Thermomagnetic Oxygen (Cont.) SOV/2429

AVAILABLE: Library of Congress

Card 3/3

TM/ec
10-26-59

L 12962-63 EWG(k)/BDS/EWT(1)/EEC(b)-2/ES(w)-2 AFFTC/AFWL/ASD/ESD-3/
SSD Pz-4/Pab-4/Pi-4/Po-4 IJP(C)/AT S/109/63/008/004/012/030

AUTHOR: Malkin, O. A. 18

TITLE: Calculation of the electric conductivity of gaseous mixtures in a plasma state

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 4, 1963, 630-638

TEXT: The article describes the methodology of computing the concentration of neutral and charged particles as well as the efficiency of electric conductivity of mixtures of gases in a state of plasma. The author discusses the limitations of applicability of various methods of calculating these values as well as of certain assumptions regarding the properties of plasma. The article stresses the need of devising new methods for computing plasma parameters, because of the growing utilization of plasma in wide areas of science and technology, apart from its earlier use in converters and electronic tubes. Allowing for certain limitations described, the work covers a temperature range of from 2 or 3 thousand degrees K. to 50,000°K., and a pressure range of from 0.1 ata to 1,000 at. It discusses the computation of the coefficient of electric conductivity, of the plasma content, the lowering of ionization energy in dense plasma (defining the parameters in which the Debaye theory is and is not applicable), and it also discusses the effective cross sections of the plasma components, using the Spitzer formula.

Card 1/2

L 40758-65 EWP(m)/EPF(c)/EPR/EWG(j)/EWA(h)/EWA(c)/EWT(l)/EWT(m)/FCS(k)/EWP(b)/EWA(d)/EWP(t) Pd-1/Pi-4/Pr-4/Ps-4 IJP(c) MM/JD

ACCESSION NR: AP5006160 S/0258/65/005/001/0065/0072

54
50
B

AUTHOR: Malkin, O. A.; Grigor'yev, V. N.; Vitshas, A. F.

TITLE: Experimental investigation of shock waves excited by a current pulse in a rarefied gas

SOURCE: Inzhenernyy zhurnal, v. 5, no. 1, 1965, 65-72

TOPIC TAGS: shock wave, plasma motion, plasma electromagnetic wave interaction, pressure dependence

ABSTRACT: The authors investigated the motion of a plasma between two plane-parallel electrodes over a wide range of pressures, for the purpose of checking the applicability of the various theories proposed for the acceleration of a plasma by an electromagnetic field. Simultaneous measurements of the plasma velocity were carried out by optical (photomultipliers and spectrograph) and electrical (double probes) methods. The test set-up is illustrated in Fig. 1 of the Enclosure and the apparatus is described in some detail. The results show that, starting with an initial pressure 2—3 x 10^{-3} mm Hg, the layer of current flowing be-

Card 1/3

L 40758-65

ACCESSION NR: AP5006160 4

tween two plane-parallel electrodes in air begins to behave like a shock wave moving over the gas particles, and can be described by the usual gasdynamic "piston-wave" model. The front of this shock wave and of the current layer coinciding with it, measured with high-speed framing camera, reaches a maximum value at an initial pressure 5×10^{-3} mm Hg. At pressures below 2×10^{-3} mm Hg the velocity of the layer coincides with that of the ions (heavy particles). The cause of this maximum is the fact that the nitrogen and oxygen have a maximum ionization rate at the same pressure. "The authors thank V. L. Granovskiy for useful discussions and Ye. G. Kormakov for furnishing the photomultiplier for the measurements." Orig. art. has: 6 figures, 1 formula, and 1 table.

ASSOCIATION: None

SUBMITTED: 20Mar64 ENCL: 01 SUB CODE: ME

NR REF SOV: 006 OTHER: 004

Card 2/3

L 7706-66 EWT(l)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) GG/AT

ACC NR: AP5025900 SOURCE CODE: UR/0057/65/035/010/1853/1859

AUTHOR: Basharov, R.; Gavrilovskaya, Ye. N.; Malkin, O.A.; Trekhov, Ye. S. 77 B

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Investigation of the cathode spots of a pulsed discharge between parallel electrodes

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 10, 1965, 1853-1859

TOPIC TAGS: gas discharge, discharge plasma, air, plasma gun, electrode, cathode spot

ABSTRACT: The 3 kV discharge of a 36 μfd capacitor between plane parallel copper electrodes in 9×10^{-3} mm Hg of air was investigated in order to obtain information concerning the processes taking place near the electrodes in a plasma gun. Ordinary and streak photographs of the electrodes were recorded during the discharge and the damaged electrode was subsequently examined under optical and electron microscopes. The streak photographs showed that while the discharge moved along the cathode at velocities up to 5×10^6 cm/sec there were bright regions that did not move. The presence of these stationary glowing regions was confirmed by the ordinary photographs, and small damaged regions were found by microscopic examination. These stationary glowing regions did not appear on the anode, and they are identified as cathode spots.

Card 1/2 UDC: 533.9

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L 7706-66

ACC NR: AP5025900

0

The cathode spots showed a complex microstructure (including microfractures observable only with the electron microscope), which is described in some detail. It is concluded that the cathode spots of a pulsed discharge moving rapidly along a plane electrode in a rarefied gas arise and exist independently of each other and remain stationary during their whole life. It is also concluded that one must take account of the fine structure of the cathode spot when attempting to estimate the current density; estimates based on the gross structure alone will necessarily be too small. Orig. art. has: 6 figures and 3 tables.

SUB CODE: EM, ME/ SUBM DATE: 18Dec64/ ORIG REF: 006/ OTH REF: 004

Card 2/2

L 22338-66 EWT(m)/EWA(d)/EWP(t)/EWP(k) IJP(c) JD

ACC NR: AP6013517 SOURCE CODE: UR/0120/66/000/002/0151/0153

AUTHOR: Malkin, O. A.; Reys, I. A.; Stepanov, A. M. 40 B

ORG: All-Union Electrotechnical Institute, Moscow (Vsesoyuznyy elektrotekhnicheskiy institut)

TITLE: Miniature probe for measuring variable magnetic fields 44

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1966, 151-153

TOPIC TAGS: plasma probe

ABSTRACT: A miniature magnetic probe consisting of copper wire wound on nichrome wire 0.15 mm in diameter is described (see Fig. 1). The leads are twisted and recessed 1 cm and covered with organic material which hardens upon drying. The probe is placed into a Kovar sleeve whose outside diameter is 5 mm and is covered with a glass case which isolates the probe coil from plasma. The thickness of glass where the probe is located is 0.2 mm. The sleeve is inserted into a rubber cork which establishes a vacuum equal to 10^{-5} torr. The leads are connected to a shielded coaxial cable reducing the portion exposed to fields to 10—12 mm. Five probes of different size were made. These include probes 1.2 and 1.6 mm in outside diameter with 70 and 160 turns, respectively. Measurements with a 1.2 mm-o.d. probe of mag-

Card 1/2 UDC: 621.317.42

L 22338-66
ACC NR: AP6013517

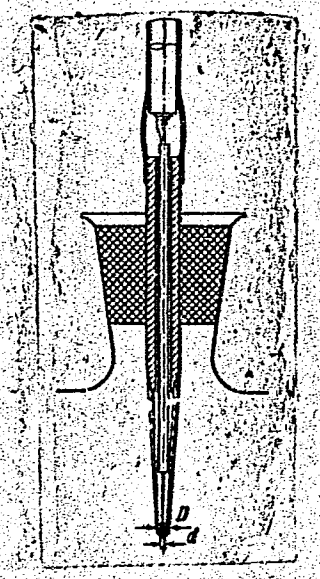

Fig. 1. Miniature magnetic probe

netic fields whose strength was equal to 2400 gauss were accurate to within 15—20%.
Orig. art. has: 4 figures. [BD]

SUB CODE: 09/ SUBM DATE: 09Nov65/ ORIG REF: 004/ OTH REF: 001/ ATD PRESS: 4241

Card 2/2

L 8157-66 EWT(1)/ETC(m) IJP(c) WW

ACC NR: AP5025727 SOURCE CODE: UR/0286/65/000/018/0080/0080

AUTHORS: Kozodon, M. S.; Malkin, O. A.

ORG: none

TITLE: Apparatus for separation of spectral lines. Class 42, No. 174809

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 80

TOPIC TAGS: spectrometry, spectrometer, spectral line, spectrometer attachment

ABSTRACT: This Author Certificate presents an apparatus for separation of spectral lines, consisting of a mirror attachment to a spectrometer (see Fig. 1).

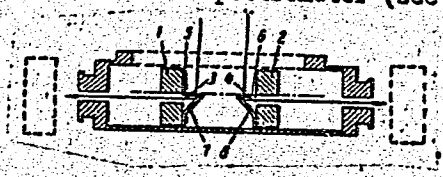

Fig. 1. 1- movable carriers; 3 and 4- transparent windows; 5 and 6- adjustable slits; 7 and 8- mirrors.

To insure simultaneous and separate direction of the spectral lines to the receivers,

Card 1/2 UDC: 681.45

L 8157-66
ACC NR: AP5025727 O

the attachment contains two movable carriers equipped with windows for the exit of the spectral lines. The carriers, situated in the focal plane of the apparatus, have adjustable slits and two mirrors situated at right angles to the optical axis of the device in the immediate vicinity of the slits. Orig. art. has: 1 figure.

SUB CODE: NP, EC/ SUBM DATE: 21May64

jw
Card 2/2

MALKIN, P.F.; RAKITINA, P.A.

Erythematous reaction of the skin to ultraviolet rays in mental diseases. Nevropat.psikhiat., Moskva 20 no.1:94-96 Jan-Feb 51. (CLML 20:6)

1. Prof.P.F.Malkin. 2. Of the Psychiatric Clinic of Sverdlovsk Medical Institute and of Sverclovsk Oblast Psychiatric Hospital (Head of Clinic and Scientific Director of Hospital--Prof.P.F.Malkin; Head Physician of Hospital -- Candidate Medical Sciences P.M.Zhelobov).

1. MALKIN, P. F.

2. USSR (600)

4. Psychiatry

7. Some other controversial psychiatric problems. Zhur. nevr. i psikh. No. 11 - 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

M[illegible]KIN, [illegible].F. (Kuyb[illegible]shev)

Changes in [illegible] reactivity of the body in [illegible] diseases. Trudy Gos. [illegible] psikhonevr. inst. 29:103-1[illegible] [illegible]. [illegible]

L 51010-65
ACCESSION NR: AP5010333 UR/0205/65/005/002/0183/0185

AUTHOR: Dubrovina, Z. V.; Malkin, P. M.; Andreyeva, L. P. 12 B

TITLE: Effects of calcium, magnesium, phosphorus and fat on strontium-90 assimilation in rats

SOURCE: Radiobiologiya, v. 5, no. 2, 1965, 183-185

TOPIC TAGS: animal, rat, strontium-90, deposit formation, calcium metabolism, calcium radioprotective effect, food requirement, enriched food, calcium, magnesium, phosphorus, fat

ABSTRACT: In an experiment on 6 groups of white rats weighing 130±3 g the possibility of increasing the radioprotective effect of calcium against strontium-90 by enriching standard rations with calcium.

L 51010-65
ACCESSION NR: AP5010333

rations of the second, third, and fourth groups were enriched with calcium, phosphorus, magnesium, and fat in different proportions.

rations of the second, third, and fourth groups were similar with calcium, phosphorus, magnesium, and fat in different proportions. The fifth group received in addition to standard rations only ammonia oxylate which inhibits calcium intake. The sixth group received soy bean milk rations containing approximately the same amounts of calcium, phosphorus, magnesium, and fat as the control standard ration. Daily calcium intake and amount of calcium excreted in feces and urine were determined. On the 22nd day all animals were killed. Calcium and strontium-90 distribution and activity in bones and carcass were measured by radiochemical analysis and STS-6 counters. Findings show that in the second group with magnesium enriched rations strontium-90 activity was reduced [illegible] compared to the control. In the third group, the addition of [illegible]

with magnesium and fatty [illegible]

twofold compared to the control. In the third group, the addition of phosphorus to the rations did not enhance the effect of the magnesium. In the fourth group strontium-90 deposition was reduced by four times with calcium, phosphorus, magnesium, and fat enriched rations. In the fifth group strontium-90 deposition was barely affected by the ammonia oxylate. In all groups, with the exception of the fifth, calcium assimilation was higher than in the control group and at the same time strontium-90 deposition was lower than in the control group.

Card 2/3

L 51040-65
ACCESSION NR: AP5010333

The enriching substances appear to affect strontium-90 assimilation indirectly by intensifying or weakening the competitive role of calcium. The ratio between Ca:P:Mg:fat apparently is not a determining factor, because in the sixth group whose rations were practically the same as the control, strontium-90 deposition was almost 1.5 times less. Thus, study data indicate that the radioprotective effect of calcium against strontium-90 deposition may be increased by enriching rations with magnesium, phosphorus, and fat. Orig. art. has: 3 tables.

ASSOCIATION: None

SUBMITTED: 20Apr63 ENCL: 00 SUB CODE: LS

NR REF SOV: 002 OTHER: 011

Card 3/3 mb

AUTHOR: Malkin, R.A. 127-58-7-3/20

TITLE: The Development of the Iron Ore Base of the Nizhniy-Tagil Metallurgical Combine (Razvitiye zhelezorudnoy bazy Nizhne-Tagil'skogo metallurgicheskogo kombinata)

PERIODICAL: Gornyy zhurnal, 1958, Nr 7, pp 14-17 (USSR)

ABSTRACT: Deposits of the Tagil-Kushva region form the base for the Nizhne-Tagil'skiy metallurgicheskiy kombinat (Nizhniy-Tagil Metallurgical Combine). These deposits have been exploited for about 200 years. Some parts of the mine were completely modernized after WW II and production increased by 4.4 times between 1940 to 1955. As the production of cast iron increased even more sharply, the combine was short of iron ore. New mines must be opened to compensate the closing of some of the open cast mines. As possibilities to increase production of the Tagil-Kushva region are limited, it is necessary to build a new iron ore base at the Kachkanar group of titanium-magnesite ore deposits, 130 km from the Nizhniy-Tagil combine. The reserves of this group are very important (Table 4). The full development of the Kachkanar group will create very favorable conditions for a further development of the ferrous metallurgy of the Central Urals. There are 6 tables.

ASSOCIATION: Uralgiproruda

Card 1/1 1. Industry-USSR 2. Iron ore-Production

MALKINA, R.L.

Application of the method of asymptotic integration to problems of the vibration of shells of revolution with nearly spherical shape. Izv.vys.ucheb.zav.; av.tekh.7 no.2:47-56 '64. (MIRA 17:9)

MALKIN, S.A.

29T94

USSR/Radio Stations Mar 1947
Communications

"Analysis of the Economy Factor in Regional Communications Offices," S. Malkin, Chief, Section of the Planning and Finance Administration, Ministry of Communications, 2 pp

"Vestnik Svyazi- Elektrosvyaz'" No 3 (84)

The author discusses the financing of regional communications offices. Gives the system used in calculating the economy achieved by these offices. Illustrates his statements with imaginary operations of an imaginary station.

LC 29T94

MALKIN, S.A. PA 30T11

USSR/Communications Jul 1947

"Analysing the Economy of Regional Communications Offices," S. A. Malkin, Chief of the Section for Control of Fulfilling the Planning and Financing Administration of the Ministry of Communications, 2 pp

"Vestnik Svyazi - Pochta" No 7 (88)

One of the greatest factors in improving the operation of regional offices, the quality of the work, and fulfilling the norms established by the new Five-Year Plan, is lowering the cost of the service. Many of these regional offices do not understand economy. The author attempts to explain the basic principles of economy at regional communications offices.

LC 30T11

MALKIN, S. A.

PA 22T40

Aug 1947

USSR/Engineering
Turbines, Gas
Thermodynamics

"Basic Technics of Gas Turbines," S. A. Malkin, 2½ pp

"Energeticheskiy Byulleten'" No 8

The author claims that the ideal gas turbine works on the principle of Brayton's closed cycle with adiabatic compression. Heating is under conditions of constant pressure and adiabatic expansion. Article has many mathematical formulae to illustrate the author's statements. He makes the statement that in a very short while the gas turbine will be able to compete favorably with other forms of thermal engines. 22T40

MALKIN, S.A., dotsent.

Hydraulic resistance and strength of the fuel bed. Trudy RIIZHT no.18:196-208 '54. (MLRA 9:3)
(Gases, Flow of) (Fuel--Testing)

MALKIN, S.A.

Aerodynamic calculations of gas generators. Gaz.prom. no.12:8-15 D '57. (MIRA 11:1)

(Gas producers--Aerodynamics)

MALKIN, S.A.; MAGNITSKIY, Yu.A.

Method of investigating the distribution of velocities and pressures in a layer of grainy materials. Inzh.-fiz.zhur. no.5:96-99 My '60. (MIRA 13:8)

1. Institut inzhenerov zheleznodorozhnogo transporta, Rostov-na-Donu.
(Granular materials)

MALKIN, Sergey Aleksandrovich; SMORCHKOVA, Ye.P., otv. red.; KAZ'MINA, R.A., red.; SLUTSKIN, A.A., tekhn. red.

[Analysis of the administrative operations of communication enterprises] Analiz khoziaistvennoi deiatel'nosti predpriiatii sviazi. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1961. 104 p. (MIRA 14:9)
(Communication and traffic—Accounting)

MALKIN, Sergey Aleksandrovich; SMORCHKOVA, Ye.P., otv. red.; KAZ'MINA, R.A., red.; SLUTSKIN, A.A., tekhn. red.

[Analysis of the economic activity of communication enterprises] Analiz khoziaistvennoi deiatel'nosti predpriiatii sviazi. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1961. 106 p. (MIRA 14:11)

(Telecommunication)

MALKIN, S.Z.

Automatic sampling device for large-sized ore lumps. TSvet. met. 29 no.8:73-75 Ag '56. (MLRA 9:10)

1. Kombinat Severonikel'.
(Ores--Sampling and estimation) (Automatic control)

MALKIN, V. B.

"Concerning the Possibility of Using a Strong Electric Current to Eliminate Heart Fibrillation." Sub 22 Feb 51, Acad Med Sci USSR.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.

ALTUKHOV, G.V.; MALKIN, V.B.; PRUTSKOY, A.N.

Registration of cardiac sounds on a portable electrocardiograph with the aid of a differential intensifier. Klin.med.,Moskva 29 no.5:83-85 May 1951. (CIML 20:9)

1. Moscow.

1. MALKIN. V. B.: ALTUKHOV, G. V.

2. USSR (600)

4. Anoxemia

7. Study of the effect of acute anozia on cardiac function. Klin.med. 30 no. 10 1952

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

MALKIN, V. B., MANSUROV, A. R., USACHEV, V.V., KOMENDANTOV, G. L., BABUSHKIN, V. I. and IVANOV, P. N.

"The Effect of Accelerations Upon the Human Organism" (The Eighth All-union Congress of Physiologists, Biochemists, and Pharmacologists), pp. 313-314, Moskva, 1955.

MALKIN, V. B. and ISAKOV, P. K.

"Critical Remarks Regarding the Book 'Aviation Medicine'," Voyenno-medits. zhurnal, No.2, pp 92-95, 1955

Translation D 312229, 15 Aug 55

ARUTYUNOV, G.A., polkovnik meditsinskoy sluzhby, kandidat meditsinskikh nauk; MALKIN, V.B., kandidat meditsinskikh nauk

Problems in aviation medicine. Voen.-med. zhur. no.9:84-89 S '55.
(AVIATION MEDICINE) (MLRA 9:9)

BABUSHKIN, V.I., podpolkovnik meditsinskoy sluzhby; MALKIN, V.B., kandidat meditsinskikh nauk; USACHEV, V.V., podpolkovnik meditsinskoy sluzhby

Some data on the body's adaptation to the effect of radial acceleration. Voen.-med. zhur. no.4:10-19 Ap '56. (MLRA 9:9)
(AVIATION MEDICINE)

MALKIN, V. B.

Balakhovskii, I. S. and Malkin, V. B. Biologicheskie problemy mezhplanetnykh poletov. Priroda, Moscow, No. 8:13–21, Aug. 1956. 2 figs. DLC. German version as Biologische Probleme des Raumflugs. [Biological problems of space flight.] Naturwissenschaftliche Rundschau, 10(5):173–177, May 1957. DWB—Problems considered are influence of acceleration on man, absence of gravity, cosmic radiation and meteorites. Cosmic rays are the greatest danger and may derange functioning of whole organism. Oxygen pressure must be at least 100 mm, or 200 mm if mixed with CO_2 and water vapor. Problems of setting foot on strange planets are also discussed. There are many unsolved problems in interplanetary flight. *Subject Heading:* 1. Space medicine.—*C.E.P.B.*

7

MALKIN, V., Cand. Med. Sci.

"Medical Problems in Cosmic Flights," Sovetskaya Aviatsiya, 1st-May 1957.

1135321 Full Translation

MALKIN, V.B., kand.med.nauk

Studying cardiac function in radical acceleration. Voen.med.zhur. no.9:57-61 S '57. (MIRA 11:3)

(ELECTROCARDIOGRAPHY,
eff. of acceleration (Rus)
(ACCELERATION, effects,
on ECG (Rus)

MAIKIN, V.

Measuring the relative mobility of cations in three-component silicate fluid solutions. Tr. from the Russian.

P. 985. (HUTNICKE LISTY) (Brno, Czechoslovakia) Vol. 12, no. 11, Nov. 1957

SO: Monthly Index of East European Accession (EEAI) LC Vol. 7, No. 5, May 1958

BESTUGIN, A.V.; IVANOV, D.I.; MALKIN, V.B.; PRUTSKOY, A.N. (Moskva)

Piezoelectric pickup for recording ballistocardiographic changes on an electrocardiograph. Fiziol.zhur.43 no.9:906-908 S '57. (MIRA 10:11)

(BALLISTOCARDIOGRAPHY, apparatus and instruments, piezo-electric counter for registration on electrocardiograph (Rus))

Malkin, V. B.

AUTHOR: Malkin. V. B. 206-46/48

TITLE: On the Problem of Stopping the Ciliating of Heart Ventricles With the Aid of Electric Stimuli (K voprosu o prekrashchenii fibrillyatsii zheludochkov serdtsa elektricheskim stimulom).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 115, Nr 6, pp. 1220-1223 (USSR)

ABSTRACT: After a survey of the historical development of the research work done in this field the author describes his tests. They aimed at the investigation of the threshold-value of the electric stimulus which is capable of stopping fibrillations of various durations. Dogs were used as test animals. It is known that fibrillations in pubescent animals do not stop and lead to death. The author judged on the height of the treshold value from the readings of a kilovoltmeter with a great ohmic resistance expressly constructed for this purpose. An electrocardiogram was taken everywhere. The tests made with 27 dogs showed that the voltage-threshold of the condenser-discharge which is capable of stopping the fibrillation, increases

CARD 1/4

with increasing duration of fibrillation. It is possible that in animals in which no threshold increase in the condensor-discharge occurs which is capable of stopping a 60 seconds lasting fibrillation, a threshold increase is nevertheless observed when the fibrillation is prolongued up to 3 minutes. Here a single maximum discharge (6500-7000 volt) was sufficient for stopping the fibrillation. In the other tests a series of rapidly repeated discharges was necessary for this. The tests made by the author show that a certain interaction exists between the duration of fibrillation and the course of the restoration processes of heart heat blood pressure and respiration following the stopping of fibrillation. With increasing duration of fibrillation the blood level which is measured after the stopping of fibrillation sinks. The test results show that a complete absence of blood circulation during 60 seconds, when it is caused by fibrillation, leads to a marked decrease in the functional activity of the vasomotoric and the respiration center, further to the reflectional inhibition of the activity of the heart. According to the electrocardiograms no serious

disturbance of the heart beat after 30 seconds of fibrillation is to be noticed. As a rule a sinus-tachycardia and an enlargement of the T-tine are the only things to be observed. After 60 seconds of fibrillation the P-tine often is missing and a node-rhythm sets in. The ventricle-complex is deformed. The period of the conduction of stimuli through the ventriculi is prolongued. After 3-4 minutes of fibrillation an effective activity of the heart is missing, the sinus-rhythm always is absent, the ventricle-body was so much deformed that it assumed the shape of a monophase-fluctuation. This regular increase in the pathological modifications with increasing duration of fibrillation leads to a disturbance of the heart beat which is probably connected with oxygen starvation. The increase in the threshold value on that occasion is due to the development of an ischemic hypoxia which changes the functional state of the heart and the activity of the nervous apparatus which regulates the function of the heart. The oxygen starvation is apparently accompanied by the enlargement of an other-

On the Problem of Stopping the Ciliating of Heart Ventricles With the Aid of Electric Stimuli 20-6-46/48

wise present heterochromism between individual myocardium-elements. This favors the establishment of a stable ring-rhythm of the stimulus, i.e. the maintenance of fibrillation.
There are 3 figures and 7 references, 3 of which are Slavic.

ASSOCIATION: -

PRESENTED: By L. S. Shtern, Academician, March 18, 1957

SUBMITTED: March 6, 1957

AVAILABLE: Library of Congress

CARD 4/4

MALKIN, V.B.

AUTHORS: [redacted], V. B., Fogel'son, L. I. 20-2-47/50

TITLE: On the Possibility to Use an Electric Stimulus in Order to Restore Normal Activity of the Heart in the Case of Flickering of Auricles (O vozmozhnosti ispol'zovaniya elektricheskogo stimula dlya vosstanovleniya normal'noy deyatel'nosti serdtsa pri mertsanii predserdiy)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 2, pp. 331-334 (USSR)

ABSTRACT: According to the conceptions of many researchers the flickering of the auricles and of the chambers are according to their nature closely connected processes which have the same pathophysiological mechanism. Since a strong electric stimulus was successfully used for the restoring of normal activity of the heart in the case of flickering arythmy was raised. This phenomenon was effected in dogs by stimulation of the auricles by an interrupted induction current. In the case of cats for this purpose a 1o% $CaCl_2$.solution was introduced intravenously. In all cases at different points an electrocardiogram was taken. Not in all dogs a relatively constant flickering could be produced. In the case of 7 of 1o it lasted only as long as the current action. In 2 cases of a current amplification in order to obtain a constant flickering also simultaneous flickering of the chambers was found. One succeeded in both cases to restore the normal activity of the

Card 1/2

On the Possibility to Use an Electric Stimulus in Order to Re- 20-2-47/50
store Normal Activity of the Heart in the Case of Flickering of Auricles.

heart by the condenser discharge. The results of the carried out work show a principal possibility of using a strong electric stimulus for the elimination of the flickering of the auricles of warm-blooded animals. The lack of a permanent positive action of a condenser discharge in the case of flickering effected by an injection of the $CaCl_2$- solution is apparently to be traced back to the uninterrupted action of this factor during the electric stimulus. However, too low an intensity of this stimulus is not excluded. There are 3 figures and 8 references 3 of which are Slavic.

PRESENTED: March 18, 1957, by L. S. Shterr, Academician

SUBMITTED: March 6, 1957

AVAILABLE: Library of Congress

Card 2/2

SOV/25-58-11-9/44

AUTHORS: Gazenko, O.G., Malkin, V.B., Candidates of Medical Sciences

TITLE: Biology of Cosmic Flights (Biologiya kosmicheskikh poletov)

PERIODICAL: Nauka i zhizn', 1958, Nr 11, pp 17-22 and p 2 of centerfolds (USSR)

ABSTRACT: The maintenance of normal living conditions for men during cosmic flights is the main task of cosmic biology. At the present time 2 groups of experiments are being conducted in the USSR: laboratory experiments and experiments in rockets with telemetric registration of biologic functions. Tests with animals carried in rockets up to 110 km showed normal reactions, insofar as they withstood acceleration and retardation satisfactorily, and blood pressure, pulse and breathing increased only slightly. At heights up to 212 km, especially unfavorable effects were noticed at re-entry of the rockets into the atmosphere. However, the problem of re-entry at 450 km has been solved. Soviet researchers are especially concerned with the problem of re-entry of passengers from space ships. Great difficulties have yet to be overcome in solving re-entry at supersonic velocities. When a space ship travels at a velocity exceeding sonic velocity

by 5 times, the nose section is heated to more than 1,000° C. Subsequently, temperatures in the airtight compartment may become unbearable for humans. It has been shown by special experiments, that at an humidity of 30 %, temperatures of 100° can be endured by men for 30 minutes, and temperatures of 200° only for 3 minutes. The effects of acceleration are being thoroughly studied, whereby it was found that acceleration of 10 G may be endured for several minutes. However, acceleration should be considerable lower than this to maintain operating ability. The authors describe the different operations of re-entry from a cosmic flight: catapulting of pressure cabin from the space ship, slowing down of descent by means of reactive drives and parachute, and finally landing of the cabin with a parachute.
There are 8 photos and 7 drawings.

MALKIN, V. B.

USSR / Human and Animal Physiology (Normal and Pathological). Neuromuscular Physiology T

Abs Jour: Ref Zhur-Biologiya, No 21, 1958, 97825

Author : Babushkin, V. I., Isakov, P. K., Malkin, V. B., Usachev, V. V.

Inst : Not given

Title : Study of Bioelectric Activity of Skeletal Musculature in Man by the Action of Radial Accelerations

Orig Pub: Fiziol. zh. SSSR, 1958, 44, No 4, 10-13

Abstract: Those tested (10 persons 20 to 30 years old) were placed in centrifugal arm chairs. The time of acceleration (A) action of maximum intensity was 20 seconds. In all those tested, an increase in bioelectric activity of the skeletal musculature

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MALKIN, V.B.

BARUSHKIN, V.I., ISAKOV, P.K.; MALKIN, V.B.; USACHEV, V.V. (Moskva)

Respiration and gas exchange in man subjected to radial acceleration [with summary in English]. Fiziol.zhur. 44 no.4:342-347 Ap '58. (MIRA 11:4)

(RESPIRATION,
eff. of rotation of man in centrifuge (Rus))
(CENTRIFUGATION,
eff. of rotation of man in centrifuge on resp. & exchange of gases (Rus))

17(4) SOV/26-59-10-6/51

AUTHOR: Malkin, V.B., Candidate of Medical Sciences (Moscow)

TITLE: The Biological Problems of Cosmic Flights (Tsiolkovskiy's Ideas Should be Realized)

PERIODICAL: Priroda, 1959, Nr 10, pp 35-44 (USSR)

ABSTRACT: This article is mainly based on the ideas of Russian scientist K.E. Tsiolkovskiy (1857-1935). Tsiolkovskiy, who is called an initiator of scientific aeronautics by the author, has also dealt with the above mentioned subject. Today, aviation physicians investigate the influence of acceleration on the animal and human organism by means of centrifuges. Attention is paid to the direction, quantity and time of the centrifugal force as well as to the most rational corporeal position of the aeronaut (already Tsiolkovskiy had proposed a horizontal position). The author also refers to the "hydraulic" method, i.e. the submerging of the body into water as a self-protecting measure against acceleration. In this connection, he mentions the

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The Biological Problems of Cosmic Flights (Tsiolkovskiy's Ideas Should be Realized)

tests carried out by Soviet scientist Professor N.A. Rynin in cooperation with physicians A.N. Likhachev, A.A. Sergeyev and V.M. Karasik. The author further mentions the so-called gravitron (Figure 2). There are 2 photographs, 1 scheme and 9 references, 8 of which are Soviet and 1 American.

Card 2/2

GURFINKEL', V.S.; IVANOV, D.I.; IVANOV, A.Ye.; MALKIN, V.B.

Use of Na^{24} in studying blood circulation during respiration under increased pressure. Biofizika 4 no. 4:498-503 '59. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut aviatsionnoy meditsiny, Moskva.
(SODIUM—ISOTOPES) (OXYGEN—PHYSIOLOGICAL EFFECT)
(BLOOD—CIRCULATION)

MALKIN, V.B.

USSR

(INTL FEDERATION OF MEDICAL ELECTRONICS.)
Tentative reports for the 3rd Intl Conference on Medical Electronics, London, England, 21-27 Jul 60.

GURFINKEL, V. S., Institute of Experimental Biology and Medicine, Siberian Dept., Academy of Sciences USSR, MALKIN, V. B., Scientific Research Testing Institute of Aviation Medicine, Moscow, and TSETLIN, M. L. - "Basic aspects of the problem of bio-electrical control of medical appliances" (Section a)

- KOZHEVNIKOV, V. A., Prof., Institute of Physiology im. I. P. Pavlov, Academy of Sciences USSR, Leningrad - "Modern methods of analyzing records of bio-potentials" (Section 1)
- KUZNETSOV, A. G., Head, Physiology Dept., Scientific Research Testing Institute of Aviation Medicine - "A survey" (Section b)

LEBEDINSKIY, A. V., Corresponding Member, Academy of Medical Sciences USSR - "Biological applications of isotopes" (Section c)

MOSKALENKO, E., Sechenov Institute of Evolutionary Physiology, Academy of Sciences USSR, Leningrad - "Peculiarities of absorption of ultrahigh frequency radiation in tissues of the body" (Section d)

- PARIN, V. V., Prof., Active Member, Academy of Medical Sciences USSR - "Development of ballistocardiographic techniques in the USSR" (Section g)

AGADZHANYAN, N.A., mayor med.sluzhby; VAKAR, M.I., podpolkovnik med.sluzhby; TSIVILASHVILI, A.S., mayor med.sluzhby; MALKIN, V.B.; CHERNYAKOV, I.N., kapitan med.sluzhby

Reaction of the human cardiovascular system during hypoxia. Voen.-med.zhur. no.2:65-69 F '60. (MIRA 13:5)
(ANOXEMIA physiology)
(CARDIOVASCULAR SYSTEM physiol.)

IVANOV, P.N.; KUZNETSOV, A.G.; MALKIN, V.B.; POPOVA, Ye.O.

Decompression phenomena in the human body at extremely low atmospheric pressures. Biofizika 5 no. 6:704-709 '60. (MIRA 13:10)

(DECOMPRESSION SICKNESS)

GAZENKO, O.G., kand.med.nauk; MALKIN, V.B., kand.med.nauk

Problems in space flight. Zdorov'e 6 no.9:4-5 S '60. (MIRA 13:8)
(SPACE FLIGHT)

17-2000

86168
R/002/60/ 000 /009/001/003
A125/A026

AUTHORS: Gazenco, O.G. and Malkin, V.B., Candidates of Medical Sciences

TITLE: Can Man Live Without Weight

PERIODICAL: Ştiinţă şi Tehnică, 1960, No. 9, pp. 14-15

TEXT: Subject article presents some problems regarding the life in space, i.e., in a state of weightlessness. Since no man yet was in space, Scientists were restricted to study these problems on the basis of simulated conditions. The German cardiologist Langer believed that an absolute loss of weight would have fatal consequences. But, the results obtained during the flight of the Soviet satellite having the dog Laika on board, and especially after the recovery of the second Soviet space ship having various animals on board, proved him wrong. The electrocardiogram and the recordings of the respiratory tract revealed a normal functioning of these organs. Although there are no data on the influence of the weightlessness on the digestion, it is supposed that this function will not be considerably impaired. Weightlessness will almost not disturb at all the activity of plants. The behavior of man in weightless state was studied during parabolic flight trajectories of aircraft. Many experiments were conducted to

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Can Man Live Without Weight

R/002/60/000/009/001/003
A125/A026

establish the feelings of pilots in weightless state. Based on the data obtained, scientists believe that disturbances of the physiological functions due to a state of weightlessness will not be too great. Another important problem is the return of the man from space, i.e., a passing from the state of weightlessness to normal weight. The unfavorable influences of the weightlessness can be eliminated by producing an artificial gravity based on the centrifugal force. The results of all these examinations show that life is possible also under the conditions of weightlessness. There are 2 figures and 1 photograph.

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86341

S/025/60/000/010/004/007
A166/A029

17.1156
17.1520

AUTHOR: Malkin, V., B. Candidate of Medical Sciences

TITLE: Space Flight and the Problem of Feeding

PERIODICAL: Nauka i zhizn', 1960, No. 10, pp. 18-23

TEXT: Space flight presents certain problems in feeding. Cooking is impossible because of the lingering fumes. No crumbly foods can be eaten because they disintegrate in the mouth under the effects of weightlessness and the particles penetrate the respiratory tracts, causing severe coughing and possible inflammation of the lungs. Weightlessness may also weaken the sphinctor of the oesophagus so that food may easily be forced back into the mouth . To prevent this, the pressure in the stomach must be reduced. Food could be taken frequently in small portions. Water can be drunk: 1) under an artificial gravity, 2) from long-necked plastic bottles, 3) in the form of a jelly with some binding substance. The last method was used for the dogs Belka and Strelka on the second Soviet spaceship. The animals' feed contained: meat, sausage, combined fat, groats, water, agar-agar and basic vitamins and was presterilized in an autoclave at 115°C. To reduce the spaceman's evacuatory needs to a minimum he could be fed on a special highly -assimilable liquid nutrient mixture (meat, rice, eggs, sugar, fruit juice,

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Space Flight and the Problem of Feeding

tea and coffee) with a low ballast residue. For longer space flights, however, some other system of providing food is needed since the amount of payload which could be devoted to food and provisions is limited. Intensive research is now being conducted into a "closed ecological cycle" for space ships, whereby the human waste products could be utilized for nutrient media in hydroponics (developed in the USSR by K.A. Timiryazev). The first experiments along this line were made by F.A. Tsander who cultured plants in water with human waste products in a ratio of 1 : 1200 and suggested that this method might be suitable for space flight, since the plants would absorb the excess CO_2 and liberate oxygen. Tsander experimented with the cultivation of peas, cabbage and other vegetables on charcoal, a light "soil" for space ships. Tests with plants suggest that monocellular green algae might be very suitable for the purpose since they are very resistant and can utilize about 7 % of the sun's energy for the purpose of growth (they increase their mass 7-fold in 24 hours). Some algae can be cultivated on synthetic media and synthesize a large amount of protein, fats, carbohydrates and vitamins. Chlorella contains up to 50 % protein, 25 % fat, 15 % carbohydrates and 10 % mineral salts, including vitamins A, B and C. It can also readily utilize human waste products. Experimental installations containing 230 liters of algae suspension (in a concentration of 10 grams per liter) should liberate no less than 20 liters of

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A166/A029

Space Flight and the Problem of Feeding

oxygen a day and have a dry substance increase of 23 grams per liter, i.e., sufficient for one man's oxygen and food requirements. The second Soviet space ship contained Chlorella to test the effects of space flight on its growth. One of the main problems is to adjust the rate of algae increase exactly to man's needs, i.e., achieve a biological balance. Moreover, Chlorella would give an unusual diet of 50 % protein, only 15 % carbohydrates and a great mass of cellulose. It is not sure whether man could stand such a diet for long and some researchers now argue that it might be better to use a combination of biological and chemical synthesis of food products.

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27 2800 (3212)

23653
R/002/61/000/001/003/005
A231/A126

AUTHOR: Malkin, V., Candidate of Medical Sciences (Moscow)

TITLE: Alimentation in space

PERIODICAL: Ştiinţă si Tehnică, no. 1, 1961, 16 - 17

TEXT: The article reviews the alimentation possibilities for space ship crews during a flight. Investigations on the alimentation in space are conducted in different directions, depending on the duration and purpose of the space flight. In case of a short flight lasting only a few days or weeks, there are no really great problems. The food of the crew should consist of saccharoses, albumen and fat, plus a great quantity of C-vitamine. Canned food has to be taken along since cooking is not possible in the space ship. Some difficulties arise because of the weightlessness. A fractionated alimentation with small quantities of food seems to be very advantageous. Another difficult problem is the drinking of water. Scientists recommend the use of jellified water combined with food. This method has been already used in the feeding of the animals in the second Soviet satellite and of the dogs Belka and Strelka in the second space ship. The jelly

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Alimentation in space

used consisted of water, meat, fats and floury substances. The food for a short flight should be prepared in such a way that the crew could eliminate as little excrements as possible. The alimentation during a longer flight presents more difficult problems. Tsiolkovskiy has already worked out the idea of the closed circuit of the necessary substances. He has recommended the use of terrestrial plants cultivated in liquid media. First successful experiments have been conducted by the Soviet scientist F. A. Tsander. Tsiolkovskiy has also recommended the use of very fertile plants, such as bananas, and some western researchers the use of pumpkins. Tsander has conducted experiments with charcoal to be used instead of earthy soils for the cultivation of plants. Because of their considerable advantages, algae have been selected by many scientists to be the most important food supply on board of a space ship. They are resistant, grow very fast, can easily be cultivated in artificial media and synthetize a great quantity of proteins, fats, saccharoses and vitamines. They also re-utilize almost all substances eliminated by the human organism and they produce oxygen. To prove the influence of the algae on the flying conditions, different species of algae were introduced on board of the second Soviet space ship. The greatest dif-

23653
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A231/A126

Alimentation in space

ficulty in the use of plants in space ships represents the establishment of a very accurate biological equilibrium. In order to prevent the biological equilibrium's disturbance, some scientists recommend the use of biological processes as well as the chemical synthesis of the food substances. There are 4 figures.

X

Card 3/3

S/177/61/000/004/001/001
D264/D305

AUTHORS: Agadzhanyan, N.A., Major, Medical Corps, Candidate of Medical Sciences, and Malkin, V.B., Candidate of Medical Sciences

TITLE: Questions of ensuring the safety of high-altitude flights; A review of foreign literature

PERIODICAL: Voyenno-meditsinskiy zhurnal, no. 4, 1961, 62-66

TEXT: The authors describe various high-altitude compensating suits developed in the west. Among the suits of which details are given are: that developed by Henry, Drury, Grady and Bennet; the T-1 suit; the suit developed in 1957 for the X-15 plane; the MC-4 suit; the French "Seva-10" suit; the US MC-2 suit (as compared with the MC-3A and MC-4 suits). Hall and Martins' research on prolonged flights at heights "equivalent to space" in a BMC suit is also discussed. The article ends with a brief

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S/177/61/000/004/001/001
D264/D305

Questions of ensuring ...

summary of recent foreign research on measures for protection against high temperatures. There are 2 non-Soviet-bloc references. The references to English-language publications read as follows: Washington " Evening Star" April 1957; Aerospace Medicine No. 2, 1960.

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17.2250
27.2500

32556
S/177/61/000/006/001/003
D298/D305

AUTHORS: Babushkin, V.I., Lieutenant-Colonel, Medical Corps, Candidate of Medical Sciences, Isakov, P.K., Colonel, Medical Corps, Candidate of Biological Sciences, Malkin, V.B., Candidate of Medical Sciences, and Usachev, V.V., Lieutenant-Colonel, Medical Corps, Candidate of Medical Sciences

TITLE: Some changes in higher nervous activity under acceleration

PERIODICAL: Voyenno-meditsinskiy zhurnal, no. 6, 1961, 54-58

TEXT: Because of the effects of acceleration in flight on the brain the authors studied the functional state of the higher sections of the central nervous system under radial acceleration. Radial acceleration was effected in a centrifuge with a seat equipped for recording motor reflexes and studying the structure of certain special volitional movements. The first series of tests studied the state of conditioned motor reflexes to light and sound stimuli under varying degrees of acceleration.

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Some changes in higher ...

The results showed that under relatively low acceleration of 3-4 g a slight increase in the latent period of the motor conditioned response was noted. As the experiment was repeated, the difference in the latent period became less marked. At greater accelerations of 5-6 g the picture was different. While the latent period of response to a sound stimulus increased slightly, there was a marked increase in the latent period of response to light stimulus. To check the pilot's work capacity under acceleration a second series of tests studied the effects of acceleration on motor actions simulating working movements that a pilot has normally to make. It was found that the changes in the structure of the motor action varied with the degree of acceleration and the plane in which the activating arm moved. The most marked increase in movement time was noted when the arm was shifted in a direction opposite to the action of the centrifugal force. When the arm was moved in a plane perpendicular to the action of centrifugal forces, the movement time increased only slightly. When an anti-gravity suit was worn under only slight acceleration, the latent period of conditioned motor reflexes

Some changes in higher ...

to light and sound stimuli increased slightly. With greater acceleration, the latent period changed much less than when no anti-gravity suit was worn. The use of an anti-gravity suit also led to less marked changes in the structure of working movements. Various researchers have noted that increasing acceleration leads to progressive drop in the blood pressure of the cerebral vessels. The use of an anti-gravity suit, however, helps maintain blood circulation at a high level. This is corroborated by the authors' previous research (1954-56): persons wearing an anti-gravity suit and subjected to acceleration had a higher blood pressure in the brachial artery than persons with no anti-gravity suit. The authors view this as experimental proof that the increased resistance to acceleration afforded by an anti-gravity suit derives mainly from compensation of the shifts in the blood circulation system. The authors disagree with certain Soviet researchers (G.L. Komendantov, 1952; D.M. Savin, 1953), who attribute the profound disturbances in the activity of the central nervous system caused by acceleration to afferent pulsation from the interoreceptors of the viscera. The authors assert that in the present case afferent pulsation from these receptors has no

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Some changes in higher...

definite significance; the disturbances are obviously caused by dystrophy of cerebral blood circulation as a result of the drop in blood pressure in the cerebral vessels. The visual disturbances under acceleration are probably caused by dystrophy of the peripheral section of the visual analyzer, i.e., the retina. On the basis of their observations the authors conclude that sound signaling is preferable to visual signaling in flying and could be used as a basis for a more rational distribution of control levers and switches in a plane's cabin. There are 2 tables and 2 figures.

SUBMITTED: November, 1960

Card 4/4

GURFINKEL', V.S.; MALKIN, V.B.; TSEYTLIN, M.L.

Method for electric stimulation of the heart. Biofizika 6 no. 1:125-126 '61. (MIRA 14:2)
(ELECTROCARDIOGRAPHY)

GURFINKEL', V.S. (Moskva, A-319, 1-y TSvetkovskiy per., d.19, kv.43);
MALKIN, V.B.; TSETLIN, M.L.; KHUDYAKOV, A.V.

Roentgenography of the heart during phases of the cardiac cycle selected at random. Vest. rent. i rad. 36 no.6:25-28 N-D '61.
(MIRA 15:2)

1. Iz Instituta eksperimental'noy biologii i meditsiny Sibirskogo otdeleniya AN SSSR i Matematicheskogo instituta imeni V.A.Steklova AN SSSR. (HEART--RADIOGRAPHY)

VLASOV, Yu.A.; GURFINKEL', V.S.; IVANOV, D.I.; MALKIN, V.B.; POPOVA, Ye.O.; SHIK, M.L.

Hemodynamic studies during the respiration of O_2 under excessive pressure. Biul. eksp. biol. i med. 51 no.4:22-27 Ap '61. (MIRA 14:8)

1. Iz Instituta eksperimental'noy biologii i meditsiny (dir. - prof. Ye.N.Meshalkin) Sibirskogo otdeleniya AN SSSR, Novosibirsk. Predstavlena deystvitel'nym chlenom AMN SSSR V.V.Parinym.

(BLOOD—CIRCULATION) (RESPIRATION)
(ATMOSPHERIC PRESSURE—PHYSIOLOGICAL EFFECT)

GURFINKEL', V.S.; MALKIN, V.B.; TSETLIN, M.L.; KHUDYAKOV, A.V.

Use of bioelectric signals of the heart for the purpose of control. Vop. pat. i reg. org. krov. i dykh. no.1:33-37 '61. (MIRA 18:7)

S/865/62/001/000/031/033
E028/E485

AUTHORS: Kovalenko, Ye.A., Malkin, V.B.

TITLE: A study of bioelectric potentials and oxygen tension in the brain tissues during hypoxia

SOURCE: Problemy kosmicheskoy biologii. v.1. Ed. by N.M.Sisakyan. Moscow, Izd-vo AN SSSR, 1962. 427-437

TEXT: The authors have investigated the effect of hypoxia upon the electro-encephalogram in dogs and rabbits. Electrodes were previously implanted in the motor cortex and thalamus, and the oxygen tension of the brain tissues was simultaneously recorded polarographically from the same electrodes. [Abstracter's note: No details of the method are given.] Respiration and the electro-cardiogram were also recorded. Acute hypoxia was produced by causing the animals to breathe a gas mixture poor in oxygen, and also by placing them in a low-pressure chamber. In the electro-encephalogram there was an initial phase of high-voltage slow waves of increasing amplitude which passed off as hypoxia continued and was followed by a phase of depression, in which the potentials were reduced and the slow waves became infrequent. In some

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animals changes appeared in the electro-encephalogram when the oxygen tension of the brain tissue had fallen by only 20 to 25% of the initial value but it was not possible to observe a strict correlation between oxygen tension and the extent of the electro-encephalographic changes. There are 3 figures.

MALKIN, V.B.; YURKOV, A.F.

Resistance of adrenalectomized and hypophysectomized rats to acute oxygen deficit. Probl.kosm.biol. 2:393-398 '62.
(MIRA 16:4)

(ANOXEMIA) (PITUITARY BODY) (ADRENAL GLANDS)

ACCESSION NR: AT4042650 S/0000/63/000/000/0047/0051

AUTHOR: Babushkin, V. I.; Isakov, P. K.; Malkin, V. B.; Usachev, V. V.

TITLE: Physiological reactions to radial accelerations

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 47-51

TOPIC TAGS: acceleration effect, radial acceleration, cardiovascular system, respiratory system, pilot testing, work capacity, compensating reaction

ABSTRACT: Experiments to determine the effects of acceleration on various physiological functions and the work capacity of pilots were performed on centrifuges and in flights. Particular attention was paid to the effects of acceleration on the cardiovascular and respiratory systems. Examination of data indicated that persons able to withstand accelerations of 6 to 7 g reacted to acceleration stress by an increase in arterial pressure, the heartbeat rate, and the respiration rate. These indices were less well defined in persons who could not withstand acceleration well. Analysis of experimental data has shown that an increase in pulmonary

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ACCESSION NR: AT4042650

ventilation accompanies acceleration stress. The pulmonary ventilation of pilots subjected to an acceleration stress of 5 g increases more than two fold. This effect can be reduced considerably by the use of high-altitude pressure suits. When pilots are subjected to accelerations of between 5 and 6 g, oxygen consumption almost doubles and the production of CO_2 by the body increases significantly. Results of experiments on gas exchange have indicated that during the first five minutes after acceleration has taken effect, the consumption of oxygen remains increased while the respiration coefficient remains close to 1. This indicates that acceleration causes a significant increase in the intensity of the metabolic processes. The use of a high-altitude pressure suit reduces the consumption of oxygen and of energy requirements. The development of compensating reactions during acceleration, such as the increase of muscle tone, the increase of the functional activity of the cardiovascular system, and the increase in respiration, brings about an increase in energy requirements. The use of a high-altitude pressure suit has the effect of relieving the organism of part of the "load," thereby increasing the physiological capabilities of the pilot.

ASSOCIATION: none

Card 2/3

ACCESSION NR: AT4042650

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AT4042657 S/0000/63/000/000/0072/0075

AUTHOR: Beregovkin, A. V.; Buyanov, P. V.; Malkin, V. B.

TITLE: Respiration and gas exchange during acute hypoxia

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 72-75

TOPIC TAGS: hypoxia, respiration, gas exchange, diagnostic tool, low oxygen mixture, respiratory volume, oxygen consumption

ABSTRACT: Hypoxia is a recognized diagnostic tool for determining the reserve potential of the nervous system, respiration, and circulation in healthy individuals. It is also a useful mechanism for detecting the initial stages of some diseases. The purpose of this study was to determine some general mechanisms of breathing through individual response to acute hypoxia in 54 healthy male subjects aged 20--23 years. The medium for producing

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ACCESSION NR: AT4042657

acute hypoxia consisted of an oxygen-nitrogen mixture (9.3--10.9% oxygen in the first series and 8.0--8.5% oxygen in the second). Investigations were conducted following prolonged sleep, on an empty stomach, and when subjects were in a supine position. Frequency, depth and rhythm of respiratory movement, and the maximum capacity of the lungs were measured spirographically. Lung ventilation was measured using a gasometer, and gas exchange was determined by the Douglas-Holden method. In the first series, (9.3--10.9% oxygen), the mean increase in lung ventilation was 24% whereas in the second series the increase was 47%. Respiratory volume increased by 28% in the first series and 51% in the second. Oxygen consumption in the first series fell 11% in the first 15 min but reached 98% of the normal value after 50 min. In the second series, oxygen consumption fell 71% and reached only 79% of the normal value by the end of the test. Respiration rate did not vary appreciably in either series. The authors conclude that low resistance to hypoxia is indicated by a lack of noticeable change in the volume of lung ventilation or a sharp rise thereof (greater than 100%), decreased depth of breathing, decreased vital capacity of the lungs (40% and more), and a sharp

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ACCESSION NR: AT4042657

drop in gas exchange during the initial stages of a hypoxia probe followed by delayed normalization.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

MAIKIN, V.B., kand. med. nauk; TERENT'YEV, V.G., polkovnik meditsinskoy sluzhby, kand. med. nauk

Epileptic seizures caused by hypoxemia. Voen.-med. zhur. no.6:49-50 '64. (MIRA 18:5)

AUTHOR: Malkin, V. B.; Asyamolova, N. M.; Izosimov, G. V.; Monakhov, K. K.

TITLE: The bioelectrical activity of an isolated section of the cerebral cortex of rabbits during acute hypoxia

SOURCE: AN SSSR. Izvestiya. Seriya biologicheskaya, no. 4, 1965, 584-591

TOPIC TAGS: bioelectrical activity, acute hypoxia, cerebral cortex, humoral effect, neural isolation

ABSTRACT: Experiments on the bioelectrical activity of the cortex during the development of hypoxia were conducted with an isolated cortical section in order to exclude afferent influences and retain humoral ones. Twelve adult rabbits were used. For six animals, only the spontaneous bioelectrical activity of the section was recorded; for the other six, additional electrical stimulation of the section (15 x 7 x 3 mm) with a Neurovar stimulator (frequency, 5—8 sec; pulse duration, 5 m/sec) was employed. After trephination, a parietal area of the cortex was completely isolated from the underlying tissue. Blood supply was maintained through the soft meninx. Acute hypoxia was induced by placing the animals in an altitude chamber

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ACCESSION NR: AP5017767

0

where they rapidly "ascended" to 12,000 m. The animals were kept at this altitude until the bioelectrical activity of the brain had been completely supressed, after which conditions were rapidly normalized. In the first series of experiments, it was found that spontaneous bioelectrical activity was retained in the cortical section 2--3 hr after isolation, which was considerably longer than in previous experiments. In the altitude chamber, depression of bioelectrical activity developed almost simultaneously in the isolated section and in the intact cortex. When direct electrical stimulation of the section was employed, increase of excitability was expressed in a lowering of the threshold voltage causing a direct response or in increase in the amplitude of direct cortical response. With direct electrical stimulation, the increase in excitability takes place earlier during the gradual development of hypoxia (at 2000 m). Changes in bioelectrical activity are thus not connected with afferent impulses, as had been previously suggested. It was concluded that hypoxia in conditions of neural isolation has a direct stimulating effect on cells of the cerebral cortex, which is transmitted along humoral pathways. This stimulating effect begins to show in the isolated cortical section at comparatively low altitudes, while there are still no visible changes of bioelectrical activity in the intact cortex. A period of increase in excitability in the isolated cortex precedes intensification of spontaneous discharge activity. The maximum increase of excitability and of spontaneous discharges in the isolated cortical section corresponds to the beginning of the phase of synchronous slow waves in the cor-

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tex of the intact hemisphere. At comparatively high altitudes (11,000—12,000 m), a sharp drop in the excitability of the isolated cortex is observed with the simultaneous disappearance of spontaneous bioelectrical activity. Orig. art. has: 3 figures and 1 table. [JS]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: LS

NO REF SOV: 004 OTHER: 004 ATD PRESS: 4058

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IVANOV, D.I.; MALKIN, V.B.; POPKOV, V.L.; POPOVA, Ye.O.; CHERNYAKOV, I.N.

Automatic analysis of diurnal periodic changes in the human electroencephalogram. Probl. kosm. biol. 4:642-644 '65. (MIRA 18:9)

L 11259-66 RD
ACC NR: AT5003902 SOURCE CODE: UR/2865/65/004/000/0642/0645

AUTHOR: Ivanov, D. I.; Malkin, V. B.; Popkov, V. L.; Popova, Ye. O.; Chernyakov, I. N. 13 B41

ORG: none

TITLE: Automatic analysis of diurnal periodic changes in human EEG rhythms

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 642-645

TOPIC TAGS: electrophysiology, man, brain

ABSTRACT: Existing studies of circadian variations in EEG rhythms are of limited value for establishing norms against which to evaluate EEG effects of external environmental factors, since they are almost always collected from patients in pyschiatric hospitals or from healthy individuals during natural sleep. In addition, all existing studies have relied on visual analysis of EEG traces.

In the present study, the EEG's of healthy male subjects were taken 4 times daily (10 a. m., 5 p. m., 1 a. m., and 5 a. m.) for 10 to 30 days.

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Bipolar leads (frontal and occipital) were used. EKG's, pneumograms, and arterial blood pressure were simultaneously recorded.

Frequency analysis of EEG's (after band filter separation of the delta-, theta-, alpha-, and beta-rhythms) yielded data on frequency shifts in individual physiological rhythms. Total EMF (total bioelectric intensity) of the EEG's and the bioelectric intensity of individual biocurrent rhythms were obtained as ratios on an integrator.

Frequency analysis of the EEG's showed that delta- and theta-waves are always present in the waking state, a fact never ascertained by visual analysis of EEG traces owing to the masking effect of the higher frequency alpha- and beta-rhythms. These results cast doubt on the established theory that delta- and theta-waves appear in the EEG only during deep inhibition of the CNS (by drugs or sleep) or in pathological states (hypoxia, psychic disturbances, coma, etc.).

The observation of delta- and theta-waves under the latter conditions is due to increased amplitude of the slow rhythms and probably also to reduced alpha- and beta-activity in the cerebral cortex. However, delta- and theta-rhythms are always present, and can be recorded both in the waking and sleeping states.

The general EEG picture over a 24-hr period is thus not determined by the alternation of rhythms. The alpha-rhythm is most nearly characteristic of the overall circadian EEG picture.

Most of the 5-p.m. EEG's show a 1 to 2 cps shift of the dominant alpha-rhythm toward higher frequencies by comparison with the morning EEG's (see figure). In the sleeping EEG spectograms, the characteristic daytime alpha-spike was absent and the number of low-frequency alpha waves was greater. Distribution of alpha-waves was comparatively even over the whole range (8 to 13 cps) of the alpha-wave pass filter. The total number of alpha-waves was less than in daytime EEG's.

Nighttime waking EEG's (5 a. m.) generally showed at alpha-rhythm picture close to that of 5-p. m. EEG's (at the end of the working day), and in some cases an alpha-rhythm distribution similar to that of sleeping EEG

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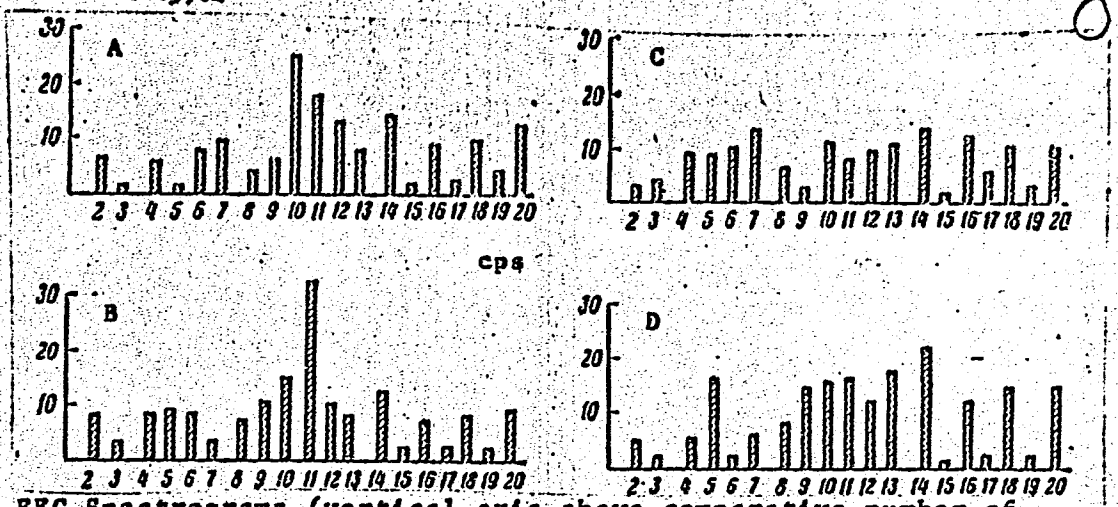

EEG Spectrograms (vertical axis shows comparative number of waves of each frequency)

A - 10 a.m.; B - 5 p.m.; C - 1 a.m. (sleeping); D - 5 a.m. (waking). 2-3 cps = delta-rhythm, 4-7 cps = theta-rhythm, 8-13 cps = alpha-rhythm, 14-20 cps = beta-rhythm

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As stated above, delta- and theta-waves were never absent from the EEG's. The total number of delta- and theta-waves isolated by the pass filter, always several times less than the total number of alpha- and beta-waves, varied greatly: delta-waves from 1 to 15 in 10 sec, theta-waves from 15 to 56 in 10 sec. No clearcut dependence could be established between the number of delta- and theta-waves and the time of day.

The total EMF and the EMF's of the theta-, alpha-, and beta-rhythms individually were fairly consistent for a given time of day. The lowest EMF's were noted in the morning and the highest at night during sleep. The 5-p.m. EMF was generally higher than the 10-a.m. EMF. Evenings EMF's were higher both with eyes closed and with eyes open. The eyes-closed EMF was more pronounced (143%--300% of the eyes-open EMF).

Eyes-closed theta- and beta- EMF's changed very little or not at all. It is concluded that EMF changes in waking EEG's are due primarily to alpha-EMF changes. Increased EMF during sleep results not from greater numbers of delta- and theta-waves, but from increase in their amplitude.

Orig. art. has: 1 figure. [ATD PRESS: 4091-F]

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AUTHOR: Malkin, V. B.; Bogacheva, I. D.; Martens, V. K.; Roshchina, N. A.

ORG: none

TITLE: Mechanism of adaptation to hypoxia [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, 270-272

TOPIC TAGS: high altitude physiology, hypoxia, alpine acclimatization, adrenal gland, pituitary gland, cerebral cortex

ABSTRACT:

The roles of the adrenals, hypophysis, and cerebral cortex in mammalian adaptation to prolonged conditions of lowered barometric pressure were studied in 3 series of experiments on half-grown white rats: in series 1 the animals had undergone adrenalectomy; in series 2, hypophysectomy; and in series 3, preliminary unilateral or bilateral decortication.

The hypophysectomized and adrenalectomized rats were acclimatized to alpine conditions: 14 days at an altitude of 2000 m, and 14 to 20 days at an

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altitude of 3800 m. Decorticated and adrenalectomized rats were also acclimatized to pressure-chamber altitudes of 3000 to 7000 m.

Controls were hypophysectomized, adrenalectomized, and decorticated animals which were not exposed to high altitudes, and intact animals some of which were exposed to high altitudes and some of which were not.

Indices of adaptation were body weight, arterial blood shifts, and tolerance of acute hypoxia.

Weight gain lagged in all the altitude-acclimatized animals, more so in the intact animals than in the adrenalectomized and decorticated rats. This difference was least in the hypophysectomized rats.

After prolonged exposure to rarefied atmospheres, increased peripheral erythrocyte, reticulocyte, and hemoglobin counts were seen in the intact, adrenalectomized, and decorticated rats. Hypophysectomy caused erythrocytes and hemoglobin to decrease; in these rats, prolonged exposure to high altitude did not stimulate erythropoiesis or increase hemoglobin. This indicates the direct participation of hypophyseal hormones in hematopoiesis stimulation during hypoxia.

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Both the alpine- and pressure-chamber acclimatized rats displayed increased tolerance of acute hypoxia. Increase in tolerance in the intact and adrenalectomized rats was almost identical, even though adrenalectomy usually decreases altitude tolerance in animals not already acclimatized to high altitudes. In most cases hypophysectomy decreased altitude tolerance slightly. Hypophysectomized animals acclimatized to high altitude showed a reliable increase in resistance to acute hypoxia. Unilateral or bilateral decortication substantially increased altitude tolerance, and acclimatization of these animals to rarefied atmospheres only slightly increased their tolerance of acute hypoxia.

It is concluded that removal of the hypophysis and adrenals no more prevents the development of adaptation to hypoxia than does decortication.

[W. A. No. 22; ATD Report 66-116]

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SOV/32-24-10-65/70

AUTHORS: Lukin, V. V., Vaksman, S. S., Dolzhanskiy, A. I., Berezin, V. I., Malkin, S. Z., Moldaver, T. I.

TITLE: News in Brief (Korotkiye soobshcheniya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 10, pp 1292-1293 (USSR)

ABSTRACT: V. V. Lukin (Moskovskiy inzhenerno-fizicheskiy institut) (Moscow Technological-Physical Institute) suggests a new method of determining the maximum plasticity of metals by the destruction of crosspieces (obtained by the drilling of two holes at the ends of the metal piece to be investigated). The crosspieces are destroyed by pressing a special instrument into the bore holes (Figure). The tests are carried out with the testing machine -5. The measurements of the crosspiece prior to and after the test are carried out by means of a metallographical microscope. The idea of this testing method comes from M. P. Markovets (Ref 1). S. S. Vaksman (Vsesoyuznyy nauchno-issledovatel'skiy institut avtogennoy obrabotki metallov) (All-Union Scientific Research Institute for the Autogenous Treatment of Metals) mentions that at this institute an electric furnace with a capacity of 15 kg was constructed for the melting of cast-iron and non-ferrous

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metals. The highest operation temperature of the furnace is 1600°, the current being supplied by a transformer STE -34. A. I. Dolzhanskiy (zavod "Elektrostal'") ("Elektrostal'" Factory) wrote that the crack detector according to L. K. Tatochenko, V. V. Lyndin et al. (Ref 1) was completed. According to a suggestion by the foreman A. A. Polyakov two permanent magnets EKh9K15M were used for the holding device. V. I. Berezin, S. Z. Malkin completed the laboratory jaw crusher 58-IK. To secure a higher resistivity the casing will be made of steel type St. 25-4518. The other modifications are explained by diagrams. T. I. Moldaver (Berdskiy radiozavod) (Berdsk Wireless Factory) recommends the use of Teflon rings of a thickness of 2 mm in carbon analyses in Mars furnaces to protect the rubber sealings on the porcelain tubes. There are 3 figures and 2 references, which are Soviet.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Technological Physical Institute); Vsesoyuznyy nauchno-issledovatel'skiy institut avtogennoy obrabotki metallov (All-Union Research Institute for the Autogenous Treatment of Metals); zavod "Elektrostal'" ("Elektrostal'" Factory); Berdskiy radiozavod