"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

17(1)

AUTHOR: Glezer, V. D. SOV/20-126-5-56/69

TITLE: Cone Adaptation Viewed as a Nervous Process
(Kolbochkovaya adaptatsiya kak nervnyy protsess)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 1110-1113
(USSR)

ABSTRACT: The importance of the nervous system for the darkness adaptation was pointed out in recent papers. A hypothesis was set up according to which the adaptive increase in sensitiveness to light is connected with the extension of the zone of spatial summation (prostranstvennaya summatsiya) on the retina (Refs 1-3). Essential changes of the said summation in the cone part of the curve of darkness adaptation could be proved by experiment. At the same time, the rod changes are very small (Ref 4). Some authors think it possible to identify the summation zone with the receptive field which appears in electrophysiological tests (Ref 5). There is much reason to assume that the zone of spatial summation really corresponds to the rod receptive field. As is known, the foveala cones have isolated nervous canals. It is also inevitable to assume that a cooperation of the cones is possible in fields which are analogous to the rod fields. In the present paper, the

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following hypothesis is supported by experiment: the increase in sensitiveness to light in the process of darkness adaptation must be connected with the extension of the receptive field, i.e. with the increase in the number of cones, which converge toward a common nervous canal. At first, the magnitudes of the foveola-cone-receptive fields were determined in 12 test persons under the conditions of darkness adaptation (after a stay of 30 minutes in the dark). In control investigations by means of artificial pupils, white fixation points and spectacle glasses, it was proved that neither the spherical, nor the chromatic, nor the night myopia affect the determination of the receptive field. Figure 1 shows a typical diagram obtained in such a determination (Ref 7). The author concludes from the results that the probability of such a complicated occurrence, as is the threshold excitation of a ganglicus cell, is determined by the number of quanta falling upon the receptive field, as well as by the number of nervous elements which, at a given point of time, converge to the ganglious cell. At the moment, it is difficult to judge which mechanism is the basis for the dependence observed. It can, however, be assumed: if the photoreceptors are able to generate spontaneous impulses (Ref 9), the increase in the number of



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receptors converging to the original cell must lead to an accumulation of subthreshold excitation in this cell as well as to an increase in the excitability of the field as a whole. It can also be assumed that the spontaneous eye motions play a certain part in this phenomenon. Under experimental conditions, the changes of the foveala sensitiveness to light in the range observed can be completely explained ba reorganizations (perestroyki) of the nervous structure. The rule observed (mN = const) can be of interest to the building of cybernetic models of the nervous system. There are 3 figures, 1 table, and 10 references, 5 of which are Soviet.

ASSOCIATION: Institut fiziologii im. I. P. Pavlova Akademii nauk SSSR (Institute of Physiology imeni I. P. Pavlov of the Academy of Sciences, USSR)

PRESENTED: February 25, 1959, by K. M. Bykov, Academician

SUBMITTED: February 15, 1959



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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V.D.; MANGUSHEV, R.G.; ATLAVIN, A.B.

Role of the neural factor in dark adaptation. Biofizika 5 no. 2:152-157 '60. (MIRA 14:4)

1. Institut fiziologii im. I.P. Pavlova, Leningrad.
(NIGHT VISION)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V.D.

Functional units of foveal vision. Fiziol. zhur. 46 no.11:1325-1335 N '60. (MIRA 13:11)

1. From the Laboratory of the Visual Analyzer Physiology, Pavlov Institute of Physiology, U.S.S.R. Academy of Sciences, Leningrad. (VISION)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, Vadim Davydovich; TSUKKERMAN, Il'ya Ioannovich; LEBEDEV, D.S., otv. red.; RAZUMOV, S.A., red. izd-va; ARONS, R.A., tekhn. red.

[Information and vision] Informatsiia i zrenie. Moskva, Izd-vo Akad. nauk SSSR, 1961. 181 p. (MIRA 14:10)
(VISION) (INFORMATION THEORY)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

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B016/B052

AUTHORS: Glezer, V. D., Tsukkerman, I. I., and Tsykunova, T. M.

TITLE: The Dependence of the Throughput of Eyesight on Brightness

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3, p. 720

TEXT: The authors studied the dependence of the throughput of eyesight on brightness. They define this throughput as the maximum information which is conveyed to the brain via eyesight within a certain time unit. Under optimum conditions of visual observation, this throughput attains some dozens of binary information units per second (Ref. 1). In their experiments, the authors followed G. S. Sziklai's methods (Ref. 1) except for brightness variations by neutral filters. The test persons were well trained in identifying eight standard objects (order of magnitude of 2 - 4 angular degrees) contrasting by approximately 80%. These objects were shown to them in random sequence. The throughput was measured as being C=H/T binary units per second, where T denotes the period of time necessary for the correct identification of an object, $H = \log_2 B = 3$

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The Dependence of the Throughput of Eyesight on Brightness

S/020/61/136/003/027/027
B016/B052

binary units, i.e. the information conveyed to the brain. Fig. 1 shows the dependence of C on the logarithm of the ratio between the brightness B and initial brightness $B_0$ ($B_0$ has an order of magnitude of 100 asb in white light). At lower brightness levels, the throughput increases as the logarithm of brightness increases (Ref. 2). If the brightness in this section is doubled, the throughput is increased by approximately 10 binary units per second. The authors compare the linear dependence of C on $\log_2 B$ with the linear dependence of the visual acuity on $\log_2 B$, and express the assumption that a change in the volume of the optic foramen (Ref. 3) forms the basis for the mechanism of the increase in the throughput in this section. A further increase of brightness (under the given experimental conditions) did not render the identification of objects less accurate.
[Abstracter's note: This is nearly a full translation from the original.]
There are 1 figure and 3 references: 2 Soviet.



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The Dependence of the Throughput of Eyesight on Brightness

S/020/61/136/003/027/027
B016/B052

ASSOCIATION: Institut fiziologii im. I. P. Pavlova Akademii nauk SSSR (Institute of Physiology imeni I. P. Pavlov of the Academy of Sciences USSR)

PRESENTED: July 28, 1960, by V. N. Chernyshevskiy, Academician

SUBMITTED: July 26, 1960

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V.D.; ZYAZINA, Z.N.; SMOLENSKAYA, L.N.

Changes in the foveal receptor fields in man. Biofizika 7 no.4:486-488 '62. (MIRA 15:11)

1. Institut fiziologii imeni I.P.Pavlova AN SSSR, Leningrad. (VISION RESEARCH)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V.D., kand.biolog.nauk; TSUKKERMAN, I.I., kand.fiz.-matem.nauk (Leningrad)

Image and the visual system. Priroda 51 no.10:14-20 O '62. (MIRA 15:10)

(VISION) (INFORMATION THEORY IN BIOLOGY)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEBA, V.P.; IVANOV, V.A.

Electroretinographic study of [illegible] adaptation.
Fiziol. zhur. 49 no.11:1357-1[illegible] (MIRA 17:8)

1. Laboratoriya fiziologii [illegible]
fiziologii imeni I.[illegible]

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V. D.

"Investigations of mechanisms for Image Identification in the Visual System."

report submitted for Symp on Psychological Problems of Cybernetics, E. Berlin, 3-5 Sep 64.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZER, V.D.; NEVSKAYA, A.A.

Synchronous and consecutive information processing in the visual system. Dokl. AN SSSR 155 no. 3:711-714 Mr '64. (MIRA 17:5)

1. Institut fiziologii im. I.P.Pavlova AN SSSR. Predstavleno akademikom V.N.Chernigovskim.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEBER, V.D.

Physiological side of the conception "visual image." Zhur. vys. nerv. delat. 15 no.5:[illegible] S-O '65. (MIRA 18:11)

1. Laboratoriya fiziologii zritel'nogo analizatora Instituta fiziologii im. I.P. Pavlova AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

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ACC NR: AM6034593 Monograph UR/

Glezer, Vadim Devydovich

Identification mechanisms of optical images (Mekhanizmy opoznaniya zritel'nykh obrazov) Moscow, Izd-vo "Nauka", 1966. 203 p. illus., biblio. (At head of title: Akademiya nauk SSSR. Institut fiziologii im. I. P. Pavlova) 2700 copies printed.

TOPIC TAGS: image recognition, optic image, human physiology, ~~visual~~ perception, bionics, ~~sensory physiology~~ VISION, PSYCHOLOGY, HUMAN SENSE

PURPOSE AND COVERAGE: This book is intended for physiologists and psychologists, as well as engineers and mathematicians studying machine perception and the bionic aspect of the mechanisms of identification of visual images. It discusses, from the point of view of modern perception theory, those facts of visual physiology and psychology which are essential to the problem of visual image identification. Neurophysiological mechanisms of the retina for initial transformation of visual information are discussed and those systems which separate the simple signs of the image described. Questions concerning image formation are presented. Data contributing to an understanding of mechanisms of the detail of an image in the higher branches of the visual system are discussed. The book is based on data obtained in the Laboratory of Visual Physiology of the Institute of Physiology Im. Pavlov and on literature data. The mechanisms of and interrelationship between generalization and individualization processes of identification of visual images

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are described. New tasks designed to implement ideas on the mechanisms of identification are formulated.

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SUB CODE: 06/ SUBM DATE: 09Jul66/ ORIG REF: 128/ OTH REF: 235/

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ALEKSEYEV, F.A.; BARS, Ye.A.; GULYAYEVA, L.A.; GLEZER, V.G.; GAVRILENKO, Ye.S., KOGAN, S.S.

Erroneous interpretation of V.A. Sulin's genetic classification of waters. Geol. nefti 1 no.6:66-69 Je '57. (MLRA 10:8)
(Water, Underground--Analysis)

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GLEZER, V.G.

Hydrochemical survey of the Minusinsk Lowland. Trudy Inst.nefti 9:68-80 '58. (MIRA 12:4)
(Minusinsk Lowland--Water, Underground)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

BARS, Ye.A.; GLEZER, V.G.

Hydrochemical surveying in Arkhangel'skoye District, Bashkir A.S.S.R. Trudy Inst. geol. i razrab. gor. iskop. 1:314-327 '60. (MIRA 14:1)

(Arkhangel'skoye District--Water, Underground--Analysis)

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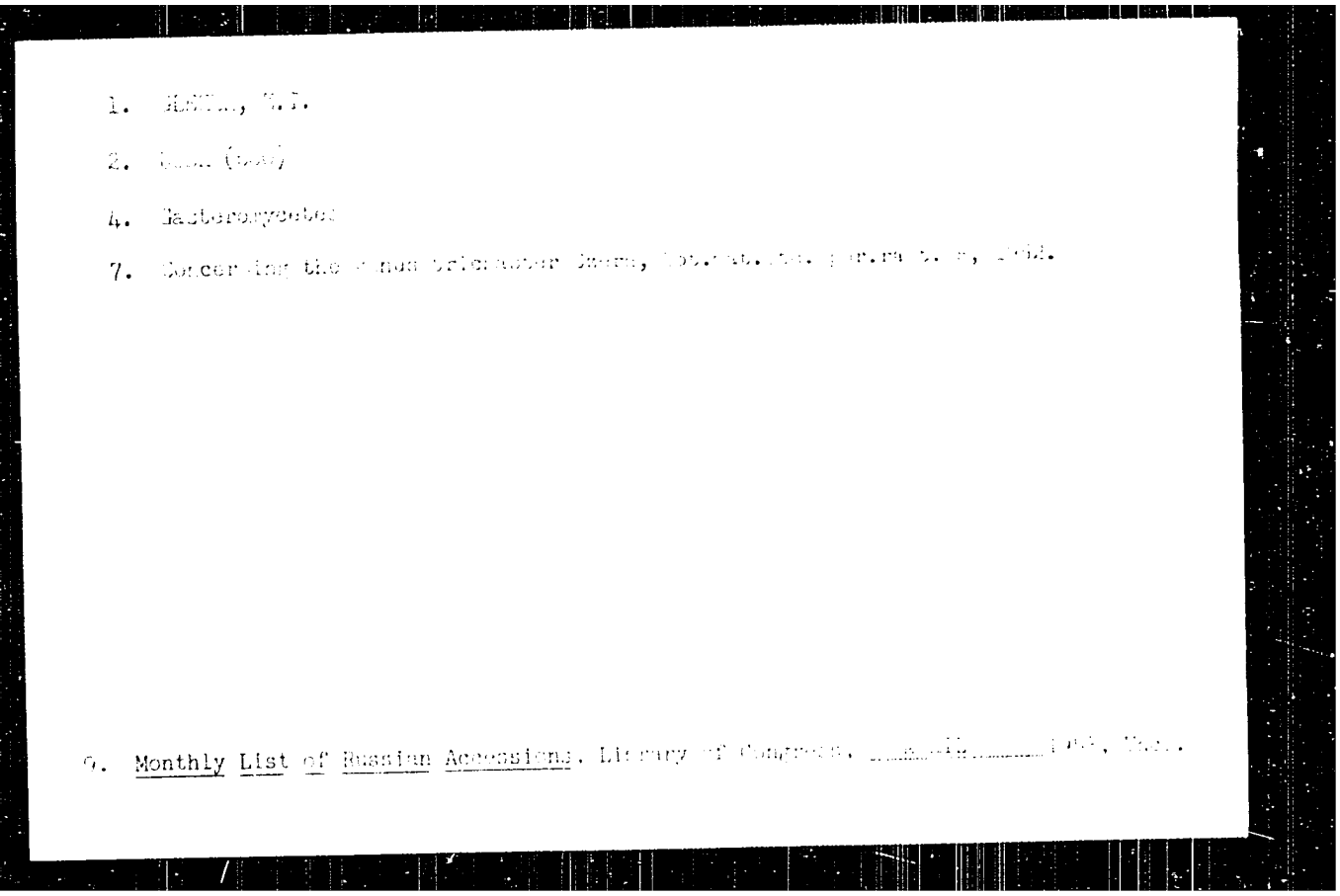

1. [illegible], [illegible]

2. [illegible] ([illegible])

4. Gasteromycetes

7. Concerning the genus Trichaster Czern, [illegible]

9. Monthly List of Russian Accessions, Library of Congress, [illegible] 19[illegible], [illegible].

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GLEZER, Z.I.

A new genus and several new species of fungi in the Crimea.
Bot.mat.Otd.spor.rast. 12:162-172 Ja '59. (MIRA 12:12)
(Crimea--Fungi, Phytopathogenic)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

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GLEZER, Z. I.

Some new data on the Vallacertaceae Deflandre (Silicoflagellatae) family. Inform. sbor. VSEGEI no.10:103-113 '59. (MIRA 13:12)
(Flagellata, Fossil)

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GLEZER, Z.I.

Phylogeny of silicoflagellates. Paleont.zhur. no.1:146-156 '62.
(MIRA 15:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskiy institut.
(Silicoflagellidae, Fossil)

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GLEZER, Z.I.

New species of the genus Poretzkia Jouse (Bacillariophyta from Paleocene sediments of the eastern slope of the Ural Mountains. Bot. mat. Otd. spor. rast. 15:32-34 Ja '62. (MIRA 15:10)
(Makhnevo District--Diatoms, Fossil)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

SHESHUKOVA-PORETSKAYA, V.S.; GLEZER, Z.I.

Diatoms, Silicoflagellatae and Ebriideae from Maikop sediments in the Shibik River; Krasnodar Territory. Uch. zap. LGU no.313:171-202 '62. (MIRA 15:12)
(Shibik River—Algae, Fossil)

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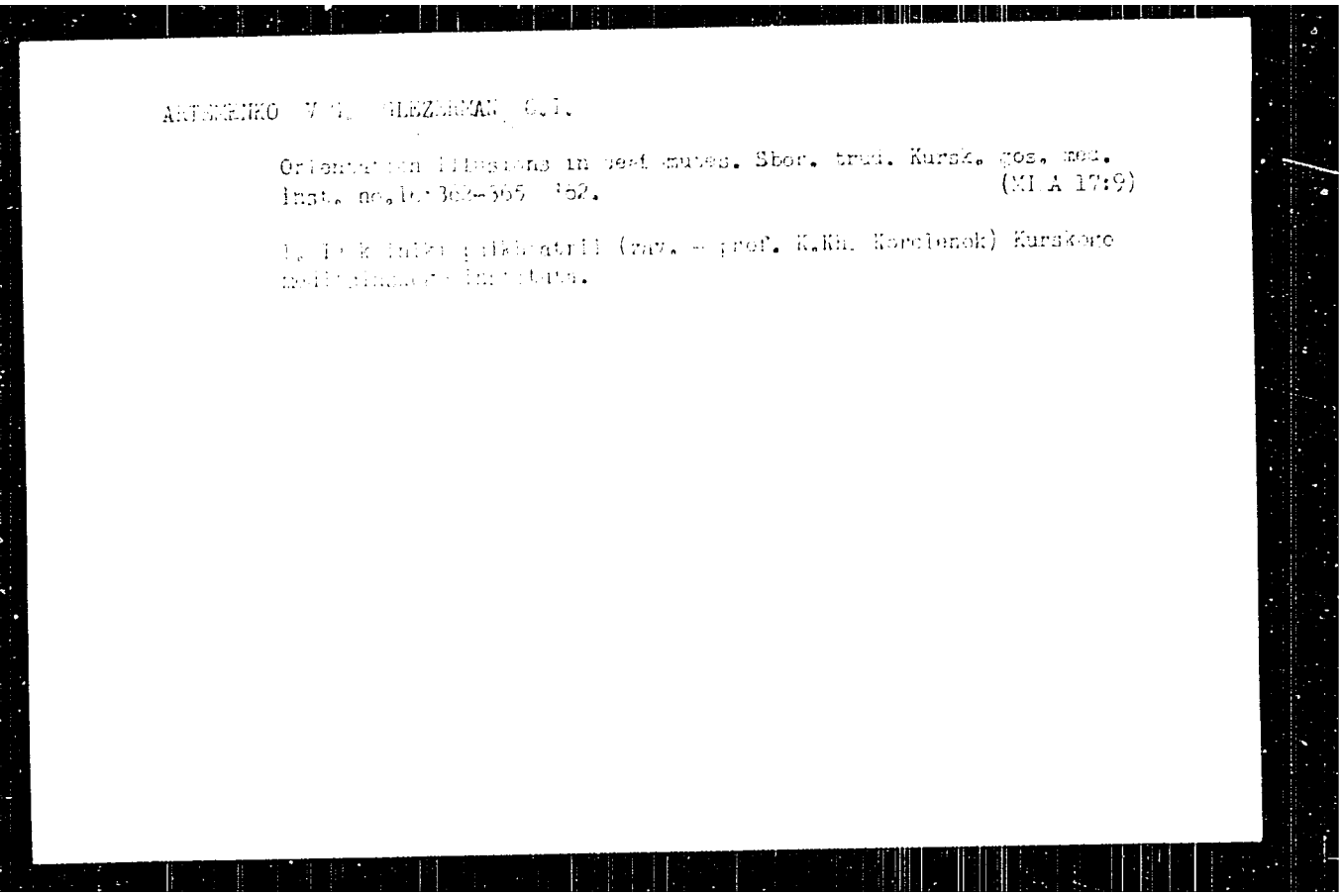

ARTEMENKO V. G., GLEZERMAN, G. I.

Orientation illusions in deaf mutes. Sbor. trud. Kursk. gos. med. inst. no.16:362-365 '62. (MIRA 17:9)

1. Iz kliniki psikhiatrii (zav. - prof. K.Kh. Korolenok) Kurskogo meditsinskogo instituta.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZERMAN, Grigoriy Yefimovich

[The future that begins today; the building of communism in the U.S.S.R.] Budushchee, kotoroe nachinaetsia segodnia; o stroitel'stve kommunizma v SSSR. Izd.2., dop. Moskva, Molodaia gvardiia, 1960. 142 p. (MIRA 14:2)
(Russia--Economic conditions)

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GLEZEROV, B.E., kandidat tekhnicheskikh nauk.

New experimental cavitation stand of the Moscow V.M.Molotov Institute of Power Engineering. Gidr.stroi. 22 no.7:44-47 Jl '53. (MLRA 6:7)
(Power engineering) (Cavitation)

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GLEZEROV, B.E., kandidat tekhnicheskikh nauk.

Two-stage turbine and its use in small hydroelectric power stations. Trudy VIGM no.18:66-90 '54. (MLRA 9:4)
(Hydraulic turbines)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZEROV, B.E.

Recalculation of the unsteady operating conditions of hydraulic turbines. Nauch.dokl.vys.shkoly; energ. no.2:125-132 '59. (MIRA 13:1)

1. Rekomendovana kafedroy gidromashin Moskovskogo energeticheskogo instituta.
(Hydraulic turbines)

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GLEZEROV, M.

Training of drivers in brought closer to operating conditions.
Av.transp. 40 no.7:49 Jl '62. (MIRA 15:8)

1. Direktor Izhevskogo uchebnogo kombinata.
(Izhevsk--Automobile drivers)

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GLEZEROV, S.I.

Cataracts due to trinitrotoluene. Vest. oft., Moskva 32 no.4:21-23 July-Aug 1953. (CLML 25:1)

1. Professor. 2. Of Gor'ki Institute of Labor Hygiene and Occupational Diseases.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZEROV, S.Ya, professor

New tenorrhaphy technique in strabismus. Vest. oft. 33 no.4:23-26 Jl-Ag '54. (MLRA 7:8)

1. Iz Gor'kovskogo instituta gigiyeny truda i professional'nykh bolezney.
(STRABISMUS, surgery,
*tenorrhaphy)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZEROV, S. Ya., prof.

Characteristics of functional changes in lesions of the cortical visual analyser. Vest.oft. 34 no.1:9-13 Ja-F '55 (MLRA 8:4)

1. Iz Gor'kovskogo instituta gigiyeny truda i professional'nykh boleznej.

(EYE, diseases,
disord. of grey matter of visual analyser, physiol.)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZEROV, S.Ya., professor

Surgery in paralytic lagophthalmos. Vest.oft.34 no.4:25-27 Jl-Ag '55. (MLRA 8:10)

1. Iz Gor'kovskogo instituta gigiyeny truda i professional'nykh bolezney.
(EYELIDS, diseases,
lagophthalmos, paralytic surg.)

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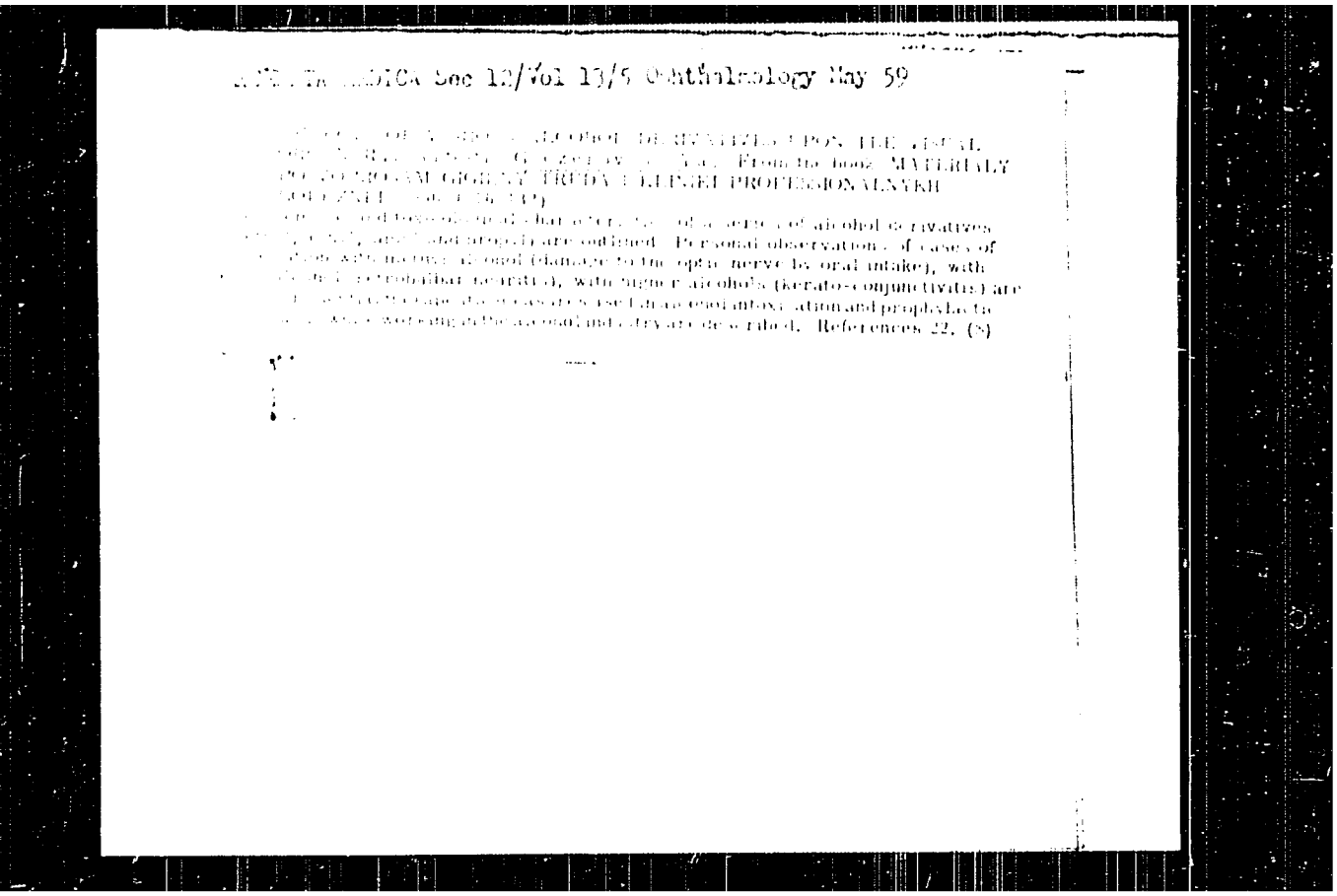

Ophthalmology May 59

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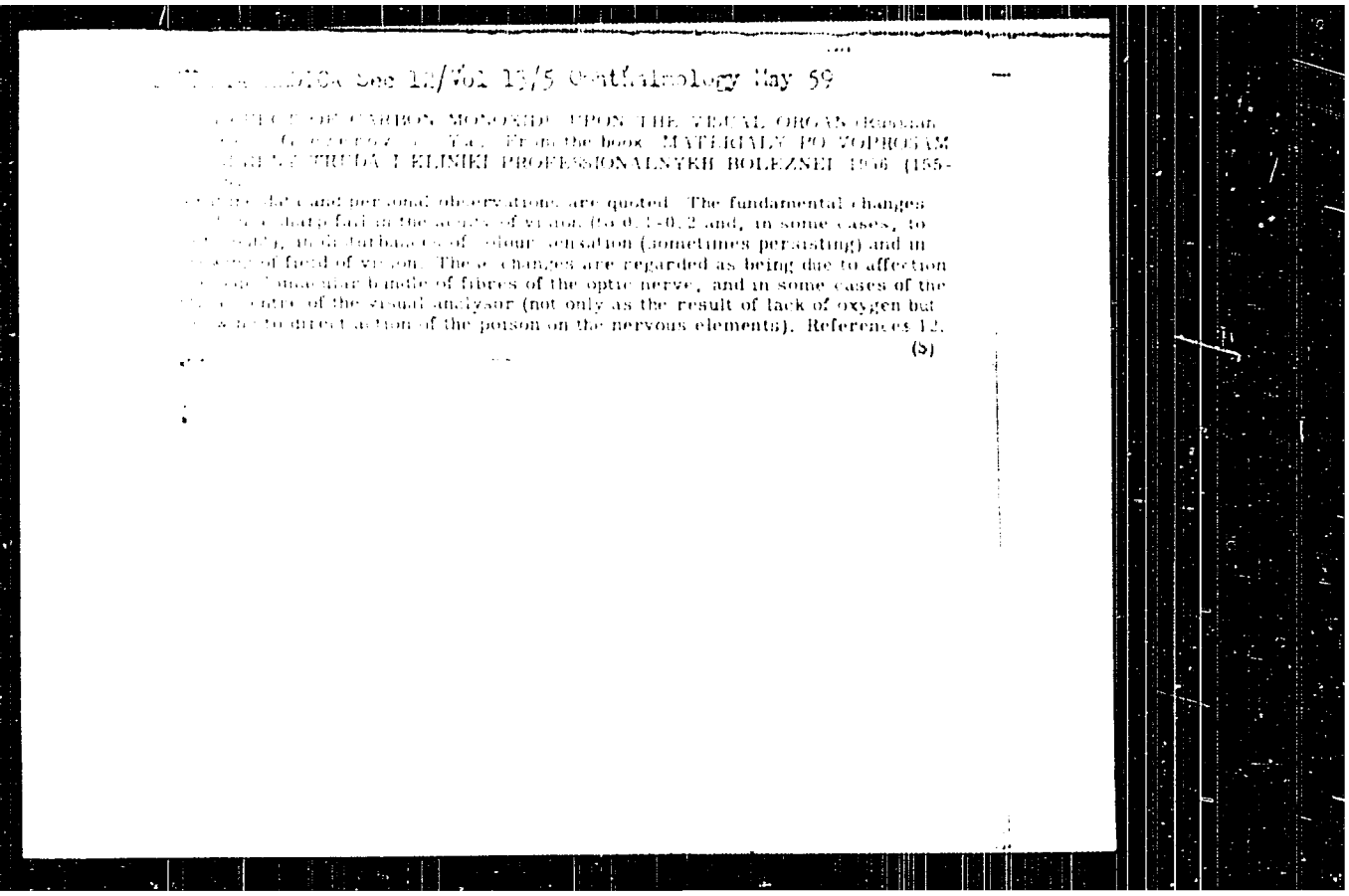

[illegible] See 12/Vol 13/5 Ophthalmology May 59

[illegible] OF CARBON MONOXIDE UPON THE VISUAL ORGANS [illegible] From the book MATERIALY PO VOPROSAM [illegible] TRUDA I ELINIKI PROFESSIONALNYKH BOLEZNEI 1956 (155-[illegible]

[illegible] case personal observations are quoted. The fundamental changes [illegible] data fall in the sphere of vision (to 0.1-0.2 and, in some cases, to [illegible], in disturbances of colour sensation (sometimes persisting) and in [illegible] of field of vision. These changes are regarded as being due to affection [illegible] connective bundle of fibres of the optic nerve, and in some cases of the [illegible] centre of the visual analyzer (not only as the result of lack of oxygen but [illegible] to direct action of the poison on the nervous elements). References 12.

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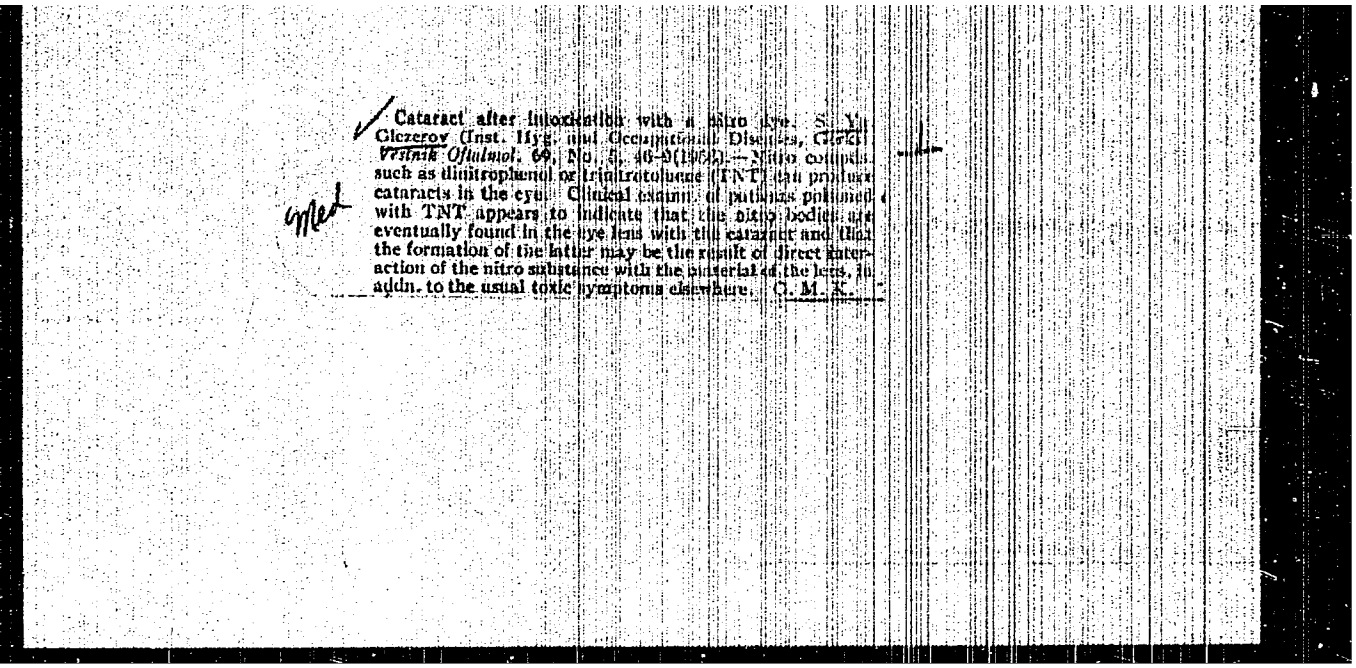

Cataract after intoxication with a nitro cyc. S. Ya. Glezerov (Inst. Hyg. and Occupational Diseases, Gorki) *Vestnik Oftalmol.* 69, No. 5, 46-9(1956).—Nitro compds. such as dinitrophenol or trinitrotoluene (TNT) can produce cataracts in the eye. Clinical examn. of patients poisoned with TNT appears to indicate that the nitro bodies are eventually found in the eye lens with the cataract and that the formation of the latter may be the result of direct interaction of the nitro substance with the material of the lens, in addn. to the usual toxic symptoms elsewhere. G. M. K.

Med

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

KUSHNIRSKAYA, M. TS.; GLEYZEROVA, L.L.

Deep staining of beech wood. Bum. i drev. prom. no.4:34-36 O-D '64
(MIRA 18:2)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

KUSHNIRSKAYA, M.TS.; GLEYZEROVA, L.L.

Staining ground wood. Der. prom. 13 no.6:7-9 Je '64.
(MIRA 17:6)

1. Ukrainskiy nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki drevesiny.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZEROVA, N. and GRINBAUM, F. T.

"Mass Investigation of Typhoid-Paratyphoid Bacilli Carrying among "orkers of the Food Industry," Zhur. Mikrob., Epidem. i Immunobiol., No.2, p. 180-194, 1935

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

SINELNIKOV, A. S.; [illegible], A. G.; [illegible], I. I.

Centrifugation of unreamed peat with illuminating gas. Trudy VNIIT no. 11:81-87 '62. (MIRA 17:5)

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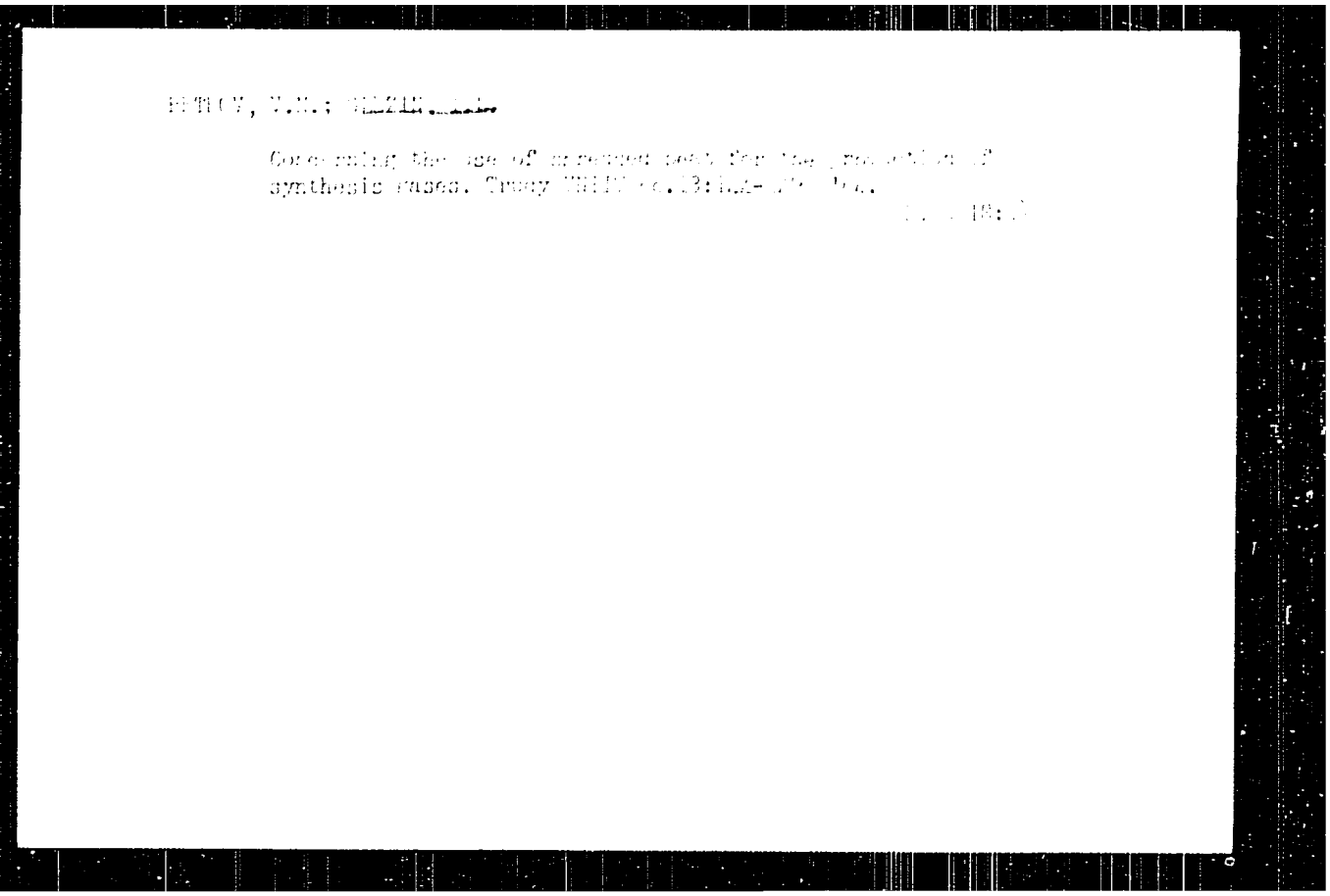

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L 6366-66 EPF(c)/EWT(m)/EWP(b)/T/EWP(t) IJP(c) WE/JD

ACC NR: AP5026738 SOURCE CODE: UR/0286/65/000/017/0031/0031

INVENTOR: Bezmozgin, E. S.; Glezin, I. L.; Petrov, V. N.

ORG: none

TITLE: Continuous action equipment for production of commercial hydrogen." Class 12, No. 174174

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 14

TOPIC TAGS: hydrogen, chemical plant equipment, manufactured gas

ABSTRACT: This Author's Certificate introduces continuous action equipment for production of commercial hydrogen from natural or mixed gas. The equipment is made in the form of two chambers for full conversion of hydrocarbon gases. The first chamber is filled with a catalyst or an inert packing material for conversion of hydrocarbon gases with heat supply. The second chamber is filled with a catalyst for conversion of carbon monoxide with water jacket cooling.

UDC: 661.961 : 66.05

SUB CODE: IE,3C/ SUBM DATE: 06Jul62/ ORIG REF: 000/ OTH REF: 000

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZIN, M.M.

Home delivery of drugs. Apt.delo 7 no.5:58-59 S-O'58 (MIRA 11:10)

1. Upravlyayushchiy aptekoy No.39 (Moskva).
(DELIVERY OF GOODS)
(PHARMACY)

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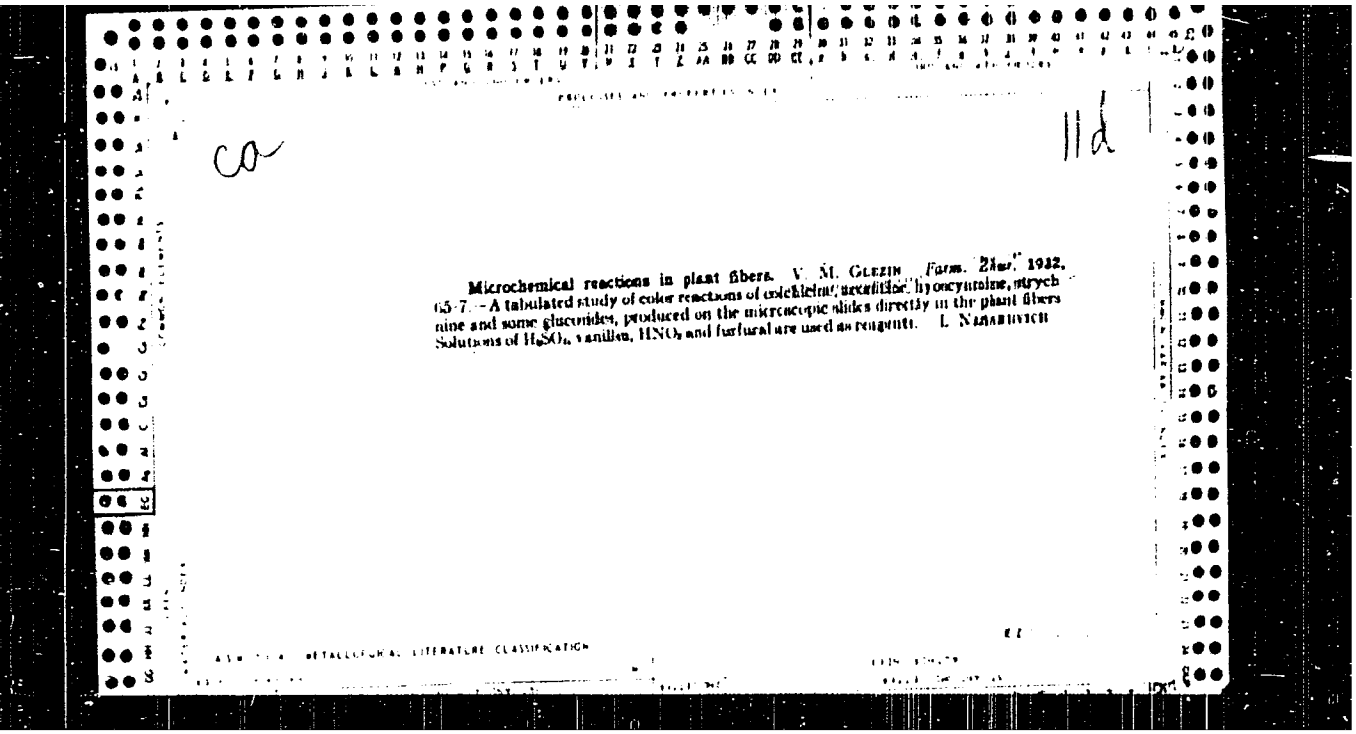

CO

11d

Microchemical reactions in plant fibers. V. M. GERZIN. *Farm. Zhur.* 1932, 65-7.—A tabulated study of color reactions of colchicine, veratrine, hyoscyamine, strychnine and some glucosides, produced on the microscopic slides directly in the plant fibers. Solutions of $H_2SO_4$, vanillin, $HNO_3$ and furfural are used as reagents. L. NAMIAS

METALLURGICAL LITERATURE CLASSIFICATION

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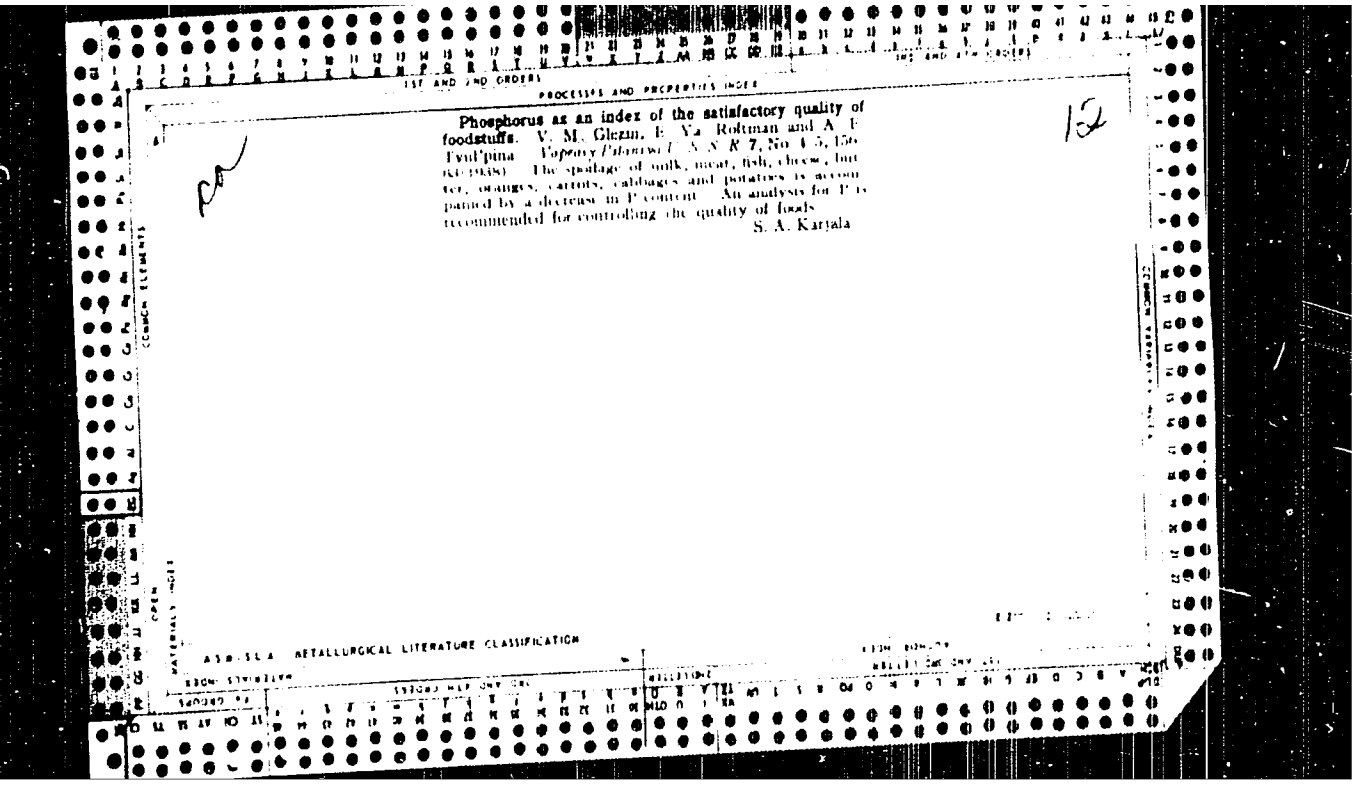
1ST AND 2ND ORDERS



PROCESSES AND PROPERTIES INDEX

**Phosphorus as an index of the satisfactory quality of foodstuffs.** V. M. Glezin, E. Ya. Roltman and A. F. Tyul'pina. *Voprosy Pitaniya U. S. S. R.* 7, No. 4-5, 156 (1938). The spoilage of milk, meat, fish, cheese, butter, oranges, carrots, cabbages and potatoes is accompanied by a decrease in P content. An analysis for P is recommended for controlling the quality of foods.

S. A. Karjala

12

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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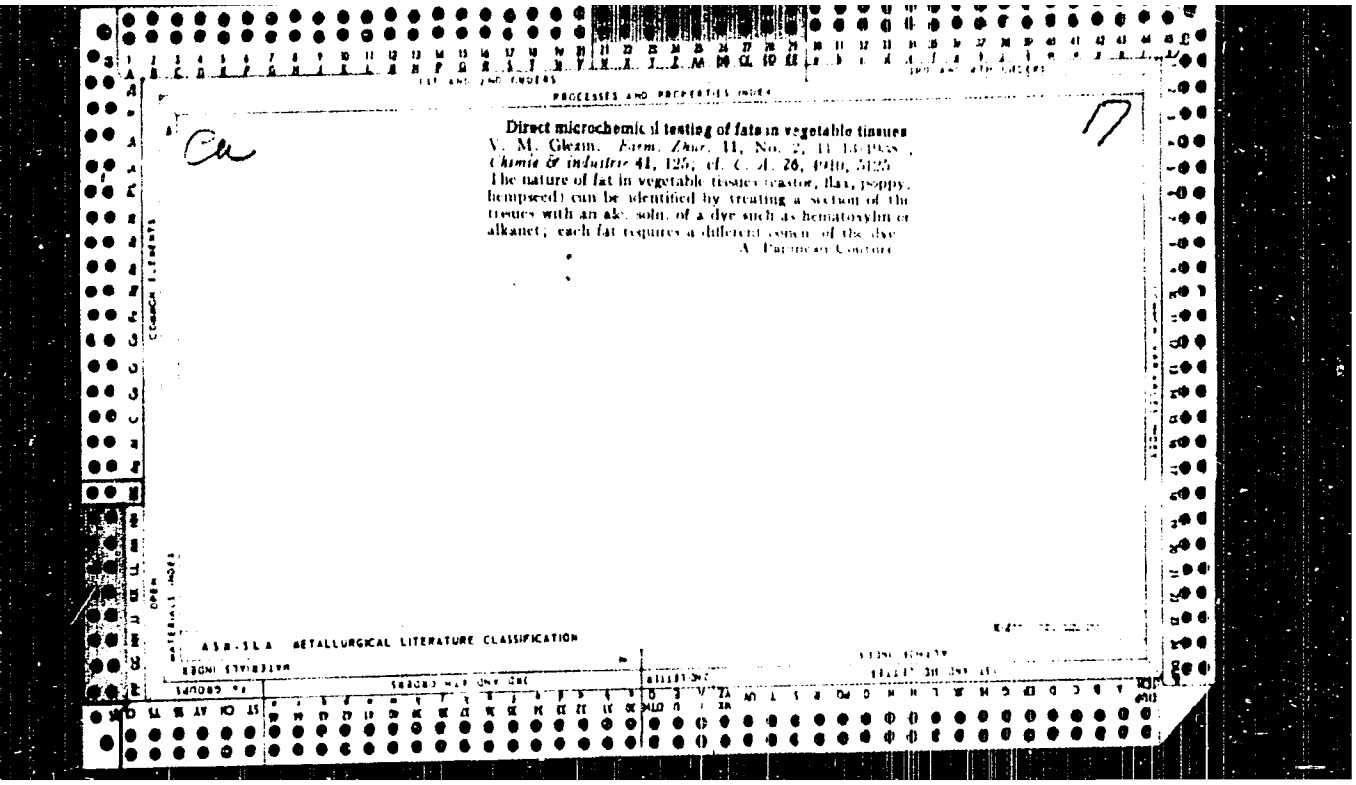

PROCESSES AND PROPERTIES INDEX

**Direct microchemical testing of fats in vegetable tissues**

V. M. Gleam. *Farm. Zhur.* 11, No. 2, 11-16 (1935); *Chimie & industrie* 41, 125; cf. C. A. 26, 4910, 5025.

The nature of fat in vegetable tissues (castor, flax, poppy, hempseed) can be identified by treating a section of the tissues with an alc. soln. of a dye such as hematoxylin or alkanet; each fat requires a different concn. of the dye.

A. Paimean Couture

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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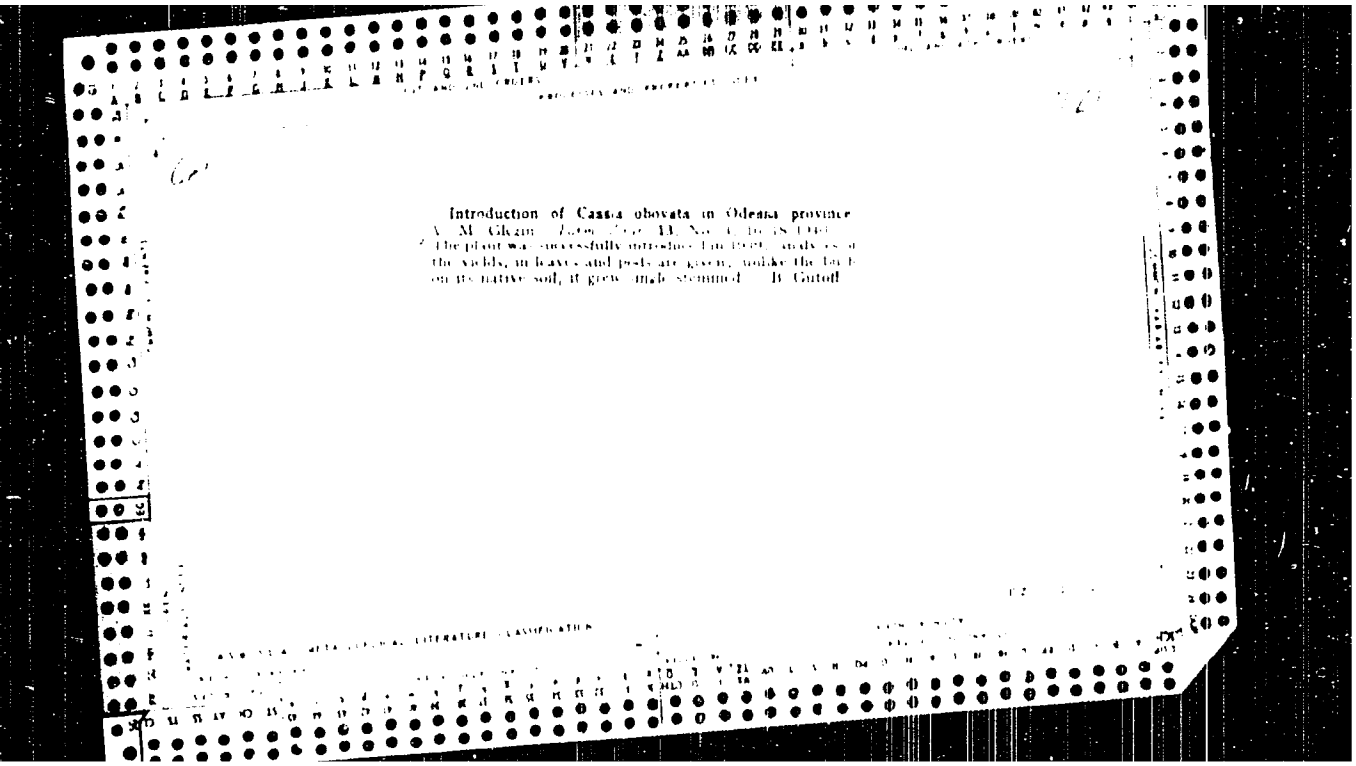

**Introduction of Cassia obovata in Odessa province**

A. M. Glezin. *Farm. Zoor.* 13, No. 4, 16-18 1940.

The plant was successfully introduced in 1939; analyses of the yields, in leaves and pods are given; unlike the bush on its native soil, it grew single stemmed. — B. Gutoff

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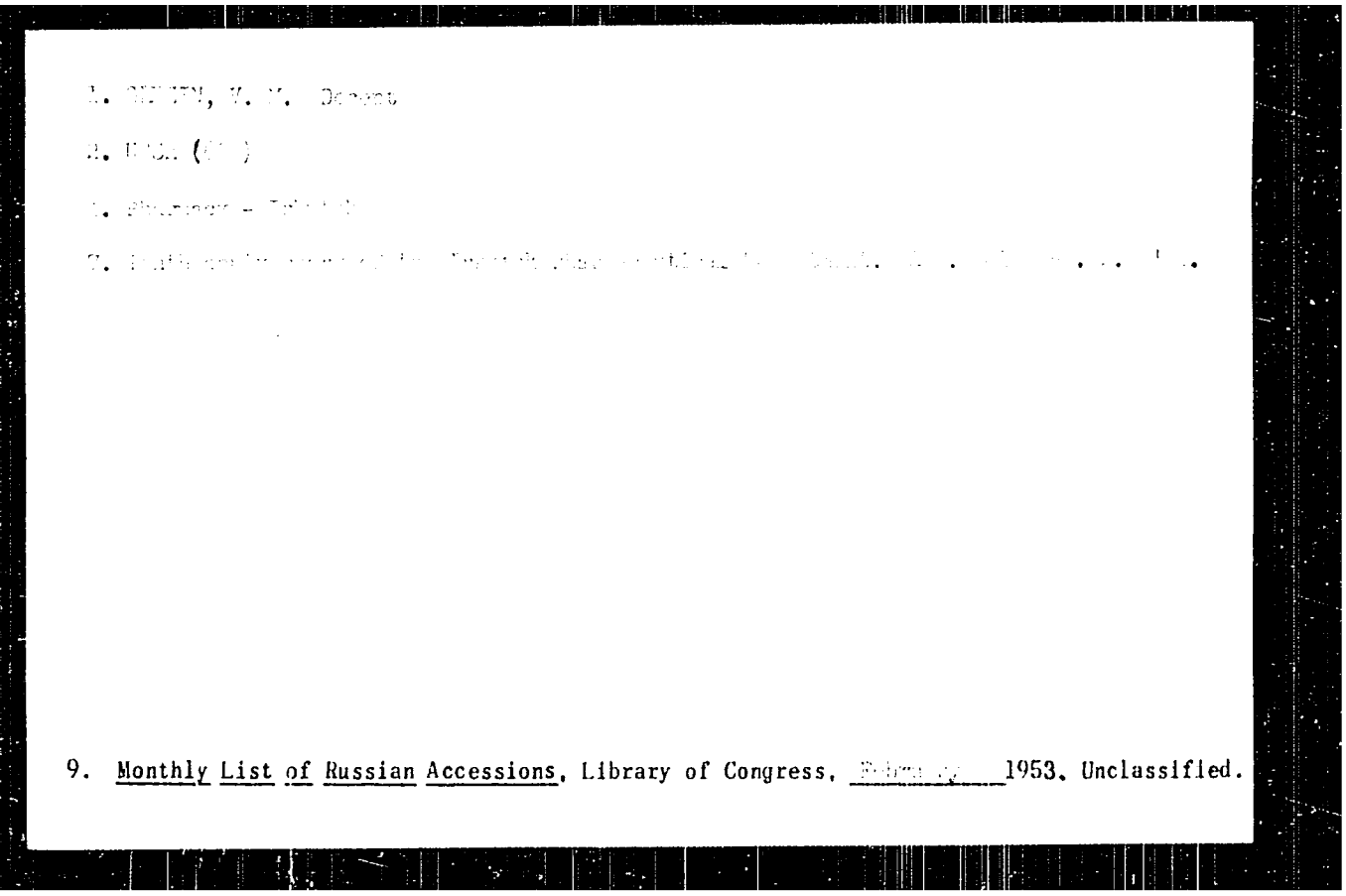

9. Monthly List of Russian Accessions, Library of Congress, [illegible] 1953. Unclassified.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZIN, V. M. Docent, GESSEN, V. K.

Tangerine

Anatomic examination of the tangerine skin; materials for the pharmacopoeia. Apt. delo no. 3, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZIN, V. M.

Quantitative determination of tannin in medicinal raw material. V. M. Glezin (Med. Inst., Irkutsk). *Aptechnoe Delo* 4, No. 5, 13-9(1955).--The raw material contg. tannin must be comminuted to 2-3 mm. particles with rustless scissors if necessary. Contact with metals must be avoided. The extn. of tannic substances with hot water is repeated a few times and the washing of the residue continued until no more tannin passes the filter. Of the methods used for detn. of tannin, the $KMnO_4$ method yields the best results.

A. S. Mirkin

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLESIN, V. M., Doc Pharm Sci -- (diss) "Phytochemical study of raw materials of certain tanning medicinal plants of Eastern Siberia and pharmaceutical preparations made from it." Mos, 1[illegible]. [illegible] pp (Min of Health RSFSR, Mos Pharmaceutical Inst), 250 copies (KL, 15-58, 125)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZIN, V.M., dotsent

Separating tanning substances in a mixed group into pyrogallic and pyrocatechoic tannins. Apt.delo no.3:70-74 My-Je '58
(MIRA 11:7)

1. Iz farmatsevticheskogo fakul'teta Irkutskogo meditsinskogo instituta.
(TANNING MATERIALS--ANALYSIS)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZIN, V.M.

Fractional separation of tanning agents by means of adsorbents.
Zhur. prikl. khim. 31 no.10:1554-1560 O '58. (MIRA 12:1)

1.Kafedra farmatsevticheskoy khimii i farmakognozii farmatsevticheskogo fakul'teta Irkutskogo meditsinstituta.
(Adsorbents) (Tanning materials)

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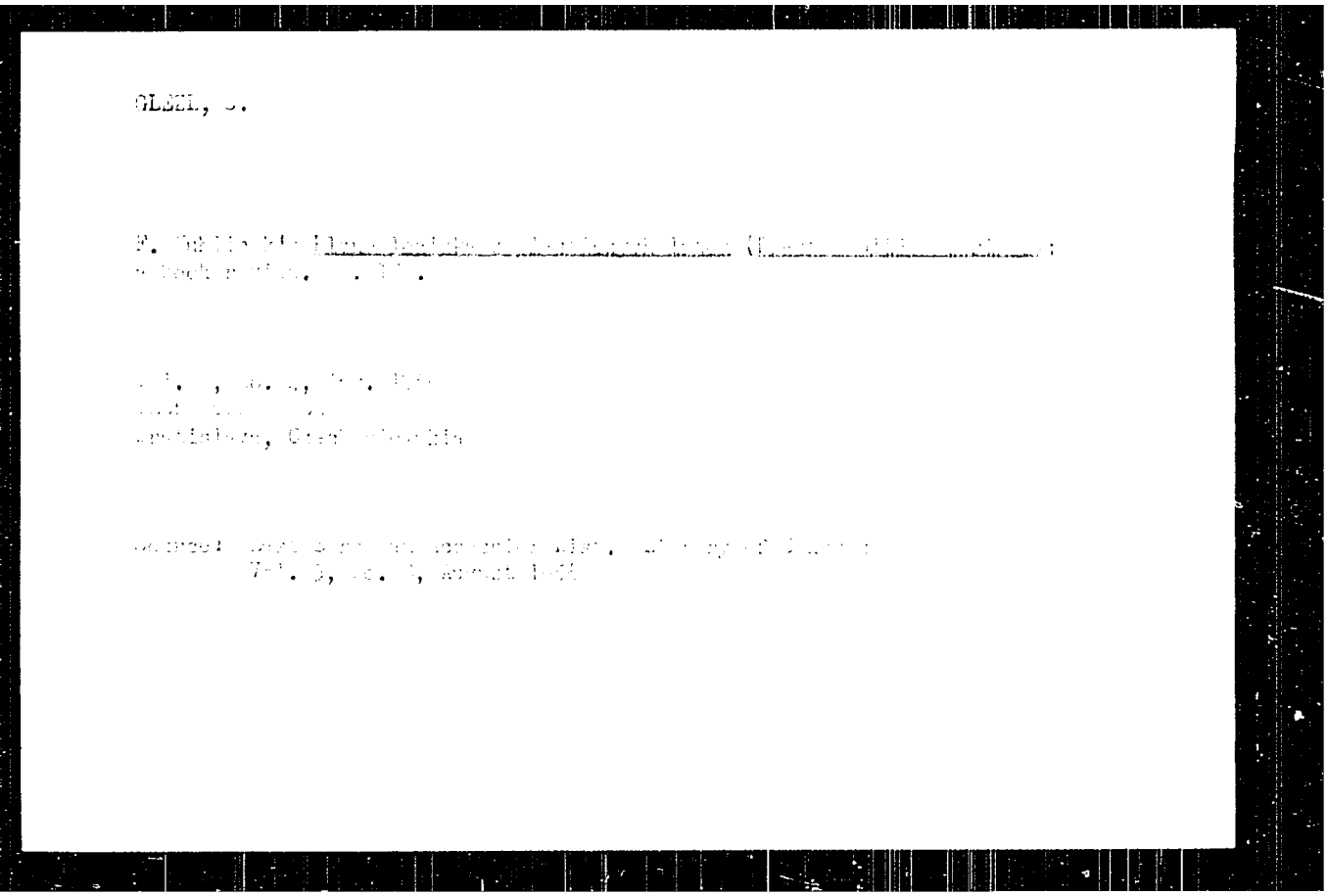

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Z/032/63/013/003/003/006
E112/E136

AUTHOR: Glézl Š., Engineer, Candidate of Science

TITLE: Porous bearings impregnated with polytetrafluoroethylene

PERIODICAL: Strojírenství, v.13, no.3, 1963, 203-207

TEXT: Sintered ferrous bearings with a maximum carbon content of 0.1% were impregnated with polytetrafluoroethylene emulsified with Triton X. Two techniques were employed: a) surface impregnation, and b) vacuum impregnation. Metallographic examinations indicated that the sintered ferrous base had a non-homogeneous structure with irregular pore characteristics and pore size. The surface-impregnated bearings had their pore characteristics and self-lubricating properties modified. Performance tests were undertaken with the following types of bearing: 1) standard, untreated; 2) surface-impregnated with polytetrafluoroethylene; and 3) vacuum impregnated with polytetrafluoroethylene, with simultaneous addition of lubricant. Performance tests indicate that surface-impregnated bearings can be recommended for comparatively low sliding velocities, v = 0.3 m/sec at higher loads 50 kg/cm$^2$; vacuum-impregnated



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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

Porous bearings impregnated with ... 2/032/63/013/003/003/006
E112/E136

sintered bearings should be used for lower loads up to 30 kg/cm$^2$ and preferably for higher temperatures, where other bearings or conventional lubricants would fail. Polytetrafluoroethylene retains excellent lubricating properties between -100 and +300 °C. There are 5 figures.

ASSOCIATION: SVŠT, Bratislava

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLEZL, Stefan, doc. ing. CSc.

Hydrodynamic theory of sliding bearings lubrication. Strojn cas 16 no.3:328-341 '65.

1. Chair of Machine Parts of the Faculty of Mechanical Engineering of the Slovak Higher School of Technology, Bratislava. Submitted July 25, 1964.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

GLIAVIN, Viktor L., dots., inzh.

Problem of dam construction in Bulgaria. Gidrotekh i melior 8 no.1:24-26 '63.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

MEDONIS, A.; GLIBAUSKAITE, M., red.; VYSHOMIRSKIS, Ch.[Vyšomirskis,Č.] tekhn. red.

[Along the Baltic seacoast] Po Baltiiskomu poberezh'iu. Vil'nius, Gospolitnauchizdat Lit.SSR, 1962. 47 p. (MIRA 16:5)

(Baltic Sea region--Guidebooks)

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4"

"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

BROGA, L.; DANILYAVICHYUS, E.[Danilevicius, E.]; GLIBAUSKAYTE, M., [Glibauskaite, M.], red.; MEDONIS, A., red.; CHECHITE, V. [Cecite, V.], tekhn. red.

[Tourist map of the Lithuanian S.S.R.] Turistskaia karta Litovskoi SSR. Vil'nos, Gos.izd-vo polit. i nauchn. lit-ry Litovskoi SSR, 1963. 72 p. (MIRA 17:4)

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

82992
S/181/60/002/006/011/045
B006/B070

9.4160

AUTHORS: Gliberman, A. Ya. Zaytseva, A. K., Landsman, A. P.

TITLE: A Photoelectric Transformer From Polycrystalline Silicon

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 6, pp. 1751-1754

TEXT: For the preparation of photoelectric transformers the cost of the initial material is an important consideration. Polycrystalline silicon costs only a fourth or fifth of what a single crystal does, but the former is not used because of its low efficiency (0.6%). The possibility of its application in a photoelement was recently investigated by the authors. They used polycrystalline p-type silicon whose structure is reproduced photographically. Phosphorous was thermally diffused in this silicon from the gaseous phase and thus a p-n junction was prepared. The transformers connected in series had resistances 1 - 2 ohms, those connected in parallel 4.5 - 10 kohms. Fig. 3 shows the load characteristic of three different transformers (whose parameters and method of preparation are given), and Fig. 4 the

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A Photoelectric Transformer F[illegible]
Polycrystalline Silicon

S/181/60/002/008/011/045
B006/B070

characteristics for different exposures of the sample No. 3. The maximum of the spectral sensitivity of the transformer lay in the region of 8000 - 8100 A and could, by special treatment, be shifted on either side by 500 A. The relative spectral sensitivities of the three samples investigated are shown in Fig. 5. The following results are obtained from the experiments: (1) Polycrystalline silicon can very well be used for making photoelectric transformers to convert solar energy into electrical energy. (2) The action of the crystalline points of contact, which is harmful for the transformer property, may be eliminated by applying a grid to the surface (Photo Fig. 2). (3) The maximum power of this transformer with solar radiation is on the average 5-6 mw/cm$^2$ of the effective surface. (4) The cost of a battery of 1 w power, made of polycrystalline silicon, is 1/2 to 1/3 of that which is made of single crystals. (5) The temperature and exposure dependence of the parameters of polycrystalline transformers are the same as for a single crystal one.

The authors thank N. S. Lidorenko for his interest and help, and V. K. Subashiyev, candidate of physical and mathematical sciences, for discussions. There are 5 figures and 3 references: 2 Soviet and 1 US.

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82992

A Photoelectric Transformer From Polycrystalline Silicon

S/181/63/005/003/008/011/045
B006/B070

SUBMITTED: April 4, 1959

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

38027 R
S/181/60/002/010/037/039
B104/B205

AUTHORS: Gliberman, A. Ya. [illegible], E. P.

TITLE: Study of the effect of [illegible] crystallographic orientation of silicon upon the [illegible] of photo-converters

PERIODICAL: Fizika tverdogo tela, v. 2, no. 10, 1960, 2359 - [illegible]

TEXT: The use of polycrystalline silicon as a starting material for the production of ordinary photo-converters and of monocrystalline photo-converters with large areas calls for a study of the effect of crystal orientation upon the quality of photo-converters. Silicon crystals were cut in plates parallel to the three principal crystallographic axes (111), (110), and (100). Nickel coatings applied to the contact faces made the contact resistance of 0.1 ohm independent of the crystal orientation. Photocells made of silicon plates of different orientation were all made as follows: Phosphorus was allowed to diffuse from the gaseous phase in p-type silicon and, at the same time, boron from the solid phase into n-type silicon plates. The depth of the position of the p-n junction in plates of different orientation was determined through coloration of a

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Study of the effect...

diagonal cut, and was found to be equal for all silicon plates, irrespective of their orientation (error in measurement, ± 10 %). All grain of polycrystalline plates showed equal depth for all p-n junctions. The volt-ampere characteristics of photocurrent and dark current were determined for the photocells. The volt-ampere characteristics obtained for both n-type and p-type silicon photocells were found to be in good agreement for all three directions ( 111, 110, 100 ). The data presented further indicate that maximum power, series resistance, short-circuit current, and open-circuit voltage are nearly equal for photocells of different orientation. This is evidence to the fact that the quality of photo-converters does not depend on the crystallographic orientation. The curves shown in Fig. 5 resulted from measurements of a large number of photocells. In this figure, the relative numbers of photocells are represented as a function of the specific power for photocells with the (111) plane (curve 1) and for photocells of any orientations (curve 2). The good agreement between the curves, obtained for different numbers of photocells, prove that the quality of photo-converters is independent of the crystallographic orientation. T. M. Tolovner is thanked for making the X-ray diffraction measurements. There are 5 figures, 1 table, and 5 references: 1 Soviet-bloc and 2 non-Soviet-bloc. The two referenced to



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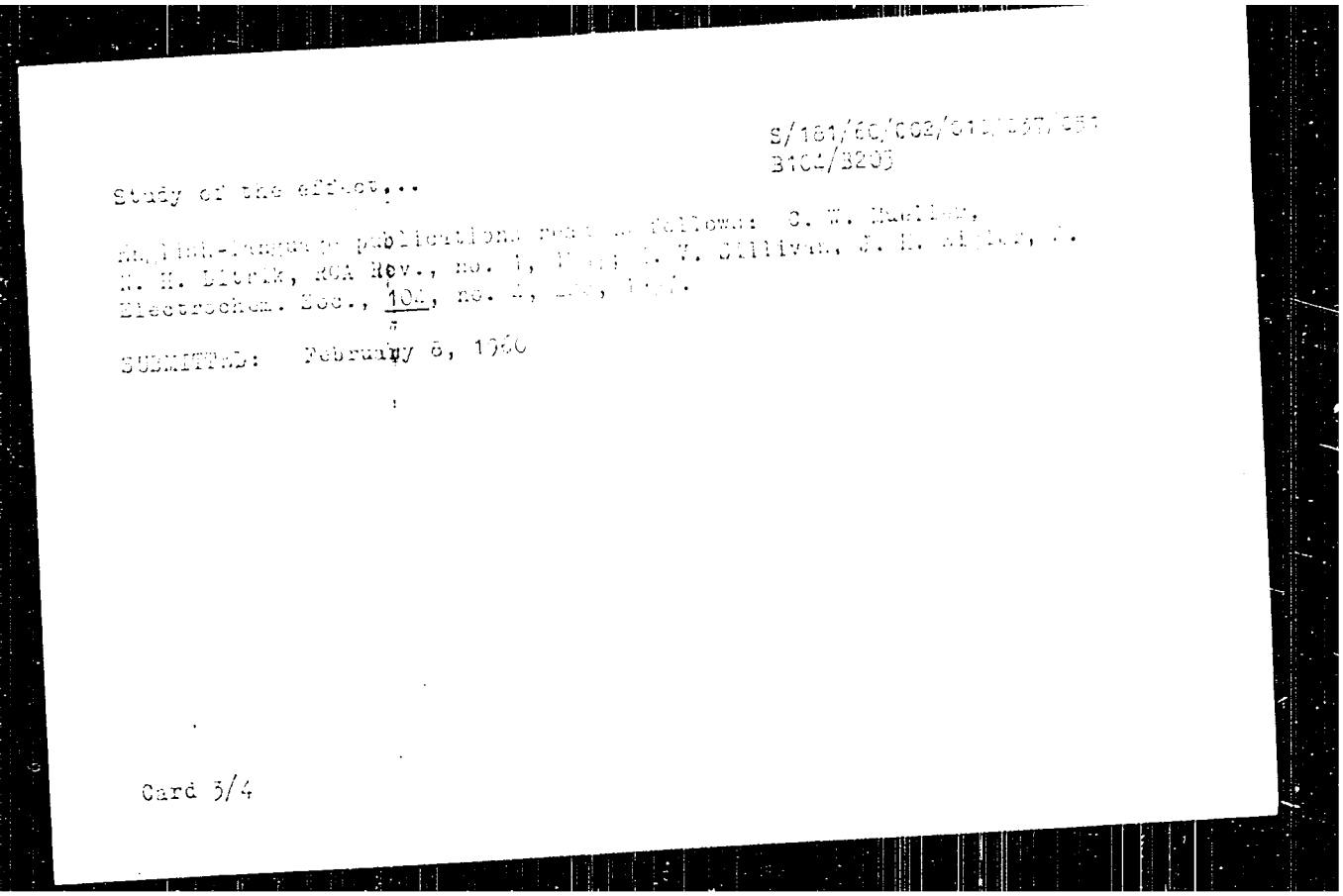

S/181/60/002/01[illegible]/[illegible]
B104/B203

Study of the effect...

English-language publications read as follows: C. W. Mueller, N. H. Ditrik, RCA Rev., no. 1, [illegible] V. Sillivan, J. H. [illegible], J. Electrochem. Soc., 104, no. 4, [illegible], [illegible].

SUBMITTED: February 8, 1960

Card 3/4

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

Study of the effect...

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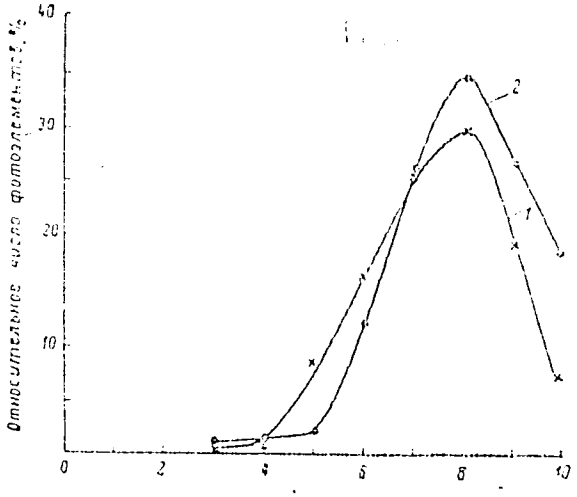
Fig. 5: Distribution curves of maximum specific power.

Legend: Relative number of photocells as a function of maximum specific power. 1 for photocells with (111) plane; 2 for photocells of any orientations.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

PHASE I BOOK EXPLOITATION SOV/5506

Gliberman, Anatoliy Yakov'levich, and Ayta Konstan'tinova Zaytseva

Kremniyevyye solnechnyye batarei (Silicon Solar Batteries) Moscow, Gosenergoizdat, 1961. 70 p. (Series: Massovaya radiobibliotcka, vyp. 396) 35,000 copies printed.

Editorial Board: A. I. Berg, F. I. Burdeynyy, V. A. Burlyand, V. I. Vaneyev, Ye. N. Genishta, I. S. Dzhigit, A. M. Kanayeva, E. T. Krenkel', A. A. Kulikovskiy, A. D. Smirnov, F. I. Tarasov, and V. I. Shamshur; Ed.: P. A. Popov; Tech. Ed.: N. I. Borunov.

PURPOSE: This booklet is intended for advanced radio amateurs. It may also be of use to students, technicians, and engineers.

COVERAGE: The booklet presents physical principles of silicon photoelectric devices designed for the conversion of solar energy into

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

S/665/61/000/003/011/018
E039/E420

AUTHORS Giberman, A.Ya., Fedoseyeva, O.P.

TITLE An investigation of the factors influencing the series resistance and other parameters of silicon photo-converters

SOURCE Akademiya nauk SSSR. Energeticheskiy institut. Teploenergetika, no.3, 1961. Poluprovodnikovyye preobrazovateli solnechnoy energii, 91-99

TEXT The maximum power yield from silicon photoconverters is largely defined by the value of its series resistance $R_s$ which is the sum of the base resistance $R_T$ and the alloy layer resistance $R_p$

$$R_s = R_T + R_p \qquad (1)$$

The value of the layer resistance for a rectangular photo converter with a current carrying contact on one edge of the working surface is given by

$$R_p = \frac{\rho W}{2t} \qquad (2)$$

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S/665/61/000/003/011/018
E039/E420

An investigation of the factors . . .

where $\rho$ specific resistance of the alloyed layer, W distance between the contact and the opposite side of the photoelement, length of the photoelement, t thickness of the alloy layer. Both $R_T$ and $R_p$ are small - in the usual photo converter. The aim of the present work was to determine the two components of the series resistance and to show the relationship between them as a function of various factors. It is assumed that the layer resistance is defined by Eq.(2) and that the base resistance is inversely proportional to the area of the element:

$$R_I = \frac{R_I'}{S} \quad (3)$$

where $R_I'$ is the base resistance for unit area of photoelement, hence

$$R_S = \frac{\rho W^2}{2t} + R_I' \quad (5)$$

where W is the area of the photoelement.

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E039/E420

An investigation of the factors

Experiments were carried out with rectangular photoelements of area 10 to 16 $cm^2$. The dependence of the series resistance on the width W of a series of photoelements was obtained. It is shown that $R_p$ does not change appreciably for values of W from 2 to 4 cm but it rises sharply when W is less than 1 cm. As [illegible] $R_T$ are independent of W then the series resistance

$$R_p = AW + \frac{B}{W} \qquad (6)$$

where $A = \frac{\rho}{2\pi}$ and $B = \frac{R_T}{\rho}$

This indicates a linear dependence of the layer resistance $R_p$ on W and that the base resistance $R_T$ follows a hyperbolic law. The experimental results confirm this. The dependence of the efficiency on the width W was also investigated for photo-converters with different specific resistances. The optimum efficiency (≈ 5%) occurred at W = 0.5 to 1.5 cm and decreased steadily as W was increased further. Data was obtained on the

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An investigation of the factors

hange in maximum power yield with W. It was shown that the yield rises to a maximum at W = 1 to 3 m after which it levels off as W is increased. In addition the effect of changing the length while keeping W constant was investigated. We have

$$R = \frac{C}{\quad} \qquad (7)$$

where

$$C = \frac{W}{2} + \frac{RT}{W} = \text{const}$$

The experimental results confirm the hyperbolic form. It is shown that the efficiency is independent of the length while the power yield is proportional to it. There are 9 figures, 2 tables and 2 references: 1 Soviet bloc and 1 non-Soviet bloc. The reference to an English language publication reads as follows:
Ref. 1: Brainerd M. J. Appl. Phys. no.26 (5) 1955

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394

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E194/E420

21 1512

AUTHORS Zayrseva A.K. Gliberman, A.Ya

TITLE Semiconductor solar energy converters

SOURCE Akademiya nauk SSSR. Energeticheskiy institut. Teploenergetika no 3 1961. Poluprovodnikovyye preobrazovateli solnechnoy energii 100-107

TEXT Semiconductor devices made by diffusion of donor or acceptor impurities and having a large p-n transition area are being widely used for example as photo-electric generators. This article gives the experimental results of an investigation of such layers of acceptor impurity (boron) in n type silicon and of donor impurity (phosphorus) in p type silicon. The experimental method is also described. The specific resistance and Hall effect of the samples were measured before diffusion. After diffusion one side of the specimen was ground clean and an alloyed layer was left on the edges only near the centres. Nickel contacts were used. In making measurements current was passed only through the surface layer since the p-n transition region is a plane which electrically insulates the base material from the

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Semiconductors for solar energy

alloyed layer which has conductivity of the opposite type. All the specimens except the upper active layer were varnished and the active layer was etched away by successive treatments with KOH solution. Measurements of electrical properties were made between etchings. Photoelectric measurements were made using a calibrated lamp with filters. The mean concentration of impurity as a function of depth was assessed from the mean concentration of main current carriers. The conductivity of the remaining alloyed layer was measured by applying electrodes to the end edges of the samples and passing a current of 10 to 20 mA, measuring the voltage drop between probes. The Hall effect was measured. When the p-n transition was created by diffusion of phosphorus into p type silicon or for boron on to n type silicon the concentration of phosphorus or of boron altered relatively little (by about one order of magnitude) on moving from the surface to near the p-n transition and then fell suddenly by several orders near the p-n transition. This is attributed to differences in the coefficients of diffusion of impurities across the thickness of the alloyed layers. Fig 5 shows a graph of the relationship between

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Semiconductor solar energy

the electrical properties of the specimen and the depth of the p-n transition. The left hand scales are $I_k$ mA - short circuit current and $P_{max}$ mW power, the right hand scales are $V_{xx}$ mV - no load voltage - and r ohms. It will be seen that as etching proceeds there is a steady increase in the no load voltage, the short circuit current and the power, this continues until a certain optimum depth of layer is reached beyond which there is a rapid fall off in the properties. The optimum depth depends on the total surface and the recombination of s type carriers and the series resistance of the photo cells. To reduce recombination loss the p n transition must be separated from the region where the pairs are formed by a distance not greater than the diffusion length of current carriers. The electron hole pairs are formed by light at a depth of about 25 microns and therefore in deep transitions all the pairs originate in the alloyed region. The separation factor then depends mainly on the diffusion length of the subsidiary current carriers of the alloyed zone. As the surface is etched the alloyed zone becomes thinner and there is an increase in the number of pairs originating in the base silicon. The

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Semiconductors for solar energy ...

separation factor then depends both on the diffusion length of carriers from the alloyed region and on that from carriers from the base material. The optimum transition depth depends on the ratio between these two diffusion lengths and on the concentration of electron hole pairs on the two sides of the p-n transition. As etching proceeds the resistance of the upper alloyed layer increases but the resistance of the silicon base and of the photo converter contact resistance remains unchanged and this probably increases the optimum depth. The optimum depth also probably depends on the base resistance of the photocell which increases greatly once the dimensions of the photocell exceed a certain value. There are 5 figures and 6 references: 4 Soviet bloc and 2 non-Soviet bloc. The two references to English language publications read as follows: Ref. 3: Backenstoss G., Bell System Tech. no. 37, 1958, 699-710. Ref. 4: Chapin D.M., Fuller C.S., Pearson G.L., Bell Laboratories Record no. 1, 1955, 242-246.

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1950
S/665/61/000/003/014/018
E194/E420

AUTHORS Gliberman, A.Ya. Zaytseva A.K. Landsman A.P.

TITLE An investigation of the possibility of using polycrystalline silicon for making photo electric converters

SOURCE Akademiya nauk SSSR. Energeticheskiy institut. Teplosenergetika no.3 1961 Poluprovodnikovyye preobrazovateli solnechnoy energii 116-128

TEXT Hitherto silicon photo cells have been made from single crystals but as these are expensive it would be advantageous to use polycrystalline silicon for this purpose. Published work on the subject is reviewed and seems to indicate that this is possible. The nature of polycrystalline silicon is discussed and also the nature of conduction whether current flows through at the individual single crystals or round them through the impurities at their surfaces. The mobility of current carriers may be reduced by the intercrystalline layer and tests show that this mobility is indeed lower in polycrystals than in single crystals and this has limited the field of application of polycrystals. Polycrystalline

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An investigation of the possibility

silicon may be characterized by the type of conductivity (p or n) by the dimensions of the individual single crystals and by the method of production depending on whether the crystal is grown with oriented seeding or not. If the seeding is oriented the individual crystals are of fairly constant resistance but the resistance of the grain borders is high. There are indications that ohmic contact resistance between grains is ohmic but that resistance jumps can result from the presence of impurities at the surface. The resistance characteristics of the components of the polycrystal are however yet inadequately understood. The influence of harmful effects at the boundaries of large grains of germanium may be overcome by appropriate construction of the semiconductor device. Most of the pairs generated need not overcome the boundary layer before separation. Apparently the boundary layer affects only pairs formed near to it. If the grains are much bigger than the diffusion length of the current carriers and in particular if they are greater than the thickness of the layer the probability

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of recombination on the boundaries is slight. The bad effect of high resistance of the intercrystalline layers can be overcome by using a grid type terminal construction so that the converter consists of a number of small elements in parallel but the need even for this construction can be avoided by the deposition of a film of good conductivity. The presence of impurities in the inter crystalline region has a damaging effect on the converter and high concentrations of impurities can shunt the p-n transition. This has been observed in samples made from polycrystal ingots of low resistance. In general the operating characteristics of polycrystalline converters differ little from those of photo-cells made from single crystals however the no load voltage and short circuit current density are lower so that the efficiency is lower. Performance data are given for photo cells made with both orientated and unorientated polycrystals and in general the polycrystalline cells may be classified into two types. In one type there is an inflection point in curves of the natural logarithm of current as function of voltage in the voltage range of 250 to 450 mV. In the second type there is no such inflection

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point. The changes in no load voltage, short circuit current, series resistance and maximum power with temperature of polycrystal converters are very similar to those of single crystals but sometimes, at low temperatures, the series resistance is very high, though this does not always cause a great reduction in the output. The reasons for this are discussed. The maximum spectral sensitivity of polycrystal photo-converters lies in the wavelength range 7500 to 8500 Å. The maximum output per unit surface of a typical polycrystalline converter exposed to sunlight is at present 5 to 6 mW/cm$^2$. The cost of a 1W battery made of polycrystalline silica is a half to a third of the cost of a single crystal battery. Despite the inferior power characteristics polycrystalline silicon photo cells may prove to be promising material for the mass production of photo electrical converters. There are 11 figures, 2 tables and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to an English language publication reads as follows: Ref. 6: Prince M. J. Appl. Phys. 26 (5): 1955, 534.

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27291

S/181/61/003/008/021/034
B102/B202

26.2421 also 3010, 3110

AUTHORS: Zaytseva, A. K. and Gliberman, A. Ya.

TITLE: Study of the impurity distribution in the surface layer of n-type silicon photoelectric converters of solar energy

PERIODICAL: Fizika tverdogo tela, v. 3, no. 8, 1961, 2377-2382

TEXT: The authors describe a model of a silicon photoelectric converter with p-n junction. The junction was produced by thermal diffusion of boron into n-type silicon. Prior to diffusion, the resistivity ρ and the Hall voltage were measured and the concentration n of the majority carriers was calculated. After the diffusion one side of the specimen was completely ground off, at the lateral faces the alloyed layer was left only in the central part. The authors used lead-coated nickel contacts. The model is schematically shown in Figs. 1a and 1b. The measurements were made under a heating lamp of the type ЗС-3 (ZS-3) with filter correction of the spectrum according to a solar irradiation of an intensity of 78 mw/cm$^2$. To determine the electrical parameters in the surface layers, layers were etched off by means of KOH and the conductivity and the Hall voltage were

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Study of the impurity distribution ...

measured before and after the etching. From these measurements mobility and concentration of the boron atoms in silicon could be determined. The distribution of the boron atoms in the entire alloyed layer was determined by successive etchings and measurements. The electrical parameters of the silicon converter were studied as a function of the thickness of the alloyed layer. The results are illustrated in Fig. 4. The distance x from the surface of the specimen, measured into the interior of the specimen, was chosen as the common abscissa. As can be seen, no-load voltage $U_{x.x.}$ increases with an increase in x, also the short-circuit current $I_{k.z.}$ and the maximum power $P_{макс}$ increase until a certain depth is reached ($x_{опт} = x_{opt}$). On further approach to the p-n junction (which was at a depth of about 11$\mu$) these quantities again decreased. The change of the resistance r of the alloyed layer is illustrated by the dashed line. At depths of the p-n junction greater than $x_{opt}$ the resistance of the alloyed layer is relatively low and increases slowly with the approach to x. In the case shown in Fig. 4 $x_{opt} \approx 3\mu$. There are 4 figures and 5 references: 4 Soviet and 1 non-Soviet.

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

S/194/62/000/006/085/232
D413/D308

AUTHORS: Gliberman, A.Ya. and Fedoseyeva, O.P.

TITLE: An investigation of the factors affecting the series resistance and other parameters of photo-electric silicon converters

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 6, 1962, abstract 6-3-57 s (V sb. "Teploenergetika" no. 3, M., AN SSSR, 1961, 91-99)

TEXT: The series resistance $R_s$ of photoelectric silicon converters, on which their maximum output power depends, is determined by the back resistance $R_b$ and the spreading resistance $R_{sp}$, i.e. $R_s = R_b + R_{sp}$. The resistance $R_b$ is inversely proportional to the area S of the element. The resistance $R_{sp} = \rho W/2tl$, where $\rho$ is the resistivity, t the thickness of the alloyed layer, W the distance between the contact and the opposite edge of the element, and l the length of the element. Because of the difficulty of determining $R_b$ and $R_{sp}$

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directly, the ratio between them was found as a function of the resistivity of the silicon used and of the dimensions of the converter. The ratio of $R_b$ to $R_{sp}$ depends on the width of the element W, the proportion of $R_b$ increasing as W decreases. $R_s$ was practically constant for W = 2 - 4 cm, but rose sharply for W < 1 cm. The nature of the dependence of $R_s$S on W was determined by the resistance $R_b$, which decreases according to a quadratic law with decrease in W. Graphs of $R_s$S against W are given for a number of photo-elements; for W = 2.5 - 3 cm, the relation becomes linear. Figures of $R_b$, $R_s$ and efficiency $\eta$ are given for three silicon photo-elements with $\rho$ = 1.7, 0.6 and 0.03 Ω cm. The larger $\rho$ is, the larger the fraction of $R_s$ contributed by $R_b$. The maximum output power of the element $P_{max}$ decreases with decrease in its surface area or in W, corresponding to the change in $\eta$. Graphs have also been obtained of the resistance $R_s$ against the length l for constant W. In the form

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of hyperbolas, and of $R_s S$ and $\eta$ as horizontal straight lines, and also of $P_{max}$. 2 references. [Abstracter's note: Complete translation.]

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S/058/62/000/008/132/134
A160/A101

AUTHORS: Zaytseva, A. K., Gliberman, A. Ya.

TITLE: The distribution of impurities in an alloyed layer of photoelectric converters

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1962, 44, abstract 8-3-87yu (In collection: "Teploenergetika", no. 3, Moscow, AN SSSR, 1961, 100 - 107)

TEXT: A description is given of the method of investigating the surface layer which developed by the diffusion of acceptor impurities (B) in n-type Si or of donor impurity (P) in p-type Si. The investigation of the main parameters of the raw material and of the electrical properties with the degree of pickling of the alloyed layer was carried out on rectangular-shaped samples. The measuring of the Hall effect as a function of the depth of the pickled layer x was conducted on a special installation. The investigations were carried out on a few samples in which the p-n transition came about by the diffusion of P in p-type Si and by the diffusion of B in n-type Si. They revealed that the distribution of the impurity atoms in the alloyed zone has a peculiar character and is not

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A160/A101

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subject to the Fick law. The impurity diffusion front in Si is steep, i.e. the concentration of the impurity relatively slightly changes along the whole layer and it sharply decreases at a small distance from the p-n transition. The optimum depth of the p-n transition, corresponding to the maximum power yielded by the photoconverter, is mainly determined by the following quantities: by the total magnitude of the surface and volumetric recombination of the carriers, the resistance of the alloyed layer and by the magnitude of the rear resistance. The ultimate magnitude of the most favorable depth of the p-n transition corresponds to the magnitude at which the total action of all enumerated factors passes through the minimum. There are 6 references.

V. Shch.

[Abstracter's note: Complete translation]

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S/058/62/000/008/127/134
A130/A101

AUTHORS: Gliberman, A. Ya., Zaytseva, A. K., Landsman, A. I.

TITLE: An investigation of the possibility of using polycrystalline silicon for the production of photoelectric converters

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1962, 43, abstract 8-3-82t (In collection: "Teploenergetika". No. 3, Moscow, AN SSSR, 1961, 116 - 128)

TEXT: The polycrystalline Si may be characterized by the sign of conductivity (p or n-type) and a degree of polycrystallinity (by the size of the single monocrystalline grains), and also by its method of growing a crystal bar (with the help of oriented or non-oriented seed crystal). The magnitude of the specific resistance of polycrystals $\rho$ remained unchanged from grain to grain, whereby, at the boundary of the grains, resistance jumps were observed in a more highly-ohmic material ($\rho \sim 1$ ohm·cm and more). No jumps whatsoever were observed in a low-ohmic material ($\rho \sim 0.1$ ohm·cm). In case the dimensions of the grains are larger than the diffusion length of the minority charge carriers, the por-

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tion of the recombined grains at the boundary will be inconsiderable. When designing polycrystalline photoelectric converters, the harmful effects of an increased resistance of intercrystalline junctions are eliminated by an additional grid of current taps. In this case, the polycrystalline photoelectric converters seemingly consist of small single monocrystalline photocells connected in parallel. The polycrystalline photoelectric converters are distinguished from single crystalline photocells mainly by the lower resistance of the run and by the lower density of short-circuit current, and, as a result, by a lower efficiency. The load, light and spectral characteristics of the polycrystalline photoelectric converters are presented. Their main parameters are shown in a table. The maximum spectral sensitivity of the polycrystalline photoelectric converters is to be found in the region of 7,500 - 8,500 Å, the maximum power yielded during solar lighting is 5 - 6 milliwatt/cm$^2$. The costs of polycrystalline photoelectric converters with a power of 1 watt are 2 - 3 times lower than those of single crystalline ones. There are 9 references.

V. Shch.

[Abstracter's note: Complete translation]

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ACCESSION NR: AT5015790 AT/WW/JD/GS UR/0000/65/000/000/0034/0042

AUTHOR: Gliberman, A. Ya.; Fedoseyeva, O. P.

TITLE: Problem of series resistance of silicon solar cells

SOURCE: AN SSSR. Energeticheskiy institut. Ispol'zovaniye solnechnoy energii v narodnom khozyaystve SSSR (Use of solar [illegible]

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U.S.S.R.). Moscow, Izd-vo Nauka, 1965, 34-42

TOPIC TAGS: solar cell, silicon solar cell

ABSTRACT: The results of an experimental investigation of backing-alloyed silicon photoconverters (solar cells) with a resistivity of source material of 0.6—200 ohms are reported. The alloying was made after M. B. Prince (U.S. Patent 2790940, 30 Apr 57) and J. E. Cline et al. (Electrochem., 1958, v. 105, no. 12, p. 700). It was found the series resistivity of the backing-alloyed cells is 0.1—0.2 ohm-cm and is independent of the resistivity of the source material.

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The efficiency of such cells is practically constant and their power increases linearly with the cell width; their behavior under intense-illumination conditions is also improved. The efficiency of the backing-alloyed cell falls off rather slowly with the increasing cell width. The voltage drop depending on the cell width and the alloyed-layer thickness was also investigated. Orig. art. has:

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6 figures, 2 formulas, and 3 tables.

ASSOCIATION: none

SUBMITTED: 12Feb65 ENCL: 00 SUB CODE: EE

NO REF SOV: 003 OTHER: 004

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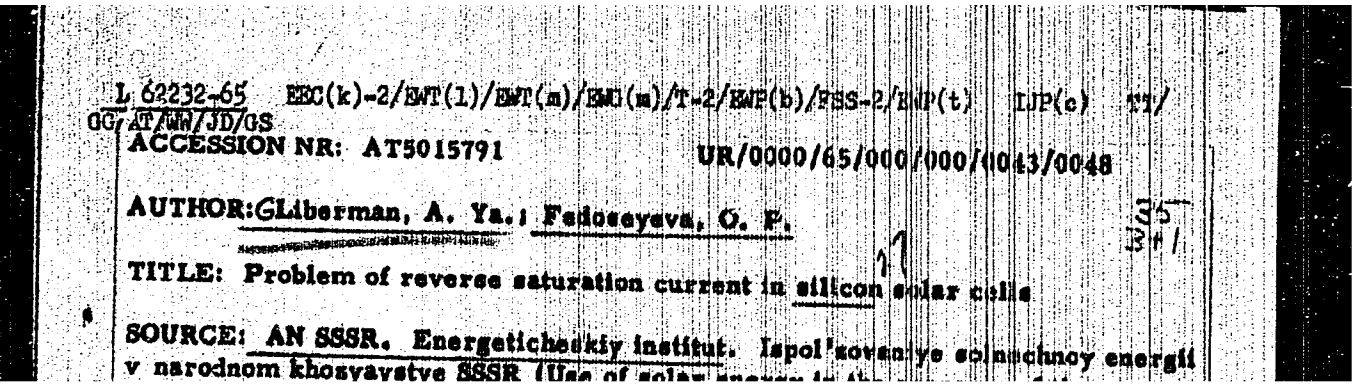

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OC/AT/WW/JD/GS
ACCESSION NR: AT5015791 UR/0000/65/000/000/0043/0048

AUTHOR: Gliberman, A. Ya.; Fedoseyeva, O. P.

TITLE: Problem of reverse saturation current in silicon solar cells

SOURCE: AN SSSR. Energeticheskiy institut. Ispol'zovaniye solnechnoy energii v narodnom khozyaystve SSSR [Use of solar energy in the

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"APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500030009-4

U.S.S.R.). Moscow, Izd-vo Nauka, 1965, 43-48

TOPIC TAGS: solar cell, silicon solar cell

ABSTRACT: Some factors influencing the saturation reverse current and the shape of I / V characteristics of silicon photoconverters (solar cells) have been theoretically and experimentally investigated. Many cells made from single- and polycrystalline p-Si were tested. Good reproducibility of I / V characteristics measured in the course of two months is noted. The saturation reverse-current density lay within $10^{-6}$ —$10^{-7}$ amp/cm$^2$ (its estimated value was $8 \times 10^{-7}$

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amp/cm$^2$). The cells made from silicon having resistivities of 0.01, 16, 100, and 300 ohms·cm exhibited very close saturation currents. Experiments with various cell surfaces and p-n-junction depths were inconclusive. The saturation reverse current was practically constant within −70—0C and sharply increased with the positive temperature. Orig. art. has: 5 figures, 2 formulas, and

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