5 (3)

AUTHORS: Shostakovskiy, M. F., Vasil'yev, [illegible], SOV/62-59-5-39/42
Sidel'kovskaya, F. P., Morgunova, Ye. S., Belenskaya, M. S., Gyul'bademova, N. M.

TITLE: Investigation in the Field of Lactones and Lactams (Issledovaniye v oblasti laktonov i laktamov). Communication 15. Preparations of Polyvinylpyrrolidones Having Different Molecular Weights and Their Physico-Chemical Properties (Soobshcheniye 15. Preparaty polivinilpirrolidona razlichnogo molekulyarnogo vesa i ikh fiziko-khimicheskiye svoystva)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 5, pp 896-900 (USSR)

ABSTRACT: "Block polymerization" of vinylpyrrolidone under the effect of H_2O_2 and of dinitrile of azoisobisic acid, and polymerization in aqueous solutions (Refs 3, 5) had been investigated at the Institute mentioned under Association. In connection with it, the physico-chemical properties of various preparations of polyvinylpyrrolidone (PVP) were investigated in this work because these properties are very important for the investigation of the biologic activity of the preparations.

Card 1/3

The preparations can be obtained in various ways; therefore, they may exhibit slight deviations from their physico-chemical characteristics. (Table 1: physico-chemical characteristics of (PVP) solutions as produced in various countries). The polymerization conditions for (PVP) from aqueous solutions in the presence of 30 % H_2O_2 and with 0.3-8.5 % concentrations of this initiator are summarized in table 2. The characteristics of salt water solutions of (PVP) being used as a plasmosubstitute are shown in table 3. Relative viscosity, osmotic pressure, and the molecular weight of the various preparations were determined. A comparison of the characteristics shows that those of (PVP) are more effective than those of the plasmosubstitute. 1.8 % H_2O_2 had to be used as initiator in order to obtain a highly effective polymer. The determination of the molecular weight and the investigation of the polydispersity of several preparations showed that the block polymers have a higher degree of polydispersity than those obtained in solutions. Moreover,

Investigation in the Field of Lactones and Lactams. SOV/62-59-5-20/40
Communication 15. Preparations of Polyvinylpyrrolidones Having Different Molecular Weights and Their Physico-chemical Properties

a method for obtaining biologically active sterile salt water solutions of the preparations has been worked out. There are 2 figures, 4 tables, and 21 references, 12 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry imeni N. D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: July 12, 1957

Card 3/3

VASIL'YEV, P.S., prof.; RUDASHEVSKAYA, M.M.

Influence of carbohydrates on the erythrocytes of the blood stabilized with natrog (sodium 2,3,4,-trioxglutaric acid). Probl. gemat. i perel. krovi 5 no.3:39-43 Mr '60. (MIRA 14:5)

1. Iz TSentral'nogo ordena Lenina instituta gematologii i perelivaniya krovi (dir. - deystvitel'nyy chlen AMN SSSR prof. A.A.Bogdasarov).
(BLOOD--COLLECTION AND PRESERVATION) (GLUTARIC ACID)
(GLUCOSE) (SUCROSE) (ERYTHROCYTES)

VASILYEV, P.S., PETROVA, M.P., GINZBURG, L.G., (USSR)

"The Role of Protein-Lipid Complexes and Osmotic Equilibrium in the Maintenance of Erythrocyte Structure (A Contribution to the Theory of Hemolysis and the Preservation of Blood.)"

Report presented at the 5th Int'l. Biochemistry, Congress, Moscow, 10-16 Aug 1961.

VASIL'YEV, Pavel Stepanovich; GOLIKOV, Andrey Dmitriyevich; GOROKHOV, Nikolay Stepanovich; KRIVONOSOV, Ivan Vasil'yevich; MURAV'YEV, V.M., red.; LAVROV, N.I., ved. red.

[Technology of interval hydraulic fracturing] Tekhnologiia pointerval'nogo gidravlicheskogo razryva plastov; opyt neftianikov Tatarii). Moskva, Izd-vo "Nedra," 1964. 131 p. (MIRA 17:6)

SIMONOV, P.M.; KROPANEV, A.I.; TIUNOV, V.Ye.; VASIL'YEV, P.T.; TURTSEVA, I.M.; SAKALDINA, Ye.D.; DYLDIN, Yu.N.; BRAYLOVSKIY, N.G., inzh., red.; MEDVEDEVA, M.A., tekhn. red.

[Advanced method for car inspection and repair in trains; experience of the technical inspection point of the Sverdlovsk-Sortirovochnaya Station of the Sverdlovsk Railroad] Peredovoi metod osmotra i remonta vagonov v poezdakh; opyt raboty punkta tekhnicheskogo osmotra stantsii Sverdlovsk-Sortirovochnyi Sverdlovskoi dorogi. Moskva, Transzheldorizdat, 1963. 39 p. (MIRA 17:3)

SIMONOV, P.M.; KROPANEV, A.I.; TIUNOV, V.Ye.; VASIL'YEV, P.T.; TURTSEVA, I.M.; SAKALDINA, Ye.D.; DYLDIN, Yu.N.; BRAYLOVSKIY, N.G., inzh., red.; MEDVEDEVA, M.A., tekhn. red.

[Advanced method for the inspection and repair of cars in trains] Peredovoi metod osmotra i remonta vagonov v poezdakh. Moskva, Transzheldorizdat, 1963. 39 p. (MIRA 16:10)

(Railroads--Cars--Maintenance and repair)

L 63751-65 EWT(d)/FSS-2/EEC-4

ACCESSION NR: AR5003352 S/0271/64/000/011/B016/B016
681.142.2

SOURCE: Ref. zh. Avtomatika, telemekhanika i vychislitel'naya tekhnika. Svodnyy tom, Abs. 11B99

AUTHOR: Vasil'yev, P. V.

TITLE: Criterion for evaluating the efficiency of discrete-information transmission systems

CITED SOURCE: Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR, vyp. 20, 1964, 128-139

TOPIC TAGS: discrete information transmission, discrete information transmission efficiency, error correcting code, error detecting code

TRANSLATION: A formula is developed for evaluating the efficiency E of discrete-information systems. When information is transmitted by binary codes and the probabilities of transmission of 0 and 1 are equal ($x_1 = x_2$), the efficiency is $E = \lg \frac{V_0 p_0 + V_1 p_1}{V_{n_0} p_{n_0} + V_{n_1} p_{n_1}}$, where V_0 and V_1 are the capacities of elementary packets that correspond to 0 and 1 before the application of redundancy coding; V_{n_0} and V_{n_1} are the same quantities after the application of redundancy coding; p_0 and p_1 are

Card 1/3

the probabilities of errors in reception of 0 and 1 before the application of redundancy coding; p_{n0} and p_{n1} are the same quantities after the application of redundancy coding. The redundancy coding is equivalent to a greater signal duration T, the signal being always higher than the noise H and the spectrum width being F: $H_0F_0 = H_{n0}F_{n0}$, $H_1F_1 = H_{n1}F_{n1}$. Considering the above, $E = \lg \frac{p_0T_0 + p_1T_1}{p_{n0}T_{n0} + p_{n1}T_{n1}}$

The error correction in a message is considered in the systems with automatic detection and request for repetition (ADRQ). The fidelity-improvement method requires that after each message, a summation check be transmitted whose elements are set up from the message elements according to a definite law. The same law is used at the receiving station for setting up a check from the received message; both checks are compared. If the checks do not tally, an error signal is sent back, and the transmitting station repeats the message. The following assumptions are made for determining the efficiency of the above method: the probabilities of erroneous reception of 0 and 1 are equal $p_0 = p_1 = p$, $p_{n0} = p_{n1} = p_n$; the elementary packets corresponding to 0 and 1 have equal durations $T_0 = T_1 = T$, $T_{n0} = T_{n1} = T_n$. The errors are distributed according to a binomial law. On the strength of the afore-said, the efficiency is:

L 63751-65

ACCESSION NR: AR5003352

$$E = \lg \frac{p_k\left(1 + \frac{p_{nn}}{p_{k\bullet}}\right)}{\left(1 + \frac{\delta}{t_r^-}\right)},$$

where p_δ^* is the probability of failure to detect errors in a message containing b elementary packets, δ is the time between the end of the last character in a message and the beginning of the first character in the next message, t_{nn} is the

L 56039-65 EWT(d)/EED-2 Pac-4/Pae-2/Pj-4

ACCESSION NR: AR5012182 UR/0372/65/000/003/V046/V046
51:621.391

SOURCE: Ref. zh. Kibernetika. Svodnyy tom, Abs. 3V159

AUTHOR: Vasil'yev, P. V.

TITLE: A criterion for evaluating the effectiveness of discrete information transmission systems

CITED SOURCE: Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR, vyp. 20, 1964, 128-139

TOPIC TAGS: discrete information transmission, binary symmetric channel, reinquiry transmission, correction code

TRANSLATION: The author evolves certain considerations and concludes from these that the efficiency of data transmission through a binary symmetric channel can be characterized by the magnitude $\left\{E = 1 - \frac{p_0 r_{p_0} + p_1 r_{p_1}}{p_{p_0} r_{p_0} + p_{p_1} r_{p_1}}\right\}$

where p_0 and p_1, p_{p_0} and p_{p_1} represent the probability of errors in receiving

Card 1/2

L 56039-65
ACCESSION NR: AR5012182

zero and unit signals, respectively, prior to the use of coding and after its use, while T_i and T_{p_i} are the corresponding magnitudes for periods of elemental transmissions corresponding to signals 0 and 1 prior to and after coding.

[illegible] are found for some partial cases and [illegible] analyzing the efficiency of a transmitting [illegible] using group codes with an assigned number of verification symbols, and transmission by means of correction codes with or without the use of reinquiry. V. Prelov.

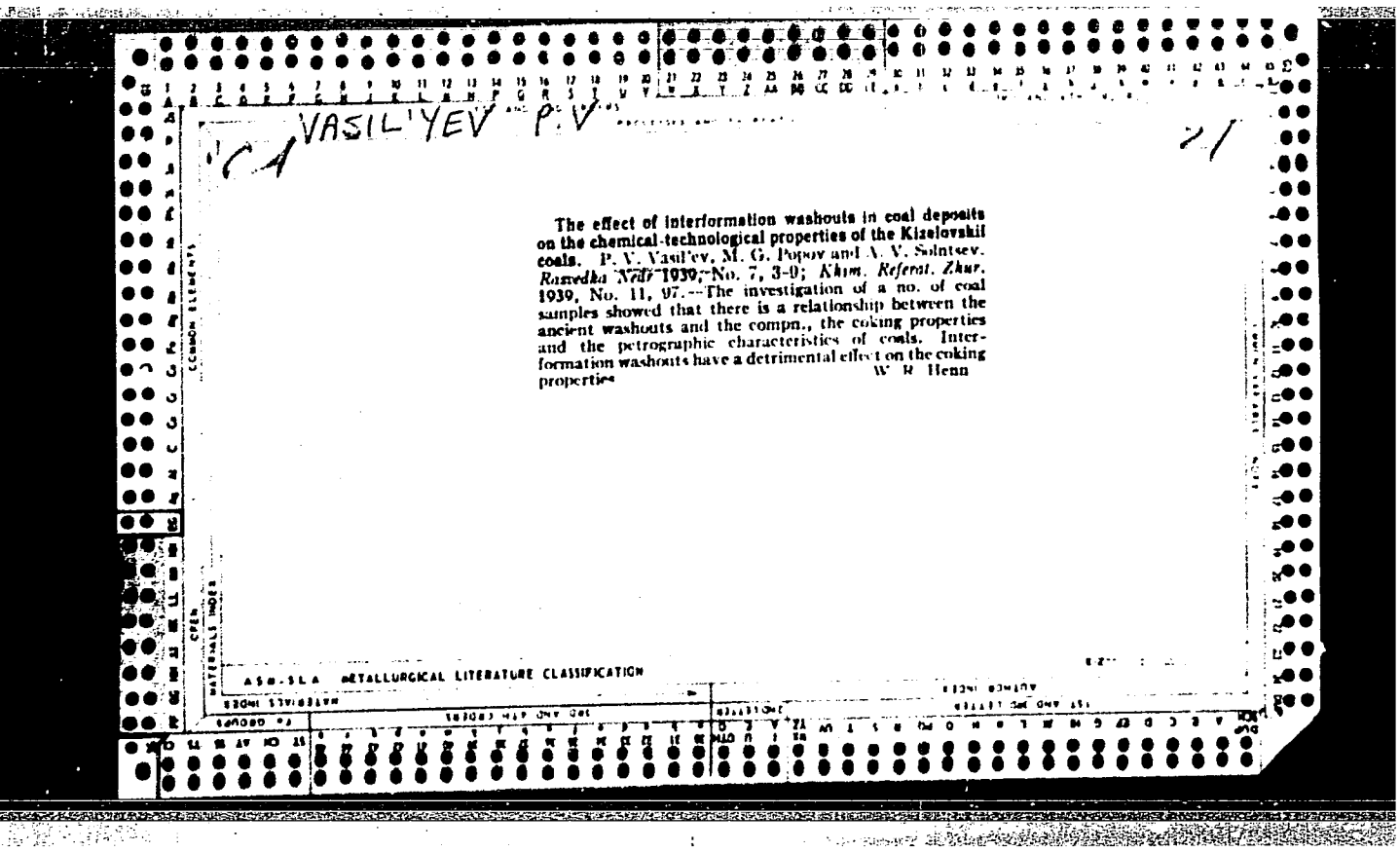
SUB CODE: DP, EC ENCL: 00

Card 2/2

BLOKHIN, N.N.; VASIL'YEV, P.V., kand. biol. nauk; LEBEDINSKIY, A.V., prof. [deceased]; YAZDOVSKIY, V.I., doktor med. nauk, prof.; CHERNOV, A.G.; NIKOLAYEV, V.R., red.

[Man in a space ship. Eighth discussion. Participants in the discussion: N.N.Blokhin and others] Chelovek v kosmicheskom korable. Beseda vos'maia. V besede uchastvuiut: N.N.Blokhin i dr. Moskva, Znanie, 1965. 30 p. (Novoe v zhizni, nauke, tekhnike. VIII seriia: Biologiia i meditsina, no.7) (MIRA 18:4)

1. Deystvitel'nyy chlen, prezident AMN SSSR (for Blokhin).
2. Deystvitel'nyy chlen AMN SSSR (for Lebedinskiy).



VASIL'YEV P. V.

21

The effect of interformation washouts in coal deposits on the chemical-technological properties of the Kizelovskii coals. P. V. Vasil'ev, M. G. Popov and A. V. Solntsev. *Razvedka Nedr* 1939, No. 7, 3-9; *Khim. Referat. Zhur.* 1939, No. 11, 97.—The investigation of a no. of coal samples showed that there is a relationship between the ancient washouts and the compn., the coking properties and the petrographic characteristics of coals. Interformation washouts have a detrimental effect on the coking properties

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

VASIL'YEV, P.V.

Methods of studying indeterminate coal-bearing strata as found in the Kizel coal fields. Trudy Inst.geol.nauk. no.90:53-69 '47. (MLRA 9:11)

(Kizel Basin--Coal geology)

VASIL'YEV, P.V.

Geology - Stratigraphic - Carboniferous

Paleogeographical conditions in the formation of coal bearing deposits of the Lower Carboniferous series of the western slope of the Urals. Reviewed by O. Yeinor., **Izv.** AN SSSR. Ser. geol., no. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1952 Uncl.

VASIL'YEV, P.V.

ABRAMOV, S.K., kand.tekhn.nauk; AVERSHIN, S.G., prof., doktor tekhn.nauk; AMMOSOV, I.I., doktor geol.-min.nauk; ANDRIYEVSKIY, V.D., inzh.; ANTROPOV, A.N., inzh.; AFANAS'YEV, B.L., inzh.; BERGMAN, Ya.V., inzh.; BLOKHA, Ye.Ye., inzh.; BOGACHEVA, Ye.N., inzh.; BUKRINSKIY, V.A., kand.tekhn.nauk; VASIL'YEV, P.V., doktor geol.-min.nauk; VINOGRADOV, B.G., inzh.; GOLUBEV, S.A., inzh.; GORDIYENKO, P.D., inzh.; GUSEV, N.A., kand.tekhn.nauk; DOKOKHIN, I.V., kand.geol.-min.nauk; KALMYKOV, G.S., inzh.; KASATOCHKIN, V.I., doktor khim.nauk; KOROLEV, I.V., inzh.; KOSTLIVTSEV, A.A., inzh.; KRATKOVSKIY, L.F., inzh.; KRASHENINNIKOV, G.F., prof. doktor geol.-min.nauk; KRIKUNOV, L.A., inzh.; LEVIT, D.Ye., inzh.; LISITSA, I.G., kand.tekhn.nauk; LUSHNIKOV, V.A., inzh.; MATVEYEV, A.K., dots., kand.geol.-min.nauk; MEFURISHVILI, G.Ye., inzh.; MIRONOV, K.V., inzh.; MOLCHANOV, I.I., inzh.; NAUMOVA, S.N., starshiy nauchnyy sotrudnik; NEKIPELOV, V.Ye., inzh.; PAVLOV, F.F., doktor tekhn.nauk; PANYUKOV, P.N., doktor geol.-min.nauk; POPOV, V.S., inzh.; PYATLIN, M.P., kand.tekhn. nauk; RASHKOVSKIY, Ya.Z., inzh.; ROMANOV, V.A., prof., doktor tekhn. nauk; RYZHOV, P.A., prof., doktor tekhn.nauk; SELYATITSKIY, G.A., inzh.; SPERANSKIY, M.A., inzh.; TERENT'YEV, Ye.V., inzh.; TITOV, N.G., doktor khim.nauk; GOKAREV, I.F., inzh.; TROYANSKIY, S.V., prof., doktor geol.-min.nauk; FEDOROV, B.D., dots., kand.tekhn.nauk; FEDOROV, V.S., inzh. [deceased]; KHOMENTOVSKIY, A.S., prof., doktor geol.-min.nauk; TROYANOVSKIY, S.V., otvetstvennyy red.; TERPIGOREV, A.M., red.; KRIKUNOV, L.A., red.; KUZNETSOV, I.A., red.; MIRONOV, K.V., red.; AVERSHIN, S.G., red.; BURTSEV, M.P., red.; VASIL'YEV, P.V., red.; MOLCHANOV, I.I., red.; RYZHOV, P.A., red.; BALANDIN, V.V., inzh., red.; BLOKH, I.M., kand. tekhn.nauk, red.; BUKRINSKIY, V.A., kand.tekhn.nauk, red.; VOLKOV, K.Yu., inzh., red.; VOROB'YEV, A.A., inzh., red.; ZVONAREV, K.A., prof. doktor tekhn.nauk, red.

(Continued on next card)

ABRAMOV, S.K.--- (continued) Card 2.

ZDANOVICH, V.G., prof., doktor tekhn.nauk, red.; IVANOV, G.A., doktor geol.-min.nauk, red.; KARAVAYEV, N.M., red.; KOROTKOV, G.V., kand.geol.-min.nauk, red.; KOROTKOV, M.V., kand.tekhn.nauk, red.; MAKKAVEYEV, A.A., doktor geol.-min.nauk, red.; OMEL'CHENKO, A.N., kand.tekhn.nauk, red.; SEMERZON, E.M., kand.geol.-min.nauk, red.; USHAKOV, I.N., dots., kand. tekhn.nauk, red.; YABLOKOV, V.S., kand.geol.-min.nauk, red.; KOROLEVA, T.I., red.izd-va; KACHALKINA, Z.I., red.izd-va; PROZOROVSKAYA, F.L., tekhn.red.; NADEINSKAYA, A.A., tekhn.red.

[Mining; an encyclopedia handbook] Gornoe delo; entsiklopedicheskii spravochnik. Glav. red. A.M.Terpigorev. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po ugol'noi promyshl. Vol.2. [Geology of coal deposits and surveying] Geologiia ugol'nykh mestorozhdenii i marksheiderskoe delo. Redkolegiia toma S.V.Troianskiy. 1957. 646 p. (MIRA 11:5)

1. Chlen-korrespondent AN SSSR (for Karavayev)
(Coal geology--Dictionaries)

VASIL'YEV, Petr Vasil'yevich; MALININ, Sergey Ivanovich; KOROLEVA, T.I., red.izd-va; SHKLYAR, S.Ya., tekhn.red.

[Effect of basic geological factors on the behavior of rocks in boreholes] Vliianie osnovnykh geologicheskikh faktorov na povedenie porod v gornykh vyrabotkakh. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1960. 92 p. (MIRA 13:3)
(Petrology)

VASIL'YEV, Petr Vasil'yevich; YERSHOV, A.D., glavnyy red.; KREYTER, V.M., zam. glavnogo red.; KALMYKOV, G.S., red; BRITAYEV, M.D., red.; KRASNIKOV, V.I., red.; MALYSHEV, I.I., red.; MOMDZHI, G.S., red.; SAAKYAN, P.S., red.; SMIRNOV, V.I., red.; SOLOV'YEV, D.V., red.; CHERNOSVITOV, Yu.L., red.; KHRUSHCHOV, N.A., red.; PANOVA, A.I., red.izd-va; GUROVA, O.A., tekhn.red.

[Coal] Ugol'. Moskva, Gos.nauchn.-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1960. 343 p. (Otsenka mestorozhdenii pri poiskakh i razvedkakh, no. 5) (MIRA 14:2)
(Mine examination) (Coal)

MATVEYEV, Aleksandr Kirillovich; VASIL'YEV, P.V., doktor geol.-mineral. nauk, retsenzent; KRAVTSOV, A.I., doktor geol.-mineral.nauk, retsenzent; IVANOV, G.A., doktor geol.-mineral.nauk, retsenzent; MIRONOV, K.V., nauchnyy red.; KOROLEVA, T.I., red.izd-va; KONDRAT'YEVA, M.A., tekhn.red.

[Geology of coal basins and deposits in the U.S.S.R.] Geologiia ugol'nykh basseinov i mestorozhdenii SSSR. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 495 p.
(MIRA 13:11)

(Coal geology)

CHERNOUSOV, Yakov Mikhaylovich; VASIL'YEV, P.V., red.; IZRAILEVA, G.A., red. izd-va; GUROVA, O.A., tekhn. red.

[Course in the general geology of coal deposits]Kurs obshchei geologii ugol'nykh mestorozhdenii. Moskva, Gosgeoltekhizdat, 1962. 294 p. (MIRA 16:1)

(Coal geology)

VASIL'YEV, P.V., doktor geologo-mineralogicheskikh nauk

Using geological observations in determining physiocomechanical properties of rocks. Nauch. soob. IGD 20:67-71 '63.
(MIRA 16:10)

(Rocks—Testing) (Geology, Stratigraphic)

VASIL'YEV, P.V. (Leningrad)

Effect of an increased and decreased oxygen content of inspired air on animals with cerebral anemia. Arkh.pat. 18 no.5:87-88 '56.
(MLRA 9:12)

1. Iz kafedry patologicheskoy fiziologii (nachal'nik - chlen korrespondent AMN SSSR prof. I.R.Petrov) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova.

(ANEMIA, experimental,
cerebral, eff. of oxygen content in inspired air (Rus))
(OXYGEN, effects,
on exper. cerebral anemia (Rus))

VASILEV, P.V.

EXCERPTA MEDICA Sec.2 Vol.9/12 Physiology,etc. Dec 56

5551. VASILEV P. V. Chair of Pathol. Physiol., Military Med. Acad., Leningrad. *Possibilities of development of neck-brain collateral circulation in mammals (Russian text) FIZIOL. Z. 1956, 42/5 (376-382) Tables 1 Illus. 2

The development of collateral circulation after successive ligation of carotid and vertebral arteries at different time intervals was best in dogs, and decreased in the following order: cats, rabbits, white rats and white mice. The general behaviour of the animals, pain sensitivity, pupil reflex, body temperature, respiration and mortality served as criteria. In dogs, simultaneous ligation of both common carotid arteries and 2 vertebral arteries did not produce signs of acute cerebral ischaemia, while in mice, ligation of the second carotid artery 13 to 42 days after ligation of the first one produced nearly 100% mortality. It is concluded that the potential development of collateral circulation improves with the development of the CNS.

Simonson - Minneapolis, Minn.

VASIL'YEV, P.V., SAKSONOV, P.P.

Characteristics of animal reactions to drugs in radiation injuries. Farm. i toks. 21 no.3:30-33 My-Je '58 (MIRA 11:7)

(COBALT, radioactive,
reaction of irradiated animals to various drugs (Rus))
(DRUGS, effects,
same (Rus))

VASIL'YEV, P. V.

USSR/Pharmacology and Toxicology - Miscellaneous Preparations V

Abs Jour : Ref Zhur - Biol., No 2, 1959, 9289

Author : Vasil'yev, P.V., Saksonov, P.P.
Inst :
Title : Pharmacology of Pyrogenic Bacterial Polysaccharides

Orig Pub : Byul. eksperim. biol. i med., 1957, 44, No 10, 77-80

Abstract : The preparation of pyrogenic polysaccharide (PP) obtained from the culture of Proteus vulgaris is nontoxic and has no local irritating effect. PP administered to rats, rabbits and dogs in doses of 1-2 γ /kg produces gradual rise of temperature (during $1\frac{1}{2}$-$2\frac{1}{2}$ hours). Thereafter, the body temperature decreases and returns to the initial level in 5-7 hours. Preliminary administration of novocain and urethane decreases this effect. PP has anti-inflammatory action. When PP is introduced in a dose of 500 γ /kg, a short-lived hypotension and respiratory depression is observed. -- A.M. Ivanitskiy

Card 1/1

BELAY, V.Ye.; VASIL'YEV, P.V.; SAKSONOV,P.P.

Data on the comparative pharmacological characteristics of various salts of mercamine. Farm. i tks. 23 no. 5:450-455 S-O '60.
(MIRA 13:12)

(ETHYLAMINE)

VASIL'YEV, P.V.; SAKSONOV, P.P. (Moskva)

Pharmacology of various high-molecular polysaccharides. Biul. eksp.biol.i med. 50 no.9:97-100 S '60. (MIRA 13:11)
(POLYSACCHARIDES)

BELAY, V.Ye.; VASIL'YEV, P.V.; SAKSONOV, P.P.; CHERNENKO, G.T.

Reactivity of the organism to durgs in radiation sickness. (MIRA 14:11)
Med.rad. no.11:72-78 '61.
(RADIATION SICKNESS)

VASILYEV, P. V., VOSKRESENSKIY, A. D. and GAZENKO, O. G.

"Some Problems of Experimental Space Physiology"

report presented at the 13th Intl. Astronautical Federation Congress (IAF)
Varna, Bulgaria, 23-29 Sep 1962

VOLYNKIN, Yu.M.; YAZDOVSKIY, V.I.; GENIN, A.M.; VASIL'YEV, P.V.; GYURDZHIAN, A.A.; GUROVSKIY, N.N.; GORBOV, F.D.; SERYAPIN, A.D.; BELAY, V.Ye.; BAYEVSKIY, R.M.; ALTUKHOV, G.V.; KOPANEV, V.I.; KAS'YAN, I.I.; YEGOROV, A.D.; SIL'VESTROV, M.M.; SIMPURA, S.F.; TERENT'YEV, V.G.; KRYLOV, Yu.V.; FOMIN, A.G.; USHAKOV, A.S.; DEGTYAREV, V.A.; VOLOVICH, V.G.; STEPANTSOV, V.I.; MYASNIKOV, V.I.; YAZDOVSKIY, V.I.; KASHIN, P.S., tekhn. red.

[First space flights of man; the scientific results of the medicobiological research conducted during the orbital flights of the spaceships "Vostok" and "Vostok-2"] Pervye kosmicheskie polety cheloveka; nauchny rezul'taty mediko-biologicheskikh issledovanii, provedennykh vo vremia orbital'nykh poletov korablei-sputnikov "Vostok" i "Vostok-2." Moskva, Izd-vo Akad. nauk SSSR, 1962. 202 p. (MIRA 15:11)
(SPACE MEDICINE) (SPACE FLIGHT TRAINING)

ACCESSION NR: AT4042642 S/0000/63/000/000/0006/0008

AUTHOR: Akulinichev, I. T.; Bayevskiy, R. M.; Belay, V. Ye. Vasil'yev, P. V.; Gazenko, O. G.; Kakurin, L. I.; Kotovskaya, A. R.; Maksimov, D. G.; Mikhaylovskiy, G. P.; Yazdovskiy, V. I.

TITLE: Results of physiological investigations aboard the "Vosfok-3" and "Vostok-4" spaceships

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 6-8

TOPIC TAGS: biomedical monitoring, electrooculogram, pneumogram/Vostok-3, Vostok-4, EEG, EKG

ABSTRACT: A number of physiological indices were monitored during the tandem spaceflights of Nikolayev and Popovich (Vostok-3 and Vostok-4). New procedures used for the first time on these flights and improvements of existing equipment yielded a great deal of physiological information. Weightless-

ness had no noticeable effect on the functional state of the CNS in either cosmonaut, as evaluated on the basis of performance of various tasks. EEG's showed a dominance of comparatively high-amplitude rhythms with a frequency of 5 to 7 cps, similar to those observed in athletes after intense physical exertion, during the first hours of weightlessness. Later a gradual shift toward beta-rhythms with a reduced mean amplitude of EEG biopotentials occurred. Heightened emotional stress in the first hours of flight and before reentry was reflected in decreased electrical resistance of the cortex. Functional stability of the higher involuntary nervous centers is indicated by the maintenance of normal daily variation of cortical resistance--higher at night, lower during the daytime--during the rest of the flights. EOG's (electrooculograms) were used as an index of the functional state of the vestibular apparatus. Asymmetries in oculomotor reaction, which could have indicated disturbances of the vestibular centers, were not observed in either cosmonaut. Vestibular tests not supplemented by EOG's also failed to yield any evidence of vestibular disturbance. Oculomotor activity was also used as an index of general and motor activity. Variations in oculomotor activity had a phase character. At the beginning of the flight Nikolayev, and to

ACCESSION NR: AT4042642

a lesser degree Popovich, showed an increase of oculomotor activity up to 4 to 6 eye movements per second. Eye movements of an uncoordinated character, of both large and small amplitude, were recorded. On the 6th and 7th orbits eye movement fell off, and later EOG's show periodic increases and decreases in oculomotor activity. Toward the end of the flight a second stable increase in oculomotor activity occurred, but its level was lower than at the beginning of the flight. Cardiac activity was monitored by EKG's (using chest leads). Increased pulse rates (from 98 to 112 for Nikolayev, and from 94 to 136 for Popovich) occurred immediately before launch, with corresponding shortening of the PQ and QT intervals. EKG changes during the powered-flight phase were similar to those observed in ground experiments with centrifuging. The maximum pulse rate during the first minute of flight was 136 for Nikolayev and 132 for Popovich. Normalization of pulse rates to the rates observed 4 hr before launch took place on Nikolayev's 6th and 7th orbit and on Popovich's 3rd to 4th orbit. Normalization of pulse to initial rates took 5 to 10 min during tests. No IKG changes indicating disturbances of automatism, excitability, or conductivity were observed. In flight Popovich registered 3 separate extra

Card 3/5

ACCESSION NR: AT4042642

systoles; this had also occurred during training tests. The character of daily variation of cardiac activity remained unchanged. Pneumographic data revealed no respiratory irregularities. Some increase in respiration rate was noted during the powered-flight phase; this had also been observed during centrifuge tests. No pathological change in physiological functions of either cosmonaut was observed during flight. During the powered-flight phase, functional shifts similar to those observed during centrifuge tests occurred. Definite changes in the functional state of various physiological systems took place during the first hours of orbital flight, as indicated by the inhibition of pulse-rate normalization and the character of EEG and cortical resistance changes. Changes in the character of EEG's during prolonged (3 to 4 days) weightlessnes indicate shifts in the interaction of excitation-inhibition processes in the higher levels of the CNS. However, the mental activity and neuro-regulatory functions of the cosmonauts remained at a high level.

ASSOCIATION: none

ACCESSION NR: AT4042642

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: 00

NO REF SOV: 000 OTHER: 000

Card 5/5

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R001858910015-3"

ACCESSION NR: AT4042662 S/0000/63/000/000/0096/0101

AUTHOR: Vasil'yev, P. V.; Belay, V. Ye.

TITLE: Effect of drugs on resistance to acceleration stress

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy konferentsii. Moscow, 1963, 96-101

TOPIC TAGS: acceleration, rabbit, mouse, adrenalin, antiacceleration drug, phenamine, ephedrine, chloral hydrate, pentothal, dog, rat, pharmacological agent

ABSTRACT: The effects of adrenalin, noradrenalin, phenamine, phenatine, ephedrine, chloral hydrate, and pentothal were tested on white mice, rats, rabbits, and dogs for the purpose of determining whether these substances can increase the resistance of animals to accelerations. Solutions of these substances were administered intraperitoneally in mice and rats and intravenously, subcutaneously, or intramuscularly in rabbits and dogs. Experiments with adrenalin and noadrenalin on both rabbits and mice gave contradictory and indefinite results. Experiments with phenamine gave positive results. When doses of phenamine ranging

Card 1/2

ACCESSION NR: AT4042662

from 0.8 to 1 mg/kg were administered intraperitoneally 15--30 minutes before the animals were subjected to accelerations of 50-55g, the resistance of the animals to effects of accelerations (based on LD_{50}) increased by 8.7 g as compared with the controls. If phenamine was administered in doses of 1--3 mg/kg, the positive effect of phenamine was lowered, and when doses of 5 mg/kg were administered, a negative result was observed. Satisfactory results were obtained with ephedrine. Best results with ephedrine were obtained when doses of 0.5 mg/kg were used. If the dosage was cut in half, ephedrine was ineffective, whereas if the dosage was increased, it lowered the positive effect of the drug. Further experiments with adrenalin are being performed using rabbits and administering the drug intramuscularly. Experiments with narcotics (chloral hydrate and pentothal) gave rather indefinite results. Analysis of data obtained in the experiments indicates that by using pharmaceutical agents to change the functional condition it is possible to increase the resistance of the organism to the effects of acceleration.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 2/2

S/216/63/000/001/002/004
A066/A126

AUTHORS: Vasil'yev, P.V., Voskresenskiy, A.D., Gazenko, O.G.

TITLE: Experimental studies in space physiology

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya biologicheskaya, no. 1, 1963, 15 - 23

TEXT: The accumulation of data relating to the physiological effects of space traveling upon the human organism makes it necessary to consider the two alternatives of experimental research: 1) the study of individual functions (heart activity, respiration, etc.) under the influence of certain factors of actual space flight; 2) the study of the physiological effects of certain factors of space flight. The second alternative involves comprehensive animal experiments which, though only indicative of the relevant reactions of the human organism, make it possible to work out diagnostic criteria and training programs. The necessity of experimental research into the physiological mechanisms is illustrated by the effects of transverse acceleration. Data relative to pulmonary circulation, oxygen consumption by the cardiac muscle, oxygen tension in the

Card 1/2

cerebral tissues, and the functions of the central nervous system, as well as literature data were used to set up a diagram illustrating the principal physiological effects of transverse acceleration which are as follows: 1) Changes in pulmonary ventilation and in the redistribution of blood in the lungs disturb the oxygenation of blood in the lungs; 2) redistribution of blood in the vascular system of the cerebrum, accompanied by a higher intensity of the afferent impulses, disturbs nutrition and the regulatory activity of the brain; 3) general changes of the hemodynamic conditions deteriorate the supply of O_2 to the heart. These pathological symptoms were observed exclusively in transverse accelerations lasting longer than 1 min. It appears possible to describe physiological changes quantitatively and to set up a model reproducing physiological changes in the human organism under various conditions of space traveling. Such a model will permit an estimate and prognosis of the astronaut's state of health. In addition, better training programs may thus be worked out, and also the action of pharmacological and other agents can be examined under conditions of space flight.

SUBMITTED: August 24, 1962

SAKSONOV, P.P., polkovnik meditsinskoy sluzhby; VASIL'YEV, P.V.; polkovnik meditsinskoy sluzhby; BELAY, V.Ye., podpolkovnik meditsinskoy sluzhby; CHERNENKO, G.T., podpolkovnik meditsinskoy sluzhby

Characteristics of the action of drugs in acute radiation sickness; a review of the literature. Voen. - med. zhur. no.1: 44-50 1963. (MIRA 17:8)

BELAY, V.Ye.; VASIL'YEV, P.V.; KOLCHIN, S.P. (Moskva)

Reactivity of the animal body to narcotics following a prolonged effect of lateral acceleration. Farm. i toks. 26 no.5: 559-563 S-O '63. (MIRA 17:8)

PARIN, V. V.; VASIL'YEV, P. V.; BELAY, V. Ye.

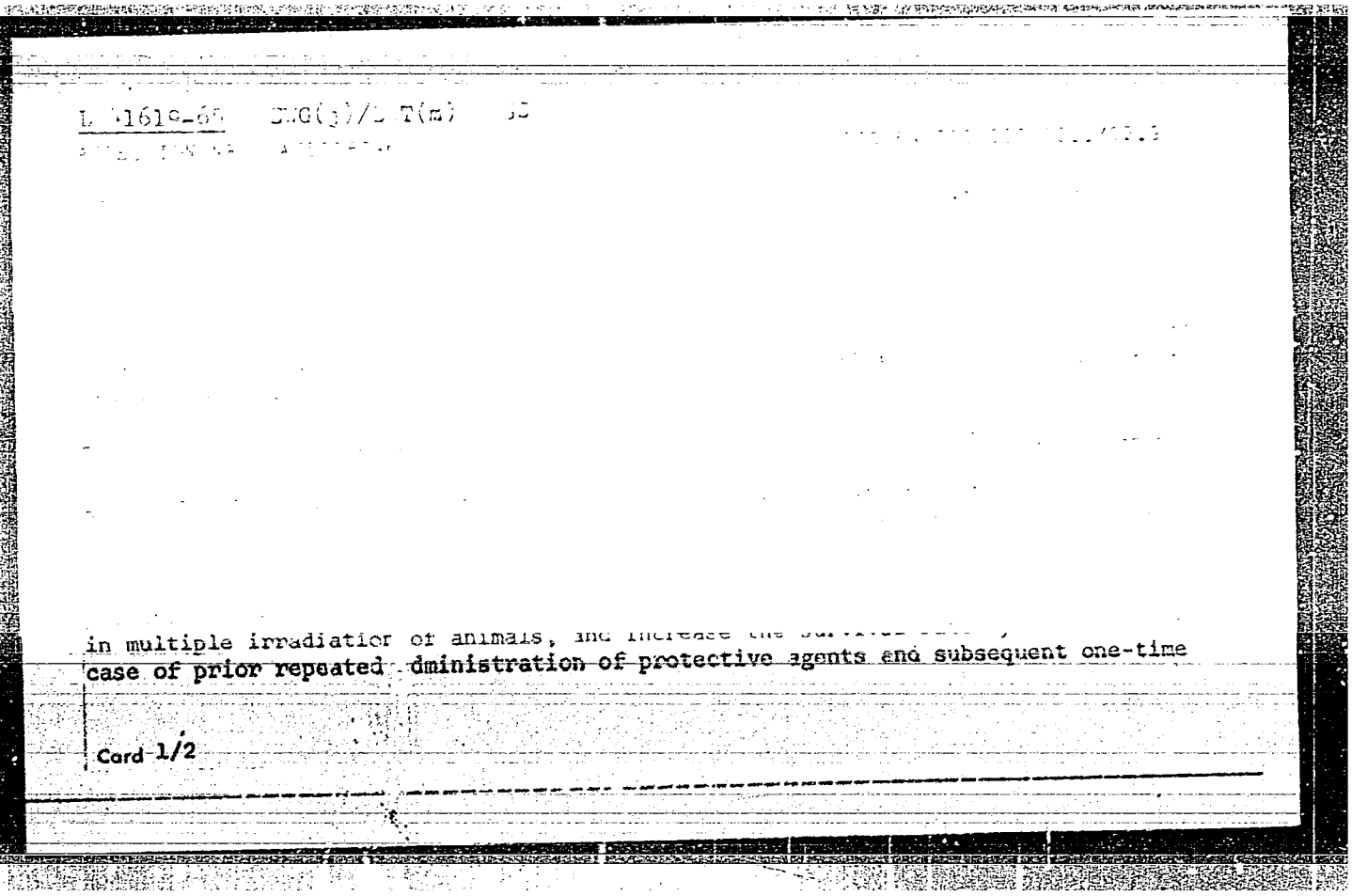
"Reactivity in space medicine."

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

PARIN, V. V.; VASIL'YEV, P. V.; BELAY, N. Ye.

"Some problems of reactivity in cosmic medicine."

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



L 41619-65 EWG(j)/EWT(m) JD

in multiple irradiation of animals, and increase the survival rate)
case of prior repeated administration of protective agents and subsequent one-time

Card 1/2

L 41619-65

ACCESSION NR: AT5008046

tration of the protective agent. [illegible]

ASSOCIATION: none

SUBMITTED: 19Aug64 ENCL: 00 SUB CODE: LS,NP

NO REF SOV: 002 OTHER: 008

Card 2/2

L 24289-66 EWT(d)/FSS-2

ACC NR: AR6005244 SOURCE CODE: UR/0058/65/000/009/H011/H011

AUTHOR: Vasil'yev, P. V.

TITLE: Concerning the question of the efficiency of system s for data transmission using a feedback channel

SOURCE: Ref. zh. Fizika, Abs. 9Zh80

REF. SOURCE: Tr. Nauchno-tekhn. konferentsii Leningr. elektrotekhn. in-ta svyazi, vyp. 3, 1964, 27-30

TOPIC TAGS: data transmission, signal distortion, communication channel

ABSTRACT: An expression is obtained for determining the efficiency of systems for the transmission of discrete information with a feedback channel, with account taken of the distortions in the channel.

SUB CODE: 17

Card 1/1

ACCESSION NR: AT4037702 S/2865/64/003/000/0318/0323

AUTHOR: Belay, V. Ye.; Vasil'yev, P. V.; Kolchin, S. P.

TITLE: Effect of prolonged transverse acceleration on the functional state of the central nervous system in animals

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 318-323

TOPIC TAGS: acceleration, centrifuge, mouse, rat, central nervous system, chloral hydrate, narcosis, sodium pentothal, conditioned reflex

ABSTRACT: The functional state of excitation-inhibition processes in the cerebral cortex and subcortical structures under the effect of transverse accelerations of various magnitudes and durations was studied in 467 mice and 80 rats. The functional state was estimated on the basis of response to two narcotics, the first (chloral hydrate) acting primarily on the cortex and the second (sodium pentothal) on the subcortical structures. Acceleration was generated on a centrifuge with a radius of 3.7 m. The usual direction of acceleration was back-to-chest. The general condition and behavior of the animals depended on the magnitude and dura-

Card 1/3

ACCESSION NR: AT4037702

tion of loading. Acceleration of 13 g for 9 min produced depression, quiescence, and tremor, while the same acceleration for 3 min produced general excitation expressed in increased motor activity and aggressiveness. Reaction to the drugs also varied with the magnitude and duration of acceleration. The duration of chloral hydrate narcosis in mice subjected to 13 g for 3 min was half that observed in the controls; the same acceleration for 9 min caused narcosis to last more than twice as long as it did in the controls. Analogous results were obtained with rats, though the differences between centrifuged animals and controls were less pronounced. Tests with sodium pentothal produced exactly opposite results. Acceleration of 13 g for 3 min increased the duration of sodium pentothal narcosis, while 9 min of the same acceleration decreased it. Tests conducted to determine the time required after centrifugation for excitation-inhibition processes to return to normal showed that chloral hydrate narcosis of close to normal duration can be obtained only when the drug is administered at least 2 hr after centrifugation. This may be compared with a normalization time of 10 to 15 min for conditioned reflexes. It is concluded that longer (9 min) accelerations result in inhibition of the cortex and excitation of subcortical structures, while the briefer

Card 2/3

ACCESSION NR: AT4037702

(3 min) accelerations excite the cortex and inhibit the subcortical structures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: PH, LS

NO REF SOV: 008 OTHER: 003

Card 3/3

BELAY, V.Ye.; VASIL'YEV, P.V.; KOLCHIN, S.P.; MASLYANENKO, S.V. (Moskva)

Effect of strychnine on the resistance of animals to acceleration. Pat. fiziol. i eksp. terap. 8 no.5:15-20 S-O '64. (MIRA 18:12)

1. Submitted May 28, 1963.

VASIL'YEV, P.V.; GERD, M.A. (Moskva)

Effect of acceleration on the higher nervous activity of dogs.
Pat. fiziol. i eksp. terap. 8 no.6:3-7 N-D '64.
(MIRA 18:6)

VOLYNKIN, Yu.M.; ARUTYUNOV, G.A.; ANTIPOV, V.V.; ALTUKHOV, G.V.; BAYEVSKIY, R.M.; BELAY, V.Ye.; BUYANOV, P.V.; BRYANOV, I.I.; VASIL'YEV, P.V.; VOLOVICH, V.G.; GAGARIN, Yu.A.; GENIN, A.M.; GORBOV, F.D.; GORSHKOV, A.I.; GUROVSKIY, N.N.; YESHANOV, N.Kh.; YEGOROV, A.D.; KARPOV, Ye.A.; KOVALEV, V.V.; KOLOSOV, V.A.; KORESHKOV, A.A.; KAS'YAN, I.I.; KOTOVSKAYA, A.R.; KALIBERDIN, G.V.; KOPANEV, V.I.; KUZ'MINOV, A.P.; KAKURIN, L.I.; KUDROVA, R.V.; LEBEDEV, V.I.; LEBEDEV, A.A.; LOBZIN, P.P.; MAKSIMOV, D.G.; MYASNIKOV, V.I.; MALYSHKIN, Ye.G.; NEUMYVAKIN, I.P.; ONISHCHENKO, V.F.; POPOV, I.G.; PORUCHIKOV, Ye.P.; SIL'VESTROV, M.M.; SERYAPIN, A.D.; SAKSONOV, P.P.; TERENT'YEV, V.G.; USHAKOV, A.S.; UDALOV, Yu.F.; FOMIN, V.S.; FOMIN, A.G.; KHLEBNIKOV, G.F.; YUGANOV, Ye.M.; YAZDOVSKIY, V.I.; KRICHAGIN, V.I.; AKULINICHEV, I.T.; SAVINICH, F.K.; SIMPURA, S.F.; VOSKRESENSKIY, O.G.; GAZENKO, O.G., SISAKYAN, N.M., akademik, red.

[Second group space flight and some results of the Soviet astronauts' flights on "Vostok" ships; scientific results of medical and biological research conducted during the second group space flight] Vtoroi gruppovoi kosmicheskii polet i nekotorye itogi poletov sovetskikh kosmonavtov na korabliakh "Vostok"; nauchnye rezul'taty medikobiologicheskikh issledovanii, provedennykh vo vremia vtorogo gruppovogo kosmicheskogo poleta. Moskva, Nauka, 1965. 277 p. (MIRA 18:6)

ACCESSION NR: AP5007274

AUTHOR: Altukhov, G. V.; Belay, [illegible] Ye; Yegorov, A. [illegible]; Vasil'yev, P. V.

TITLE: Diurnal rhythm of vegetative functions during space flight

SOURCE: AN SSSR. Izvestiya, Seriya biologicheskaya, no. 2, 1965, 182-187

TOPIC TAGS: diurnal rhythm, vegetative functions, space flight, cardiac rate, systolic index

ABSTRACT: Data obtained during the space flights of Soviet cosmonauts A. G. Nikolayev, P. R. Popovich, V. F. Bykovskiy, and V. V. Tereshkova shed light on the effect of weightlessness on the diurnal rhythm of physiological and, in particular, vegetative functions. In the present article, the nature of changes in diurnal variations in pulse frequency and of the systolic index is analyzed. In the prelaunch period, the pulse frequency and the systolic index of the three male cosmonauts increased during the second half of the day, while Tereshkova declined during the second half of the day. During space flight, these indices changed. In the case of Nikolayev and Popovich, the pulse

Card 1/2

L 34096-65
ACCESSION NR: AP5007274

frequency and the systolic index either declined slightly or remained practically unchanged during the second half of the day. In [illegible]'s case, the relative magnitudes of the pulse frequency and the systolic index generally remained constant during the first and second halves of the day. During the second half of the day, Tereshkova's pulse frequency and systolic index declined even more than they did during the prelaunch period. In short, the data indicate that the pulse frequency and systolic index reactions of the cosmonauts during the period of flight were not identical. The changes in the diurnal rhythm of physiological functions cannot be attributed wholly to the specific effects of weightlessness. There can be little doubt that emotional tension had a significant effect on these indices. Orig. art. has: 1 table and 2 figures.' [BM]

ASSOCIATION: none

SUBMITTED: 10Jul64 ENCLOSURE: 00 SUB CODE: PH, LS

NO REF SOV: 004 OTHER: 010 ATD PRESS: 3209

Card 2/2

VASIL'YEV, P.V.; BELAY, V.Ye. (Moskva)

Effect of sympathomimetic amines on the resistance of animals to the effect of acceleration. Pat. fiziol. i eksp. terap. 9 no.3:12-16 My-Je '65. (MIRA 18:9)

L 31933-66 EWT(1) SCTB DD

ACC NR: AP5017760 SOURCE CODE: UR/0216/65/000/004/0481/0490

AUTHOR: Parin, V. V.; Vasil'yev, P. V.; Belay, V. Ye.

ORG: none

TITLE: The problem of reactivity in space medicine

SOURCE: AN SSSR. Izvestiya. Seriya biologicheskaya, no. 4, 1965, 481-490

TOPIC TAGS: biologic acceleration effect, acceleration test, experiment animal, cardiovascular system disease, centrifuge test, drug effect, biologic respiration

ABSTRACT: The use of pharmacological agents to increase the tolerance of white mice, rats, rabbits, and dogs to acceleration was investigated. The animals were centrifuged for periods up to 86.2 min; the animals were injected (before and after centrifuging) with various narcotics, cardiac glycosides, vasoconstrictors and vasodilators: strichnine, adrenalin, noradrenalin, benzedrine, phenatrin, ephedrine, caffeine, Corazol, strophanthin-K, nitroglycerine, dibazol, chloral hydrate and thiopental sodium. The results of these injections on the various animals are presented in the form of graphs, tables, and electrocardiograms. The criteria used to evaluate changes in reaction to acceleration were (in experiments on mice and rats) the number that survived the experiment and (in the case of dogs and rabbits) the time of onset and the degree of cardiac and respiratory malfunction. The authors conclude that the use of pharma-

UDC: 629.195.2 : 61

Card 1/2

L 31933-66
ACC NR: AP5017760

cological preparations is a promising means of increasing tolerance to G-forces.
Orig. art. has: 9 figures, 1 table.

SUB CODE: 06/ SUBM DATE: 05Jan65/ ORIG REF: 031/ OTH REF: 006

mt
Card 2/2

TITLE: Reaction of the [illegible]
to orbital flight in Voskhod-1

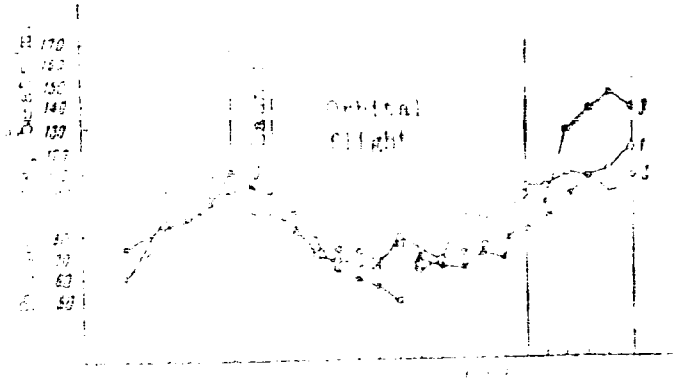
SOURCE: AN SSSR. Izvestiya. Seriya biologicheskaya, [illegible]

TOPIC TAGS: space physiology, cardiovascular system, cardiology, respiratory system, manned space flight [illegible]

ABSTRACT: [illegible] relationship between cardiovascular changes in EKG and seismocardiogram [illegible] of these investigations are given in the following figures

L 64051-65

ACCESSION NR: AP5017761



1 - V. M. Komarov; 2 - K. P. Feoktistov; 3 - B. B. Yegorov

Card 2/8

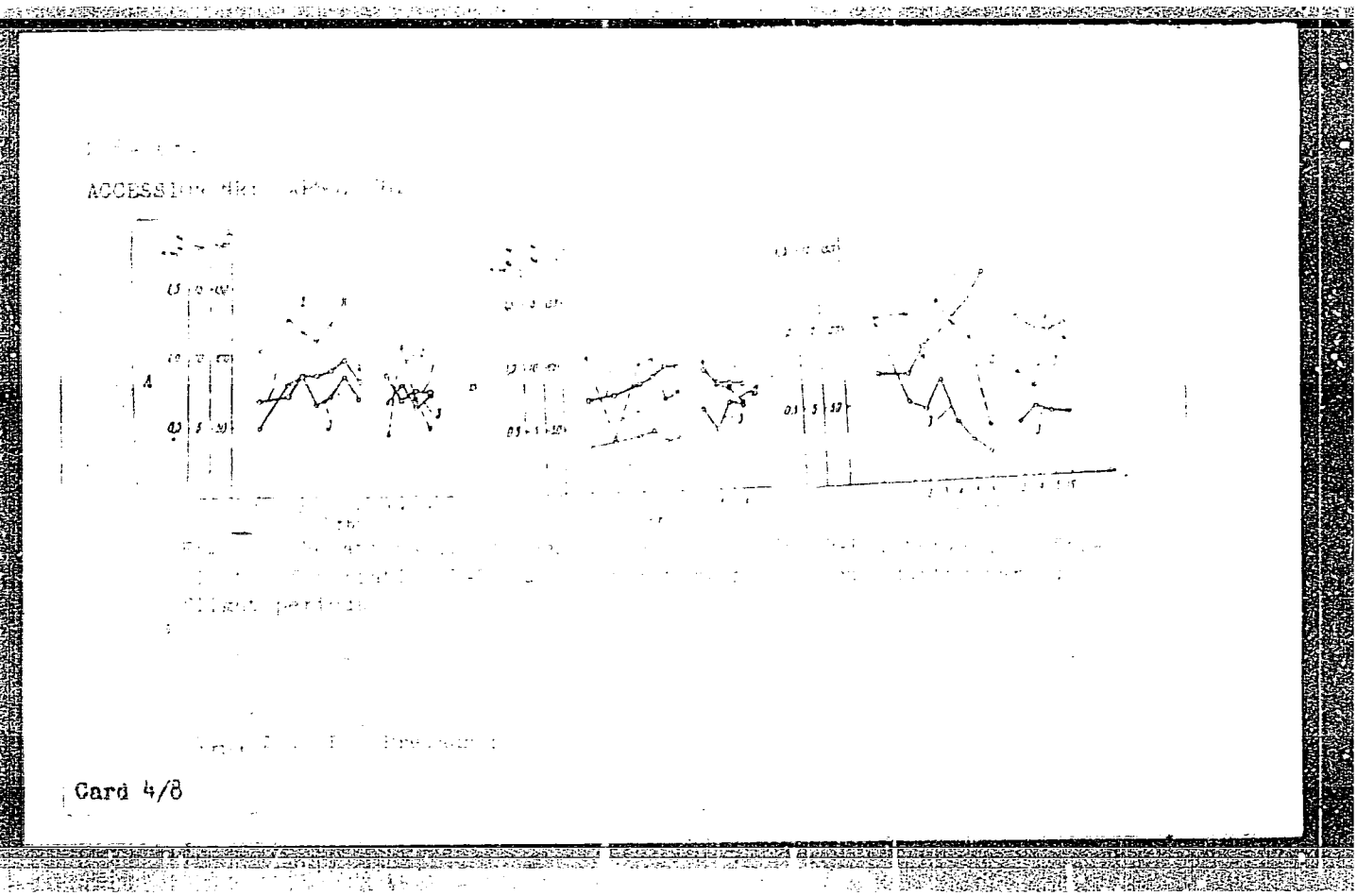
ACCESSION NR: AP5017[illegible]

Table 1. Dynamics of the respiratory rate of cosmonauts prior

Cosmonauts	Day before flight	Prelaunch 4 hr before	Prelaunch 5 min before	Launch	1st	3rd	6th	13th	16th	Landing
V.M. Komarov	10	18	23	15.8	16.8	19.1	21.8	17.1	18.2	20.1
K.P. Feoktistov	18	21	20	24.5	19.4	18.4	19.3	15.5	16.0	17.4
B.B. Yegorov	14	18	27	33.5	26.8	23.1	16.0	20.4	20.4	25.2

The data showed that pulse and respiratory dynamics, as well as electrocardiogram and seismocardiogram indices had some individual peculiarities [illegible]

Card 3/3



Card 4/8

ACCESSION NR: AP[illegible]

[illegible] during the first

Cosmonauts	Index	Orbital periods of measurement
V. M. Komarov	Diurnal X	[illegible]
	V_1	24.7 40.7 [illegible]
	Lunar X	0.82 0.85 1.02 1.26 1.44 1.54 1.22 [illegible]
	V_1	32.7 [illegible]

Card 5/8

L 64068-65

ACCESSION NR: AP5017761

Continuation of Table 2 from Card 5/8

Exhale	$\dot{X}$	0.81	0.86	—	0.54	0.81	0.87	0.78	1.10	0.87	0.82	0.87
	V_t	14.1	31.2	—	24.0	31.2	33.3	28.7	33.7	36.2	28.6	19.9
Pause	$\dot{X}$	0.99	1.25	—	1.69	1.99	1.45	1.58	2.54	1.90	2.14	2.39
	V_t	36.3	38.6	—	42.2	46.2	38.3	40.0	61.1	48.9	66.2	64.1
B. H.	Inhale	0.88	0.96	0.84	0.79	0.94	0.95	1.39	1.16	1.06	1.00	1.03

Card 6

L 64068-65

ACCESSION NR: AP5017761

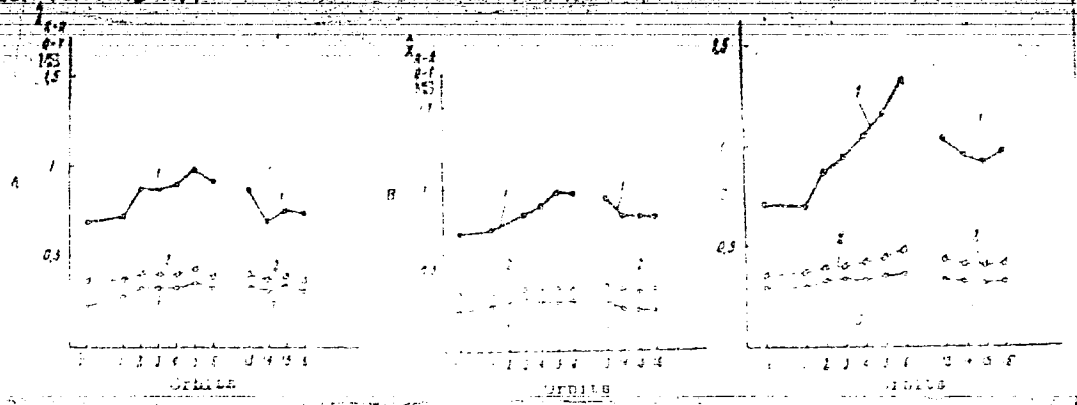


Fig. 3. Relationship of the mean values of EKG R-R and Q-T intervals and the duration of mechanical systole (ms) of cosmonauts during various space-flight periods

A - V. M. Komarov, B - K. P. Feoktistov, C - B. B. Yegorov; 1 - mean R-R value, sec; 2 - mean Q-T value, sec; 3 - mean ms value, sec. P - Prelaunch.

V Card 7/8

L 64068-65
ACCESSION NR: AP5017761

flight. It was noted, however, that B. B. Yegorov, the flight physician, exhibited a marked vagotonic reaction while sleeping during the 6th orbit of Voskhod-1. His pulse rate decreased to 45— 48 beats/min.

As a rule, EKG R-R coefficient variations coincided with respiratory pauses in time and tendencies from one orbit to the next. The lowest R-R lability was exhibited by B. B. Yegorov during sleep.

[illegible] characteristics of the respiratory

7 graphs.

ASSOCIATION: none

SUBMITTED: 09Mar65 ENCL: 00 SUB CODE: LS, SV

NR REF SOV: 001 OTHER: 000

Card 8/8

L 23975-66 FSS-2/EWT(1)/EEC(k)-2/EWA(d) SCTB TT/DD/RD/GW

ACC NR: AT6003858 SOURCE CODE: UR/2865/65/004/000/0237/0247

AUTHOR: Yazdovskiy, V. I.; Yemel'yanov, M. D.; Vasil'yev, P. V.; Kopanev, V. I.

ORG: none

TITLE: Some results of medicobiological studies conducted during preparation and flight of the astronauts V. F. Bykovsk and V. V. Tereshkova

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 237-247

TOPIC TAGS: space medicine, space medicine equipment, space physiology, astronaut

ABSTRACT: The program of study is described and results of medical observations during June 14-19, 1963 are reported. The study program includes the long term effect of cosmic flight on the human organism, psychophysiologic capacities and working capacity of humans under such conditions, reactions of the female organism, the 24 hour physiologic processes during cosmic flight, effectiveness of methods for selecting and training astronauts, analysis of the medical-biological monitoring system in the cabin, the microclimate of the spaceship, and the

Card 1/2

L 14282-66 EWT(1)/FS(v)-3 SCTB DD/RD

ACC NR: AT6003866 SOURCE CODE: UR/2865/65/004/000/0322/0332

AUTHOR: Kotovskaya, A. R.; Vasil'yev, P. V.; Lapin, B. A.; Simpura, S. F.; Shakhlamov, V. A.; Artem'yeva, N. S. 36 B+1

ORG: none

TITLE: Effect of transverse accelerations 2,4Y on the organism of female monkeys

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 322-332

TOPIC TAGS: cardiovascular system, experiment animal, biologic acceleration effect, biologic respiration, space physiology, histology, biologic reproduction, space biologic experiment

ABSTRACT: Tests were conducted on 16 half-grown monkeys, 5 mandrill and 11 rhesus. Exposure to 12 G centrifugation (varying durations) took place during the following sex cycles: proliferation, secretion, desquamation, and ovulation. Acceleration took place on a centrifuge with an arm radius of 7.25 m in a chest-back position. The behavior of the animals was monitored by TV, and cardiovascular and respiratory activity were used as criteria for the resistance of animals to acceleration. A photograph shows the position of a monkey fixed in the chair of the centrifuge. Table 1 shows the effect of acceleration on cardiovascular and respiratory activity.

Card 1/3

ACC NR: AT6003858

effectiveness of systems providing for survival and safety. In selecting astronauts the compensatory work of the organism was most important. Under simulated cosmic conditions, women were seen to react least during the proliferative phase of the ovarian cycle, with some reaction during ovulation. Training increased resistance to the effect of cosmic factors and strengthened will power and the neuropsychic system. Radiation was low; the dosimeters showed about 80 and 44 millirad respectively. The astronauts received food in amounts of 2500-2900 calories per day. The microclimate in the cabin was satisfactorily maintained as to temperature, pressure and oxygen (13-26°C, 250-60% humidity, 22-28% oxygen, to 0.50% CO_2 and 740-780 mm Hg pressure). Medical controls included ECG, EEG, skin galvenic reaction, respiratory and pulse rates, tests for vestibular and vegetative insufficiency and observation by television. Before and at the start of flight the respiratory and pulse rates increased from 68 and 84 to 137 and 144, during the first minutes of flight they increased to 154 and 157, and then they returned to normal after several hours. The EEG showed a tendency for substitution of low frequency waves and a later decrease of amplitude of bioelectric rhythms; in the woman an increase of low frequency potentials was seen. Adaptation to weightlessness was good. All medical and biological control systems worked satisfactorily. It is concluded that a 5 day flight for men and 3 days for women is fully feasible without pathologic reactions. Orig. art. has: none.

SUB CODE: 06/ SUBM DATE: none **[ADDCLUE WORD: Vostok 5 12 Vostok 6 12]

Card 2/2 FV

Table 1. Changes in pulse rate and respiration rate in monkeys exposed to 12 G (mean for 14 animals)

Physiological function	Before	During	After
Pulse rate	152--186	190--230	150--160
Respiration rate	24--36	36--48--54	18--36

The EKG's of animals exposed to acceleration revealed sinus tachycardia, shortened T-P intervals, and ventricular and atrioventricular extrasystole. Cardiac activity in general returned to normal 10-20 min after centrifugation. It was found that the endurance of female monkeys to 12 G ranged from 1 to 4.5 min. A histological analysis of the ovaries of monkeys examined 10 min, 1 hr, 24 hr, and 72 hr after termination of acceleration revealed the following deviations from normal: Proliferation phase: Weakly pronounced depolymerization of acid mucopolysaccharides in the medulla and separate cortical sections of the ovaries, as well as in the uterus. Ovulation: After one, and especially 3 days after the termination of the experiment, all ovarian tissues were found to be full of erythrocytes; The areas around the venules were plasmorrhagic and locally hemorrhagic; Acid mucopolysaccharide depolymerization was intense. Secretory phase: Two monkeys showed premature menstruation and

hemorrhaging in the endometrium when examined 10 min after termination. This was attributed to the deleterious effects of acceleration. Examination of an animal 24 hr later revealed individual small hemorrhages in the cortical ovarian tissue. Some erythrocytes were observed along the vascular walls. Moderate depolymerization of acid mucopolysaccharides was evident.

Desquamative phase. A macro- and microscopic examination of the ovaries, Fallopian tubes, and uterus revealed the same changes as occurred during the proliferation phase.

It was apparent that acceleration had its greatest deleterious effect during ovulation and its minimum effect during proliferation. The observed deviations probably reflected neuroendocrine processes associated with stress reactions to acceleration. The long-term effects of acceleration were not evident one month after acceleration, demonstrating the ability of the ovaries to regenerate after various injuries. Orig. art. has: 5 figures and 2 tables. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 004 / OTH REF: 006

QC

L 23281-66 FSS-2/EWT(1)/EEC(k)-2/EWA(d) SCTB IJ/ED/GW

ACC NR: AP6011411 SOURCE CODE: UR/0216/66/000/002/0212/0220

AUTHOR: Balakhovskiy, I. S.; Vasil'yev, P. V.; Kas'yan, I. I.; Popov, I. G.

ORG: none

TITLE: Results of a physiological and biochemical examination of the Voskhod-1 crew

SOURCE: AN SSSR. Izvestiya. Seriya biologicheskaya, no. 2, 1966, 212-220

TOPIC TAGS: manned spaceflight, human physiology / Voskhod-1

ABSTRACT: Some detailed physiological and biochemical results (including some redundant data) of the Voskhod-1 flight are given in the following figures:

Card 1/7 UDC: 612.17

L 23081-66

ACC NR: AP6011411

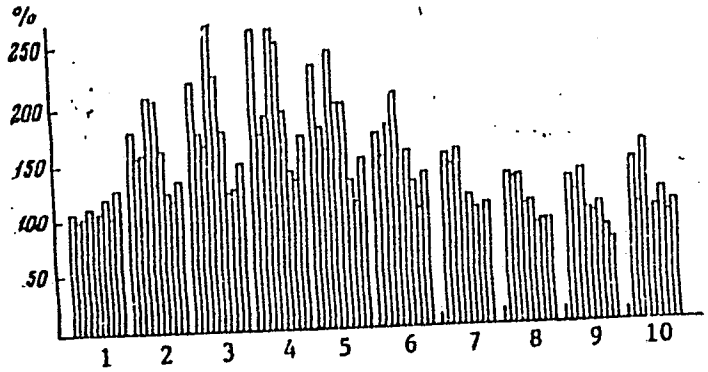


Fig. 1. Comparative data on pulse variations for all cosmonauts (% above normal) at various flight stages. The sequence of bars in each frame corresponds to: Gagarin, Titov, Nikolayev, Popovich, Bykovskiy, Tereshkova, Komarov, Feoktistov, Yegorov.

1 - 4 hr before launch; 2 - 5 min before launch; 3 - 1 min before launch; 4 - 1 min after launch; 5 - greatest G force; 6 - 1st orbit; 7 - 2nd orbit; 8 - 4th orbit; 9 - 6th orbit; 10 - last orbit.

Card 2/7

L 23281-66
ACC NR: AP6011411

Table 1. Changes in some EKG indexes during the Voskhod-1 flight; PQ, QRS, Q-T, R-R intervals in sec; spike amplitudes of P, R, T in relative units; systolic index (SI) in %; all mean data

Cosmonauts	Indexes	Pre-launch, 5 min.	Orbits 2	7	13	16
V. M. Komarov	P	0,88	3,2	2,9	0,6	0,78
	R	15,4	49,3	30,5	10,0	10,1
	T	2,7	14,2	14,5	3,6	2,6
	PQ	0,10	0,11	0,11	0,10	0,10
	QRS	0,06	0,07	0,07	0,07	0,08
	Q—T	0,34	0,37	0,38	0,38	0,34
	R—R	0,61	0,78	0,76	0,89	0,75
	SI	55,7	48,7	50,7	45,0	45,3
K. P Feoktistov	P	0,81	—	2,4	0,60	0,64
	R	16,4	—	38,7	8,9	9,1
	T	3,4	—	13,2	3,2	2,8
	PQ	0,14	—	0,14	0,11	0,12
	QRS	0,05	—	0,06	0,06	0,08
	Q—T	0,36	—	0,42	0,38	0,36
	R—R	0,69	—	0,06	0,87	0,78
	SI	52,9	—	43,3	44,2	46,8
B. B. Yegorov	P	0,37	2,4	1,6	0,44	0,51
	R	10,9	32,0	39,2	8,9	8,1
	T	1,1	5,7	10,8	2,4	1,8
	PQ	0,12	0,12	0,16	0,10	0,10
	QRS	0,06	0,06	0,07	0,07	0,07
	Q—T	0,34	0,37	0,39	0,40	0,37
	R—R	0,59	0,73	0,98	1,03	0,90
	SI	58,6	50,7	40,1	39,2	41,0

Card 3/7

L 23231-66
ACC NR: AP6011411

Table 2. Water balance during the flight

1 - Loss of water with urine; 2 - cosmonauts; 3 - linen chloride content, mg; 4 - urine excretion, liters; 5 - water lost via imperceptible perspiration during the flight, liters; 6 - total, calculated water loss through the skin during the flight, liters; 7 - water ingested, including water in food, during the flight, liters; 8 - actual weight lost from 8:20, 12/10 to 18:10, 13/10, 1964, kg; 9 - V. M. Komarov, K. P. Feoktistov, B. B. Yegorov in that order.

2	1		5	6	7	8
	3	4				
9	532	3,4	1,0	4,4	1,6	1,9
	324	2,1	1,0	3,1	1,6	2,0
	460	3,2	1,0	4,2	1,6	3,0

Card 4/7

L 23231-66
ACC NR: AP6011411

Table 3. Biochemical and morphological content of the blood during the flight compared with training data

Indexes	Complex training		Background examination		Landi	Flight		After flight		
	Before	After	43 days	12 days		start	end	immed.	1 day	15 days
V. M. Komarov										
Sugar, mg%	92	115	—	105	101	—	—	160	115	107
Urea, mg%	34	38	38	22	32	—	—	41	39	28
Chlorine, mg%	225	250	280	225	175	—	—	225	210	135
Leukocytes, 1000/mm³	5,4	6,8	5,1	4,5	4,9	—	—	7,0	5,9	—
Formula:										
Rods	5,5	3	3	6	5	—	—	6	6	—
Segments	63	60,5	55,5	64	40	—	—	64	51	—
Eosinophiles	1	3,5	2	5	3	—	—	1	2	—
Lymphocytes	26	25,5	33,5	17	47	—	—	25	35	—
Monocytes	4,5	7,5	6	8	5	—	—	4	6	—

Card 5/7

ACC NR: AP6011411

K. P. Feoktistov

Sugar, mg%	82	115	133	75	100	—	85	105	70	63
Urea, mg%	21	25	35	25	31	—	47	49	—	36
Chlorine, mg%	237	250	250	225	225	—	200	225	255	230
Leukocytes, 1000/mm³	5,2	6,1	5,1	5,4	4,2	5,1	5,4	6,8	4,8	—
Formula:										
Rods	2	4,5	2,5	1	1	1,5	4,0	1,5	2	—
Segments	57	60	61,5	64	60	67,5	48	60	60	—
Eosinophiles	2	1,5	1,0	1	2	2	2	0,5	3,5	—
Lymphocytes	32	30	27	30	28	24,5	36	29,5	28,5	—
Monocytes	7	4	8	4	9	4,5	10	8,5	6	—

B. B. Yegorov

Sugar, mg%	50	50	110	115	115	76	112	55	65	59
Urea, mg%	20	19	33	23	—	51	41	40	41	38
Chlorine, mg%	240	280	220	260	220	210	180	220	240	200
Leukocytes, 1000/mm³	7,5	11,5	6,5	8,0	8,1	—	18,1	12,9	8,2	—
Formula:										
Rods	2	3	2,5	1	3	—	0,5	1,5	2,5	—
Segments	53	50,5	51	55	43	—	35,5	62,5	51,5	—
Eosinophiles	3	3	2,5	1	4	—	2,5	1	2,5	—
Lymphocytes	7	6,5	8	7	7	—	5,5	4,5	5,5	—
Monocytes										

It was noted that the cosmonauts did not tolerate re-entry as well as they did centrifugation during training. This was attributed to the day-long exposure to weightlessness. None of the observed deviations

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L 23281-66
ACC NR: AP6011411

from normal was pathological and rapid recovery took place. Attention is brought to the individual somatic and autonomic peculiarities of the cosmonauts and their level of training. Orig. art. has: 4 tables and 2 figs. [CD]

SUB CODE: 22, 06/ SUBM DATE: 10Sep65/ ORIG REF: 010/ OTH REF: 004
ATD PRESS: 4231

Card 7/7 ULR

L 08274-67 EOS-2/EWT(1)/...

ACC NR: AT6036472 SOURCE CODE: UR/0000/66/000/000/0018/0019

AUTHOR: Akulinichev, I. T.; Baykov, A. Ye.; Vasil'yev, P. V.; Kas'yan, I. I.; Maksimov, D. G.; Uglov, A. Ye.; Chekhonadskiy, N.A.

ORG: none

TITLE: Some data from electrophysiological investigations conducted on the crew of the Voskhod-2 during spaceflight (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, 18-19

TOPIC TAGS: space physiology, manned space flight, Leonov, extravehicular activity, cardiology, cardiovascular system, electrooculogram, electrocardiogram, body temperature, electrophysiology, respiration, heart rate / Voskhod-2

ABSTRACT:
Electrocardiograms, pneumograms, seismocardiograms, and electro-oculograms were registered on the Voskhod-2 cosmonauts, Belyayev and Leonov. In addition, Leonov's body temperature was measured. After the spaceship attained orbit, the frequency of cardiac contractions continued to increase and to exceed the levels registered

Card 1/3

during active acceleration. These changes in pulse rate were due to the preparations for Leonov' s EVA. During EVA, their heart rates reached the maximums of 129 and 162 beats/min. By the third orbit, the heart rate and respiration frequencies of the two cosmonauts became normal, equaling prelaunch magnitude. Further changes were comparable to those noted in preceding flights. The lowest heart rates were recorded during the seventh orbit. From the thirteenth to the eighteenth orbit there was a gradual increase in the rate of cardiac contractions (86—111) and an increase in respiration rate up to 18—20 cycles/min, which was related to the performance of a series of tasks according to the program, and to the emotional strain induced by preparation for manual re-entry.

Analysis of the EKG indicated that the significance of the Q—T and R—R intervals in both cosmonauts corresponded to changes in frequency of the heart rate. The lability of the Q—T coefficient was higher at the beginning and end of the flight in both cosmonauts and diminished noticeably during the middle of the flight. The same was observed in relation to the amplitude of the EKG peaks. The duration of the mechanical systole in general followed changes in pulse rate from the third to the sixteenth orbit; the duration of Leonov' s mechanical systole varied from 0.32—0.35

sec. During the 17th and 18th orbits, the duration of the mechanical systole diminished to 0.29—0.27 sec simultaneously with an increase in the pulse rate. Electromechanical lag was determined only in Leonov and during various times of the flight varied from 0.02—0.06 sec.

Oculomotor activity during the first two orbits rose in both cosmonauts to 105—111 movements/min. During the third and fourth orbits the number of oculomotor reactions diminished and after that varied within relatively low limits: 10—40 movements/min. The dynamics of the electro-oculogram corresponded to changes in the pulse and respiration frequency and reflected, apparently, the general condition of the cosmonauts. An analysis of the amplitudes and the curve of the EOG indicated that eye movements in the cosmonauts were rather symmetrical during the entire duration of the flight.

Leonov's armpit temperature varied during the flight from 35—37.6° C. The higher temperatures were recorded during the 2nd, 16th, and the 17th orbits. This can be explained by emotional strain and performance of physical tasks by the cosmonaut. [W. A. No. 22; ATD Report 66-116]

SUB CODE: 06,22 / SUBM DATE: 00May66

ACC NR: AT6036518 SOURCE CODE: UR/0000/66/000/000/0096/0097

AUTHOR: Vasil'yev, P. V.; Lysukhina, G. V.; Uglova, N. N.

ORG: none

TITLE: Increasing the resistance of animals to transverse accelerations by means of active and passive acclimatization under alpine conditions [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, 96-97

TOPIC TAGS: high altitude physiology, hypoxia, alpine acclimatization, cosmonaut training, biologic acceleration effect, acceleration tolerance

ABSTRACT: The efficacy of passive and active (with physical exercise) alpine acclimatization as a nonspecific training method of increasing adaptive capacity to several extremal spaceflight factors, especially accelerations, was studied in 461 mice, 95 rats, and 28 guinea pigs acclimatized to alpine conditions in the neighborhood of Mt. El'brus. Functional state of the animals was evaluated before, during, and after acclimitization from blood analyses, gas metabolism determinations, and body weight dynamics.

Card 1/2

ACC NR: AT6036518

Acceleration tolerance in mice was determined by comparing survival rates for experimental and control groups of animals. In rats and guinea pigs, tolerance to acceleration was based on onset time and severity of cardiovascular disturbances shown on EKG's.

It was found that survival of acclimatized animals exposed to large accelerations was 1.5 to 2 times higher than that of the controls, this effect persisting 3 to 4 weeks after acclimatization ended. Cardiac disturbances appeared later and were less severe in acclimatized animals.

Active alpine adaptation with systematic physical training was more effective than passive exposure to high altitude. Active alpine acclimatization produced an acceleration survival rate 10% to 25% higher than passive acclimatization. [W. A. No. 22; ATD Report 66-116]

SUB CODE: 06 / SUBM DATE: 00May66

Card 2/2

ACC NR: AP6033399 SOURCE CODE: UR/0293/66/004/005/0755/0767

AUTHOR: Volynkin, Yu. M.; Akulinichev, I. T.; Vasil'yev, P. V.; Voskresenskiy, A. D.; Kas'yan, I. I.; Maksimov, D. G.

ORG: none

TITLE: Some data on the condition of cosmonauts during the flight of the Voskhod-1 spacecraft

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 5, 1966, 755-767

TOPIC TAGS: manned spacecraft, space physiology, space medicine, human physiology, cardiovascular system, nervous system, vestibular analyzer/Voskhod 1 spacecraft

ABSTRACT: A diagram of the biomedical monitoring parameters and some results of a further statistical analysis of the Voskhod-1 flight are presented in the following figures and tables. As in other discussions of this flight, the general conclusion was that none of the observed physiological shifts were of a pathological nature, and therefore, were reversible. The most significant finding of the flight was a confirmation of the possible specific effect of weightlessness on the statokinetic

Card 1/6 UDC: 629.198.61

ACC NR: AP6033399

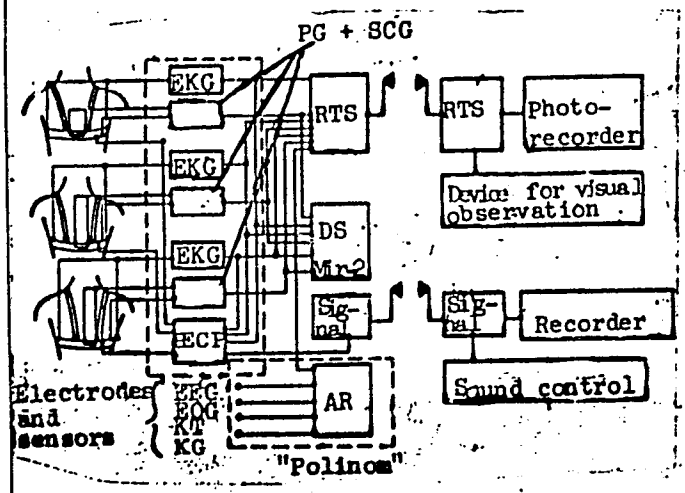

Fig. 1. Block diagram of physiological parameters recorded during the flight of Voskhod-1

EKG - Electrocardiogram; PG, SCG - pneumogram plus seismocardiogram; EEG - electroencephalogram; PECP - pulmoelectrocardiophone; EOG - electrooculogram; KT - coordination test; KG - kinetogram; RTS - radiotelemetry system; DS-Mir-2 - data storage unit; AR - amplifier-readout.

Card 2/6

ACC NR: AP6033399

Cosmonauts	Physiological index	Before flight						After flight	
		6.X	8.X	11.X 1964	4 hr Prelaunch	5 min Prelaunch	1 min Prelaunch 12.X 1964	1st day	15 th day
V. M. Komarov	Pulse	76	68	72	87	89	89	80	68
	Respiration	8	12	10	18	23	20	11	10
	Arterial pressure	115/75	115/70	120/75	—	—	—	115/80	115/75
K. A. Feoktistov	Pulse	80	84	80	78	86	97	84	72
	Respiration	12	16	18	21	20	21	16	11
	Arterial pressure	110/75	105/75	125/85	—	—	—	105/85	115/80
B. B. Yegorov	Pulse	72	64	64	81	86	95	84	68
	Respiration	14	14	14	18	26	21	10	16
	Arterial pressure	100/70	105/65	120/70	—	—	—	120/80	110/65

Table 1. Dynamics of the pulse rate, respiration rate, and arterial pressure of the Voskhod-1 cosmonauts before, during, and after the flight (from the data of M. D. Nikitin et al).

Card 3/6

ACC NR: AP6033399

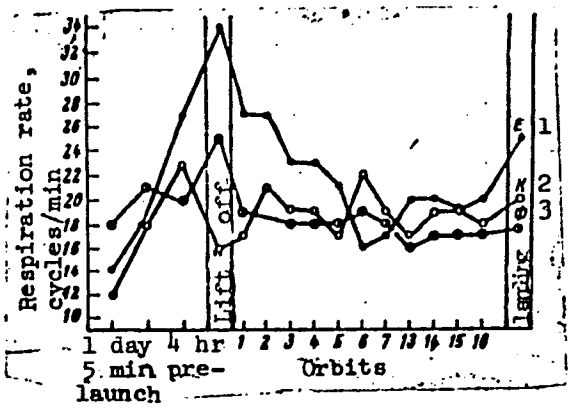

Fig. 2. Dynamics of the average respiratory rates of V. M. Komarov (2), K. P. Feoktistov (3), and B. B. Yegorov (1) before, during, and after the Voskhod-1 flight

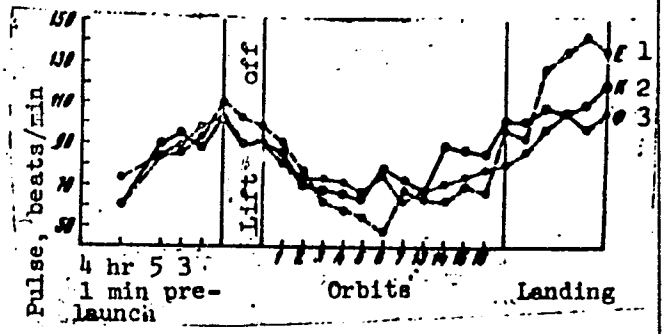

Fig. 3. Dynamics of the average pulse rates of B. B. Yegorov (1), V. M. Komarov (2), and K. P. Feoktistov (3), before, during, and after the Voskhod-1 flight

Card 4/6

ACC NR: AP6033399

Parameters	Cosmonauts	2.5 hr before launch	Orbits 1	2	3	4	5	6	7	12	14	15	16
P-Q, sec	V. M. Komarov	0,12	0,10	0,11	0,10	0,12	0,11	0,11	0,11	0,10	0,10	0,10	0,10
	K. P. Feoktistov	0,15	0,14	—	0,13	0,16	0,13	0,16	0,14	0,11	0,12	0,12	0,12
	B. B. Yegorov	0,12	0,12	0,12	0,13	0,13	0,14	0,14	0,16	0,10	0,12	—	0,10
Q-T, sec	V. M. Komarov	0,34	0,34	0,37	0,36	0,37	0,38	0,38	0,38	0,39	0,36	0,34	0,34
	K. P. Feoktistov	0,36	0,36	—	0,36	0,37	0,37	0,37	0,42	0,38	0,39	0,37	0,36
	B. B. Yegorov	0,33	0,34	0,37	0,38	0,39	0,41	0,44	0,39	0,40	0,38	—	0,37
R-R, sec	V. M. Komarov	0,69	0,61	0,78	0,70	0,86	0,99	0,61	0,76	0,89	0,71	0,72	0,75
	K. P. Feoktistov	0,75	0,69	—	0,82	0,86	0,91	0,90	0,96	0,87	0,82	0,80	0,78
	B. B. Yegorov	0,67	0,69	0,73	0,86	0,96	1,13	1,24	0,96	1,03	0,87	—	0,90
Systolic index,	V. M. Komarov	49,9	57,7	48,7	51,7	43,7	40,0	56,2	50,7	45,0	51,1	47,2	45,3
	K. P. Feoktistov	47,6	52,9	—	44,6	42,4	40,0	41,3	43,3	44,2	47,9	46,5	46,8
	B. B. Yegorov	49,2	58,6	50,7	43,4	39,7	36,2	36,8	40,1	39,2	44,2	—	41,0

Table 2. Some indices of the cardiac activity of V. M. Komarov (1), K. P. Feoktistov (2), and B. B. Yegorov (3) before and during the flight of Voskhod-1

Card 5/6

Orbits	V. M. Komarov			K. P. Feoktistov			B. B. Yegorov		
	M, sec	σ, sec	C, %	M, sec	σ, sec	C, %	M, sec	σ, sec	C, %
5 min before	0,68	0,07	10,5	0,72	0,076	10,56	0,70	0,073	10,50
1	0,72	0,08	12,8	0,75	0,031	4,15	0,69	0,074	10,74
3	0,87	0,098	11,26	0,84	0,084	9,96	0,94	0,109	11,55
6	0,82	0,075	9,14	0,86	0,074	7,66	1,31	0,044	3,36
13	0,87	0,038	4,34	0,93	0,091	9,80	1,02	0,067	6,58
16	0,74	0,043	5,82	0,81	0,053	6,50	0,96	0,082	8,60

Table 3. Results of a statistical analysis of R-R intervals for V. M. Komarov (1), K. P. Feoktistov (2), and B. B. Yegorov (3) before and during the Voskhod-1 flight

analyzer and its interaction with other analyzers leading to the possible development of prolonged spatial disorientation illusions and prolonged vestibulosutonomic reactions which decrease the work capacity of cosmonauts. Orig. art. has: 4 figures and 4 tables.

SUB CODE: 06/ SUBM DATE: 26May66/ ORIG REF: 010/ OTH REF: 001/ ATD PRESS: 5100

Card 6/6

ACC NR: AT7011641 SOURCE CODE: UR/0000/66/000/000/0001/0018

AUTHOR: Belay, V. Ye.; Vasil'yev, P. V.; Glod, G. D.

ORG: none

TITLE: Pharmacology and manned spaceflight

SOURCE: International Astronautical Congress. 17th, Madrid, 1966. Doklady. no. 3. 1966. Problema farmakologii v kosmicheskoy meditsine, 1-18

TOPIC TAGS: space pharmacology, antiacceleration drug, altered biologic reactivity, weightlessness, biologic acceleration effect, antimotion sickness drug, antiradiation drug

ABSTRACT:

The authors feel that pharmacological preparations can be used to advantage in enabling man to withstand the effects of certain spaceflight factors. While antiacceleration drugs need not be used during launch into orbit, it is felt that after two or more weeks of weightlessness they may become important on reentry. Phenamine, strychnine, and securine appear to be the most promising antiacceleration drugs. For countering the effects of weightlessness, phenamine, caffeine, strychnine, securine, ginseng, and Elentherococcus have been found useful. For countering the effects of motion

Card 1/3

sickness, pentasen (merpanit), animazine, and metamizil [2-(diethylamino benzilate hydrochloride] are suggested.

Antiradiation drugs are considered a special problem due to presence of other spaceflight factors. At present they are using cysteamine, cystamine, AET, and serotonin. However, while these drugs are effective antiradiation agents they happen to reduce resistance to acceleration stress and vibration. Consequently, substances will have to be found which will reduce the unfavorable effects of antiradiation drugs on acceleration and vibration tolerance before an effective pharmacological antiradiation system can be developed for spaceflight purposes.

Studies have been made indicating that exposure to different spaceflight factors affects the reactivity of the organism to various drugs. Thus, acceleration increases sensitivity to cardiac glucosides (K-strophanthin, convasid) and narcotics (barbituates, ether, chloral hydrate) but reduces sensitivity to certain analeptics (caffeine, corazol, cytisine). Reactions of the

organism to adrenalin are interesting because they tend to change with the intensity and magnitude of acceleration stress. Hypoxia also affects the organism's reaction to radiation and tends to increase sensitivity to cardiac glucosides and certain pharmacological substances.

Consequently the tasks of space pharmacology should be: 1 - to search for drugs capable of increasing the stability of an organism to the unfavorable effect of spaceflight factors; 2 - to study the effect of individual and combined spaceflight factors on reactions of the organism to various drugs; 3 - to develop dosimetry and methods of introduction of drugs under spaceflight conditions; 4 - to utilize drugs as indicators of physiological functions for the purpose of clarifying the effects of spaceflight on the organism.
Orig. art. has: 3 figures and 1 table. [ATD PRESS: 5098-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 047/ OTH REF: 023

Card 3/3

ACC NR: AP7005701 SOURCE CODE: UR/0216/67/000/001/0104/0115

AUTHOR: Kas'yan, I.I.; Vasil'yev, P.V.; Maksimov, D.G.; Akulinichev, I.T.; Uglov, A.Ye.; Baykov, A.Ye.; Chekhonadskiy, N. A.

ORG: none

TITLE: Some cardiovascular and respiratory system reactions of the cosmonauts during the orbital flight of the Voskhod-2 spacecraft

SOURCE: AN SSSR. Izvestiya. Seriya biologicheskaya, no 1, 1967, 104-115

TOPIC TAGS: weightlessness, cardiovascular system, respiratory system, electrocardiography, psychologic stress, SPACE PHYSIOLOGY

ABSTRACT:
Cardiovascular and respiratory system data for A. A. Leonov and P. I. Belyayev monitored during the March 18, 1965 Voskhod-2 spacecraft flight and extravehicular excursion is analyzed. The significance of the R-R, PQ, QT and QRS intervals and the P, R, S and T-waves of the EKG's was determined. Pulse rate, respiration frequency, and systolic index were found on the basis of pneumogram data. The EKG and pneumogram data were mathematically processed for each orbit. Findings show that under conditions of weightlessness the general condition of the cosmonauts was not marked

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by any significant disorders with the exception of some functional shifts in the cardiovascular system: marked reduction of heart contraction frequency, sometimes lower than initial values; more marked fluctuation of time intervals and amplitudes of EKG waves; and, in the case of P. I. Belyayev, the presence of ventricular extrasystoles. Analysis of the respiratory cycle phases and their coefficients of variation indicates relative stability of respiratory functions. Postflight medical examinations did not disclose any significant functional system shifts. Pulse rate increases by 12 to 16 beats/min, systolic arterial pressure increases by 10 to 15 mm Hg, and the diastolic pressure remained practically the same. Respiration frequencies corresponded to initial values. The most pronounced cardiovascular and respiratory reactions were displayed by Belyayev during the second orbit when his companion returned to the spacecraft and during the seventeenth orbit when he operated the controls manually. The highest reactions displayed by Leonov were during the second orbit at the time of his extravehicular excursion and return to the spacecraft. These shifts are attributed to the emotional strain involved in performing the most difficult tasks of the flight mission. The medical data show that the orbital flight and extravehicular excursion did not produce any sharp changes in the basic functional system and did not reduce the work capacities of the cosmonauts. Orig. art. has: 7 figures and 1 table. [06]

SUB CODE: 06/ SUBM DATE: 26Apr66/ ORIG REF: 006/ OTH REF: 003/
ATD PRESS: 5116

Card 2/2

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ACC NR: AP5028142 SOURCE CODE: UR/0106/65/000/011/0048/0054

AUTHOR: Vasil'yev, P. V. 44,55

ORG: none

TITLE: Optimal code-combination length for feedback signals in RQ data-transmission systems

SOURCE: Elektrosvyaz', no. 11, 1965, 48-54

TOPIC TAGS: data processing, 16C,44,55 data transmission

ABSTRACT: A formula is developed for the length of code combination that conveys automatic-request-for-repetition (ARQ) signals; this length ensures maximum efficiency of transmission in ARQ-equipped systems; a binomial error distribution in both forward and reverse channels is assumed. The system has no storage and permits unlimited number of ARQ's. It is found that the data-transmission efficiency (a) largely depends on the length of the code combination used in the ARQ channel and (b) has a pronounced maximum. The position of this maximum is practically independent of the length of the coded unit transmitted over the forward channel. Higher fidelity of information transmission over the forward channel requires longer code combinations in the reverse channel. Orig. art. has: 4 figures, 32 formulas, and 1 table.

UDC:621.391.151

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