, 1 Western.

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USSR UDC 632.4.633.16:582.285.14

TYULINA, L. R., and MAL'TSEVA, A. I., Kirov Agricultural Institute; Scientific Research Institute of Agriculture of the Northeast, Kirov

BLACK LOOSE SMUT OF BARLEY IN THE NORTHEAST OF THE NONCHERNOZEM ZONE OF THE RSFSR

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 5, 1976 signed to press 4 Dec 75 pp 397-402

[Abstract] Loose smut of barley is caused by Ustilage nuda (Jens) Rostr. and U. nigra Tapke. The disease caused by the second species is called black loose smut. Important studies in the discovery of this species are mentioned. The differences between the species are very slight and can usually be determined only under laboratory conditions. The species composition of loose smut-causal organisms has not been studied for the Northeast of the Nonchernozem zone. Barley from the collection of the All Union Institute of Plant Raising (VIR) and regionalized varieties from Scientific Research Institute for Agriculture of the Northeast (NIISKh Northeast) were tested for resistance of U. nigra. The species composition of loose smut was studied in 1972 in the north, central, and southern rayons of Kirovskaya Oblast and in the Mordovskaya, Chuvashskaya, Tatarskaya, and Mariyskaya autonomous

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TYULINA, L. R. and MAL'TSEVA, A. I., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 5, 1976 pp 397-402

republics. Loss rates are high. The spores have different morphometric characteristics in different geographic areas. A table gives details. The most constant measure is the diameter of the chlamydospore. 160 varieties from the VIR collection and 32 varieties from the NIISKh Northeast were tested using a pathogen extracted from the Kazanskiy 6/4 variety from the Tatarskaya ASSR, the most virulent. During the 3 year period five varieties were not damaged by loose smut: 17 843 [VIR catalogue number] local (Omskaya Oblast); 6665 (Armenian SSR); 19 110, S 251 (India); 18 703 Dzhet (Ethiopia); K 19 069, Unitan (US). Several others also showed "practical resistance". These are given in a table which shows quantity of plants, productivity per plot and per head and incidence rate for controls and inoculated plants. The productivity of the group with practical resistance was generally higher than that of the highly resistant group, the highest yield in the latter being Unitan. Productivity (in grams) per head ranged from .38 for Dzhet to 1.26 for Hienes Haga (Federal Republic of Germany). Use of Unitan and Khar'kovskaya is recommended as well as Keyston and Trayl (both from Canada), the latter two had a productivity per head of 1.13 and 1.20 respectively. Tables 3, references 9: 8 Russian, 1 Western.
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USSR UDC 547.963.32

DUBININ, N. P., academician, SLYUSARENKO, A. G., KAPELINSKAYA, T. V., BOGUSPAYEV, K. K., and GORODETSKIY, S. I., Institute of General Genetics, Academy of Sciences USSR, Moscow

PRODUCTION OF COMBINED DNA MOLECULES OF LAMBDA PHAGE AND BACILLUS SUBTILIS BY THE METHOD OF COMPLETING ADHESIVE ENDS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 230, No 3, 1976 signed to press 7 Jun 76 pp 729-732

[Abstract] The method of obtaining combined DNA which does not require preliminary processing by restrictase produces a higher percentage of covalent attached annular molecules of DNA. It is used to obtain such molecules of lambda DNA (molecular weight $3 \cdot 10^7$ daltons) from fragments of Bacillus subtilis DNA ($6 \cdot 10^6$ daltons). The procedures and parameters of the experiment are presented. The completion process consists of two stages: the "adhesive" ends are processed with DNA polymerase T4, incubated and centrifuged; then homopolynucleotides are attached to the DNA ends. The final mixture is analyzed in a 5-20% alkaline gradient of sucrose. Two graphs show the results. Annular molecules of combined DNA make up about 40% of the total mixture.
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USSR

DUBININ, N. P., SLYUSARENKO, A. G., KAPELINSKAYA, T. V., BOGUSPAYEV, K. K., and GORODETSKIY, S. I., DOKLADY AKADEMII NAUK SSSR Vol 230, No 3, 1976 pp 729-732

There are two types of molecules: super-twisted and annular. The total length of observed annular combined DNA corresponds to the length of the two DNAs. The conditions of the experiment permit using DNA with ends built up by polymerase in order to add homopolynucleotides. In subsequent reactions only two desoxynucleotides of triphosphate are needed and it is not necessary to use exionuclease. In some experiments the resulting mixture was 70-80% annular molecules. Figures 3; references: 15 Western.

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USSR

KISELEV, B. A., YEVSTIGNEYEV, V. B., and TSIGANKOVA, I. G., Institute of Photosynthesis, Academy of Sciences USSR, Pushchino

PIGMENT-PIGMENT ELECTRON TRANSFER AND SEPARATION OF CHARGES IN AGGREGATES OF CHLOROPHYLL DURING PHOTOEXCITATION

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 230, No 3, 1976 signed to press 4 Jun 76 pp 726-728

[Abstract] The transfer of electrons in chlorophyll and the formation of anions and cations in the triplet excited state has been studied. This, however, is not an accurate model of initial photosynthesis, in which transfer takes place in the singlet excited state of aggregated chlorophyll. Because of the relation of oxidation and reduction potentials, the transition of a chlorophyll molecule to the singlet state makes possible the transfer of an electron. The experiment shows the possibility of this reaction and the formation of Chl^+ and Chl^-. A solution of chlorophyll in petroleum ether or hexane is mixed so as to form monomers, dimers, and tetramers. The electrical properties of this solution are described. The apparatus consists of a shallow cell hooked up to electrical measurement equipment. This apparatus
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USSR

KISELEV, B. A., YEVSTIGNEYEV, V. B., and TSIGANKOVA, I. G., DOKLADY AKADEMII NAUK SSSR Vol 230, No 3, 1976 pp 726-728

can measure lower magnitudes of electrical permeability than previously used equipment (down to epsilon=2). A graph shows the dependence of the signal on the electrical field applied (it reaches a maximum at wave lengths of 680 nm). Its dependence on the concentration of chlorophyll indicates that it is a light induced transfer. The weak light source used excludes triplet molecules. The necessity of an external electrical field is due to the fact that delta W is less than the energy of dissociation. In living systems the aggregated state of the pigment (in contrast to the dimers) and the light induced potential of the membrane would create an electrical field of sufficient voltage. In the classical z-scheme of photosynthesis the degradation of electrical energy into heat would overheat the chlorophyll. The z-scheme cannot explain this. In the above model the formation of Chl^+ and Ch^- and the absorption of red light explains the functioning of the reaction center. Figures 3; references 12: 3 Russian, 9 Western.

2/2

USSR

STRIGINA, L. P., "AKSAY" Republic Specialized Children's Hospital

BONE REGENERATION AFTER DIFFERENT LENGTHS OF EXPOSURE TO LASER IRRADIATION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, 1976 pp 50-52

[Abstract] Rabbits in which a portion of the tibia was excised and replaced with preserved bone were locally irradiated by an LG-75 laser (25 mv) for 30 seconds, 1, 2, 5, or 10 minutes a day for a month. Histological examination of sections showed an acceleration of the inflammatory reaction and more rapid maturation of periosteal callus in experimental animals compared to controls. Cartilage appeared on day 9 instead of 15. The proliferation of histiogenic cells and their differentiation into fibroblasts and osteoblasts were more vigorous than in the control. The effects of irradiation on osteosynthesis were directly dependent on the duration of exposure. The development of the inflammatory reaction and resorption of the graft were most pronounced in the animals exposed for 10 minutes daily. References: 31 Russian.

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USSR

KORYTNYY, D. L., Department of Therapeutic Stomatology, Alma-Ata Medical Institute

HELIUM-NEON LASER LIGHT IN THERAPEUTIC STOMATOLOGY

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, 1976 pp 65-67

[Abstract] Animal experiments and clinical studies run by the Department of Therapeutic Stomatology of the Alma-Ata Medical Institute showed that local helium-neon laser irradiation stimulates regeneration of skin and buccal mucosa, intensifies tissue resistance, stimulates phagocytosis, increases saliva lysozyme activity, and normalizes serum proteins in sensitized individuals. Laser irradiation is useful but not curative in pulpitis, periodontitis, nonspecific stomatitis, and glossalgia, for it does not eliminate the cause of the disease or the factor promoting the development of the pathological process. It potentiates other modes of therapy by normalizing the immunological system of the body and, in most patients, has an analgesic effect. References: 9 Russian.

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USSR

UDC 613.1

CHIKIN, S. YA.

ROLE OF THE ENVIRONMENT IN PROTECTING HUMAN HEALTH

Kazan' KAZANSKIY MEDITSINSKIY ZHURNAL in Russian No 2, 1976 pp 119-124

[Abstract] Environmental protection has been a concern of the Soviet Union since its establishment. A succession of decrees and statements by Soviet leaders from Lenin to Brezhnev together with the many actions taken to implement the various plans--building of countless water treatment facilities, planting trees and other landscaping activities, controlling industrial effluent, etc.--as well as efforts by millions of people and organizations reflect national awareness of the relationship between environmental degradation and human health.

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USSR

UDC 547.814-02:616-006

SHABAD, L. M., Institute of Experimental and Clinical Oncology, Academy of Medical Sciences USSR, Moscow

CARCINOGENIC ACTION OF POLYCYCLIC HYDROCARBONS IN ANIMALS AND MAN

Kazan' KAZANSKIY MEDITSINSKIY ZHURNAL in Russian No 2, 1976 pp 124-129

[Abstract] Polycyclic hydrocarbons are universally present in the atmosphere, soil, lakes and streams, vegetation, and human and animal tissues, the concentrations varying with distance from the sources (heating systems, industrial plants, automobile highways and airports, petroleum refineries, etc.). The most potent of the carcinogens is benz (a) pyrene whose presence in an object, as shown by studies done in the author's laboratory, is an indication that other polycyclic hydrocarbons are also present. These studies also demonstrated that while benz(a)pyrene may accumulate in soil with seasonal fluctuations, it can also be destroyed by certain microorganisms, e.g., B. sphericus. Other experiments showed that benz(a)pyrene and other such compounds can be destroyed in tissue culture as well as in vivo (e.g., benz(a)-pyrene given to cows with fodder was found in their milk but not in meat after

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USSR

SHABAD, L. M., KAZANSKIY MEDITSINSKIY ZHURNAL No 2, 1976 pp 124-129

they were slaughtered). It is suggested that maximum permissible concentrations be set for benz(a)pyrene in air and water to minimize its potential carcinogenic effects.

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USSR UDC 687.17:066

SPECIAL CLOTHING

Moscow STANDARD EKSPRESS - INFORMATSIYA in Russian No 43[649] 1976 signed to press 1 Jun 76

[Abstract] The new state standard for special clothing, GOST 12.4.015-76, specifies thirteen classifications of protective clothing in place of eleven in the old standard. The groups include protection from mechanical injury, high and low temperature, radioactive substances, X-rays, acids and toxic and nontoxic substances. The standard will be introduced on 1 Jan 1977.

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USSR UDC 616.981.42

REMENTSOVA, M. M., Kazakh Institute of Epidemiology, Microbiology, and Infectious Diseases, East Kazakhstan Oblast Sanitary-Epidemiological Station

PROGRESS IN ERADICATING BRUCELLOSIS IN EAST KAZAKHSTAN OBLAST AND REDUCTION OF THE INCIDENCE OF BRUCELLOSIS AMONG PEOPLE

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, 1976 pp 79-82

[Abstract] Until the middle 1960's brucellosis was prevalent on the farms of East Kazakhstan Oblast, particularly among sheep, cattle, camels, horses, goats, and working dogs. In some years over 90% of the farms suffered epidemics of the disease. Many persons become infected, particularly those caring for sheep and cattle. As a result of systematic efforts that included large-scale mechanization of operations involving direct contact with the animals, isolating and slaughtering animals that reacted positively to brucellin, extensive campaigns to educate farm workers in proper hygiene, and mass vaccinations, the incidence of brucellosis of sheep and cattle declined, respectively, from 7.8 and 4.5% in 1957 to 0.5 and 1.06% in 1974. The brucellosis rate among humans dropped in the same period from 180% to 1.6%. 1/1

USSR UDC 576.8:663.1

ZAYTSEV, V. A., KIPRIYANOV, YU. I., KRATS, V. M., STEPANISHCHEV, K. P., and SHAMGUNOV, T. G.

A FLOTATION APPARATUS FOR ISOLATING MICROORGANISMS FROM CULTURE FLUID

Moscow USSR patent, cl. C 12 c 11/24, B 03 d1/14, No 469742, filed 8.05.73, No 1918862, published 8.08.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L464 P by A. Ramenskaya]

[Text] The distinguishing feature of the apparatus is the use of a device for dehydrating foam in order to accelerate the process and ensure more complete isolation of the yeasts. The device which consists of flat inclined plates arranged in tiers one above the other with water seals; is set in the top vessel. The apparatus is equipped with several additional air dispersers in the form of grid plates arranged in tiers one above the other and set in the vessel to isolate microorganisms from the culture fluid. The device for supplying culture fluid is a gas jet pump with a distributing collector set in the top of the vessel to isolate microorganisms from the culture fluid above the top disperser.
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USSR UDC 576.8:663.1

SEVEROV, B. P.

AN APPARATUS FOR GROWING MICROORGANISMS

Moscow USSR patent, cl. C 12 b 1/10, No. 477,188, filed 17.09.73, 1,961,320, published 16.10.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L465 P by A. Ramenskaya]

[Text] To accelerate the processing of growing microorganisms, the proposed apparatus is additionally equipped with a device to move the funnel with the foam-removing tube in a vertical plane. The funnel is perforated and provided with a foam seal.

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USSR UDC 576.8:663.1

MAKAROV, N. A. and SKIBA, A. I., Special Design Bureau for Biological Instrumentation

AN APPARATUS FOR GROWING MICROORGANISMS

Moscow USSR patent, cl. C 12 b 1/10, No 452.577, filed 10.08.71, No 1,682,672 published 12.08.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L466 P by A. Ramenskaya]

[Text] To accelerate mass exchange and rate of growth, the proposed apparatus is equipped with a deflecting device consisting of a set of blades with curved surfaces set in such a way that the curve of each pair of blades is facing in the opposite direction from each other. The distance between the ends of each pair of blades facing the mixer is not less than the height of the butt end of the latter. The blades are perforated and they have ribs. The device is suitable for growing microorganisms and it can be used in the microbiological, pharmaceutical, and food industries. A diagram of the proposed apparatus is shown in a figure.
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USSR UDC 576.8:663.1

SEMENOV, YA. V., REVENKO, S. K., ASRIYEV, E. I., and REDIKUL'TSEV, YU. V., All-Union Biotechnical Institute

AN APPARATUS FOR GROWING MICROORGANISMS

Moscow USSR patent, cl. C 12 b 1/10, No 452,578, filed 2.04.73, No 1,899,971, published 12.08.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7 L467 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed apparatus is the use of a vessel shaped like a torus to accelerate the growth of microorganisms. In the center of the torus is an ejector equipped with a flow divider with spiral ribs situated at the outlet of the ejector. The absorbing main of the circulating system is connected tangentially to the vessel in the direction of the spiral ribs of the divider. A diagram of the described apparatus is shown in a figure. It will be useful in the microbiological industry.

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USSR UDC 576.8:663.1

LOSKUTOV, G. M., DMITRIYEV, YE. YE., SHCHERBAKOV, N. G., and MIKHAYLOV, V. A., All-Union Scientific-Industrial and Design-Construction Association of the Microbiological Industry

AN INFORMATION DEVICE FOR CONTROLLING INDUSTRIAL PROCESSES

Moscow USSR patent, cl. G06f 15/46, No 481,905, filed 27.03.74, No 2,008,972 published 18.11.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7 L468 P by A. Ramenskaya]

[Text] The efficiency of the proposed device is increased by the use of a device into which is inserted a unit for selecing the optimum values of the parameters. Its input is connected to the output of the information input unit while the output is connected through the storage block to the input of the information output unit. The reliability of operation is increased by a unit to control the performance and for self-control of the correctness of the situation introduced. The inputs of this unit are connected to the outputs of the storage block and information input unit while the output is connected

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USSR

LOSKUTOV, G. M., DMITRIYEV, YE. YE., SHCHERBAKOV, N. G. and MIKHAYLOV, V. A., USSR patent cl. G06f 15/46 No 481,905

to the corresponding input unit of the output information. The invention can be used, for example, in the microbiological industry, as an "adviser" or element in a system for automatic control of hydrolysis of plant raw material in hydrolysis apparatus.

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USSR UDC 576.8:663.1

KONONYUK, A. YE. and KOZLENKO, N. A., Ukrainian Institute of the Alcohol and Liqueur and Vodka Industry

AN APPARATUS FOR GROWING MICROORGANISMS

Moscow USSR patent, cl. C 12 k 1/10, C 12 b 1/10, No 472,975, filed 2.04.73, No 1,899,490, published 3.09.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L470 P by A. Ramenskaya]

[Text] To accelerate mass exchange between liquid and gas, the proposed apparatus is equipped with a shell able to turn and hold part of the diffuser, which has slits at the level of the mixing device. A diagram of the apparatus for growing microorganisms is shown in the figure.

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USSR UDC 576.8:577.15

ALEKSEYEVA, V. V., KALUNYANTS, K. A., OVCHAROV, A. K., and SLOBODYANIKOVA, L. S.

ISOLATION AND STUDY OF SOME PROPERTIES OF THE PROTEOLYTIC COMPLEX OF BACILLUS SUBTILIS STRAIN 103 ENZYMES

Moscow MIKROBIOL. PROM-ST'. REF. SB. [Microbiological Industry. Collection of Abstracts] in Russian No 10(130), 1975, pp 24-26

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L473]

[Text] Proteinase was isolated from Bac. subtilis strain 103 culture fluid and partly purified. The resulting preparation was found to possess caseinolytic, esterase, and elastolytic activities. The enzyme manifested maximum caseinolytic activity at pH 7.3 and temperature of 50 to 60°.

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USSR/USA

UDC 576.8:577.15

KANESHIRO, T., KELSON, B. F., and SLONEKER, J. H.

FIBROUS MATERIAL IN FEEDLOT WASTE FERMENTED BY TRICHODERMA VIRIDE

APPL. MICROBIOL in English Vol 30, No 5, 1975 pp 876-878

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L478 by V. Pomelova]

[Text] Unprocessed feedlot wastes at at2.5% concentration are an adequate and convenient medium for the production of cellulolytic enzymes by the fungus T. viride QM 9123, although fungal growth is inhibited at higher concentrations. The possibility of using fibrous material separated from feedlot wastes as a fermentable enzyme was studied. Fermentation of the samples isolated did not result in inhibition at substrate concentrations of up to 16.7%, but a nutritional deficiency developed, i.e., food additives had to be supplied to produce the enzymes. The carbohydrate content decreased by about 60% in all the fiber samples while the other insoluble components decreased by 32%. Cellulolytic activity was highest during the fermentation of fibrous material treated in advance with an alkali, with the lowest hemicellulose:
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USSR/USA

KANESHIRO, T., KELSON, B. F., and SLONEKER, J. H., APPL. MICROBIOL Vol 30, No 5, 1975 pp 876-878

cellulose ratio. About 60 to 70% of the assimilable nutrients in the fibrous material was utilized between days 3 and 7 of incubation, whereas the cellulolytic enzymes appeared during the following days. United States, Northern Regional Research Laboratory, Agricultural Research Service, Peoria, Illinois 61604.

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USSR UDC 576.8:577.15

LOGINOVA, L. G., ISMAILOVA, D. YU., and BURDENKO, L. G.

DECOMPOSITION OF CELLULOSE-CONTAINING WASTES BY THE HEAT-TOLERANT FUNGUS ASPERGILLUS TERREUS 17 p

Moscow MIKROBIOL. PROM-ST'. REF. SB. [Microbiological Industry. Collection of Abstracts] in Russian No 10(130) 1975 pp 27-29

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L480]

[Text] The heat-tolerant fungus Aspergillus terreus 17 p grows and forms cellulolytic enzymes and xylanase in such agricultural wastes as barley and wheat chaff, cotton, bolls, wheat straw, birch sawdust, corn stumps, and beet pulp. The cellulolytic enzymes and xylanase are most active on a medium with wheat straw as the only carbon source. Their activity varies when the fungus is grown on straw taken from different regions. Industrial enzyme preparations are obtained by precipitation with organic solvents and ammonium sulfate. The activity is greater in an enzyme preparation obtained by salting out with ammonium sulfate.

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USSR UDC 576.8.663

VINAROV, A. YU.

ANALYSIS OF THE PHYSICOCHEMICAL PROPERTIES OF FERMENTATION MEDIA USED TO GROW YEASTS

Moscow MIKROBIOL. PROM-ST'. REF. SB [Microbiological Industry. Collection of Abstracts] in Russian No 10(130) 1975 pp 6-13

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L518]

[Text] Problems connected with the analysis of the structure of fermentation media are examined. A quantitative evaluation is made of the constituents of a multiphase system such as a fermentation medium. The phenomena that cause the phases of the system to interact and give rise to new elements of the system (aggregates) are examined. Methods for quantitative estimation of the specific properties of a fermentation medium are described.

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USSR

UDC 576.8:577.15

KASHCHENKO, V. YE. and SHAVLOVSKIY, G. M.

PURIFICATION AND PROPERTIES OF RIBOFLAVINKINASE FROM THE YEAST PICHIA GUILLIERMONDII

Moscow BIOKHIMIYA in Russian Vol 41 (2) 1976 pp 376-383

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7(I) 1976 Abstract No 7L481]

[Text] Riboflavinkinase (I, K.F.2.7.1.26) was isolated from the yeast P. guilliermondii. The enzyme was purified 680 times by fractionation with ammonium sulfate, ion-exchange chromatography on DEAE Sephadex A-50, KM Sephadex C-50, and gel filtration on Sephadex G-75. The purified I preparations did not contain phosphatase and FAD synthetase activities. I activity was optimal at pH 8.7 and 45°. The enzyme was activated by zinc, magnesium, and cobalt ions. The K_M of I was $1.0 \cdot 10^{-5}$ M for riboflavin and $6.7 \cdot 10^{-6}$ M for ATP. The enzyme catalyzed the phosphorylation of riboflavin analogs with substitutions of the trifluoromethyl group and chlorine atom for the methyl groups in the 7th or 8th position. Besides ATP, phosphate donors were UPT, ADP, GTP, and CTP. I was inactive with IPT. AMP inhibited the enzyme. The

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USSR

KASHCHENKO, V. YE. and SHAVLOVSKIY, G. M., BIOKHIMIYA Vol 41 (2) 1976 pp 376-383

molecular weight of I determined by gel filtration on Sephadex G-150 was 28,000. Purified I was stable during storage.

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USSR

UDC 576.8.663

SALTYKOVA, L. Z., ITKIND, A. N., BLINCHEVSKAYA, N. YA., and BYKHOVSKIY, YE. G.

DETERMINATION OF THE CONCENTRATION OF CARBOXYLIC ACID IN CULTURE FLUID USED TO GROW YEASTS ON OXIDATES OF NATURAL GASOLINE

Moscow MIKROBIOL. PROM-ST'. REF. SB. [Microbiological Industry. Collection of Abstracts] in Russian No 10(130), 1975 pp 15-17

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L520]

[Text] A rapid method of determining the concentration of carboxylic acid in culture fluid by potentiometric titration in an acetone medium is proposed. It can be used during the fermentation of oxidates of natural gasoline to control the kinetics of assimilation of carboxylic acid in the course of biosynthesis.

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USSR

UDC 576.8.663

KOZHEMYAKIN, V. G., KALUNYANTS, K. A., VERIGIN, N. N., and GOLGER, L. I.

INTENSIFICATION OF MICROBIAL SYNTHESIS IN SUBMERGED GRAIN NUTRIENT MEDIA BY VOLUME AERATION

Moscow MIKROBIOL. PROM-ST'. REF. SB. [Microbiological Industry. Collection of Abstracts] in Russian No 10(130) 1975 pp 17-20

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L521]

[Text] The dynamics of enzymatic activity with submerged and surface methods of cultivation is compared. An analysis is made of changes in the parameters of the process from the depth of the layer of the medium with surface aeration. The possibility of intensifying the industrial growing of microorganisms by enlarging the active depth of cultivation is examined.

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USSR UDC 576.8.663

DENIS, A. D., STARYK, L. B., KOROTCHENKO, N. I., SAMOKHINA, O. V., and KRASINSKAYA, A. L.

STUDY OF METHODS OF PREPARING SOLUTIONS OF NUTRIENT SALTS FOR GROWING YEASTS

Moscow MIKROBIOL. PROM-ST'. NAUCH.-TEKHN. REF. SB. [Microbiological Industry. Collection of Scientific and Technical Abstracts] in Russian No 1(132) 1975 pp 1-4

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L522]

[Text] Several methods of preparing solutions of nutrient salts used in the production of fodder yeasts were tested under laboratory and semi-industrial conditions. The main purpose was to achieve a stable content of the individual elements at the calculated concentration during storage of the solutions. Based on the results of the tests, it is recommended that 2 solutions be prepared: (i) extracts of superphosphate by the precipitation of calcium with ammonium sulfate or ammonia water and (ii) solutions containing a mixture of potassium and magnesium salts and trace elements with sulfuric acid added to ensure better dissolving of the iron.
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USSR UDC 576.8.663

KOZHEMYAKIN, V. G., KALUNYANTS, K. A., VERIGIN, N. N., and FENIKSOVA, R. V.

EXTERNAL THERMAL MASS EXCHANGE IN CULTIVATION OF MICROORGANISMS ON GRAIN MEDIA

Moscow MIKROBIOL. PROM-ST'. NAUCH.-TEKHN. REF. SB. [Microbiological Industry. Collection of Scientific and Technical Abstracts] in Russian No 1 (132)1975 pp 7-10

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L523]

[Text] The authors examine the effect of temperature and humidity on enzyme production in surface cultivation. They analyze the patterns of external thermal mass exchange in a culture with an aerating air current.

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USSR UDC 576.8.663

SELEZNEVA, A. A., BABENKO, G. A., ROZHANSKAYA, T. I., and MARGOLINA, N. A.

COMPARISON OF DIFFERENT METHODS OF DEMINERALIZING THE PROTEOLYTIC ENZYME TERRILYTIN

Moscow MIKROBIOL. PROM-ST'. NAUCH.-TEKHN. REF. SB. [Microbiological Industry. Collection of Scientific and Technical Abstracts] in Russian No 1 (132) 1975 pp 10-12

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L524]

[Text] Several methods of demineralizing and concentrating the proteolytic enzyme terrilytin are examined: precipitation by specific reagents, ion-exchange sorption, gel filtration, dialysis, ultrafiltration. Gel filtration and especially ultrafiltration are shown to be much superior to the other methods of demineralization.

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USSR UDC 576.8.663

SHCHERBAKOV, M. A., TYURINA, ZH. P., and AL'MAN, A. V.

STABILITY OF PECTOLYTIC ENZYMES IN A SUBMERGED CULTURE OF THE FUNGUS BOTRYTIS CINEREA STRAIN 70

Moscow MIKROBIOL. PROM-ST'. NAUCH.-TEKHN. REF. SB. [Microbiological Industry. Collection of Scientific and Technical Abstracts] in Russian No 1(132) 1975 pp 13-15

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7(I) 1976 Abstract No 7L525]

[Text] The optimum conditions of action of pectolytic enzymes synthesized by the fungus B. cinerea strain 70 were studied in relation to the temperature of hydrolysis and pH. A temperature of 40° and pH of 3.5 are optimum for the action of the cultural filtrate and pectocinerin preparation G-10x. The cultural filtrate of the fungus was found to be stable at pH 3.0 to 3.5 and temperature of 30 to 35° while the pectocinerin preparation G-10x was stable at pH 4.5 and 30°. The pectolytic enzymes are completely inactivated at a temperature of hydrolysis of over 45 and 65° for the cultural filtrate and preparation, respectively.
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USSR

UDC 576.8.663

ROMANOV, S. L. and LOBANOK, A. G.

A METHOD OF DEMINERALIZING THE SULFATE-PRECIPITATED PREPARATION OF CELLULASE FROM THE FUNGUS TRICHODERMA LIGNORUM STRAIN 534 IMMOBILIZED IN POLYACRYLAMIDE GEL

Moscow MIKROBIOL. PROM-ST'. NAUCH.-TEKHN. REF. SB. [Microbiological Industry Collection of Scientific and Technical Abstracts] in Russian No 1 (132) 1975 pp 18-19

[From REFERATIVNYY ZHURNAL, BIOLOGIYA 7 (I) 1976 Abstract No 7L526]

[Text] The authors propose a method for the rapid demineralization of sulfate-precipitated preparations of cellulases by immobilization in polyacrylamide gel and subsequent dialysis in running water or electrodialysis.

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USSR

UDC 576.8.663

LEBEDEV, V. D., LYSOV, V. D., MISKILEV, V. F., BERKOVICH, YU. A., and ANISOMOV, O. L., All-Union Biotechnical Institute

A METHOD OF DETERMINING THE CONCENTRATION OF MICROORGANISMS

Moscow USSR patent cl. C 12 k 1/00, No 481,640 filed 12.07.73, No 1, 951,598 published 19.11.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L528 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed method of determining the concentration of microorganisms, e.g., Chlorella, by passing a light flux through them is that to increase the accuracy of measurement and obtain information on the viability of cells in the population, the intensity of Streller's luminescence is measured while the concentration of microorganisms is determined from a graduated curve showing the dependence of the intensity of Streller's luminescence on the concentration of microorganisms.

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USSR

UDC 576.8.663

KHANUKAYEV, YA. A., BABAYANTS, A. V., and ALESHECHKIN, V. V., Groznyy Branch of the Research and Design Institute for Combined Automation in the Petroleum and Chemical Industry

A METHOD OF AUTOMATIC CONTROL OF THE PREPARATION OF NUTRIENT MEDIA

Moscow USSR patent, cl. C 12 b 3/00, C 12 k 1/06, No 452,579, filed 19.02.73 published 12.08.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L529 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed method of automatic control of the preparation of nutrient media for the production of entobacterin is that to improve the quality of the media, the content of reducing substances in the corn extract and the glucose concentration are also measured while the pH of the medium is regulated by supplying an alkali. The glucose concentration is corrected by the content of reducing substances in the corn extract. All the components (solutions of glucose concentrate and corn extract, etc.) used to prepare the nutrient medium are fed into the reactor as it empties. The method is illustrated by a diagram.
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USSR

UDC 576.8.663

DENIS, A. D., GRADOVA, N. B., and MIKHALEVA, V. V., Pilot Plant of the All-Union Research and Design-Construction Institute of the Petroleum Refining and Petrochemical Industry, All-Union Institute of Biosynthesis of Proteins

A METHOD OF PREPARING A WATERY NUTRIENT MEDIUM FOR GROWING MICROORGANISMS

Moscow USSR patent, cl. C 12 b 3/00, No 499,091, filed 2.10.72, No 1,834,023 published 19.04.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L530 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed method is that to economize on the consumption of phosphorus and nitrogen-containing substances, ammonia water is added (in the quantity required to bring the pH of the solution to 4.5-10) to the salt solution during mixing. The ammonia water is added to the salt solution at 0 to 50° after the insoluble residue of mineral salts, e.g., gypsum, is removed.

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USSR UDC 576.8.663

GRANOVSKIY, YA. D., Moscow Yeast Plant

A METHOD OF DETERMINING THE MASS OF YEAST CELLS PER UNIT VOLUME OF SUSPENSION

Moscow USSR patent, cl. G 01 n 33/16, C 12 k 1/100, No 492,807 filed 19.02.73 No 1,885,628 published 10.12.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L531 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed method, which calls for the separation of the suspension into solid (yeast) and liquid fractions, is that to increase the accuracy of the determination, the density of the original suspension is determined before the suspension is separated into fractions. After this is done, the liquid fraction is removed and its density determined while the same quantity of a solution of known density is added to the solid fraction and mixed. The density of the resulting suspension is determined, after which the mass of yeast cells is calculated from the ratio of the given densities (solutions and suspensions).
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USSR UDC 576.8.663

SHCHERBAKOV, A. A., KRAYEV, L. N., VYSOTSKAYA, I. F., KALYUZHNYY, M. YA., and SIGUNOVA, YE. B., All-Union Scientific-Industrial and Design-Construction Association B, O "Mikrobioprom", L'vov Polytechnical Institute

A METHOD OF PREPARING A NUTRIENT SUBSTRATE FOR GROWING FODDER YEASTS

Moscow USSR patent, cl. C 12 b 3/08, No 492,539, filed 17.05.74 No 2,025,897 published 3.12.75

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L532 P by A. Ramenskaya]

[Text] The distinguishing feature of the proposed method of preparing a nutrient substrate for growing fodder yeasts by hydrolysis of plant raw material with dilute sulfuric acid is that to improve the quality of the substrate and increase the yeast yield, the plant raw material is mixed before hydrolysis with keratin-containing raw material used at the rate of 0.04 to 0.08% of the weight of oven-dried plant raw material.

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USSR UDC 576.8:546.3

IDESSIS, V. F., RAMAZANOVA, S. S., SHTOK, D. A., and ISANBAYEVA, G.

BIOLOGICAL DESTRUCTION OF SOME MATERIALS BY FUNGI

Tashkent AL'GOFLORA I MIKROFLORA SREDI AZII [Algal Flora and Microflora of Central Asia, Collection of Works] in Russian 1976 pp 295-297

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (I) 1976 Abstract No 7L567]

[Text] Data are presented on the destruction of some building materials (lineoleum, synthetic wall paper, spackle compound) by fungi from the genera Chaetomium, Trichoderma, Cladosporium, Alternaria, Penicillium, etc. Favorable ecological conditions (temperature and humidity) encourage the extensive growth of these fungi in dwellings.

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USSR UDC 581.9:582.28(282.247.41)

MIL'KO, A. A., and ZAKHAROVA, L. I., Institute of Microbiology and Virology, Academy of Sciences Ukraine SSR and Institute of Biology of Inland Waters, Academy of Sciences USSR, Borok

FUNGAL SPORE INFESTATION OF THE VOLGA

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3 1976 signed to press 1 Sep 75 pp 222-225

[Abstract] From 1972-74 the number of fungal spores and hyphal fragments in the Volga River from Kalinin to Astrakhan was counted and identified to species. Counts were made at seven cascades, at surface, middle and bottom layers of the channel and above and below 12 cities. The number of collections of 35 species of Penicillium and 10 species of Saprolegniales as well as other collection data are tabulated. Penicillium species, especially P. notatum, P. cyclopium, P. martensii, P. roquefortii, and Saprolegniaceae, especially Saprolegia ferax and S. parasitica, predominated. The latter two species were near banks and in shallow water where organic pollution was highest. In general, counts were lowest in the channel and high near cities. Tables 6; References 6: 1 Russian, 5 Western.
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USSR UDC 577.15.06:582.288.4:676.1.06

NYUKSHA, YU. P., and KOSSIOR, L. A., State Public Library imeni M. Ye. Saltykov-Shchedrin, Leningrad

FERMENTATIVE ACTIVITY OF PAPER-DECOMPOSING FUNGI

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3, 1976 signed to press 21 Jul 75 pp 185-190

[Abstract] Twelve species of fungi commonly isolated from paper were grown for four weeks in corn-supplemented Czapek-Dox medium containing paper, to determine their cellulase, amylase and protease activities. Activity was measured by conversion of substrate to products. Induced enzyme activity occurred. Specific roles in paper degradation were demonstrable. All fungi tested (except Cladosporium herbarum) synthesized all three enzymes. Aspergillus terreus had the greatest activity for the three enzymes. Seven of the fungi with especially high protease activity were able to utilize nonsoluble cellulose subtrate. Chaetomium globosum activity produced the C_1 cellulase enzyme but little protease. A flavus, A. niger and Penicillium purpurogenum grew poorly on the cellulase base of paper but were very capable of degrading amorphous cellulose (C_3 enzyme) and starch. A. flavus and A. niger showed
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NYUKSHA, YU. P. and KOSSIER, L. A., MIKOLOGIYA I FITOPATOLOGIYA Vol 10, No 3, 1976 pp 185-190

outstanding protease activity. On the basis of the characteristic enzymatic activity, it is possible to predict the succession of the studied species of fungi on paper of different compositions. Figures 4; References 14: 8 Russian, 6 Western.

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USSR

UDC 581.9:582.28:678.5

RUBAN, G. I., and REUTOVA, Z. A.

MICROSCOPIC FUNGI WHICH DESTROY PLASTICS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 10, No 3 1976 signed to press 28 Nov 73 pp 190-195

[Abstract] The frequency of occurrence and ability to destroy 27 brands of plastics of various compositions were studied for 160 strains of 22 species of fungi. Species of Chaetomium, Trichoderma, Scopulariopsis, Aspergillus, and Penicillium developed actively on plastics and specific differences were determinable. Differences were measured for growth dynamics, colony morphology and development of reproductive organs on nutrient agar and on different brands of plastics under natural and laboratory conditions. The degree of damage was influenced by the moisture-absorbing ability of the plastic and mechanical treatment of its surface. Increased temperature resulted in more damage in some cases. Under laboratory conditions fungi developed by pre-aged plastics after 7-14 days, after 20-90 days on nonaged plastic and after 2-4 years under natural conditions. Damage can result in decreased dielectric and mechanical properties. Tables 2; Figures 2; References 3: 1 Russian, 2 Western. 1/1

USSR UDC 572-788

LOGUA, K. SH. Institute of Psychiatry Imeni M. M. Asatiani, Public Health Ministry, GSSR

SOME METABOLIC CHANGES IN THE BRAIN NEURONS DURING CHRONIC INTOXICATION WITH MORPHINE

Tbilisi SOOBSHCHENIYA AKADEMII NAUK GRUZINSKOY SSR (Bulletin of the Academy of Sciences, Georgian SSR) in Russian, Vol 83, No 2, Aug 76 signed to press 29 Apr 76 pp 473-476

[Abstract] The study showed that chronic administration of morphine leads to alterations of a metabolic nature, which are directly related to the duration of the usage. In chronic experiment morphine affected brain structures causing acute disturbance of the metabolism, hypoxia of neurons, breakdown of the DNA structure, etc. Withdrawal of morphine for a period of one month results only in an insignificant restoration-compensation effect in the neurons, the overall picture of grave dystrophic metabolic changes remaining unaltered. No tables or figures. References 8: 7 Russian, 1 Western.

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USSR UDC 612.822.3

KROPOTOV, YU. D., Division of Human Neurophysiology, Institute of Experimental Medicine, Academy of Medical Sciences USSR, Leningrad

STRUCTURAL METHOD OF STUDYING SLOW OSCILLATIONS IN THE HUMAN BRAIN

Moscow FIZIOLOGIYA CHELOVEKA in Russian No 1, 1975 signed to press 3 Apr 74 pp 183-187

[Abstract] The author proposes a possible method of formalizing the process of distinguishing structural elements, offers a neurophysiological interpretation of the latter, and applies the structural method to the analysis of information coding in the human brain. He starts with the assumption that the slow processes (oxygen tension, slow electric potential, impedance, local blood flow) reflect the functioning of the individual systems in the brain. Several structural parameters are considered in the description of the slow processes: the parameters that characterize the frequency of oscillations and that are determined by the internal relations between the elements of the neuron and glial populations and the amplitudes of the ascending and descending phases of the oscillations that characterize the external relations between
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USSR

KROPOTOV, YU. D., FIZIOLOGIYA CHELOVEKA No 1, 1975 pp 183-187

the neuronal and glial assemblies and the environment. Analysis of histograms of the distribution and temporal dynamics of the various parameters reveals delicate differences between processing semantically significant and insignificant information in the brain systems.

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USSR

UDC 612.76

KARPOVICH, A. L. and SMOLYANINOV, V. V., Bionics Laboratory, Institute of Problems of Control, Academy of Sciences USSR, and Laboratory of Physiology of Movements, Institute of Problems of Information Transmission, Academy of Sciences USSR, Moscow

CORRELATIONS BETWEEN THE KINEMATIC CHARACTERISTICS OF HUMAN WALKING

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 1, No 1, 1975 signed to press 9 Sep 74 pp 167-174

[Abstract] The correlation between such kinematic parameters as the interval of a step, pace, etc., and rate of walking was determined in healthy young men under different conditions: (i) normal walking, (ii) walking at a fixed pace (isorhythmic walking), and (iii) walking with a fixed length of a step (isometric walking). All 3 regimes were found to be interrelated, reflecting either the generalized synergy of walking or the existence of a "general invariant" of walking. Each walking regime can be regarded as the realization of additional kinematic synergy or as the consequence of an additional "particular invariant" of walking. The particular invariant of normal walking

is the product of T_+ and ℓ, where T_+ is the duration of the phase of transfer from one foot to the other and ℓ is the length of a step. Figures 5, references 7: 3 Russian, 4 Western.

USSR UDC 612.822.3

TSITSEROSHIN, M. N., Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Academy of Sciences USSR, Leningrad

STATISTICAL PROPERTIES OF A RANDOM FIELD OF HUMAN BRAIN BIOPOTENTIALS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 1, No 1, 1975 signed to press 29 Oct 74 pp 118-125

[Abstract] Recording of the EEG, EKG, EMG, etc. in 15 healthy men during various stages of wakefulness showed the random field of brain biopotentials to be statistically heterogeneous in spatial coordinates. The spatial functions correlating the random EEG field diminished with increasing distance between the electrodes, indicating that realizations of the field in longitudinal and horizontal directions are ergodic. The different stages of sleep exhibited similar spatial spectra of brain electrical activity. Wakefulness with a pronounced alpha rhythm was characterized by the most frequent oscillations of the biopotentials of the field in space, especially in a sagittal direction. The approximately identical spatial dimensions of the waves of the various frequency constituents of the EEG were responsible for the direct proportional relationship between the rate of movement of the front of
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the electrical wave and its frequency, i.e., the alpha waves spread more rapidly over the surface of the cerebral hemispheres than did the delta waves. Figures 4; References 18: 8 Russian, 10 Western.

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USSR

UDC 612.748

LOSKUTOVA, T. D., Physiology Laboratory, Institute of Disability Evaluation and Organization of Work for the Disabled, Leningrad

EFFECT OF CENTRAL NERVOUS SYSTEM FUNCTION ON SIMPLE MOTOR REACTION (BASED ON CORRELATION ANALYSIS OF THE EEG)

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 1, No 1, 1975 signed to press 20 Aug 74 pp 98-108

[Abstract] The time required to perform a simple motor act (pressing a button in response to a light flash) was studied in 6 apparently healthy persons when awake and when drowsy and in 3 patients suffering from narcolepsy in order to determine the brain structures participating in the reaction. Correlation analysis of the EEG showed that in the healthy alert individuals, the quickest reaction time required the participation of the left interoparietal associative region. When they became drowsy, brain activity was centered beyond the inferoparietal region of the right (subdominant) hemisphere and accompanied by intensification of spatial synchronous relations in the anterior divisions of the brain. In the narcoleptic patients, the general structure

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of the intracentral relations was preserved, but there was a significant defect in the activity of the inferoparietal structures of the left hemisphere and marked intensification of spatial synchronization between the motor and anterofrontal divisions. Figures 4; Tables 2; References 30: 26 Russian, 4 Western.

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USSR

UDC 612.822.3

ILYUKHINA, V. A., Institute of Experimental Medicine, Academy of Medical Sciences USSR, Leningrad

FUNDAMENTAL DIFFERENCES BETWEEN THE INFORMATIVE VALUE AND PHYSIOLOGICAL SIGNIFICANCE OF THE SLOW ELECTRICAL PROCESSES OF THE HUMAN BRAIN IN DIFFERENT RANGES OF MEASUREMENT OF POTENTIAL

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 1, No 1, 1975 signed to press 20 Nov 74 pp 69-89

[Abstract] The slow electrical processes in 2 ranges of measurement of potential -- 110 to 1 mv (constant constituent) and 1000 to 100 μv (variable constituent) -- were studied in 16 patients with parkinsonism, 2 with hepatolenticular degeneration, and 3 with the phantom pain syndrome under various conditions (sleep, motor activity) and under the influence of L-dopa and other drugs. It was found that the recorded changes and reactions to the different stimuli varied with the range of measurement of potential and that there was a different scale of oscillations of the constant constituent for the different brain structures as well as a nonlinear dependence of the rate and nature of the dynamics of the slow electrical processes on these oscillations. The disparity between the informative and physiological significance
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of the dynamics of the slow electrical processes in the same region of the brain has important clinical implications. Figures 8; Table 1; References 57: 29 Russian, 28 Western.

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USSR

UDC 616-002.5(084.4(47-22)

BERLIN, R. S., BACHINSKIY, YU. S., candidate of medical sciences and KUNOVSKIY, B. V., Drogobych Rayon Sanitation-Epidemiological Station, Drogobych Antituberculosis Dispensary, Lvov Oblast'

EXPERIENCE OF A SANITATION-EPIDEMIOLOGICAL STATION IN CONTROLLING TUBERCULOSIS IN A RURAL SETTING

Moscow PROBLEMY TUBERKULEZA (Tuberculosis Problems) in Russian No 8, Aug 76 signed to press 28 Jan 76 pp 14-17

[Abstract] Experience gained in fighting tuberculosis in rural setting is reported. A coordinated effort involving sanitation-epidemiology station and antituberculosis dispensary encompassed workers of the general treatment-prophylaxis network, public health cadres and the general population. Annually a complex plan is prepared to combat tuberculosis, approved by the Rayon Executive Committee of the Council of Deputies of the Workers. Considerable therapeutic and prophylaxis work is carried out in the rayon and early detection coupled with treatment is stressed. The broad measures of antituberculosis efforts coupled with annual improvement in the material and cultural level of life has led to a systematic drop in the incidence and disease rate as well as in morbidity. No figures or tables; no references.
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USSR

KRAVCHENKO, N. A. and KATKOVA, I. P., Central Order of Lenin Institute for the Advanced Training of Physicians, Moscow

COMPREHENSIVE EVALUATION OF THE EFFECT OF SOME SOCIOECONOMIC FACTORS ON FAMILY PLANNING

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 6, 1976 pp 88-89

[Abstract] Analysis of representative samplings of young families (after the first 5 to 6 years of marriage) in Moscow, Alma-Ata, and Tambov showed that housing conditions are the dominant factor influencing their attitude toward having children. The type of apartment, facilities, and amount of space per individual are all taken into consideration. Another significant factor is the educational level of the women. Highly educated women particularly in Alma-Ata are less inclined to have 3 or more children than those less educated. The family income during the first years of marriage also influences attitudes toward having children. The financial burden of the first child (because of the mother's reduced earnings due to the long period off the job to take care of it) is a serious one. The unwillingness of older married couples to have a second or third child is due mostly to sociomedical and sociopsychological factors.
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USSR UDC 614.1(47+57)

BEDNYY, M. S., professor, Moscow

RECENT TRENDS IN THE HEALTH STATUS OF THE POPULATION

Moscow ZDRAVOOKHRANENIYE ROSSISKOY FEDERATSII in Russian No 8, 1976 pp 9-14

[Abstract] The mortality rate among children and adolescents has declined sharply since World War Two but is climbing in the age-groups above 30. Life expectancy is 2 years shorter among village dwellers than among urbanites and mortality from cardiovascular disease, traumas, and accidents (including automobile) is significantly higher. While child mortality rates are low, the incidence of allergic diseases, birth defects and development anomalies is steadily increasing. These and other worrisome and seemingly paradoxical trends are persisting despite the large sums allocated to and organizational improvements made in the public health system. Tables 3, References: 7 Russian.

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USSR UDC 628.517.4

VASIL'YEV, YU. M., candidate of technical sciences and ZAICHENKO, A. I., candidate of medical sciences

PREVENTION OF VIBRATION DISEASE

Moscow MASHINOSTROITEL' in Russian No 10, 1976 pp 31-32

[Abstract] Implementation of a complex of engineering-technological and medical-prophylactic measures has been designed to create the conditions for the prevention of vibration disease. In recent years work has been done in the following three directions: the development of hygienic and metrological assurance of absence of vibration danger in production, reduction of vibration of machines and equipment to levels safe for operators, and development of ways and means of technological safety in conditions of production characterized by the effect of vibration on man. Negative tendencies in the contemporary development of technology can be successfully overcome only if requirements to assure vibration-safe working conditions are established in the documentation of technological standards. Now in effect in the country are hygienic standards
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USSR

VASIL'YEV, YU. M. and ZAICHENKO, A. I., MASHINOSTROITEL' No 10, 1976 pp 31-32

to limit vibrations in workplaces in production (SN 245-71), self-propelled, technological and technological transport machines (SN 1102-73), railroad rolling stock (SN 1209-74), maritime, river and lake vessels (SN 1103-73), and manual mechanized equipment (SN 626-66). The work being done in our country to assure vibration safety already is giving results. The number of cases of vibration disease has ceased to grow and no cases of disease have been noted in workers with up to 5 years of service. This permits considering that the volume and direction of the struggle against the harmful effects of vibration have been selected correctly.

2/2

USSR

UDC 612.821.2

GRECHIN, V. B., Institute of Experimental Medicine, Academy of Medical Sciences USSR, Leningrad

FUNCTIONAL SHIFTS IN THE DEEP STRUCTURES OF THE HUMAN BRAIN DURING PROLONGED TESTS OF SHORT-TERM MEMORY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 1, No 1, 1975 signed to press 18 Nov 74 pp 90-97

[Abstract] Changes in the nonelectric slow processes of the brain were studied in 25 patients with chronic parkinsonism and the phantom pain syndrome during tests of short-term memory. Recordings were made from 42 electrodes implanted in the basal ganglia of one of the hemispheres while the subjects were given random numbers and asked to recall them 5 to 10 minutes later. In most cases the memory tests caused an increase or decrease in pO_2 (5 to 10% above or below the baseline level), intensified the local blood flow in some of the subcortical structures (thalamic nuclei, hippocampus, caudate nucleus, etc.), and decreased impedance (0.5 to 3% below the baseline value). The nature of the changes in pO_2, local blood flow, and impedance in some of the subcortical neuronal and glial cells correlated with the degree of accuracy of recall. Figures 5; References 10: 9 Russian, 1 Western.
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ZAVALISHIN, N. V. and MUCHNIK, I. B.

MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY [Models of Visual Perception and Algorithms of Image Analysis] in Russian "Nauka" Moscow 1974, 344 pp

[Excerpts] Annotation

The question is considered of devising a formal language for description of problems requiring machine treatment of visual information. As a basic requirement for this language it is assumed that it should be close to the language used by man in working with images. A hypothesis is formulated and substantiated, according to which the basic elements of descriptive language--the local geometric peculiarities of the image--are distinguished with the aid of a special search function preset in the image. On the basis of this hypothesis, there are designed a number of constructive models of the visual perception in man, as well as a system of algorithms of the automatic formation of the description language of images. The results are presented of experimental substantiation of these models and algorithms. The possibilities are examined of the use of these algorithms in designing a dialog between man and computer. 24 tables, 186 illustrations, 260 references.
1/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

Table of Contents

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

3/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

4/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

Chapter 4 Principle of the Proximate Extremum

5/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

Chapter 5 Application of the Idea of Informativity Function to Design of Machine Algorithms for Search of Geometrical Image Peculiarities

Chapter 6 Automatic Formation of Image Description Dictionary

6/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

7/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

8/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

9/10

USSR

ZAVALISHIN, N. V. and MUCHNIK, I. B., MODELI ZRITEL'NOGO VOSPRIYATIYA I ALGORITMY ANALIZA IZOBRAZHENIY 1974, 344 pp

10/10

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