BR

ACCESSION NR: AT4042698 S/0000/63/000/000/0318/0321

AUTHOR: Kuznetsov, A. G.; Agadzhanyan, N. A.; Bizin, Yu. P.; Yezepchuk, N. I.; Kalinichenko, I. R.; Karpova, L. I.; Neumy*vakin, I. P.

TITLE: The nature of changes of the functions of respiration and the cardiovascular system on prolonged exposure to conditions of lowered barometric pressure.

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 318-321

TOPIC TAGS: low barometric pressure, respiratory function, cardiovascular function, gas exchange dynamics, respiratory minute volume, lung vital capacity, pressure chamber, oxygen consumption, EKG

ABSTRACT: Two subjects were exposed to a decreased barometric pressure corresponding to 7000 m (partial O_2 pressure 150--160mm Hg). Gas exchange dynamics, the functions of the cardiovascular system, and the condition of the peripheral blood were studied. Gas exchange dynamics were studied by measuring the respiratory minute-volume, the vital capacity of the lungs, and the volume of the reserve and the residual air. Results of a prolonged stay in the chamber with lowered barometric pressure indicated that in a state of rest the oxygen consumption of

Card 1/3

ACCESSION NR: AT4042698

the subjects declined by 6--17% during the first month and by 34--36% during the second month. This was accompanied by a somewhat less marked decline in CO_2 production. At the same time, the respiratory coefficient rose from 0.75--0.82 to 0.97--1.1. The amount of heat given off by the organism of the subjects dropped during the first month by 7.5--14% and for the second month by 28--34.5%. The respiratory minute-volume decreased during the first month of the experiment on the average of 5--10% and during the second month by 9.5--25%. Prolonged stay in the chamber with lowered barometric pressure caused an increase in the heart rate by 8--10 beats (20%) and a lowering of the systolic pressure by 10--16% and of the diastolic pressure by 7--8%. The EKG performed during the course of this experiment did not show any substantial changes. There was, however, some reduction in the maximum values of the P and R peaks. A study of the peripheral blood indicated that hematological changes observed in the subjects during the course of the experiment were very insignificant. The changes in gas dynamics which were observed were strictly reversible. Respiratory indices of the two subjects returned to normal levels 8--10 days after the completion of the experiment.

ASSOCIATION: none

Card 2/3

ACCESSION NR: AT4042698

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AP4002548 S/0247/63/013/006/0953/0962

AUTHOR: Agadzhanyan, N. A.; Bizin, Yu. P.; Doronin, G. P.; Kuznetsov, A. G.

TITLE: Changes in higher nervous activity and in some vegetative reactions during a prolonged stay in relative adynamia and isolation

SOURCE: Zhurnal vy*sshey nervnoy deyatel'nosti, v. 13, no. 6, 1963, 953-962

TOPIC TAGS: higher nervous activity, vegetative nervous system, adynamia, adynamia effect, isolation, isolation effect, nervous activity, central nervous system, afferent impulse, confined environment

ABSTRACT: Two human subjects were studied in a specially equipped SBK-48 pressure chamber under conditions of relative adynamia and isolation for a period of 60 days. Conditioned reflex reactions were recorded by a multichannel oscillograph. Electromyogram, ECG, EEG, respiratory rate, and blood pressure were used as indices of physiological reactions. Work capacity of the subjects was determined by their reaction to light signals, ability to solve mental problems,

Card 1/2

ACCESSION NR: AP4002548

and coordination of movement. It was found that conditioned reflex activity is characterized by waves and phases during the various periods of investigation. A subject's ability to coordinate difficult movement does not change, but his speed of movement is distinctly lower. Fatigue and emotional instability appear between the 10th and 16th days and work capacity is reduced. Heart rate increases, and respiratory rate and blood pressure decrease. After a physical load, physiological reactions are restored much later in the second half of the experiment. Changes in vegetative and motor reactions appear to be caused by protective blocking of the central nervous system and by its reduced excitability. To compensate for the unfavorable conditions of hypodynamia and isolation, a special program of physical exercises should be developed to ensure increased work capacity. Orig. art. has: 6 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 20Apr63 DATE ACQ: 07Jan64 ENCL: 00

SUB CODE: AM NO REF SOV: 011 OTHER: 000

Card 2/2

KUZNETSOV, A. A.; AGADZHANYAN, N. A.; DIANOV, A. G.; ZHAROV, S. G.

"Effect on the body of prolonged exposure to conditions of artificial atmosphere."

report presented at the 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

KUZNETSOV, A. G.; DIANOV, Ag.

"The effect of long-term action of artificial atmosphere on the organism."

report submitted for 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

L 14271-66 EWT(1)/FS(v)-3 SCTB DD/RD

ACC NR: AT6003838 SOURCE CODE: UR/2865/65/004/000/0031/0043

AUTHOR: Agadzhanya, N. A.; Bizin, Yu. P.; Doronin, G. P.; Il'in, Ye. A.; Kuznetsov, A. G.; Yezepchuk, N. I. 55 B+1

ORG: none

TITLE: Effect on the human organism of a prolonged sojourn in a closed chamber of small volume 2,55

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 31-43

TOPIC TAGS: man, respiration, life support system, space chamber test, space physiology, central nervous system, cardiovascular system, space psychology

ABSTRACT: Experiments were performed in order to study the nature of changes in the basic functions of the organism during a prolonged stay by 2 subjects in a specially equipped pressure chamber with a 7-m^3 capacity. Air composition, temperature, and humidity were automatically maintained at a constant level by means of a special life-support system developed by G. I. Badikov, B. A. Miloslavov, and G. I. Solov'yev. The automatic system

Card 1/5

2

L 14271-66
ACC NR: AT6003838

maintained a partial oxygen pressure of 155—165 mm Hg, the CO_2 content below 2 mm Hg, the air temperature at 19.5 to 23.5° C, and the relative humidity at 40—70%. Telephone communications with the subjects were kept to a minimum.

Higher nervous activity, the bioelectrical activity of the cerebral cortex, standard EKG, arterial pressure, gas exchange, functions of external respiration, and oxygen saturation of the blood were studied during the course of the experiment. Daily tests of blood and urine were made. Detailed medical examinations were made before and after the experiment.

As the experiment progressed, the time required for performance of conditioned motor acts increased from 15—20 sec at the beginning of the experiment to 25—28 sec 30 days later, and to 35—37 sec by the end of the experiment. The quality of coordination did not show any substantial changes. There were no changes in the time required for solving arithmetical problems. Indications were obtained that prolonged isolation in a small chamber leads to the development of protective inhibition and a lowering of the flexibility of the nervous processes. The second half of the experiment was characterized by a loss of interest, the appearance of irritability, and in-

Card 2/5

L 14271-66

ACC NR: AT6003838

creased emotional instability. The lowering of the tonus of the cerebral cortex was evident from the EEG, which toward the end of the experiment showed a sharp decrease in the alpha index, accompanied by a dominance of slow waves (4—6 cps) and the appearance of waves with a frequency of 0.5—2 cps.

Experimental data showed that by the end of 60 days, the pulse frequency tended to drop by 8—10 strokes (20%), systolic pressure by 10—16%, and diastolic pressure by 7—8%, indicating a drop in the vascular tone and a weakening of the functional ability of the cardiovascular system. An increase in the stroke and minute volume of the heart, a drop in the peripheral resistance of the circulatory system, and an increase in the latent period of vascular reactions were observed.

Tests performed after the experiment showed a depression in the adaptative mechanisms of the body and a sharp increase in the excitability of the circulatory system. X-ray studies showed that prolonged hypokinesia and isolation caused a significant decrease in the size of the hearts of both subjects. This is considered to be the result of detraining.

Card 3/5

L 14271-66
ACC NR: AT6003838

During the course of the experiment, oxygen consumption dropped on the average by 32%, while CO_2 production diminished by 26%. Pulmonary ventilation dropped by 2—2.5 liters/min. These results indicate a drop in energy expenditures from 30.15 to 20.85 kcal/kg per diem.

During the course of the experiment there was a short-term increase in the number of erythrocytes and reticulocytes. Occasionally, there was also an increase in the number of lymphocytes. Beginning with the second half of the experiment, the absolute number of eosinophils increased by a factor of 1.5—2. An investigation of the phagocytic activity of neutrophils showed an increase of this activity toward the end of the experiment.

The reactions of individuals to a prolonged stay in a small chamber differ considerably, and this factor should be taken into account in the selection of cosmonauts for flights of long duration. At the same time, it is necessary not only to increase afferentation but also to properly work out a schedule for work and rest. This means that the assigned tasks have to be more varied, more creative, and require a greater variety of physical skills. Entertainment will also have to be carefully worked out and should include music, radio, and television in order to create a phycho-

Card 4/5

L 14271-66

ACC NR: AT6003838

logically stimulating environment. Orig. art. has: 3 figures and 1 table.
[ATD PRESS: 4091-F]

SUB CODE: 06, 05 / SUBM DATE: none / ORIG REF: 010 / OTH REF: 006

Card 5/5

ABSTRACT: Central nervous system function and some indices of water and salt metabolism were studied in dogs subjected to low

ACCESSION NR: AP5015946

KOMAROV, L.I.; MIKHEYSOV, P.G.

Tectonical control of mineralization in the "[illegible] zone" of the Sadon deposit. Izv.vys.uchebn.zav.; geol.i razv. 7 no.8:74-81 Ag '65. (MIRA 18:11)

1. Sadonskoye rudoupravleniye.

AGAIDZHANYAN, N.A.; ZHAROV, S.G.; KALINICHENKO, I.R.; KARPOVA, L.I.; KAPLAN, Ye.Ya.; KUZNETSOV, A.G.; OSIPOVA, M.M.; MAZIN, A.N.; SERGIYENKO, A.V.

Effect of various rates of decompression on the human body. Voen. med. zhur. no.10:49-53 O '65. (MIRA 18:11)

L 39791-66 EWT(1)/EWT(m)/EPF(n)-2/T/EWG(m)-6 IJP(c) WW/DJ/GD-2

ACC NR: AP6011520 SOURCE CODE: UR/0382/66/000/001/0127/0131

24
B

AUTHOR: Grishin, V. K.; Kuznetsov, A. G.

ORG: none

TITLE: Characteristics of an electromagnetic conductive pump on liquid sodium at temperatures up to 500C

SOURCE: Magnitnaya gidrodinamika, no. 1, 1966, 127-131

TOPIC TAGS: electromagnetic pump, electromagnetic property, electric transformer, sodium

ABSTRACT: The design, assembly diagram, and method of experimental characteristic determination are presented for an electromagnetic conductive pump of the transformer type running on liquid sodium at temperatures from 300 to 500C. Curves for the external characteristics of the pump are given. The authors point out that B. I. Bubchenkov took part in this work. Orig. art. has: 4 figures and 1 table. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 14May65/ ORIG REF: 001

Card 1/1 MLP UDC: 621.689.538.4

ACC NR: AT6036166 SOURCE CODE: UR/0000/66/000/000/0010/0011

AUTHOR: Agadzhanyan, N.A.; Kalinichenko, I. R.; Kurnosov, A. G.; Lapikhova, I. I.; Nikulina, G. A.; Orlova, N. N.; Rentova, N. B.; Sozylyenko, A. V.; Shevchenko, Yu. V.

ORG: none

23
B+1

TITLE: Effect of rapidly increasing hypoxia on the human organism [Paper presented at conference on problems of space medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 10-11

TOPIC TAGS: hypoxia, spirography, electrocardiogram, human physiology

ABSTRACT:

In order to determine the time available for taking countermeasures during a rapid drop in partial oxygen pressure, the resistance of the body to rapidly increasing hypoxia was studied in 28 human subjects by the rebreathing method using a spirograph filled at the start with 8.5 *l* of atmospheric air. The O_2 content of this air decreased as the oxygen was used up; CO_2 was chemically absorbed.

Card 1/3

ACC NR: AT6036466

The external appearance of the subjects, their behavior, and reported subjective sensations were monitored as a check on their general condition; data were recorded on conditioned reflex activity, brain biocurrents, motor coordination, the functional state of the cardiovascular and respiratory systems and blood oxygen absorption levels; and studies of the composition of peripheral blood and the functional state of the adrenal cortex were made.

The results showed that rapidly increasing hypoxia produces functional changes leading to loss of consciousness if oxygen is not quickly administered. Reserve time (time from beginning to breathe the hypoxic mixture until the hypoxic mixture is cut off) amounted on the average to 6 min 28 sec (5 min 27 sec to 10 min 02 sec). This was equivalent to an "altitude ceiling" of 10150 m (9100 to 11400 m). The O_2 content in the respired air at the end of the experiment was 4.44% (pO_2 = 31.3 mm Hg); blood oxygen saturation dropped to an average of 53.2% (42% to 64%). Hypoxia symptoms observed during the experiment included: cyanosis of the epidermis and mucosa; dyspnea, drowsiness, impaired handwriting, and sometimes even muscle spasms in the hands. Many subjects complained of respiratory distress, dizziness, dimness of vision, heat, headache, etc.

Card 2/3

ACC NR: AT6036466

The latent period in time required to solve arithmetical problems increased and motor coordination was impaired. Both the time required to solve problems and the number of errors increased more than three-fold over initial data.

Three phases were distinguished in EEG changes: 1) suppression of the alpha rythm; 2) reactivation of alpha rhythm; 3) onset of slow waves (2 to 4 per inch).

Frequency and depth of respiration and minute volume increased during hypoxia, and the oxygen requirement and O_2 utilization coefficient decreased. Arterial oxygen saturation decreased from 46% to 98% at the start to 49% to 55% at the end of the experiment.

EKGs made during rapidly increasing hypoxia showed a progressive increase in the pulse rate and a decrease in the amplitude of R and T waves.

Peripheral blood composition immediately and one hour after exposure to hypoxia showed increased erythrocyte counts and hemogolobin content. The amount of 17-oxycorticosteroids in the plasma increased from 16 to 17 γ% at the onset of 35.3 to 44.2 γ % during the aftereffect period.

[W.A. No. 22. AD Report 66-1167]

Card 3/3 SUB CODE: 06 / SUBM DATE: 00May66

ACC NR: AT6036616 SOURCE CODE: UR/0000/66/000/000/0300/0302

AUTHOR: Parin, V. V.; Agadzhanyan, N. A.; Kuznetsov, A. G.; Barer, A. S.; Isabayeva, V. A.; Mirrakhimov, M. M.; Davydov, G. A.; Kalinichenko, I. R.; Korobova, A. A.; Karpova, L. I.; Nikulina, G. A.; Tikhomirov, Ye. P.; Sokol, Ye. A.; Gavrilov, B. A.

ORG: none

TITLE: Establishing the possibility of using alpine acclimatization for the preparation and training of cosmonauts [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 300-302

TOPIC TAGS: hypoxia, high altitude physiology, alpine acclimatization, cosmonaut training

ABSTRACT:

Tasks of the present study were to:

1. Conduct complex physiological and clinical investigations during the process of acclimatization at altitudes of 3300 to 4100 m.

Card 1/4

ACC NR: AT6036616

2. Study the influence of alpine acclimatization on human tolerance to extremal spaceflight factors.

3. Study the comparative resistance of alpine inhabitants, valley inhabitants, and alpinists to extremal factors.

4. Develop a system of alpine acclimatization for cosmonauts and issue recommendations on the application of alpine acclimatization for the preparation and training of cosmonauts and on the creation of alpine camps for cosmonauts.

Acclimatization was conducted at the alpine station of the Kirgiz State Medical Institute (Tuya-Ashu mountain pass, altitude, 3300 to 4100 m). A total of 28 male subjects were studied of whom: 11 were indigenous to alpine conditions as farmers of the Tien-Shan--Pamir region (2000 to 2500 m), 11 were valley inhabitants, and 6 were accomplished alpinists. The following indices were studied under alpine conditions and using test stands: Functional condition of the central nervous system; external respiratory and cardiovascular system function; some biochemical indices; the state of the blood coagulation and anticoagulation capacity; and in separate experiments; cerebral circulation using an electroplethysmographic method.

Card 2/4

ACC NR: AT6036616

The experiments showed that after 45 days of alpine acclimatization, human tolerance to prolonged, back-chest accelerations (8 to 10 G) was improved. This was reflected in a relative increase in the amplitude of rheoencephalograms for all subjects and consequently, improved cerebral circulation and lowered pulse rate. EKG changes indicated that the heart was undergoing less strain after alpine acclimatization. After residence in alpine conditions, a decrease in basic metabolic indices and a slight increase in arterial blood oxygen saturation was noted in alpine inhabitants during accelerations.

A study of heat tolerance showed that there was a drop in basic physiological parameters (heat accumulation and basal metabolism) after alpine acclimatization in all three groups. These changes were more pronounced in indigenous alpine inhabitants and less pronounced in alpinists.

The resistance of the organism to hypoxia before and after acclimatization was studied using two approaches; exposure to a certain "altitude ceiling" in a pressure chamber and a method of reverse respiration using a spirograph first filled with atmospheric air. In the latter case as a measure of oxygen consumption, oxygen content under the bell jar of the spirograph decreased and exhaled carbon dioxide was chemically absorbed.

ACC NR: AT6036616

These tests demonstrated that resistance to hypoxia was substantially higher after alpine acclimatization. In pressure chamber tests, the "altitude ceiling" increased by 30% and "reserve time" at H = 7500 m was doubled. Its greatest increase was observed in alpine inhabitants while a more substantial increase in "altitude ceiling" was experienced by alpinists.

To study the effectiveness of alpine acclimatization for increasing overall physical work capacity, tests were conducted using an ergometer and treadmill. Maximum work rate increased by 0.4 and 0.5 m/sec in valley inhabitants and alpinists respectively. No changes were noted in foothill inhabitants. Endurance was evaluated according to running duration on the treadmill at a steady rate of 4.5 m/sec. The results of the tests established that after alpine acclimatization, both valley and alpine inhabitants had increased their endurance while alpinists, whose endurances were already high before acclimatization, did not show any substantial changes.

The literature together with experience accumulated by alpinists indicates that alpine acclimatization is far more effective if active (physical exercise) and gradual, each stage entailing a 1000-1500 m increment. The problem of acclimatization periods and methods for the prolonged maintenance of acclimatization effects require further investigation.

W. A. No. 22; ATD Report 66-1167 SUB CODE: 06,22 / SUBM DATE: 00May66

Card 4/4

L 11368-67 EEC(k)-2/EWT(1)/FSS-2 TT/DD/GW/GD

ACC NR: AT6036491 SOURCE CODE: UR/0000/66/000/000/0056/0056

AUTHOR: Barnatskiy, V. N.; Kuznetsov, A. G.

ORG: none

29

TITLE: Interaction between the analyzers and the sympathetic component of motion sickness [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24 to 27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 56

TOPIC TAGS: biologic acceleration effect, coriolis acceleration, motion sickness, diagnostic medicine, vestibular analyzer, peripheral nervous system

ABSTRACT: The medical observations of Physician-Cosmonaut B. B. Yegorov on "Voskhod" have generated interest in the so-called autonomic manifestations arising in cosmonauts during weightlessness. Authors have studied the interaction of afferent systems during motion sickness in animals (dogs) caused by rocking. The criteria of autonomic disorders have been indices of salivation, vomiting and the motor function and electrical activity of the muscular layer and nerve stems of the stomach.

Card 1/2

L 11368-67

ACC NR: AT6036491

Under normal conditions, autonomic symptoms in animals have occurred during vertical oscillation at a frequency of 30/min and acceleration of 0.3 G (equals 1.3 G) after 10—15 min. These symptoms developed more rapidly in darkness, eliminating the "flicker" of objects weakened the rocking effect. The most pronounced effect was attained when the animal was rocked in the absence of any natural leg support. Here, signals from the visual mechanism and skeletal muscle proprioceptors had an inhibitory effect on vestibular function. Stimulation of mechano- and chemoreceptors of the stomachs led to more rapid development of motion sickness.

In dogs with upper jugular sympathetic nodes removed, motion sickness developed more quickly and was more pronounced. Injection of 10 ml of a 5% sodium bicarbonate solution into the blood of animals (according to Hasegawa) sharply weakened the effect of rocking which was traced for a year. [W.A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2

ACC NR: AP7000390 SOURCE CODE: UR/0239/66/052/012/1460/1462

AUTHOR: Kuznetsov, A. G. (Moscow); Kalinchenko, I. R. (Moscow)

ORG: none

TITLE: Prolonged stay of man in a gas medium containing an increased amount of CO_2

SOURCE: Fiziologicheskiy zhurnal SSSR, v. 52, no. 12, 1966, 1460-1462

TOPIC TAGS: hypercapnic atmosphere, physiologic effect, pressure chamber, respiratory physiology, human physiology

ABSTRACT: The aim of the present study was to explain the organism's reaction to the continuous action of a small (7.1—14.2 mm Hg) concentration of CO_2 in an inhaled gaseous mixture. Seven healthy men from 20—25 yrs were observed in a pressure chamber under normal atmospheric pressure and under reduced pressure. Tests lasted for 30 days. Frequency of respiration, changes of pulmonary ventilation, and analysis of inhaled and alveolar air were registered. The composition of CO_2 in alveolar air was determined by an optical-acoustical gas analyzer produced by the "Godart" firm. The results showed that prolonged breathing of gaseous mixtures with increased $_pCO_2$ caused an increase in $_pCO_2$ in the alveolar air and an increase in pulmonary ventilation. Thus, for example, in 30-day experiments in a gaseous medium with CO_2 concentration of 7.5—7.9 mm Hg, partial pressure of CO_2 in alveolar air in the experiments increased from 37.9—42.0 mm, and pulmonary ventilation rose 0.5—10. l/min. When CO_2 partial pressure in a gaseous mixture was 14.7—15.8 mm Hg,

Card 1/3 UDC: 612.744+612.67

ACC NR: AP7000390

Table 1.

Partial CO_2 pressure in alveolar air in test subjects before and after experiment (average data). Data before experiments are 100% base.

Composition of air	Test Subjects	Experimental conditions		Before experiment (in mm Hg)	After experiment in mm Hg	After experiment in %
p_{CO_2} in respired air 7.9, total pressure 308 mm Hg + normal p_{O_2}	Kh-n	Respiring atmospheric air	At rest	43.5	45.3	104
			physical activity	45.7	47.2	103
		Respiring 5% m CO_2	Hyperventilation	18.1	11.6	63.7
				45.8	54.9	120
	K-n	Respiring atmsopheric air	At rest	41.3	43.3	105
			physical activity	43.6	53.0	121
		Respiring 5%-m CO_2	Hyperventilation	23.1	13.5	58.1
				45.8	56.8	124
p_{CO_2} in respired air 14.7, total pressure 760 mm Hg	P-s	Respiring atmospheric air	At rest	37.0	44.0	119
			physical activity	42.5	47.7	112.2
		Respiring 5%-m CO_2	Hyperventilation	16.6	21.2	128
				46.2	55.0	119
	U-n	Respiring atmospheric air	At rest	40.0	41.0	102.2
			physical activity	41.7	47.6	114
		Respiring 5%-m CO_2	hyperventilation	18.1	21.0	116
				45.3	48.0	106

Card 2/3

ACC NR: AP7000390

pulmonary ventilation increased to 1—2.5 l/min. In the course of the experiments, no parallelism was noted between the changes in pulmonary ventilation and CO_2 in alveolar air. To determine the sensitivity of the respiratory center to CO_2 after a prolonged stay in gaseous medium containing 7.9 and 14.7 mm Hg CO_2, the amount of CO_2 in alveolar air was determiend by breathing a hypercapnic gaseous mixture (5% Co_2 and 20% O_2) and regular air. The results appear in Table 1. The decreased amount of inhaled air, and the decreased sensitivity of the respiratory center to CO_2 give a basis for the conclusion that an organism is apparently capable of adapting to the prolonged action of a gaseous medium containing a small concentration of CO_2. Orig. art. has: 1 table and 1 figure. [SC]

SUB CODE: 06/ SUBM DATE: 27Jul65/ ORIG REF: 005/ OTH REF: 003/ ATD PRESS: 5110

Card 3/3

KUZNETSOV, A.I.

Conditioned reflex therapy of alcoholism using antabuse and its effect on heat regulating reactions. Sov. med. 27 no.12: 52-58 O '64. (MIRA 18:11)

1. Kafedra psikhiatrii (zav.- dotsent F.I. Grudev) Semipalatinskogo meditsinskogo instituta.

KUZNETSOV, A.I.

Limiting state of a figured interlayer under tensile and bending stresses. Issl. po uprug. i plast. no.3:62-74 '64. (MIRA 17:6)

KUZNETSOV, A.I.

Effect of alcohol on thermoregulatory reactions in healthy persons. Farmakol. toksik. 26 no.3:279-284 My-Je'63 (MIRA 17:2)

1. Kafedra psikhiatrii (zav. - kand. med. nauk F.I.Grudev) i kafedra patologicheskoy fiziologii (zav. - prof. T.A. Nazarova) Semipalatinskogo meditsinkogo instituta.

ACCESSION NR: AT4034320 S/2753/64/000/003/0062/0074

AUTHOR: Kuznetsov, A.I.

TITLE: The limit state of irregularly-shaped laminae during expansion and bending

SOURCE: Leningrad. Universitet. Matematiko-mekhanicheskiy fakul'tet. Issledovaniya po uprugosti i plastichnosti, no. 3, 1964, 62-74

TOPIC TAGS: lamina, expansion, bending, bending moment, elasticity, elastic medium, elastic body, stress, plastic state

ABSTRACT: The article deals with laminae of irregular shape which are in states of stress. A canonical model of such a lamina is the joint formed by soldering or welding two metallic substances, where the joint is weaker than the primary substances. When the joint is put under a tension which produces stress at or near the elastic limit of the joint, an example of a stress state of the form considered is exhibited. Specifically, a thin lamina is considered which is in a stress state due to redistribution of stress during the transition from an elastic state to a complicated stress state in the presence of plastic deformation. The limiting plastic state of such a lamina

Card 1/2

ACCESSION NR: AT4034320

is studied under the assumption of an expansion and a bending moment, and equations describing the deformation of the lamina are derived. The development reveals that laminae of the given sort possess several interesting peculiarities. "Calculations by the method of characteristics were carried out by G. Kopteva and N. Sil'verstova, students in the Department of Mathematics and Mechanics of LGU. The author expresses his appreciation to O.A. Bakshi for suggesting the problem and to L.M. Kachanov for his comments." Orig. art. has: 10 figures and 16 formulas.

ASSOCIATION: Matematiko-mekhanicheskiy fakul'tet Leningradskogo universiteta (Department of Mathematics and Mechanics, Leningrad State University)

SUBMITTED: 00	DATE ACQ: 30Apr64	ENCL: 00
SUB CODE: GP	NO REF SOV: 005	OTHER: 000

Card 2/2

KUZNETSOV, A.I., starshiy inzh.

Device for precise radio frequency measurements. Avtom., telem. i sviaz' 5 no.10:31-34 O '61. (MIRA 14:9)

1. TSentral'naya stantsiya svyazi Ministerstva putey soobshcheniya.

(Radio frequency—Measurement)

KUZNETSOV, A. I. 168T35

USSR/Engineering - Shipbuilding Jan/Feb 47

"Increasing the Wear Resistance of Friction Surfaces by Coating With 'Sormayt,'" A. I. Kuznetsov, Cand Tech Sci

"Sudostroyeniye" No 1, pp 21-23.

Sormayt is alloy belonging to group of stellites with composition: 26-30% Cr, 3-6% Ni, 2.5-3.3% C, 1% Mn, 3.5-4.5% Si, and over 50% Fe. Discusses application of cutting tools for deep drilling with sormayt welded on tool guides, and use of sormayt for coating spindles of various machine tools. Highly recommends sormayt for welding on necks of crankshafts in ship engines.

168T35

KUZNETSOV, A.I. (Leningrad)

Insertion of rigid stamps into a half-space in the case of exponential hardening and nonlinear creep of the material. Prikl. mat. i mekh. 26 no.3:481-491 My-Je '62. (MIRA 16:5)

1. Leningradskiy gosudarstvennyy universitet.
(Creep of materials) (Deformations (Mechanics))

KUZNETSOV, A. I., CAND TECH SCI, "INVESTIGATION OF LITTLE-STUDIED ELEMENTS OF THE TECHNOLOGICAL PROCESS FOR REMOVING SOIL-GROUNDS BY MEANS OF A TRENCH-DIGGER OF THE PLOW TYPE." MOSCOW-PLYUSHCHEVO, 1960. (JOINT SCI COUNCIL ~~VIM~~ OF the [ALL-UNION SCI RES INST] (All-Union Sci Res Inst) OF MECHANIZATION OF AGRICULTURE "VIM" AND ~~VIESKH~~ OF ELECTRIFICATION OF AGRICULTURE "VIESKH"). (KL, 3-61, 216).

KUZNETSOV, A.I. (Leningrad, Udel'nyy pr., 2-a, kv.13)

State of gastric secretion, motility and evacuation after plastic operations on the esophagus for tumors. Vest.khir. no.6:24-30 '62. (MIRA 15:11)

1. Iz fakul'tetskoy khirurgicheskoy kliniki (zav. - prof. A.A. Rusanov) Leningradskogo pediatricheskogo meditsinskogo instituta.
(ESOPHAGUS—SURGERY) (STOMACH)

21.2100

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SOV/144-59-4-13/13

AUTHORS: Belov, Ye.M., Aspirant, Gorbunov, V.I., Assistant, Cand. of Technical Sciences, Kuznetsov, A.I., Engineer, Titov, V.N., Candidate of Technical Sciences, Docent and Shipunov, I.V., Chief Engineer of Physicotechnical Dept.

TITLE: A 25 Mev Double-beam Betatron

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 4, pp 123 - 128 (USSR)

ABSTRACT: The 25 MeV betatron was designed and built by the Tomsk Polytechnical Institute and can be used to obtain a dose of 50-60 roentgens per min at a distance of 1 m. The betatron was first described in Ref 1 and was designed to work off the ordinary 50 cps mains. In order to increase the intensity both half-periods of the sinusoidal accelerating magnetic field were used as well as supply currents at a tripled frequency (150 cps). A 50 kW frequency tripler was especially designed and built by the Institute. In connection with the use of the increased frequency, experiments were carried out in order to choose the type of windings and the cooling system for the

Card1/2

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3

A 25 Mev Double-beam Betatron

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SOV/144-59-4-13/13

electromagnet. The results of these experiments and the final form of the electromagnet are now described. The betatron uses a Ш-shaped magnet whose core is made of sheet steel. The magnet is demountable and consists of two symmetric sections. The two-channel electron injection system, working on 150 cps, is shown in Figure 4.
The two-channel synchronization scheme is shown in Figure 6.
Other details described include a megavoltmeter, vacuum system and the injector.
There are 8 figures and 5 Soviet references.

ASSOCIATION: Tomskiy politekhnicheskiy institut (Tomsk Polytechnical Institute)

4

Card 2/2

KUZNETSOV, A.I.; SHIREY, V.A.

The EBTZ-56 electrothermosonde. Trudy Inst. okean. 35:65-70 '59. (MIRA 13:3)

(Ocean temperature) (Thermometers)

KUZNETSOV, A.I.

The ST-55 ship thermograph. Trudy Inst. okean. 35:61-64 '59.
(MIRA 13:3)

(Ocean temperature) (Thermometers)

KUZNETSOV, A. I.; BELYAYEV, F.V.; BYSTRITSKAYA, V.V., insh., red.; SMIRNOVA, G.V., tekhn. red.

[Problems in descriptive geometry] Sbornik zadach po nachertatel'noi geometrii. 2. izd., dop. Moskva, Mashgiz, 1963. 105 p. (MIRA 16:9)
(Geometry--Problems, exercises, etc.)

KUZNETSOV, A.I.

In the Sanitary Engineering Research Institute. Biul. stroi. tekh. 18 no.10:37-40 O '61. (MIRA 17:3)

KUZNETSOV, A.I.

Charge maintenance in a storage battery. Energetik 11 no. 12: 24 D '63. (MIRA 17:5)

[illegible]

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[illegible]

[illegible]znetsov, A. I.

[illegible]abilized creep in thin-wa[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

L 23345-65
ACCESSION NR: AR4040336

[illegible] integrated variational principles and [illegible]

Card 2/2

KUZNETSOV, A.I.

Limiting state of a shaped interlayer subjected to tension and bending. Issl. po uprug. i plast. no.3:62-74 '64. (MIRA 18:4)

KUZNETSOV, A. I.

Operation of Time Service by the Central Scientific Research Institute of Geodesy, Aerial Photography, and Cartography.
Excerpt from Tr. Vses. astrometricheskiy konferentsii, Lengingrad-Pulkovo, 1954, pp 52-53

The time service of TsNIIGAK regularly determines the moments of transmissions of time signals and compares time by means of chronometers designed by P. S. Popov. Correction of time errors are made on two transit instruments, of which one operates photoelectrically. The time service of the institute supervises improvements of instruments and methods of astronomical field operations. (RZhAstr, No 6, 1955)

SO: Sum. No. 639, 2 Sep 55

KUZNETSOV, A.I.

Using a stereoscope in adjusting topographic plans. Geod. i kart. no.2: 55-56 F '63. (MIRA 16:3)

(Photogrammetric pictures)

ACC NR: AR6018971 SOURCE CODE: UR/0271/66/000/002/B036/B037

AUTHOR: Kuznetsov, A. I.

TITLE: Analysis and design of a single-cycle ferrite core-transistorized shift register

SOURCE: Ref. zh. Avtomat telemekh i vychisl tekhn, Abs. 2B261

REF SOURCE: Tr. Mosk. energ. in-ta, vyp. 60, 1965, 75-93

TOPIC TAGS: shift register, magnetic core, logic design, logic element

TRANSLATION: A cell configuration for a single-cycle ferrite core-transistorized shift register, with a capacitor as a delay element, is described. Assumptions used to simplify the analysis of the system's operation are formulated. It is noted that a system of nonlinear differential equations describing the processes in the collector and the charging circuits can use these assumptions reduced to an algebraic system. This facilitates the analysis of the system with respect to the interdependence of its parameters and the output values and the synthesis of the system with given characteristics. The following processes are investigated: charging of the capacitor and change of core's magnetic state, dissipation of minority carriers from the transistor base, the readout of a zero from the core and the turn-on and turn-off of the transistor. The design sequence for a single-cycle cell with a gate is given. 5 figures, 6 references. N. S.

SUB CODE: 09

Card 1/1 UDC: 681.142.642.7

ACC NR: AR6018968

SOURCE CODE: UR/0271/66/000/002/B036/B036

AUTHOR: Kuznetsov, A. I.

TITLE: Analysis and design of a passive ferrite core-capacitor shift register

SOURCE: Ref. zh. Avtomat telemekh i vychisl tekhn, Abs. 2B258

REF SOURCE: Tr. Mosk. energ. in-ta, vyp. 60, no. 3, 1965, 83-97

TOPIC TAGS: shift register, magnetic core, logic design, logic element

TRANSLATION: The analysis and design of a passive ferrite core-capacitor register with a controlled discharge circuit is given. This register belongs to the class of single cycle systems. The discharge process of the capacitor is analyzed and the conclusion is reached that the configurations with small capacitances and a large number of turns in the write winding are preferable. Considerations in the selection of a transistor with regard to the resistance in the discharge circuit are cited. As a result of the analysis of the capacitor's discharge, the conclusion is reached, that the resistance in the discharge circuit should be minimal, which necessitates the choices of diodes with low forward resistance. The design sequence for a passive ferrite core-capacitor shift register with a gate is given. 6 figures, 4 references. N. P.

SUB CODE: 09

UDC: 681.142.642.7

Card 1/1

ACC NR: AT6028810 (N) SOURCE CODE: UR/3222/65/000/008/0107/0116

AUTHOR: Ramazanov, A. I. (Candidate of technical sciences); Gorashchenko, Z. A. (Aspirant)

ORG: none

TITLE: A study of wave pressure of progressive waves on a vertical wall

SOURCE: Moscow. Gosudarstvennyy proyektno-konstruktorskiy i nauchno-issledovatel'skiy institut morskogo transporta. Trudy, no. 8(14), 1965. Volnovyye issledovaniya; inzhenernyye izyskaniya (Wave studies; engineering research), 107-116

TOPIC TAGS: ocean tide, ocean dynamics, spectrum analysis

ABSTRACT: The pressure exerted on a vertical wall by sliding progressive waves along the surface of the wall and change in pressure as a function of wave parameters is experimentally studied in shallow water zones. Sliding waves are formed along harbor sides of wavebreakers as a result of diffraction of incident waves from the sea side around the wavebreaker heads. This experimental study was made during 1963—1964 in Odessa. A pool 15.45 m long, 0.98 m wide, and 1.5 m high was used; waves 0.6 to 6 m long were artificially generated at water depths of 40 to 60 cm. The experimental results were compared with theoretical results. Although voluminous data were obtained, no clear relationship between the pressure due to progressive waves and wave para-

Card 1/2

ACC NR: AT6028810

meters was established. Orig. art. has: 7 formulas and 5 figures.

SUB CODE: 08/ SUBM DATE: none/ ORIG REF: 005

Card 2/2

KUZNETSOV, Anatoliy Ivanovich; FEDOSEYEV, L.N., red.; STEPANOV, V.M., red.izd-va; DONSKAYA, G.D., tekhn.red.

[Repair of road and building machinery] Remont stroitel'nykh i dorozhnykh mashin. Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo transp. i shosseinykh dorog RSFSR, 1960. 389 p. (MIRA 13:12)

(Road machinery--Maintenance and repair)
(Building machinery--Maintenance and repair)

KUZNETSOV, Anatoliy Ivanovich; TSEKHANOV, A.D., inzh., retsenzent; FEDOSEYEV, L.N., red.; YABLOKOV, V.I., red. izd-va; BODANOVA, A.P., tekhn. red.

[Course project on the repair of motor vehicles and road machinery] Kursovoe proektirovanie po remontu avtomobilei i dorozhnykh mashin. Moskva, Avtotransizdat, 1962. 190 p. (MIRA 16:1)
(Motor vehicles--Maintenance and repair)
(Road machinery--Maintenance and repair)

KUZNETSOV, A.I., kandidat tekhnicheskikh nauk.

Portable equipment for an irrigation system. Gidr.i mel. 5 no.10:19-28 O '53. (MLRA 6:9)
(Irrigation)

KUZNETSOV, A. I. (Aspirant)

"Recent Investigations in the Field of the Interaction of Standing Waves With Vertical Walls." Cand Tech Sci, Moscow Order of Labor Red Banner Construction Engineering Inst imeni V. V. Kuybyshev, 21 Dec 54. (VM, 9 Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)

SO: SUM No. 556, 24 Jun 55

KUZNETSOV, A.I.

AID P - 1872

Subject : USSR/Meteorology and Hydrology

Card 1/1 Pub. 71-a - 15/26

Author : Kuznetsov, A. I.

Title : Method of measuring ice motion with instruments

Periodical : Met. i gidro., no.2, 42-44, 1955

Abstract : An analysis of ice motion represented with the help of equations on thickness, velocity, river width, etc. Some results and recommendations are made. Two diagrams are given.

Institution : None

Submitted : No date

SOV/124-58-3-2920

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 3, p 53 (USSR)

AUTHOR: ~~Kuznetsov, A. I.~~

TITLE: The Reciprocal Action of Standing Waves and Vertical Walls (Vzaimodeystviye stoyachikh voln s vertikal'nymi stenkami)

PERIODICAL: Sb. tr. Mosk. inzh.-stroit. in-t, 1957, Nr 20, pp 25-63

ABSTRACT: An experimental proof of the theories of "Senflu" and "Misha". Numerous numerical values are given showing the insufficiency of said theories. Several elementary formulae are derived which, according to the author's statement, permit the evaluation with sufficient practical accuracy of the pressure of standing waves upon a wall.

N. N. Moiseyev

Card 1/1

3(7), 3(9)

SOV/5o-59-2-18/25

AUTHOR: Kuznetsov, A. I.

TITLE: Determination of the Ice Mash Density (Opredeleniye plotnosti shugi)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 2, pp 56 - 57 (USSR)

ABSTRACT: In the autumnal ice flow accumulations of ice mash beneath the ice floes are observed. The determination of the thickness of the ice floe and ice mash is not difficult, and the relevant formula is given. The determination of the ice mash density is, however, more difficult as the structure of the ice mash might be destroyed in the course of th investigation. An apparatus designed for the purpose of avoiding this difficulty is described in detail. It has already been successfully used on the Volga. The case of the apparatus holds a 1000 cu cm ice mash sample; the apparatus works with temperatures down to -10°. With lower temperatures it must be preheated. If the weight of the ice mash sample, the capacity of the apparatus (1000 cu cm), and the specific weight of the ice are known, the density can be calculated according to the mentioned formula. There are 2 figures and 1 Soviet reference.

Card 1/1

KUZNETSOV, A.I.

Method for compiling data of sediment runoff. Meteor.i gidrol. no.8:49-50 Ag '60. (MIRA 13:8)
(Hydrology)

KUZNETSOV, Aleksandr Ivanovich [Kuznetsov, O.I.]; FAL'KO, Yu.G. [Fal'ko, IU.H.], red.; MATVIICHUK, O.A., tekhn. red.

[Mechanized operation in drainage and irrigation] Mekhanizatsiia hidromelioratsivnykh robit. Kyiv, 1961. 42 p. (Tovarystvo dlia poshyrennia politychnykh i naukovykh znan' Ukrains'koi RSR. Ser.5, no.9) (MIRA 14:9)

(Drainage) (Irrigation)

KUZNETSOV, A.I.

Method for plotting approximate diagrams representing the pressure of unbroken waves on a vertical wall. Gidrotekhnika no.1:39-46 '61. (MIRA 15:3)

(Waves)

SARYLOVA, K.P.; KUZNETSOV, A.I.

Phonocardiography in children [with summary in English]. Pediatriia 36 no.12:13-16 D '58. (MIRA 12:1)

1. Iz kafedry fakul'tetskoy pediatrii (zav. - prof. P.A. Ponomareva) II Moskovskogo meditsinskogo instituta imeni N.I. Pirogova (dir. - prof. O.V. Kerbikov).

(CARDIAC MURMURS AND SOUNDS
phonocardiography in child. (Rus))

KUZNETSOV, A.I.

Phonocardiography in normal and rheumatic children. Pediatriia 37 no.7:35-40 Jl '59. (MIRA 12:10)

1. Iz kafedry fakul'tetskoy pediatrii (zav. - prof.P.A.Ponomareva) II Moskovskogo meditsinskogo instituta imeni N.I.Pirogova (dir. - dotsent M.G.Sirotkina) na baze 1-y detskoy klinicheskoy bol'nitsy (glavnyy vrach Ye.V.Prokhorovich) i Instituta grudnoy khirurgii (dir. - akad.A.N.Bakulev).

(RHEUMATIC FEVER, manifest.
phonocardiography in child. (Rus))
(CARDIAC MURMURS AND SHOUND,
in normal & rheum. child. (Rus))

KUZNETSOV, A. I. Cand Med Sci -- "Phonocardiographic examinations of healthy and rheumatic [redacted] children." Mos, 1961 (Acad Med Sci USSR. Order of Labor Red Banner Inst of Pediatrics). (KL, 4-61, 209)

KUZNETSOV, A. I.

Distr: 4E2c

6856:

Kuznetzov, A. I. The problem of torsion and plane strain of non-homogeneous plastic bodies. Arch. Mech. Stos. 10 (1958), 447–462. (Polish and Russian summaries)

A perfectly-plastic material whose yield stress k is a known function of the coordinates is considered. Methods used for the solution of problems with constant k are generalized to variable k. For torsion, a single differential equation can be obtained by two different methods. The angle ϕ between a principal direction and the x axis can be introduced to satisfy the yield condition identically, or a stress function can be used to satisfy the equilibrium equation identically. The resulting characteristics are the lines of maximum shear stress and are normal to the boundary. If k is constant, the characteristics are straight; for variable k they will generally be curved. An exception is the case where k is a function only of the normal distance from the boundary. A rectangular bar where $k=k_0 \exp[\alpha(x+a)]$ is solved as an example.

1-FW

The author mentions that the elastic-plastic problem may be solved by a suitable modification of the Nadai sand hill-soap film analogy. Since for some functions k the plastic zone may start in the interior, it does not appear to this reviewer that the resulting solution is necessarily correct.

For plane strain, the mean normal stress σ and angle θ between a principal direction and the x axis are introduced to satisfy the yield condition identically. As is the case for constant k, the resulting differential equations are hyperbolic and have orthogonal characteristics in the directions of maximum shear. Thus, numerical methods evolved for constant k may be used for variable k as well. Examples considered include a circular hole in an infinite sheet under uniform pressure and tangential load, where $k=k(y)$, and a half space loaded by a uniform pressure over $a-1 \leq x \leq 1$ finite region, where $k=k_0+cy$, $c \ll k_0$.

Also discussed are the velocity solutions for plane strain and a linear perturbation method when $k=k_0+k_1(x, y)$, where $|k_1| \ll k_0$. *P. G. Hodge, Jr.* (Chicago, Ill.)

AUTHOR: Kuznetsov, A.I. (Leningrad) SOV/24-58-11-28/42

TITLE: Torsion of Non-uniform Plastic Rods (Krucheniye neodnorodnykh plasticheskikh sterzhney)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye tekhnicheskikh nauk, 1958, Nr 11, pp 110 - 113 (USSR)

ABSTRACT: The rods are considered as having yield points which are functions of the distance along and from the axis; they are otherwise uniform (cylindrical). Eqs.(1.1) give the stresses in pure plastic torsion; the stress function is f (Eq.(1.7)). The solution is formally similar to that of the wave equation when the velocity is variable. The cases where the characteristic lines are rectilinear and where the yield point varies in x only are considered in detail (the latter with application to a rectangular rod - see Figures 1 and 2). The lines of rupture are derived.
A few general remarks are then made about the torsion of rods which are both elastic and plastic.

Card1/2

Torsion of Non-uniform Plastic Rods SOV/24-58-11-28/42

There are 2 figures and 6 references, 5 of which are Soviet and 1 Polish.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: June 13, 1958

Card 2/2

AUTHOR: Kuznetsov, A.I. 43-58-13-10/13

TITLE: Plane Deformation of Nonhomogeneous Plastic Bodies (Ploskaya deformatsiya neodnorodnykh plasticheskikh tel)

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1958, Nr 13(3), pp 112-131 (USSR)

ABSTRACT: The author, using the diagram of a rigid plastic body [Ref 6], investigates the plane plastic deformation of a body, the yield limit of which is a function of the coordinates x,y of the deformation plane. § 1. Within the plastic zone it is $\tau_{xz} = \tau_{yz} = 0$, $\sigma_z = \frac{1}{2}(\sigma_x + \sigma_y)$ and there hold the equations of equilibrium $\frac{\partial \sigma_x}{\partial x} + \frac{\partial \tau_{xy}}{\partial y} = 0$, $\frac{\partial \tau_{xy}}{\partial x} + \frac{\partial \sigma_y}{\partial y} = 0$ as well as the plasticity condition

$$\frac{1}{4}(\sigma_x - \sigma_y)^2 + \tau_{xy}^2 = k^2(x,y),$$

where k(x,y) is a given continuous function with first derivatives. Putting $\sigma_x = \sigma - k(x,y)\sin 2\theta$, $\sigma_y = \sigma + k(x,y)\sin 2\theta$,

Card 1/4

$\tau_{xy} = k(x,y)\cos 2\theta$, where σ is the mean pressure and θ is the angle between the x-axis and one of the lines of slide, then one obtains the nonlinear hyperbolic system

$$(1)\begin{cases} \frac{\partial\sigma}{\partial x} - 2k(x,y)\left(\cos 2\theta \frac{\partial\theta}{\partial x} + \sin 2\theta \frac{\partial\theta}{\partial y}\right) - \frac{\partial k}{\partial x}\sin 2\theta + \frac{\partial k}{\partial y}\cos 2\theta = 0 \\ \frac{\partial\sigma}{\partial y} + 2k(x,y)\left(-\sin 2\theta \frac{\partial\theta}{\partial x} + \cos 2\theta \frac{\partial\theta}{\partial y}\right) + \frac{\partial k}{\partial x}\cos 2\theta + \frac{\partial k}{\partial y}\sin 2\theta = 0 . \end{cases}$$

It is shown that (1) is irreducible for $k \not\equiv$ const. § 2. The extremum theorems of Hill [Ref 8] are transferred to the case of a continuous variabl yield limit § 3. The author considers some special cases: a) on an interval of the x-axis it is $\sigma_y = -p$, $\tau_{xy} = t$, where p,t are constant, and k(y) is monotone; b) the distribution of tension outside of a circular opening is sought if for r = a it holds $\sigma_r = -p$, $\tau_{r\varphi} = t$ and for $r = \infty$ it is $\sigma_r = \sigma_\varphi = -P$, where k(r) is monotone, e.g. $k(r) = k(\infty) + \Delta k \left(\frac{a}{r}\right)^n$, where $\Delta k = k(a) - k(\infty) > 0$, $n > 0$; c) it is $\sigma_r = -p$ for r = a and

$\sigma_x = P$, $\sigma_y = Q$, $\tau_{xy} = 0$, $Q > P$ for $r = \infty$; $k = k(r)$. This problem is a generalization of the problem considered by Galin [Ref 9] for k = const. § 4. This paragraph contains a detailed consideration of the case of slightly variable yield limit, i.e. $k(x,y) = k_0 + k_1(x,y)$, where k_0 = const and $k_1(x,y)$ is a continuous function with the first derivatives which is small compared with k_0, while its first derivatives are small compared with $\frac{k_0}{l}$, where l is a characteristic of the plastic range. In this case it is $\sigma_x = \sigma_x^{(0)} + \sigma_x^{(1)}$ etc., where the $\sigma_x^{(0)}$ relate to a body with the yield limit k_0 and the $\sigma_x^{(1)}$ relate to a body with $k_1(x,y)$. For the stresses $\sigma_x^{(1)}, \tau_{xy}^{(1)}, \sigma_y^{(1)}$ it holds

$$(2) \quad \frac{1}{4}\left(\sigma_x^{(0)} - \sigma_y^{(0)}\right)\left(\sigma_x^{(1)} - \sigma_y^{(1)}\right) + \tau_{xy}^{(0)}\tau_{xy}^{(1)} = k_0 k_1 .$$

For the somewhat transformed equation (2) the author formulates

Plane Deformation of Inhomogeneous Plastic Bodies 43-58-13-10/13

the problems of Cauchy and Goursat and the mixed problem. Several special cases are solved, e.g. the Prandtl problem (semiplane and plane rigid die for $k = k_0 + cy$, where c is small).
There are 5 figures and 11 references, 5 of which are Soviet, 4 Polish and 2 English.

SUBMITTED: April 24, 1957

1. Plastics--Deformation 2. Mathematics

Card 4/4

KUZNETSOV, A. I. Cand Phys-Math Sci -- (diss) "Certain problems of the theory of heterogeneous plastic bodies." Len, 1959. 8 pp (Len Order of Lenin State Univ im A. A. Zhdanov), 200 copies (KL, [redacted] 49-59, 137)

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

134. A. A. Ilyushin (Moscow): Problems of the theory of plasticity under combined loading.

135. V. I. Rakhmatov (Tashkent): Elastic-plastic vibrations of rods of non-circular cross section.

136. V. S. Saltikov (Leningrad): The forced non-linear flexural vibrations of a homogeneous prismatic rod and a very long rectangular plate.

137. S. Sakhnovskiy (Kharkov): On a method of solving the equations of motion for an infinite anisotropic medium in the presence of a magnetic field.

138. G. S. Shapiro, F. A. Shkolnik (Kharkov): An engineering method for the design of open prismatic shells.

139. I. I. Sokolovskiy (Leningrad): The distribution of vertical compressive stresses and strains in foundations in homogeneous or stratified soils.

140. S. Ya. Sokolov (Kharkov): Bending of cantilever plates of variable stiffness.

141. V. G. Sokolovskiy (Kiev): The effect of aging and anisotropy on the creep of concrete.

142. L. M. Shokhanov (Leningrad): On the time of rupture in creep.

143. L. M. Shokhanov (Leningrad): On some variational principles and methods in the theory of plasticity.

144. E. A. Sperbner (Baku): A procedure of determining an input Mooney diagram for large deformations.

145. M. A. Sveklo-Vakhnovskiy (Kiev): Some generalizations of the formulation of elastodynamic and elasto-dynamic contact problems and methods for their solution.

146. A. Sh. Sin (Omsk): The flow of a visco-plastic medium in a cone.

147. L. A. Tolokonov (Leningrad): On the elastic equilibrium of thin, infinite orthotropic plates.

148. K. V. Tsvelev (Kharkov): Models of the influence surfaces for the intensity of the bending moment in thin plates and shells.

149. A. P. Zverlovka (Kiev): Shallow shells of revolution of variable thickness in a two-dimensional temperature field.

150. M. Zhurovs (Riga): Dynamic stability of cylindrical and spherical shells.

151. M. Zhurovs (Riga): The influence of initial imperfections of shape on the stability of thin elastic cylindrical sandwich shells under axial compression.

152. V. P. Zhukov (Delft): Elastic stability and post-buckling behavior.

153. A. S. Zhukovskiy (Rubtsovsk), Th. P. Zhukov (Krasnoyarsk): The effect of support elasticity on the natural vibrations of rods.

154. I. M. Zaycev, I. A. Ostrog (Moscow): Strength and plasticity of "chalmers".

155. A. S. Zarembo (Moscow): The design of flexible plates and beams on elastic foundation.

156. M. A. Zemlinskiy (Kazan): Bending of rectangular shallow shells with elastic ribs.

157. M. A. Zemlinskiy (Kazan): On the solution of the semilinear algebraic equations of shell theory.

158. I. A. Zerkalin, P. M. Tartakovskiy (Leningrad): The one-dimensional problem of the consolidation of a sediment layer with variable specific weight and variable water permeability.

159. A. S. Kosmodamianskiy (Saratov): The elastic equilibrium of anisotropic plate with a finite number of elliptical holes.

160. Th. I. Kostarin (Yaroslavl), I. V. Kragelskiy (Moscow): Rheological phenomena in dry friction.

161. Th. V. Kruter (Stalinsk): Lateral stability of coupled arches with double curvature.

162. A. I. Kunetsov (Leningrad): On the theory of plane plastic stress.

163. V. K. Kybichinskiy, L. V. Kitlitin (Moscow): Propagation of elastic, visco-plastic waves in bars.

164. V. B. Magnadze (Tbilisi): The investigation of contact problems in the theory of elasticity by the method of singular integral equations.

165. B. V. Lozovatskiy (Moscow): The investigation of the deformations of drains on models by the X-ray method.

166. A. Lozovskaya (Sverlsk): Application of the non-linear variational principle to some problems of the theory of elastic-plastic strains.

167. B. M. Lovi (Moscow): The investigation of rheological properties of gelatin solutions.

23898
P/033/60/012/002/002/008
D214/D301

1.1200 2808, 1327

AUTHOR: Kuznetsov, A.I. (Leningrad)

TITLE: The problem of non-homogeneous plastic layer

PERIODICAL: Archiwum mechaniki stosowanej, v. 12, no. 2, 1960, 163 - 172

TEXT: In this work L. Prandtl's solutions (Ref. 2: Anwendungsbeispiele zu einem Henckyschen Satz ueber das plastische Gleichgewicht, ZAMM, 3, 1923, 401 - 406) for compression of a long plastic layer between rigid rough slabs is generalized to the case of the transversely non-homogeneous plastic layer. Using the co-ordinate system as shown in Fig. 1 and assuming the yield point $k = k(y)$ to be a known function of y, the author obtains:

$$\begin{cases} \tau_{xy} = ay + b, \quad \sigma_y = -ax - c, \\ \sigma_x = -ax - c + 2\sqrt{k^2(y) - (ay+b)^2}, \end{cases} \tag{1.4}$$

Card 1/7

where, from

$$[\tau_{xy}]_{y=h} = mk(h), \quad [\tau_{xy}]_{y=-h} = -nk(-h), \quad 0 \leqslant m < 1.0 \leqslant n < 1 \quad (1.1)$$

and

$$a = \frac{1}{2h}[mk(h) + nk(-h)], \qquad b = \frac{1}{2}[mk(h) - nk(-h)]. \quad (1.5)$$

C is determined from the boundary condition and is given by

$$c = \frac{1}{h}\int_{-h}^{h} \sqrt{k^2(y) - (ay+b)^2}\, dy. \quad (1.6)$$

Equations of lines of flow are found from (1.4) and are

$$x = \int \frac{\sqrt{k^2 - (ay+b)^2}}{ay+b \pm k}\, dy + \text{const}. \quad (1.7)$$

and velocities of flow v_x, v_y corresponding to stresses (1.4) are

$$v_y = -V\frac{y}{h}, \qquad v_x = V\frac{x}{h} + 2V\frac{1}{h}\int_0^y \frac{ay+b}{\sqrt{k^2-(ay+b)^2}}\,dy + C. \tag{1.11}$$

where V = velocity of rigid slabs. C is found from the condition of imcompressibility

$$-\int_{-h}^{h} v_x\,dy = 2V(l-x).$$

and is

$$C = V\left(\frac{1}{h^2}\int_{-h}^{h}\int_0^y \frac{ay+b}{\sqrt{k^2-(ay+b)^2}}\,dy\,dy - \frac{l}{h}\right). \tag{1.12}$$

If the relation k(y) is linear and m = n = 1,

Card 3/7

$$c = \frac{\pi}{2}\sqrt{k(h)\,k(-h)},$$

and the lines of flow are given by

$$\sqrt{1-\frac{y^2}{h^2}} \pm \arcsin\frac{y}{h} = \left[\frac{k(h)}{k(-h)}\right]^{\pm 1/2}\frac{x}{h} + \text{const.} \qquad (1.13)$$

Eq. (1.4) and Eq. (1.11) are valid only if

$$/\tau_{xy}/ = /ay + b/ \leqslant k(y). \qquad (1.14)$$

The above results are applied to the theory of flow on surfaces of a non-homogeneous material, developed by A.A. Ilyushin (Ref. 3: Voprosy teorii techenya plasticheskogo veshchestva po poverkhnostyam, Prykl, Matem. Mekh. 3, 18, 1954), for the case of an homogeneous material and it is assumed that the yield point varies not only transversely, but also along the surface of the layer. Hot

metal can be an example of such behavior caused by the temperature gradient. It is shown that for a symmetrical transverse distribution of the yield point, the equations obtained differ from those derived in Ref. 3 (Op.cit.) only by the presence of the variable yield point. Pressure P on the layer is determined from

$$/\text{grad } p/ = \frac{\tau_s}{h} \tag{2.1}$$

and boundary condition on the surface contour

$$p = q_0(x, y) + \sigma_s(x, y) \equiv p_0 \tag{2.2}$$

where $2h = wh(t)$; thickness of layer $\tau_s = k(x, y, \pm h)$; $q_0(x, y)$ - longitudinal pressure; $\sigma_s(x, y)$ - average value of the yield point in transverse direction. Characteristic $y = y(x)$ of (2.1) through the points M_1, M_2 can be found from the stationary condition of

$$\int_{(M_1)}^{(M_2)} \tau_s(x, y)\, ds = \int_{(M_1)}^{(M_2)} \tau_s(x, y) \sqrt{1+y'^2}\, dx. \qquad (2.6)$$

In general characteristics can be found by graphical methods, utilizing the fact that their curvature is given by

$$\varkappa = \frac{\partial \ln \tau_s}{\partial s_2}, \qquad (2.10)$$

where s_2 is the direction of the characteristic on the contour. A numerical example is given for the compression of a rectangular layer. There are 2 figures and 4 references, 3 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: November 10, 1959

Card 6/7

S/179/61/000/005/014/022
E081/E477

AUTHOR: Kuznetsov, A.I. (Leningrad)

TITLE: The equations of the theory of plasticity, allowing for anisotropic hardening

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Mekhanika i mashinostroyeniye. no.5, 1961, 112-118

TEXT: The paper examines certain questions in connection with the mathematical presentation of the theory of plasticity, taking anisotropic hardening into consideration. It also examines simple variations of these theories, put forward by sundry authors (Ref.1: Edelman F., Drucker D.C. Some extensions of elementary plasticity theory. Journal of the Franklin Institute, 1951, June; Ref.2: Imlinskiy A.Yu. Ukr. matem. zh., 1954, v.6, no.3; Ref.3: Kadashevich Yu.I., Novozhilov V.V. PMM, 1958, v.22, no.1). The problem is formulated in the terms of the stress and strain tensors; the initial natural state of the body is isotropic and the conditions of plasticity correspond with the Mises equation

$$\sigma_{ij}'\sigma_{ij}' = 2k^2 \qquad (1.1)$$

Card 1/3

where the primes denote components of the stress deviator and k is the initial yield value. The hardening of the material during plastic deformation may be expressed as

$$(\sigma_{ij}' - c\varepsilon_{ij}^p)(\sigma_{ij}' - c\varepsilon_{ij}^p) = 2k^2 \qquad (c = \text{const} > 0) \qquad (1.2)$$

where ε_{ij} are the strain components. The equation for the increase of plastic deformation is quoted and, in the case of simple loading from the initial natural condition, this is used in conjunction with Hooke's law to find expressions for the theory of small elasto-plastic deformations, with a linear hardening law. The system of equations for plane strain is dealt with in detail, assuming that the elastic strain is negligible compared with the plastic strain. Differential equations are established for quantities $\dot{\sigma}$, $\dot{\theta}$, $\dot{\varepsilon}$ and $\dot{\omega}$, where θ is the inclination of the principal axis of strain to the axis and ω is the rotation. These equations are shown to be hyperbolic under certain conditions, although it is emphasized that they are hyperbolical independently of the direction and magnitude of the strain. Under certain other conditions, they are shown to be elliptical. The relationship

between the hyperbolic and elliptical classes of equation is considered and it is shown that the latter is not directly connected with isotropic hardening. The equations of the characteristics are derived, and conclusions in connection with hyperbolic and elliptical systems, up to the limits imposed by fracture, are discussed. A.A.Vakulenko, A.Yu.Ishlinskiy and D.D.Ivlev are mentioned in the article for their contributions in this field. There are 8 references: 6 Soviet-bloc, 1 Russian translation from non-Soviet-bloc publication and 1 non-Soviet-bloc. The reference to an English language publication reads as follows: Ref.1: Edelman F., Drucker D.C. Some extensions of elementary plasticity theory. Journal of the Franklin Institute, 1951, June.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: July 2, 1961

KUZNETSOV, A.I. (Leningrad)

Remark on the theory of inserting a stamp into a plastic medium.
PMTF no.1:162-163 Ja-F '62. (MIRA 15:4)

1. Leningradskiy gosudarstvennyy universitet.
(Plasticity) (Deformations (Mechanics))

KUZNETSOV, A.I.

Remarks on the theory of plane plastic states of stress. Issl. po uprug. i plast. no.2:216-218 '63. (MIRA 16:8)
(Plasticity) (Strains and stresses)

KUZNETSOV, A. I.

"Accident Prevention in Electrical Installations," Gosenergoizdat, 342 pp, 1950. Authorized as a textbook for power and electrical engineering institutes and faculties.

KUZNETSOV, A. I.

Safety techniques in electric installations. Izd. 2., perer. Moskva, Gos. energ. izd-vo, 1952. 352 p. (54-22799)

TK152.K88 1952

GUSEV, S.A., inzh.; ZHUKHOVITSKIY, B.Ya., kand.tekhn.nauk; ZARIN, D.D., kand.tekhn.nauk; IVANOV-SMOLENSKIY, A.V., kand.tekhn.nauk; KNYAZEVSKIY, B.A., kand.tekhn.nauk; KUZNETSOV, A.I., inzh.; KOZIS, V.L., kand.tekhn.nauk; KORYTIN, A.A., inzh.; LASHKOV, F.P., inzh.; L'VOV, Ye.L., kand.tekhn.nauk; MELESHKINA, L.P., kand.tekhn.nauk; NEKRASOVA, N.M., kand.tekhn.nauk; NIKULIN, N.V., kand.tekhn.nauk; POLEVOY, V.A., kand.tekhnicheskikh nauk; RAZEVIG, D.V., kand.tekhn.nauk; ROZANOV, G.M., kand.tekhn. nauk; RUMSHISKIY, L.Z., kand.fiz.-matem.nauk; SVISTOV, N.K., kand.tekhn.nauk; SIROTINSKIY, Ye.L., kand.tekhn.nauk; SOKOLOV, M.M., kand.tekhn.nauk; TALITSKIY, A.V., prof.; TREMBACH, V.V., inzh.; FEDOROV, A.A., kand.tekhn.nauk; GRUDINSKIY, P.G., prof.; PRYTKOV, V.T., kand.tekhn.nauk; CHILIKIN, M.G., prof., glavnyy red.; GOLOVAN, A.T., prof.; red.; PETROV, G.N., prof., red.; FEDOSEYEV, A.M., prof., red.; ANTIK, I.V., red.; SKVORTSOV, I.M., tekhn.red.

[Handbook for electric engineering] Elektrotekhnicheskii spravochnik. Moskva, Gos.energ.izd-vo, 1952. 640 p. (MIRA 13:2)

1. Prepodavateli Moskovskogo energeticheskogo instituta imeni V.M. Molotova (for all except Antik, Skvortsov).
(Electric engineering)

KUZNETSOV, A.I.

AID P - 1170

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 23/31

Author : Kuznetsov, A. I.

Title : Measuring specific gravity of electrolytes in alkaline storage batteries. (Letters from readers)

Periodical : Energetik, 11, 36, N 1954

Abstract : In reply to a question from a reader, the author briefly explains the method of testing electrolytes.

Institution : None

Submitted : No date

KUZNETSOV, A.I.

KUZNETSOV, AII.- "Grounding-to-Neutral as a Protective Measure in Networks up to 1000 volts." Min of Higher Education USSR, Moscow Order of Lenin Power Inst imeni V. M. Molotov, Moscow, 1955 (Dissertations For Degree of Candidate of Technical Sciences)

SO: Knizhnaya Letopis' No. 26, June 1955, Moscow

AID P - 3092

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 26/29

Author : Kuznetsov, A. I.

Title : Permanent recharging of a storage battery

Periodical : Energetik, 7, 39-40, Jl 1955

Abstract : In reply to a question by a reader, the author explains the proper way of connecting a storage battery for permanent recharging and also the way to operate the installation.

Institution : None

Submitted : No date

AID P - 3367

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 25/27

Author : Kuznetsov, A. I.

Title : Selenium plates; their discard and their resistances

Periodical : Energetik, 9, 39-40, S 1955

Abstract : Replying to questions from readers, the author explains the way of discarding faulty selenuim plates. He also describes the relation of direct and reverse resistances and the way of finding the coefficient of rectification. One diagram.

Institution : None

Submitted : No date

KUZNETSOV, A.I

AID P - 3413

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 28/30

Author : Kuznetsov, A. I.

Title : How to dismantle automobile starter batteries and how to repair containers

Periodical : Energetik, 10, 38-40, O 1955

Abstract : Replying to questions from a reader, the author describes how to dismantle automobile starter batteries and how to repair battery containers. Four drawings.

Institution : None

Submitted : No date

KUZNETSOV, A.I.

Possibility of using selenium rectifiers for floating storage batteries. Energetik 4 no.3:40 Mr '56. (MLRA 9:6)
(Storage batteries) (Electric current rectifiers)

KUZNETSOV, A.I.

Iron content in battery acid. Energetik 4 no.9:39 S '56. (MIRA 9:10)
(Iron--Analysis) (Electrolytes)

ROSENBOW, A. I. (Eng.)

"Experience in the Use of Storage Batteries,"(Operating Experience of the Mosenergo High-voltage Networks, Collection of Articles), Moscow, Gosenergoizdat, 1957, 79 p.

Abst.: The author considers the present set of instructions concerning the operation and maintenance of storage batteries to be out of date and suggests that they be rewritten on the basis of experience gained in this field. He suggests changing the procedure for charging storate batteries, replacing the inadequate mercury are rectifiers of the URV-1 and URV-3 types and improving the operating conditions of the batteries.

Kuznetsov, A.I.

KUZNETSOV, A.I.

On the possibilities of using selenium rectifiers for high frequencies. Energetik 5 no.10:40 O '57. (MIRA 10:12)
(Electric current rectifiers)