S/128/62/000/004/008/010
A004/A127

18.1110

AUTHORS: Grebenyuk, V.P.; Yefimov, V.A.; Sapko, V.N.

TITLE: Formation and elimination of cracks in steel castings

PERIODICAL: Liteynoye proizvodstvo, no. 4, 1962, 31 - 33

TEXT: The authors point out that the main defects of steel ingots are longitudinal and transverse cracks. Among the forces affecting the formation of cracks, the authors mention in the first place the force originating owing to a deceleration of shrinkage of the primary skin. They present formulae for calculating the stresses originating in the ingot skin for the cases of a uniform and nonuniform skin thickness and stress the point that the quantity of sulfur and hydrogen impurities in the steel affect the tendency of steel to hot-crack formation to a considerable extent. It is stated that large additions of aluminum localize the harmful effects of sulfur. Apart from the effect on the modulus of elasticity, the steel composition affects the magnitude of the coefficient of linear shrinkage, which decreases with an increase of the carbon content. Therefore, steel with a C-content of some 0.2% possesses the greatest tendency to crack formation. It is stated that a nonuniform formation of the clearance be-

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tween the crystallizing ingot and the mold and the washing away of the crystallizing skin by the circulating flow of liquid steel contributes to a local thinning of the skin and thereby to the formation of cracks. It was found that the clearance between ingot and mold is formed in the first place at the ingot corners and, to eliminate corner cracks, the rounding-off radius at the ingot corners should amount to 0.1 of the length of the shorter ingot side, or less. According to data obtained by G.P. Ivantsov the heat-transfer coefficient from the ingot to the mold decreases by a factor of 4 - 5 after the formation of the clearance. After the complete or partial separation of the ingot from the mold walls, the destroying action of the hydrostatic pressure force of the liquid metal of the ingot core affects the skin of the solidifying metal. Calculations have revealed that the magnitude of bending moments arising under the effect of hydrostatic pressure forces are the lower, the more points of the ingot skin are pressed against the mold wall. The authors point out that, to create favorable conditions for the crystallization and shrinkage of the ingot, the inner surface of the ingot mold should have a wavy profile. They present details on the most expedient wave shape and state that the most dangerous stresses depend on the cooling intensity of the ingot surface. The use of heat-insulating coatings of the mold makes it possible to reduce the cooling intensity of the ingot surface by a fac-

Formation and elimination of cracks in ....

tor of 1.4 and thus to decrease the tendency to crack formation, The best results were obtained with a coating consisting of 43% red clay, 26% refractory clay, 6% fluorspar and 25% lime. The authors comment on the hydrodynamics of steel pouring, mold design and steel shrinkage conditions in the mold, factors that affect the ingot surface quality to a great extent. It is pointed out that the best ingot surface is obtained with a total casting duration of the ingot which is approximately equal to the time of clearance formation in the lower ingot part. The speed and temperature of the circulating steel flow along the front of the crystallizing metal determines to a considerable extent the thickness of the crystallizing skin. Concluding, the authors emphasize that in the production of large-size ingots, top casting is to be preferred to bottom casting.

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S/133/62/000/004/002/008
A054/A127

AUTHORS: Kuzema, I.D.; Yefimov, V.A.; Chernyshev, I.S.; Grebenyuk, V.P.; Oleshkevich, T.I.;

TITLE: Selecting the parameters of large-sized slabs

PERIODICAL: Stal', no. 4, 1962, 312 - 313

TEXT: The geometry of slabs is characterized by the width-to-thickness ratio (k) and the length-to-width ratio (k_1). A k-ratio above 2 causes cracks in the slabs and renders their finishing more difficult. When forming slabs with a k = 1,72ratio these drawbacks are eliminated, but the slabs will be far too thick, while, moreover other difficulties arise: more passes are required in rolling, more metal is lost in cutting off the edges, etc. Tests to cast large--sized slabs with a k-ratio above 2 without cracks were carried out by imparting a wavy shape to the side-wall surfaces, while the effect of the mold shape on the solidifying skin was also studied. In slabs with a high k (width-to-thickness) ratio deep longitudinal cracks are mainly caused by stresses developing in the skin prior to its separation from the mold-wall. The skin is also subjected to bending moments. The higher the k-value, the greater the stresses working in

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Selecting the parameters....

the skin. The bending moments, however, could be reduced considerably by giving the broad side of the slab a wavy shape. In that case the shrinkage of the skin takes place progressively, starting from the angles to the centre. If several waves are formed on the broad side of a slab with a high k-value the gap formation is slowed down and the thin skin plays the part of a reinforcing continuous beam. Slabs, 5 - 7 tons in weight were tested, with width-to-thickness ratios of 2.3, 2.31 and 2.2. The best results were obtained with slabs on whose sides the curvature radius of the wave crest was not more than 5 mm. In another test series 11 - 15-ton slabs were tested with 5 - 5 waves on their broad sides and satisfactory crackfree surfaces were obtained in 70% of the output. By improving the geometry of the waves still further and increasing their depth to 24 mm the crack formation could be eliminated completely. When applying waves of the required length and depth and sufficiently acute angles, it is possible to cast large-sized ingots with a width-to-thickness ratio of more than 2.2. There are 5 figures.

ASSOCIATION: Zavod im. Il'icha (Plant im. Il'ich) and Institut gaza AN UkrSSR (Institute of Gas(es) of the Academy of Sciences UkrSSR)

YEFIMOV, Viktor Alekseyevich; OSIPOV, Vladimir Prokof'yevich; GREBENYUK, Vladimir Pavlovich; CHERNYAKHOVSKIY, Yu.A., red.izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Ways to improve the pouring of steel] Puti usovershenstvovaniia razlivki stali. Moskva, Metallurgizdat, 1963. 183 p. (MIRA 17:3)

GREBENYUK, V.P.

Efficient shape of sheet ingots of killed steel. Vop. proizv. stali no.9:105-120 '63. (MIRA 16:9)

[redacted], Ye.A.; SAPKO, V.N.; GREBENYUK, V.P.; PIORO, E.Ch.; SHCHASTNYY, P.M.; KSENZUK, F.A.; SHIRINSKIY, D.I.; TOLSTYKH, V.I.

Rapid top pouring of rimmed steel into ribbed ingot molds. Metallurg 8 no.11:17-19 N '63. (MIRA 16:12)

ZATULOVSKIY, A.N., inzh.; GREBENYUK, V.R., inzh.

Improving the design of end bearings for vertical shafts.
Khim.mashinostr. no.3:38 My-Je '63. (MIRA 16:11)

GRE[illegible]ENYUK, V.V., inzh.

Elimination of defects in the R-type governors. Elek. sta. 30 no.3:85-86 Mr '59. (MIRA 12:5)
(Governors (Machinery))

GREBENYUK, Ye. V.

SEREBRYAKOVA, A.A.; GREBENYUK, Ye.V.

Aerosynoptic analysis of conditions for heavy rainfalls in the northern region of Kazakhstan. Trudy Kaz. NIGMI no.6:60-67 '56.
(Kazakhstan--Rain and rainfall) (MLRA 10:9)

DULETOVA, T.A.; GREBENYUK, Ye.V.

Charts representing the distribution of high cold cyclones and high warm anticyclones at the end of a natural synoptic period. Trudy KazNIGMI no.10:82-87 '59. (MIRA 13:4)
(Cyclones)
(Meteorology--Charts, diagrams, etc.)

GREBENYUK, Ye.V.; DULETOVA, T.A.

Synoptic conditions resulting in heavy snowfalls in Kazakhstan. Trudy KazNIGMI no.10:92-103 '59. (MIRA 13:4)
(Kazakhstan--Snow) (Cyclones)

GREBESHKOV, [illegible]; KOVALEV, N.A.; ORLOV, V.N.

Experience in operating automatic devices for registering internal overvoltages in power systems. Trudy LOI no.242:189-196 '65.
(MIRA 18:8)

RUCHKO, Boris Fedorovich; GREBESHKOV, Yuriy Vasil'yevich; BOGUTSKIY, N.V., otv.red.; SILINA, L.A., red.izd-va; BERESLAVSKAYA, L.Sh., tekhn.red.

["Ukraina" cutter-loader] Ugol'nyi kombain "Ukraina." Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 55 p. (MIRA 14:1)

(Coal mining machinery)

BAYDAL, M.Kh.; GRIBENYUK, Ye.V.

Movement of baric centers near the ground in the east-west circulation pattern. Trudy KazNIGMI no.15:67-72 '60.
(MIRA 14:1)

(Cyclones)

POVZHITKOV, V.A.; TYAGIN, N.V.; GREBESHECHNIKOVA, A.M.

Effect of ultrahigh impulse electromagnetic fields on the onset and course of pregnancy in white mice. Biul. eksp. biol. i med. 51 no.5:103-107 My '61. (MIRA 14:8)

1. Nauchnyye rukovoditeli: chlen-korrespondent AMN SSSR prof. A.V. Triumfov; prof. V.G. Butomo. Predstavlena deystvitel'nym chlenom AMN SSSR A.V. Lebedinskim.
(PREGNANCY) (ELECTROMAGNETISM--PHYSIOLOGICAL EFFECT)

RUCHKO, Boris Fedorovich; GREBESHKOV, Yuriy Vasil'yevich;
LYUBOSHCHINSKIY, Dmitriy Markovich; KAZAK, Yuriy Nikolayevich;
BOGUTSKIY, N.V., otv. red.; SILINA, L.A., red. izd-va;
BOLDYREVA, Z.A., tekhn. red.

["Ukraina-1" coal cutter-loader] Ugol'nyi kombain
"Ukraina-1" Moskva, Gosgortekhizdat, 1963. 242 p. (MIRA 16:7)
(Coal mining machinery)

18(7)

06229
SOV/64-59-6-21/28

AUTHORS: Grebeshkova, I. D. and Teodorovich, V. P., Candidate of Chemical Sciences

TITLE: Metal Corrosion in Hydrogen Sulphide at High Temperatures

PERIODICAL: Khimicheskaya promyshlennost', 1959, Nr 6, pp 533 - 535 (USSR)

ABSTRACT: The present paper deals with work carried out under the supervision of Professor V. V. Ipat'yev (deceased). The subject mentioned in the title was investigated mainly on chromium steels as well as steels with molybdenum and tungsten additions, and a periodic weighing was carried out. At the same time, the scale on the samples was investigated microscopically as well as by chemical analyses. In a previous paper (Ref 5) an equation for the dependence on temperature of the corrosion rate of carbonaceous steels in hydrogen sulphide was derived. This equation can be represented as

$\lg K = \frac{26220}{4.57T} + 8.4$ for 10% chromium steels, and $\lg K = -\frac{25760}{4.57T} + 7.2$ for 20% chromium steels (Table 1, values for K). In the case of low-alloy chromium steels it can be assumed that the extent of corrosion is directly proportional to time. Microscopic investigations of the scale showed that the latter consists of two layers, an exterior layer of iron sulphide, and an interior one con-

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taining all the oxidized chromium. In a second of experiments steels with 1-18% of chromium and 5 and 10%, or 5 and 14% of tungsten were investigated along with steel grades EI-579, Kh7SMT, and NML. The experiments were carried out at 500°, a partial pressure of hydrogen sulphide of 0.8 atm., and a duration of 235 and 500 hours, and the above constants were calculated (Table 2). Steels with 10-12% chromium are unstable in hydrogen sulphide at 500°, and an addition of up 14% tungsten and up to 10% of molybdenum does not increase the resistance. Again, a double scale layer forms, but in contrast with chromium steels the inner layer is loose in the case of molybdenum and tungsten steels and shows no protective effect. There are 2 tables and 5 references, 1 of which is Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut neftekhimicheskikh protsessov (All-Union Scientific Research Institute for Petroleum-chemical Processes)

IPAT'YEV, V.V. [deceased]; TEODOROVICH, V.P.; GREBESHKOVA, I.D.; MERKULOVA, O.P.

Corrosion of metals in hydrogen sulfide at high temperatures. Khim. sera-i azotorg.soed.sod.v neft.i nefteprod. 3:419-430 '60. (MIRA 14:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut neftekhimicheskikh protsessov.
(Metals—Corrosion) (Hydrogen sulfide)

18.7100

77503
SOV/80-33-1-17/49

AUTHORS: Archakov, Yu. I., Grebeshkova, I. D., Teodorovich, V. P.

TITLE: The Effect of Heat Treatment on Decarburization and Cracking of Steels While Under Hydrogen at 500-600° C and 800 kg/cm^2 Pressure

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 89-94 (USSR)

ABSTRACT: This study was started under the supervision of Professor V. V. Ipat'yev. Steel of type 40X (0.41% C; 0.85% Cr) and melt 7475 (0.18% C; 3.05% Cr) were hardened and subsequently tempered at various temperatures which allowed the obtaining of various Cr-content in the carbide phase and solid solution. The tests were made in an autoclave under hydrogen pressure of 800 atm. The carbon content, structure, and composition of the carbide phase before and after the tests were determined. The composition of the carbide phase was determined by means of the electrolytic dissolution (N. M. Popova, Carbide Analysis of Steel--Karbidnyy analiz stali--,

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The Effect of Heat Treatment on Decarburization and Cracking of Steels While Under Hydrogen at 500-600° C and 800 kg/cm² Pressure

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Oborongiz, 1957) and by means of chemical, and in some instances, X-ray analysis. It was established that the amount of chromium in the carbide phase increased with the tempering temperature, and the rate of decarburization decreased. Practically full decarburization was achieved with tempering temperature equal to 550-700° C. Metallographic investigation showed that the size of microscopic cracks appearing along the grain boundaries increased with the tempering temperature and with the chromium content in the carbide phase. It was found that steel with 0.18% C alloyed with up to 3% Cr resisted the corrosive action of hydrogen better than steel 40X. The investigated steels showed low resistance, however, at 600° and 800 atm hydrogen pressure; evidently, the amount of the alloying elements was insufficient to bind all the carbon into carbides. Addition of 0.5-1.0% molybdenum to steel with 0.16% C and 3% Cr did not increase its resistance against the action of hydrogen

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zation and Cracking of Steels While Under
Hydrogen at 500-600° C and 800 kg/cm²
Pressure

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SOV/80-33-1-17/49

under the above-mentioned conditions. It was also found that a new phase, a so-called "carbide precipitate," was formed in all decarburized steels on electrolytic dissolution. In chromium steels, this precipitate contained considerable amounts of chromium, and in chromium-molybdenum steels, considerable amounts of Cr and Mo. This new phase requires further studies. There are 2 tables; 1 figure; and 3 references, 1 U.K., 1 German, 1 Soviet. The U.K. reference is: N. Inglis, W. Andreus, J. Ir. St. Int., 128, 383 (1933).

ASSOCIATION: All-Union Scientific Research Institute for Petrochemical Processes (Vsesoyuznyy nauchno-issledovatel'skiy institut neftokhimicheskikh protsessov)

SUBMITTED: January 20, 1959

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S/737/61/000/000/003/010

AUTHORS: Archakov, Yu.I., Grebeshkova, I.D., Teodorovich, V.P.

TITLE: Hydrogen corrosion of ferrochromium alloys at hydrogen pressure of 400-800 kg/cm^2 and a temperature of 600°C.

SOURCE: Stal', sbornik statey. Ed. by A.M.Yampol'skiy. Moscow. 1961, 424-435.

TEXT: Experimental findings show that the effect of H on ferrochromium (FC) alloys on the stability of the carbide component therein is not controlled by the ratio of the C and Cr contents alone. FC alloys with a C content $\leq 0.4\%$ are H-corrosion resistent at T=600°C and p_H=800 kg/cm^2, provided the Cr content is $\geq 9\%$. Decarbonization of the alloy occurs at the said temperature and pressure, even when only trigonal Cr carbide $(Cr,Fe)_7C_3$ is present. A brief state-of-the-art report on the H-corrosion problem of C steel and means for its minimization are given. The objective of this study is an investigation of the H corrosion of various FC alloys under more severe conditions than those employed in antecedent investigations. The tests defined in the title were conducted for a period of 1,000-4,000 hours. The specimens were fully exposed (on all sides, not only along an interior cavity) to the H pressure. The method used for the investigation of the

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effect of the alloy composition on the H-corrosion process was that of Yu.I.Archakov (Leningradskiy tekstil'nyy institut im. Lensoveta. Trudy, no.38, Goskhimizdat, 1957), except for a thermostatically controlled electric furnace in which a 36-mm OD, 18-mm ID, tube of 1X18H9T (1Kh18N9T) steel was set to serve as a H-pressurized reaction tank. Fresh H was circulated from one end of the reaction tube once a day to replace any H that might have diffused through the tube and to eliminate any traces of methane that might have formed. The degree of H corrosion was judged before and after soaking by microscopic examination, mechanical testing, and chemical analysis for C. The pre-test heat treatment of various FC-alloy specimens is tabulated. The carbide phase was analyzed chemically and by X-ray before the test. The precipitate was separated electrolytically and chemically, and the Cr and Fe contents were determined in the precipitate and in the separate carbide components. A tabulation of the data obtained by N.M.Popova's method (Karbidnyy analiz stali - Carbide analysis of steel. Oborongiz, 1957) and by N.A.Saverina's method (TsNIITMash, book 36, Mashgiz, 1950) is adduced for 9 alloys, and the two methods are briefly defined. X-ray analysis revealed the presence of the Me_7C_3 with hexagonal lattice, the $Me_{23}C_6$ phase, and some weak lines of an unknown phase. The changes in mechanical properties after H soaking are tabulated for the two series of tests performed at increasing H pressures and longer soaking times. FC alloys with an initial C:Cr ratio of 1:25 and 1:29 were

totally decarbonized by the H. Alloys with a C:Cr ratio as high as 1:35 were still partly decarbonized. Yet, an alloy with a C:Cr ratio of only 1:24 exhibited only an insignificant surficial decarbonization under the most severe testing conditions. It was concluded that the C:Cr-ratio criterion alone (cf. Inglis, N., Andrews, W., Journal of the Iron & Steel Institute, v. 128, 1933, 383-408, and 2 Soviet references) is inadequate, but that a definite Cr threshold value of 9% is a dependable criterion for the H-corrosion stability of FC alloys containing up to 0.4% C and a $(Cr,Fe)_7C_3$ carbide component. There are 3 figures, 5 tables, and 13 references (9 Russian-language Soviet, 2 English-language, 2 German).

ASSOCIATION: Vsesoyuznyy n.-i. institut neftekhimicheskikh protsessov (All-Union scientific research institute for petrochemical processes).

188100 1413, 1418, 2808, 4016

26864
S/080/61/034/004/005/012
A057/A129

AUTHORS: Arshakov, Yu. I., Grebeshkova, I. D., Teodorovich, V. P.

TITLE: Determination of the rate of hydrogen diffusion through 1Kh18N9T (1Kh18N9T) steel at high temperatures and pressures

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 4, 1961, 821 - 825

TEXT: A method was developed for determining the hydrogen permeability of 1Kh18N9T (AISI 321) steel under high-temperature (up to 1,000°C) and high-pressure (up to 300 kg/cm^2) conditions. It was found that the pressure dependence of the hydrogen diffusion rate is parabolic and the temperature dependence is exponential, having a temperature coefficient of 21,650 cal·g^{-1}·atom^{-1}. The method allows diffusion rates through metals at high temperatures and pressures to be determined with sufficient accuracy. It is essential that welding joints can be avoided and the amount of diffused gas can be measured. The present investigation was necessary since literature data refer only to tests at high temperature and low pressure or vice versa. No data are available for high-temperature and high-pressure conditions. In the method presented tubular samples (Figure 1) are used without welding joints and temperature and pressure were kept constant during

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the test. The testing assembly contained the diffusion unit, placed into an electric oven, a high-pressure system and the device for measuring the amount of diffused hydrogen. In all experiments technical grade hydrogen gas was used. The sample (Figure 1) was installed into the diffusion unit by welding the hydrogen gas inlet-tube at point E to the sample and inserting the sample into a vertical cylindrical tube which was placed in the vertical electrical oven. Hydrogen gas thus entered into the sample and diffusion occurred through the walls between C-D (see Figure 1). From the cylindrical tube the diffused hydrogen passed through an outlet-tube to the gas-measuring device. The high-pressure assembly used in the present experiments was described in a previous paper (Ref. 10: Tr. LTI. im. Lensoveta, Goskhimizdat, XXXVIII, 204-215, 1957; Ref. 11: ZhPKh, 32, 12, 2667, 1959). The temperature was regulated during the experiments by means of a ЭДП-17 (EDP-17) electronic potentiometer and registered by a ЭПП-09 (EPP-09) automatic electronic potentiometer. The amount of diffused hydrogen was measured in a device containing for smaller gas amounts a 2 cm^3 microburet calibrated in 0.01 cm^3, while for greater gas quantities a 100 cm^3 buret graduated in 0.2 cm^3 was used. Measurements were carried out in certain time interval and the amount of diffused gas was estimated per time unit and for normal conditions. The observation made by P.L. Chang et. al. (Ref. 3: J. Iron and Steel Inst., 3, 170, 205, 1952) that

stationary gas diffusion is quicker attained by cooling the sample was proved in preliminary experiments in the present work. Thus diffusion characteristics were estimated starting at high temperatures. The present tests were carried out on 6 tubular samples made of 1Kh18N9T steel. The following temperatures and pressures were investigated: 500°C and 300 kg/cm^2, 600 - 800°C up to 200 kg/cm^2, at 900°C up to 100 kg/cm^2, 950°C up to 75 kg/cm^2, and at 1,000°C up to 50 kg/cm^2. The maximum difference in the results between the six investigated samples was 5 %. The results shown in Figure 3 and in a table indicate a parabolic diffusion rate. In Figure 4 the temperature dependence of the diffusion rate is demonstrated. Since all isobars in Figure 4 are parallel to each other, the dependence can be expressed by $V = k \cdot e^{-21650/RT}$. Thus the apparent activation energy, estimated from the inclination angle, is 21,650 cal·g^{-1}·atom^{-1}. H. Bennek and G. Klotzbach (Ref. 1: Stahl und Eisen, 61, 25, 597, 1941) found for the diffusion of hydrogen at high temperature and 1 atm pressure through 18 % Cr, 8.9 % Ni steel an activation energy of 18,850 cal·g^{-1}·atom^{-1}. There are 4 figures, 1 table and 11 references: 4 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut neftekhimicheskikh protsessov (All-Union Scientific Research Institute of Petrochemical Processes)

L 19303-63 EWP(q)/EWT(m)/BDS ASD/AFFTC JD
ACCESSION NR: AR3006906 S/0137/63/000/007/I053/I053

SOURCE: RZh. Metalurgiya, Abs. 71363

AUTHOR: Archakov, Yu. I.; Grebeshkova, I. D.

TITLE: Hydrogen corrosion of alloyed steel

CITED SOURCE: Vestn. tekhn. i ekon. inform. N-i. in-t tekhn.-ekon. issled Gos. kom-ta Sov. Min. SSSR po khimii, no. 12, 1962, 26-31

TOPIC TAGS: corrosion, hydrogen corrosion, alloyed steel, ferro-chromium steel, hydrogen stability, carbide, interstitial carbide

TRANSLATION: The influence of Cr, W, V, and Ti on the stability to hydrogen corrosion of ferro-chromium steel was studied, with Cr (1.45-18.8%) and C (0.11-0.72%) contents in various ratios. Heat-treated samples were tested under the influence of H_2 for 1000-4000 hours at pressures of 400-800 kg/cm^2 and 600C. The deciding factors responsible for the hydrogen stability of the steel are the nature of the carbide phase of the steel, the presence of other elements dissolved in the carbide component, and the absence of cementite in the steel. The greatest

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hydrogen stability is possessed by steels with carbides of the "interstitial" type (TiC and VC), as well as with chromium carbides of the type of $Cr_{23}C_6$. Bibliography of 13 titles. N. Lukashina.

DATE ACQ: 12Aug63 SUB CODE: ML ENCL: 00

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ACCESSION NR: AT4013970 S/2659/63/010/000/0305/0313

AUTHOR: Archakov, Yu. I.; Grebeshkova, I. D.

TITLE: Influence of alloying elements on the long-term hydrogen stability of steel

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochny*m splavam, v. 10, 1963, 305-313

TOPIC TAGS: hydrogen stability, alloying element, hydrogen, chromium, tungsten, vanadium, niobium, titanium, steel, steel stability

ABSTRACT: Steel strength drops significantly under the physical and chemical action of hydrogen penetration, leading to the dissociation of the carbide phase and to decarbonization. The present investigation considers the influence of separate alloying elements (cr, W, V, Nb, Ti), and also of the combined action of Cr and Mo, Cr and W, Cr and Nb, Cr and V, Cr and Ti on the hydrogen stability of steel at a temperature of 600C, hydrogen pressure of 800 atm and test duration of 1,000-4,000 hours. It was shown that under conditions of high temperature interaction with hydrogen, steel with 0.15%C is not decarbonized when it contains 8.4% Cr, while steel with 0.4%C remains unchanged with 9.5% Cr, i.e. when all carbon

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ACCESSION NR: AT4013970

is in a carbide of the (Cr, Fe) $23C_6$ type. Second, under a hydrogen pressure of 800 atm and temperature of 600C for 1,000 hours the steels are completely decarbonized (content: 0.2%C, with addition of 0.4%W, 0.75%W, 1.57%W, or 0.48%V). Under the same conditions steel with approximately 0.2%C and 3% Cr is decarbonized with up to 0.48%V, 1.5% Mo and 1.5%W. Third, under the influence of hydrogen, the carbon content is not lowered in steels containing approximately 0.2%C with additions of 0.98% Ti and 1.97%V or in steels containing 0.2%C, 3% Cr, 1.5%V, 2% Nb, and 2%T. Fourth, the main factor ensuring the durability of the hydrogen stability of steel is the type of carbide phase. Steel is not decarbonized when the entire carbon content is chemically united in TiC and VC carbides or chromium carbide (Cr, Fe) $23C_6$. Orig. art. has: 1 chemical formula, 4 figures, and 3 tables.

ASSOCIATION: Institut metallurgii AN SSSR (Institute of Metallurgy AN SSSR)

SUBMITTED: 00 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: MM NO REF SOV: 005 OTHER: 003

Card 2/2

L 15176-65 EWT(m)/EWP(w)/EPF(c)/EPF(n)-2/EWA(d)/EWP(t)/EWP(b) Pz-4/Pu-4 SSD/
ASD(f)-2/ASD(m)-3/AFMDC/AFTC(p) JD/WW/JG/WB/MLK

ACCESSION NR: AT4045964 S/0000/64/000/000/0019/0043

AUTHOR: Archakov, Yu. I.; Grebeshkova, I. D.

TITLE: Hydrogen resistant steels of low scarcity

SOURCE: Novyye materialy* v mashinostroyenii (New materials in machinery manufacturing). Moscow, Izd-vo Mashinostroyeniye, 1964, 19-43

TOPIC TAGS: steel, alloy steel, hydrogen resistance, embrittlement, corrosion, decarbonization, stainless steel, carbon diffusion

ABSTRACT: Processes taking place under hydrogen pressure are usually carried out at elevated temperatures, so that both heat resistance and hydrogen resistance have to be considered in evaluating materials working in a hydrogen-containing environment. The two main problems are hydrogen corrosion (decarbonization) and hydrogen embrittlement, the former being the most harmful. In the present paper, the influence of alloying elements on the hydrogen resistance of steel was investigated on specimens subjected to hydrogen at various pressures at 600C, and for various test durations. Mechanical tests performed before and after heating in hydrogen showed the corresponding changes in physical properties. Four series of tests were carried out: (1) variation of the chromium content in chromium steels (hydrogen pressure 400--800 kg/cm^2 for 1000--4000 hours); (2) variation

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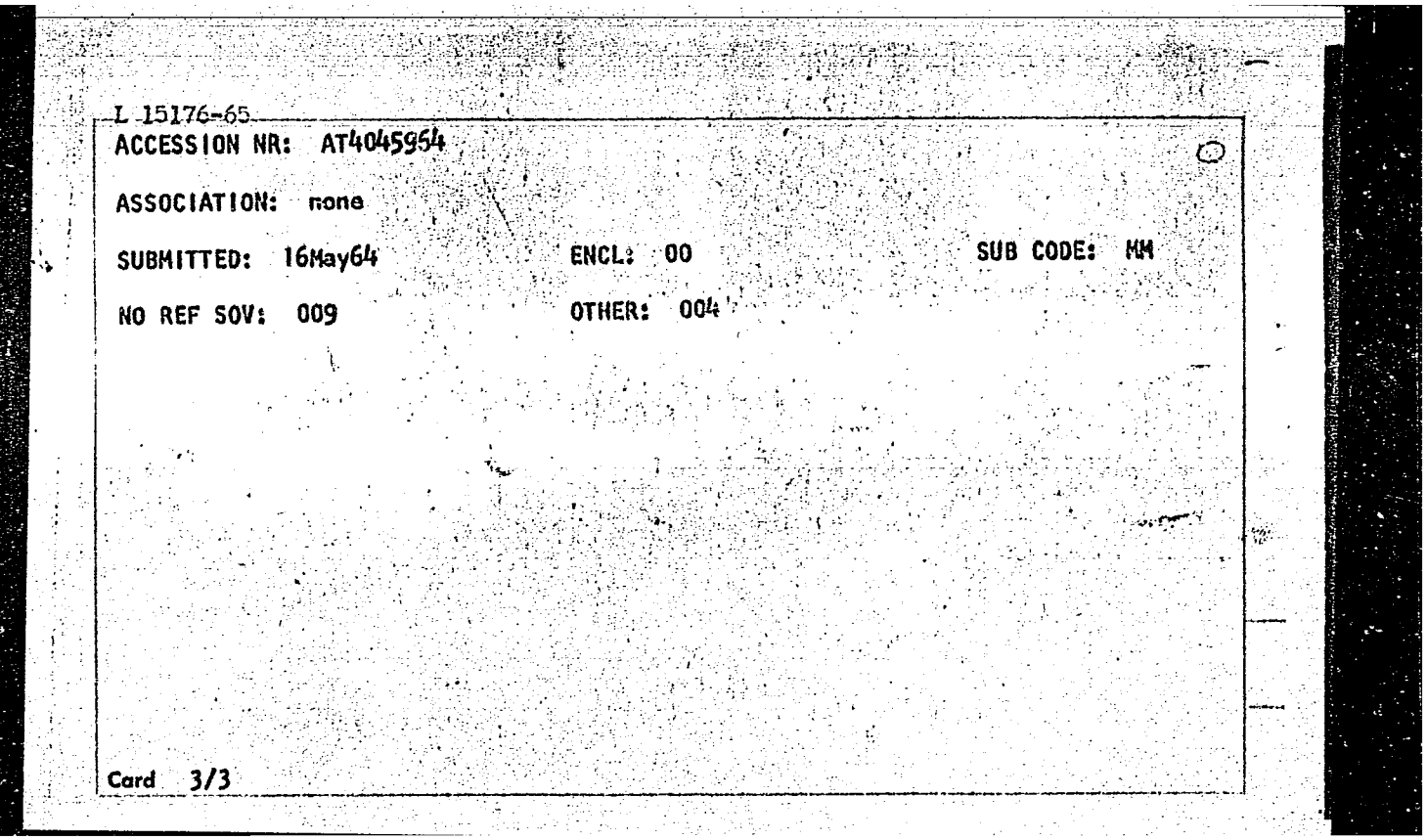
of the tungsten, columbium, vanadium, and titanium content (800 kg/cm^2; 1000 hours); (3) variation of the molybdenum, tungsten, columbium, vanadium, and titanium content in steel with 0.2% C, 3% Cr (400--750 kg/cm^2; 1000--2000 hours); (4) variation of the silicon, molybdenum, tungsten, vanadium, and titanium content in steel with 0.2% C, 6% Cr (800 kg/cm^2; 4000 hours). From the obtained test results it is concluded that the hydrogen resistance of steel is determined mainly by the type of carbide phase, the character of the interatomic ties between carbon and the alloying element, and secondarily by the velocity of carbon diffusion in chromium-containing ferrite. Tests showed that additions of Cr, Mo, W, V, Cb, and Ti increase the stability of the carbide phase; at the same time, the velocity of carbide phase coagulation decreases. The degree of dispersion of the carbide component is apparently not important. To stabilize steel with 0.2% C, 3-6% Cr against hydrogen corrosion (at 600 C), the addition of stronger carbide-forming elements such as V, Cb, and Ti, or the addition of more than 9% Cr, is required. However, at the present time, the authors are limiting their recommendations for the conditions 600C and 800 kg/cm^2. Under such conditions, not less than 8.4% Cr should be added to steels with 0.2% C (or less) and not less than 10% Cr should be added to steels with 0.2-0.4% carbon. There are not yet sufficient data available to establish a quantitative correlation between the temperature and pressure, on the one hand, and the maximum hydrogen resistance on the other. Orig. art. has: 12 figures and 12 tables.



L 15176-65

ACCESSION NR: AT4045954

ASSOCIATION: none

SUBMITTED: 16May64 ENCL: 00 SUB CODE: MM

NO REF SOV: 009 OTHER: 004

Card 3/3

L 10511-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) IJP(c) MJW/JD/RM/WH

ACC NR: AP5028201 SOURCE CODE: UR/0314/65/000/009/0026/0028

AUTHORS: Archakov, Yu. I. (Candidate of technical sciences); Grebeshkova, I. D. (Engineer) 44,55

ORG: none

TITLE: Investigation of the tendency towards carburization of steels in methane at elevated temperatures and pressures

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 9, 1965, 26-28

TOPIC TAGS: carburization, alloy steel, methane, steel, iron/ 12Kh1MF steel, NM1 steel, 7475 steel,

ABSTRACT: The tendency of a number of chromium and carbon steels towards carburization in methane at 600C and 50-200 atm pressure was investigated. The experimental procedure followed was that of Yu. I. Archakov, I. D. Grebeshkova, and V. P. Teodorovich (Sb. "Stal'". M., Metallurgizdat, 1961). The chromium steels investigated contained from 1.25 to 14% Cr. The carbon steels were of type 10, 20, and 30. In addition, the behavior of technical iron containing 0.05% C was also investigated. The elemental analysis of the steels is tabulated, and the experimental results are presented graphically (see Fig. 1). It was found that carburization of steel 7475 decreases the ductility but increases the strength of the steel. Carburization of other steels (containing 6.9-14% Cr) caused an insignificant decrease in the strength

Card 1/2 UDC: 66.046.56:547.211

L 7054-66
ACC NR: AP5028201

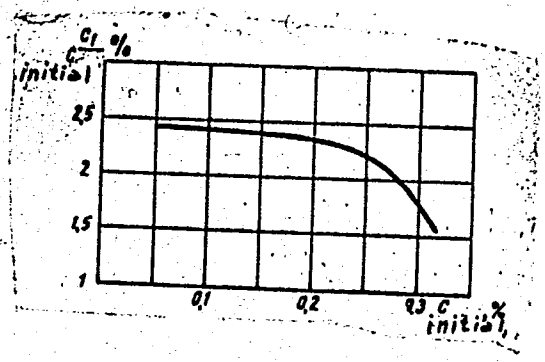


Fig. 1. Effect of carbon content on carburization of nonalloyed steel (P_{CH_4} = 50 atm)

of the steel. It is concluded that low-alloy steels of type 12Kh1MF containing strongly carbide-forming elements exhibit a pronounced tendency toward carburization. The work was undertaken at VNIIneftekhim. Orig. art. has: 2 tables and 2 graphs.

SUB CODE: GC/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001

Card 2/2

L 06055-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6028096 SOURCE CODE: UR/0314/66/000/006/0027/0032

AUTHOR: Archakov, Yu. I. (Candidate of technical sciences); Grebeshkova, I. D. (Engineer)

ORG: none

TITLE: Hydrogen resistance of two layer steels

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 6, 1966, 27-32

TOPIC TAGS: hydrogen embrittlement, gas diffusion, metal cladding

ABSTRACT: Three main methods are presently employed for the protection of two layer metals from the effects of hot hydrogen under pressure: 1) the introduction of strongly carbide forming elements (Cr, Mo, V, Nb, Ti); 2) a reduction in the working parameters (temperature and pressure); 3) cladding or lining with metals which have a high resistance to hydrogen penetration. The present article explores the possibility of protecting metals from the action of hydrogen by the formation of barriers on the surface of the metals. The article gives a mathematical treatment of the subject, based on the first law of diffusion in the differential form:

$$v = -D\frac{\partial c}{\partial x}, \qquad (1)$$

Card 1/2 UDC: 621.9-419:620.193.55.001.5

L 05035-67

ACC NR: AP6028096

where v is the rate of penetration of hydrogen through a unit of surface of a two layer metal, with steady state flow and a concentration gradient of $\partial c/\partial x$. Based on literature data, the article gives extensive tables showing the rate of hydrogen penetration into a large number of steels and alloys. It is concluded that a cladding layer can protect the base metal from hydrogen penetration. This takes place in the following manner: the stainless layer of the two layer steel, having a smaller diffusion capacity, reduces the hydrogen pressure (its concentration) at the boundary between the metals, and promotes the removal of the production of reaction, that is, it promotes the process of decarbonization. Orig. art. has: 8 formulas, 5 figures, and 6 tables.

SUB CODE: 11, 20/ SUBM DATE: none/ ORIG REF: 014/ OTH REF: 007

Card 2/2

KONOVALOV, S.A.; GREBESHOVA, R.N.; BORODKINA, V.V.

Nutrition of yeasts during the process of fermentation of starchy mashes. Trudy TSNIISP no.7:28-37 '59. (MIRA 13:9)
(Yeast) (Fermentation)

KONOVALOV, S.A.; GREBESHOVA, R.N.

Study of some phosphorus compounds in yeasts. Mikrobiologiia 28 no.6:838-845 N-D '59. (MIRA 13:4)

1. TSentral'nyy nauchno-issledovatel'skiy institut spirtovoy i likerno-vodochnoy promyshlennosti.
(PHOSPHORUS chem.)
(YEASTS chem.)

S/220/62/031/003/002/003
I016/I216

Author: Grebeshova, R. N.

Title: THE CONCENTRATION OF PHOSPHORUS COMPOUNDS IN THE MYCELIUM OF *ASPERGILLUS NIGER* MUTANTS OBTAINED BY UV-IRRADIATION

Periodical: *Mikrobiologiya*, v. 31, no. 3, 1962, 424–427

Text: *Aspergillus niger* S-$4_{10-10-III}$ obtained by UV-irradiation has a slower growth rate than the parent strain during the initial stages of growth on Chapek's medium, it lowers the *p*H of the medium more strongly and produces larger amounts of amylolytic enzymes. The total nitrogen concentration is higher and the total phosphorus and ash concentrations are lower in the mycelium of the mutant than in that of the parent strain. These differences in the phosphorus content seem to indicate a shift in phosphorus metabolism in the mutant as a result of UV-irradiation.

Association: Tsentral'nyy nauchno-issledovatel'skiy institut spirtovoi promyshlennosti (The Central Research Institute of the Alcohol Industry).

Submitted: June 9, 1961

Card 1/1

GREBESHOVA, R.N.

Some physiological characteristics of Aspergillus mutants produced under the influence of ultraviolet rays. Mikrobiologiia 33 n..5: 787-791 S-O '64. (MIRA 18:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut fermentnoy i spirtovoy promyshlennosti (VNIIFS), Moskva.

GREBESHOVA, R.N.

Biochemical characteristics of Aspergillus mutants produced under the influence of ultraviolet rays. Mikrobiologiia 33 no.6:971-974 N-D '64. (MIRA 18:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut fermentnoy i spirtovoy promyshlennosti, Moskva.

GREBESHOVA, R.N.

Effect of the various sources of phosphorus on the biosynthesis of amylolytic ferments in ultraviolet mutants of fungi. Ferm. i spirt.prom. 31 no.1:10-14 '65. (MIRA 18:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut fermentnoy i spirtovoy promyshlennosti.

GREBESHNIKOV, I. V.

Author: Grebeshnikov, Ilia Vasilevich

Title: The lucid interval optical (Prouvetlenie optiki.)

City: Moscow

Publisher: State Printing House of Technical and Theoretical Literature

Date: 1946

Available: Library of Congress

Source: Monthly List of Russian Accessions, Vol. 3, No. 11, p. 750

GREBIN', G.L. [Hrebin', H.L.]; BRONDARENKO, M.I.

Preparing coarse forage for cattle. Mekh. sil'. hosp. 9 no.2:20-21 F '58. (MIRA 11:3)

1.Naukovo-doslidniy institut tvarinnitstva Lisostepu i Polissya URSR.

(Feeding and feeding stuffs)

GREBINCHENKO, L.S.

Underground drainage of a shielded section. Gor. zhur. no.6:62-65 Je '63. (MIRA 16:7)

1. Trest Nikopol'-Marganets.
(Mine drainage)

AMPILOGOV, I.F., inzh.; GREBINCHENKO, L.S., inzh.; RIVLIN, V.M., inzh.

Underground drainage of an inclined shaft during sinking in water-bearing sand. Shakht. stroi. 9 no.2:25-27 F '65. (MIRA18:4)

1. Trest Nikopol'marganets (for Ampilogov, Grebinchenko). 2. TsNII-Gorosusheniye (for Rivlin).

GREBINCHENKO, L.S., gornyy inzh.; NECHAYEV, Yu.V., gornyy inzh.

Using electric prospecting in mine drainage practice at the Nikopol' deposit. Gor. zhur. no.4:68-69 Ap '65. (MIRA 18:5)

1. Trest Nikopol'-Marganets (for Grebinchenko). 2. Institut TsNIIgorosusheniye (for Nechayev).

BALANDIN, M.P.; GREBINNIK, V.G.; SELIVANOV, G.I.

[Synchronizing the operation of a bubble chamber and a synchrocyclotron] Sinkhronizatsiia raboty puzyr'kovoi kamery s sinkhrotsiklotronom. Dubna, Ob"edinennyi in-t iadernykh issl., 1961. 12 p. (MIRA 15:1)
(Bubble chamber) (Synchrotron)

BLOKHINTSEVA, T.D.; VASILENKO, A.T.; GREBINNIK, V.G.; ZHUKOV, V.A.; LIBMAN, G.; NEMENOV, L.L.; SELIVANOV, G.I.; YUAN' ZHUN-FAN [Yuan Jung-fang]

[Eight-liter hydrogen-deuterium dubble chamber in a magnetic field] Vos'militrovaia vodorodno-deiterievaia puzyr'kovaia kamera v magnitnom ple. Dubna, Ob"edinennyi in-t iadernykh issl., 1961. 20 p. (MIRA 15:1)
(Bubble chamber) (Magnetic fields)

BLOKHINTSEVA, T.D.; GREBINNIK, V.G.; ZHUKOV, V.A.; LIBMAN, G.; NEMENOV, L.; SELIVANOV, G.I.; YUAN' ZHUN-FAN [Yuan Jung-fang]; SARANTSEVA, V.R., tekhn. red.

[Interaction between π^--mesons and hydrogen at an energy of 340 Mev] Vzaimodeistvie π^--mezonov s vodorodom pri energii 340 Mev. Dubna, Ob"edinennyi in-t iadernykh issl., 1962. 27 p. (MIRA 15:10)

(Nuclear reactions) (Mesons) (Hydrogen)

GREBINNIK, V G

(5)

BLOKHINTSEVA, T.D., GREBINNIK, V. T., LIPMAN, G., NEMENOV, L. L., SELIVANOV, G. I. YUNG-FANG, Yuan, ZHUKOV, V. A.

"π^-—Meson Interaction with Hydrogen at 340 Mev"

report presented at the Intl. Conference on High Energy Physics, Geneva, 4-11 July 1962

Joint Inst. for Nuclear Research
Lab. of Nuclear Problems

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S/120/62/000/005/009/036
E039/E420

AUTHORS: Blokhintseva, T.D., Vasilenko, A.T., Grebinnik, V.G., Zhukov, V.A., Libman, G., Nemenov, L.L., Selivanov, G.I., Yüan Jung-Fang

TITLE: An eight litre hydrogen-deuterium bubble chamber in a magnetic field

PERIODICAL: Pribory i tekhnika eksperimenta, no.5, 1962, 51-59

TEXT: A detailed description of the apparatus is given. Essentially it consists of two coaxial cylinders, the inner space being the working volume and the outer space for temperature control. The inner cylinder is of copper to improve heat transfer and the outer cylinder, together with most of the casing, is constructed from 1Х18Н9Т (1Kh18N9T) stainless steel. Observation ports at the ends of the inner cylinder consist of discs of ЛК-5 (LK-5) glass 40 mm thick and with an aperture of 280 mm. Detailed drawings are given of the expansion apparatus and the associated two stage double acting electromagnetic valve. The normal gas pressure for operating the expansion apparatus is 7 atm and the degree of expansion can be altered by changing the

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S/120/62/000/005/010/036
E192/E382

AUTHORS: Balandin, M.P., Grebinnik, V.G. and Selivanov, G.I.

TITLE: Synchronization of the operation of a bubble chamber with a synchrocyclotron

PERIODICAL: Pribory i tekhnika eksperimenta, no. 5, 1962, 60 - 64

TEXT: The usual method of designing the synchronization circuit for a bubble chamber relies on a number of series-connected binary circuits and in this system the spread of the fronts of the triggering pulses can amount to 3% of the total duration of the delay pulse. This, in practice, produces an additional time error of about 0.9 μs, which completely obscures the growth period of the bubbles to visible dimensions. The system described does not suffer from the above fault due to the production of a coincidence between the internal signal and the synchronization pulse in the final stage. The photographic-exposure time is matched with the instant of passage of the beam to within 10^{-4} sec. The system is provided with a "type-of-operation" switch which permits the actuating of the system by

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the start pulses obtained from the photo pick-up of the accelerator (external actuation) or by trigger pulses produced by an internal generator. In either case, the system can operate continuously or only once. The internal drive is useful during the testing and adjustment of the system and permits testing the chamber independently of the accelerator. In order to provide definite intervals for the growth of the bubbles after passage of the beam through the accelerator the instant of producing the illumination pulse is made variable. Also, relative time-spacing of the other control pulses is unaltered. This is achieved by providing a delay circuit at the input of the system for the synchronization pulses. The synchronization pulses from the accelerator appear at intervals of 8 - 12 μs, whereas the operating cycle of the chamber is 2 - 5 sec. Stable operation of the system as a whole is therefore achieved by blocking it for the duration of the operating cycle as soon as a start pulses is received. The blocking pulse is produced by a special forming circuit which blocks the chamber for a duration of 0.5 - 30 sec. A single start pulse triggers therefore two independent channels:

a system for forming pulses for controlling operation of the electromagnetic valve and a unit for producing the illumination pulse. Both channels comprise delay circuits permitting the shifting of the inception of expansion, the starting of contraction and the instant of triggering of the spark tube. It is possible to select the optimum position of the illumination pulse by shifting the instant of expansion. There are 6 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute for Nuclear Research)

SUBMITTED: December 9, 1961

S/056/62/042/003/046/049
B108/B102

94 6700

AUTHORS: Blokhintseva, T. D., Grebinnik, V. G., Zhukov, V. A., Libman, G., Nemenov, L. L., Selivanov, G. I., Yüan Jung-fang

TITLE: Measurement of the total cross section of the (π^-p) reaction with 340-Mev π^--mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 912-913

TEXT: The reactions

$$\pi^- + p \to \pi^- + \pi^+ + n, \quad (1),$$
$$\pi^- + p \to \pi^- + \pi^0 + p, \quad (2),$$
$$\pi^- + p \to \pi^- + \gamma + p. \quad (3)$$

have been studied at energies of the primary π^- mesons of 340 ± 15 Mev with the aid of a 25-cm liquid-hydrogen chamber in a magnetic field of 12,000 oe. The respective total cross sections were determined as $\sigma_1 = 1.24 \pm 0.14$ mb, $\sigma_2 = 0.13^{+0.06}_{-0.04}$ mb, $\sigma_3 = 0.09^{+0.03}_{-0.06}$ mb. In the

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Measurement of the total cross ...

determination of the cross section of reaction (3) only cases where the energy of the emitted gamma quantum was higher than 100 Mev were considered. In order to obtain a representation of the contribution of the different isotopic states in the cross sections of the reactions (1) and (2), the latter are written down in the form

$$\sigma_1 = \frac{1}{9}\left[\frac{1}{5}\left|A_2^{3/2}\right|^2 - \frac{1}{2}\sqrt{\frac{2}{5}}\,\mathrm{Re}\,(A_2^{3/2*}A_0^{1/2}) + 2|A_0^{1/2}|^2\right] + \frac{1}{9}\left[|A_1^{3/2}|^2 - 2\,\mathrm{Re}\,(A_1^{3/2*}A_1^{1/2}) + |A_1^{1/2}|^2\right],$$

$$\sigma_2 = \frac{1}{10}\left|A_2^{3/2}\right|^2 + \frac{1}{9}\left[\frac{1}{2}|A_1^{3/2}|^2 + 2\mathrm{Re}(A_1^{3/2*}A_1^{1/2}) + 2|A_1^{1/2}|^2\right],$$

where A_K^i denotes the invariant isotopic amplitudes (superscript refers to total isotopic spin of entire system, subscript denotes total isotopic spin of the system of two pions). The cross sections of the reactions (1) and (2) permit with some assumptions to infer the following about the magnitudes and phases of the isotopic amplitudes: (a) if the amplitudes

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Measurement of the total cross ...

$A_1^{1/2}$ and $A_1^{3/2}$ are zero, then the $A_2^{3/2}$ will be considerably smaller than $A_o^{1/2}$: $3.1|A_2^{3/2}|^2 \leqslant |A_o^{1/2}|^2 \leqslant 5.7|A_2^{3/2}|^2$; (b) if it is considered that σ_1 and σ_2 are determined mainly by $A_1^{1/2}$ and $A_1^{3/2}$, then the phase shift of these amplitudes is about 180°C, and their moduli are connected by the relation $|A_1^{3/2}| \approx 2|A_1^{1/2}|$. For incident pion energies of 340 Mev the maximum total energy (c.m.s.) of two pions is 400 Mev. If the case (a) applies, one may state that the pions in the energy range 280-400 Mev will interact mainly in states with total isotopic spin T = 0 and not with T = 2. Professor B. M. Pontekorvo and P. F. Yermolov are thanked for advice and discussions. There are 5 references: 2 Soviet and 3 non-Soviet. The references to English—language publications read as follows: J. Deahl et al. Proc. of the 1960 Ann. Int. Conf. on High Energy Phys. at Rochester, 1960, p. 185; H. J. Schnitzer. Preprint, 1961; B. C. Barish et al. Bull. Amer. Phys. Soc., II, 6, 523, 1961.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

S/056/62/042/003/046/049
B108/B102

Measurement of the total cross ...

SUBMITTED: January 24, 1962

Card 4/4

S/056/63/044/001/022/067
B104/B144

AUTHORS: Blokhintseva, T. D., Grebinnik, V. G., Zhukov, V. A., Libman, G., Nemenov, L. L., Selivanov, G. I., Yuan Jung-fan

TITLE: Interaction of π^- mesons with hydrogen at 340 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 116-126

TEXT: The reactions $\pi^- + p \longrightarrow \pi^- + \pi^+ + n$, $\pi^- + p \longrightarrow \pi^- + \pi^0 + p$, and $\pi^- + p \longrightarrow \pi^- + \gamma + p$ were studied with a 25 cm liquid hydrogen bubble chamber in a 12,000-oe magnetic field. The π^- meson beam was generated in the synchrocyclotron of the Laboratoriya yadernykh problem OIYaI (Laboratory of Nuclear Problems OIYaI), the meson energy was 340 ± 15 Mev. 1400 two-pronged stars were found in 16,000 stereoscopic photographs. Those listed in Table 2 complied with the following conditions: (1) the angle α between the track of the incident particle and the central plane of the chamber must not exceed $\pm 4^\circ$; (2) the π^- meson track must not be shorter than 10 mm; (3) the distance between the point of interaction and the boundary of the visible range of the working volume of the chamber

Card 1/3

Interaction of π^- mesons with ...

must not be smaller than 20 mm; (4) the azimuthal angle of a negative particle must not exceed 70^o; (5) the noncomplanarity of elastic interactions must not exceed 3^o. The angular distributions and the energy distributions of the secondary particles suggest an effect due to resonance of the spin with the isospin 3/2. A steep increase of the $\pi\pi$ interaction cross section with a total isospin T = 0 was found by analyzing the energy distribution in the $(\pi^+\pi^-)$ c.m.s. There are 10 figures and 2 tables.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: August 4, 1962

Interaction of π^- mesons with ...

S/056/63/044/001/022/067
B104/B144

	(1)	(2)	(3)
$\pi^- + p \to \pi^- + \pi^0 + n$	108	$1,24 \pm 0,14$	1,80
$\pi^- + p \to \pi^- + \pi^0 + p$	11	$0,13^{+0,05}_{-0,04}$	0,19
$\pi^- + p \to \pi^- + \gamma + p$	8	$0,09^{+0,03}_{-0,03}$	—
$\pi^- + p \to \pi^0 + n$ (γ e^+, e^-)	8	—	—
Упругое $\pi^- p$-рассеяние	764	$7,52 \pm 0,55$	—

Table 2. Interaction cross sections.
Legend: (1) Number of events; (2) σ_{total}, millibarn, experimental; (3) σ_{total}, theoretical.

Card 3/3

S/056/63/044/002/019/065
B102/B186

AUTHORS: Blokhintseva, T. D., Grebinnik, V. G., Zhukov, V. A., Libman, G., Nemenov, L. L., Selivanov, G. I., Yüan Jung-fang

TITLE: The total π^-p-reaction cross-sections at π^- energies of 276 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 2, 1963, 498-499

TEXT: The total cross-sections of the reactions $\pi^- + p \rightarrow \pi^- + \pi^+ + n$ and $\pi^- + p \rightarrow \pi^- + \pi^0 + p$ were measured at $E_{\pi^-} = 276 \pm 10$ Mev in the lab system in a 25-cm liquid-hydrogen bubble chamber placed in a magnetic field. Among 6000 photographs made 5 events of the first, and one of the second reaction were found. The cross sections were:

$$\sigma_1 = 0.4^{+0.2}_{-0.3} \text{ mb} \quad \text{and} \quad \sigma_2 = 0.08 \pm 0.08 \text{ mb}.$$

The results are in close agreement with the theoretical predictions of

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S/056/63/044/002/019/065
The total π^-p-reaction ... B102/B186

H. Schnitzer (Phys. Rev. 125, 1059, 1962). There is 1 figure.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: September 24, 1962

Card 2/2

L 41014-65 EWT(m)/T/EWA(m)-2
ACCESSION NR: AP5007711 S/0367/65/001/001/0103/0112

AUTHOR: Blokhintseva, T. D.; Grebinnik, V. G.; Zhukov, V. A.; Kravtsov, A. V.; Libman, G.; Nemenov, L. L.; Selivanov, G. I.; Yuan, Jung-fang.

TITLE: Determination of the contribution of the 3/2, 3/2 isobar to inelastic interaction processes of 344 MeV Pi mesons with protons

SOURCE: Yadernaya fizika, v. 1, no. 1, 1965, 103-112

TOPIC TAGS: inelastic Pi meson scattering, isobaric model, isobar scattering effect, isobar channel contribution, meson proton interaction, inelastic scattering

ABSTRACT: S. J. Lindenbaum and R. M. Sternheimer (Phys. Rev., 109, 1723, 1958) proposed a model for the description of meson-meson production during πN collisions, according to which the meson production proceeds via the formation of the isobaric state with T = J = 3/2 which subsequently disintegrates into a nucleon and a π-meson. In the past, the most accurate comparions of the experimental data with this isobaric model have been carried out with primary particles whose energy was in the vicinity of 1 GeV (see, e.g., E. Pickup, D. K. Robinson, E. O. Salant, F. Ayer, B. A. Bunir, Phys. Rev., 132, 1819, 1963). However, it seems

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quite interesting to investigate the possible contribution of the 3/2, 3/2 isobar to the πN-interaction cross section which would permit a quantitative estimate of its role within such reactions. Consequently, by analyzing the difference in the distribution of cases for the reaction

$$\pi^- + p \to \pi^- + \pi^+ + n, \qquad (1)$$

with respect to the total energy of π^-n and π^+n in the center of mass system, the authors determined the contribution of the 3/2, 3/2-isobar to the cross section of the reaction for the 344 MeV energy level of the initial π^--mesons. An analogous analysis was performed for the data obtained at the π^--meson energies of 290 (L. K. Goodwin, R. W. Kenney, V. Perez-Mendez, Phys. Rev., 122, 655, 1961) and 360 MeV (M. Olson, G. B. Yodh, University of Maryland Department of Physics and Astronomy, Technical Report, No 358, 1964). The total cross sections of the inelastic processes (1) and

$$\pi^- + p \to \pi^- + \pi^0 + p \qquad (2)$$

are equal to $(1.50 \pm 0.10)\cdot 10^{-27}$ cm^2 and $(0.23 \pm^{0.04}_{0.07})\cdot 10^{-27}$ cm^2, respectively. Assuming that the isobaric transitions proceed only into T = 1/2 states, the

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ACCESSION NR: AP5007711

authors found that the contribution of the isobaric channels to the total cross section of (1) at 344 MeV is approximately 50%. The pion-pion interaction also plays a substantial role here. It is shown that the difference in the cross sections is related to the $D_{3/2}$-$sp_{3/2}$ transition. The possibility of determining the $\pi\pi$-scattering lengths from an analysis of this transition is also outlined. "The authors thank B. M. Pontecorvo for his constant interest in the work, V. A. Meshcheryakov for valuable advice, R. M. Ryndin and E. S. Bilen'kiy for valuable discussions, and the technical personnel who participated in the collection and processing of experimental data." Orig. art. has: 16 formulas, 8 figures, and 1 table.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute for Nuclear Research)

SUBMITTED: 28Jul64 ENCL: 00 SUB CODE: NP

NO REF SOV: 007 OTHER: 011

Card 3/3

S/068/60/000/001/006/006
E071/E433

AUTHORS: Grebinnik, Z.G. and Tselykovskaya, N.K.

TITLE: Photocolorimetric Determination of the Colour of Clear Indene Coumarone Resins

PERIODICAL: Koks i khimiya, 1960, No.1, pp.51-52

TEXT: The usual determination of the colour is done by comparing the colour of a 10% solution of resin in benzene with a standard iodometric scale. The latter is in the form of series of standards prepared by the dilution of an iodine solution containing 4000 mg of iodine in 100 ml of a 10% solution of potassium iodide. To obtain a more objective comparison the authors propose the use of a photocolorimeter type ФЭК-М (FEK-M). The experimental procedure is described in some detail. Calibration graphs are given. A comparison of visually and photocolorimetrically determined colours of a number of resins is given in the table. A greatly improved accuracy is claimed. It is stated in the editorial note that the method should be checked in works and institutes. There are 3 figures and 1 table.

ASSOCIATION: Kadiyevskiy koksokhimicheskiy zavod (Kadiyevka Coking Works)

Card 1/1

GREBINSKAYA,M.I. 600

1. GREBINSKAYA, M. I.

2. USSR (600)

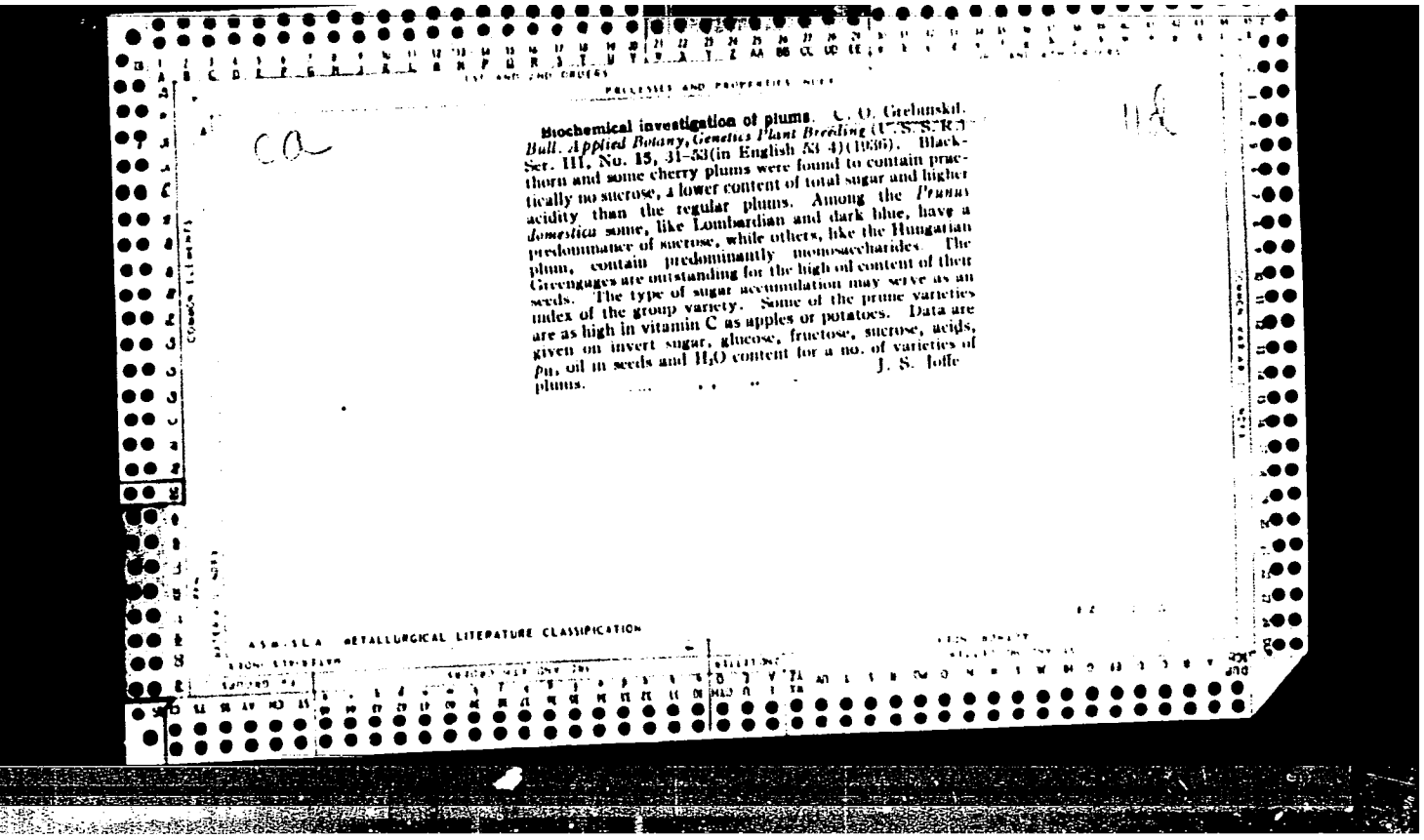
4. Mulberry; seeds - Morphology

7. Structure of the mulberry seed. Bot. zhur. 37 No. 2, 1952
Sredneaziatskiy Nauchno-Issledovatel'skiy Institut Shelkovodstva Tashkent

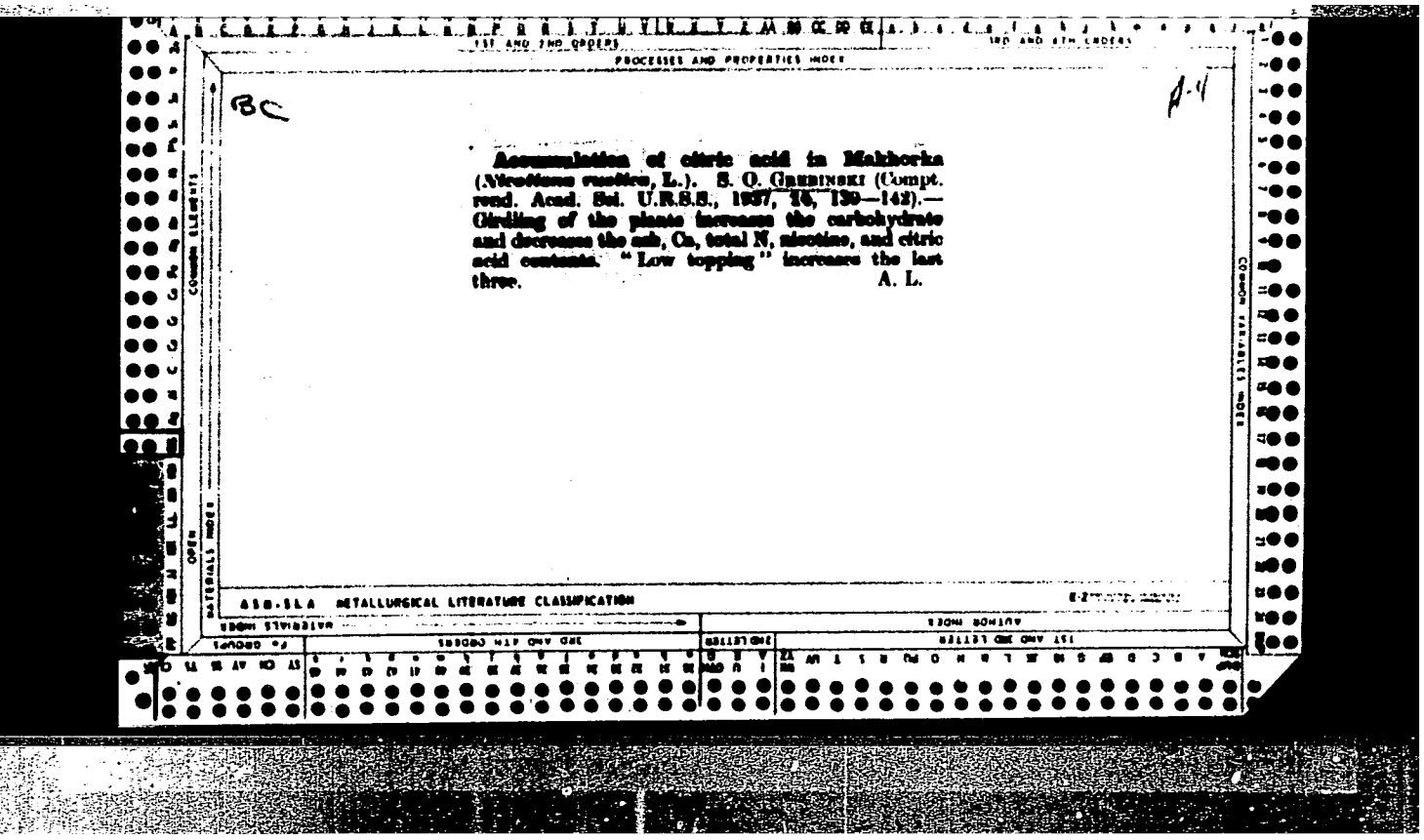
9. Monthly List of Russian Accessions, Library of Congress, Aug 1952.
UNCLASSIFIED

ABBASOV, A.R.; [illegible]; [illegible]; [illegible]; [illegible]; [illegible]; MOLCHANOV, A.P.; [illegible]; [illegible]; [illegible]; YURIN, O.I.; YASNOV, L.V.

Radioastronomical observations of the solar eclipse of July 21, 1963 in the microwave band. Vest. LGU 20 no.1:102-109 '65. (MIRA 18:2)



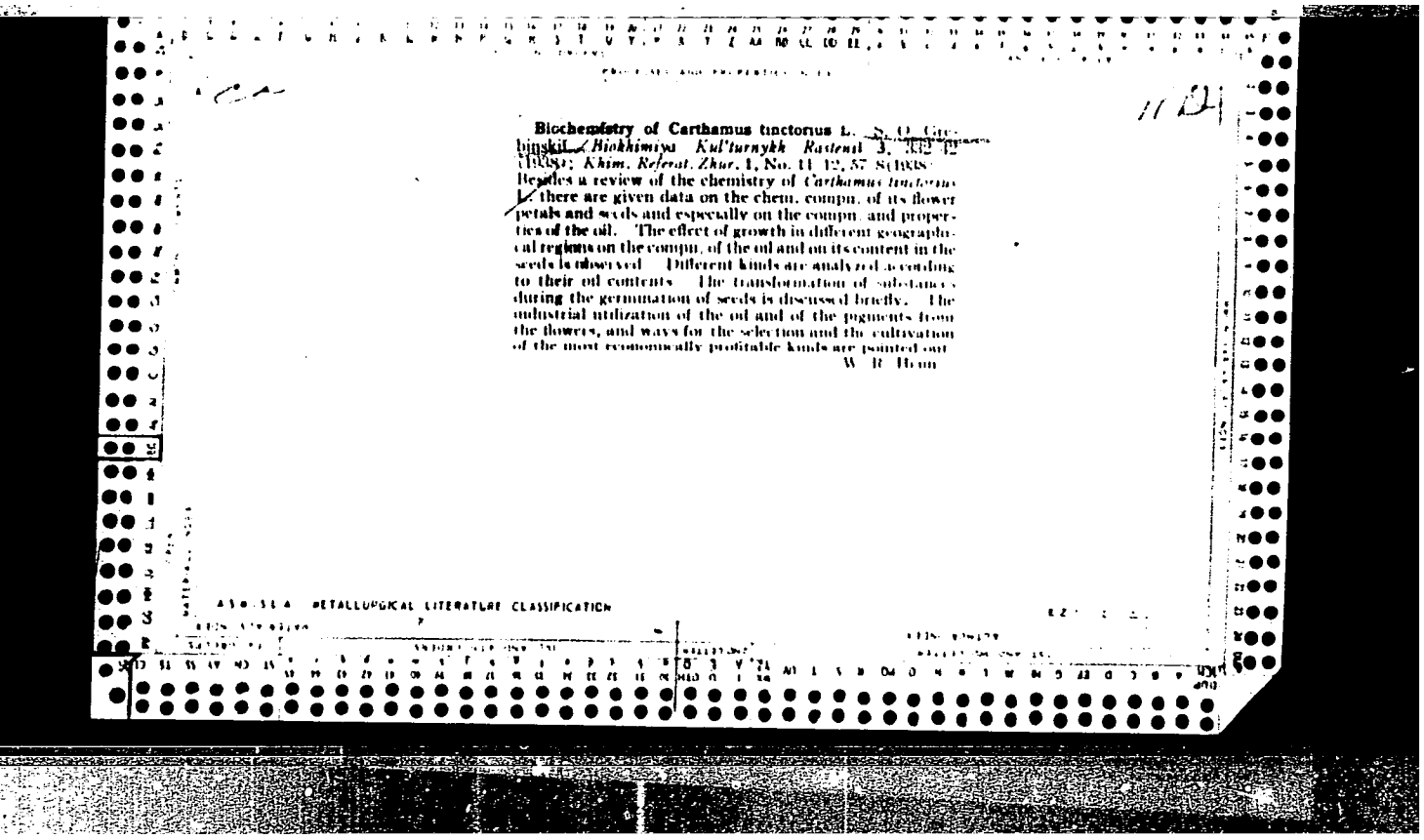
Biochemical investigation of plums. C. O. Grelunskil. *Bull. Applied Botany, Genetics Plant Breeding* (U.S.S.R.) Ser. III, No. 15, 31–53(in English 53–4)(1936). Blackthorn and some cherry plums were found to contain practically no sucrose, a lower content of total sugar and higher acidity than the regular plums. Among the *Prunus domestica* some, like Lombardian and dark blue, have a predominance of sucrose, while others, like the Hungarian plum, contain predominantly monosaccharides. The Greengages are outstanding for the high oil content of their seeds. The type of sugar accumulation may serve as an index of the group variety. Some of the prune varieties are as high in vitamin C as apples or potatoes. Data are given on invert sugar, glucose, fructose, sucrose, acids, *Pn*, oil in seeds and H_2O content for a no. of varieties of plums. J. S. Joffe



BC

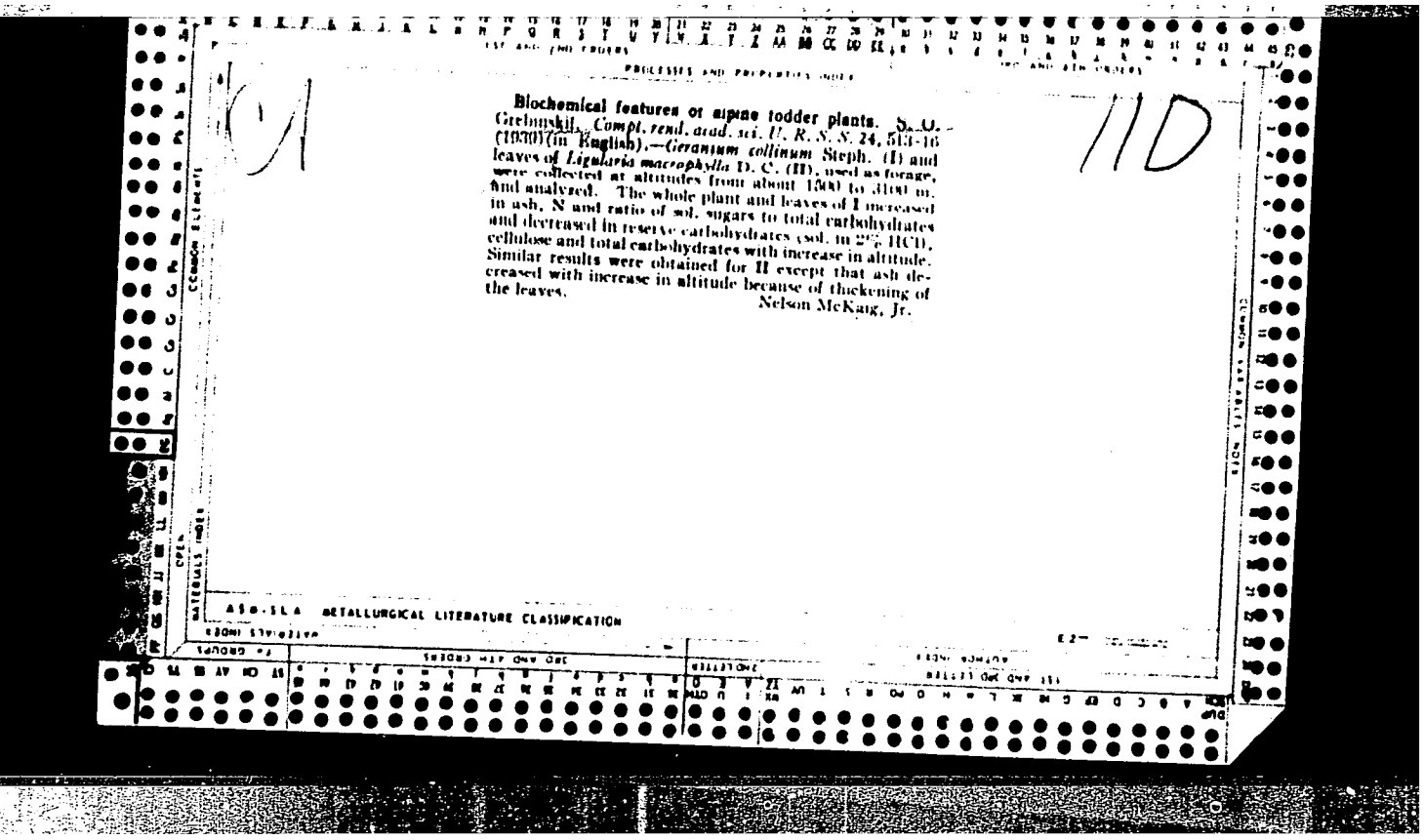
A-4

Accumulation of citric acid in Makhorka (*Nicotiana rustica*, L.). S. O. GRABINSKI (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 139—142).—Girdling of the plants increases the carbohydrate and decreases the ash, Ca, total N, nicotine, and citric acid contents. "Low topping" increases the last three. A. L.



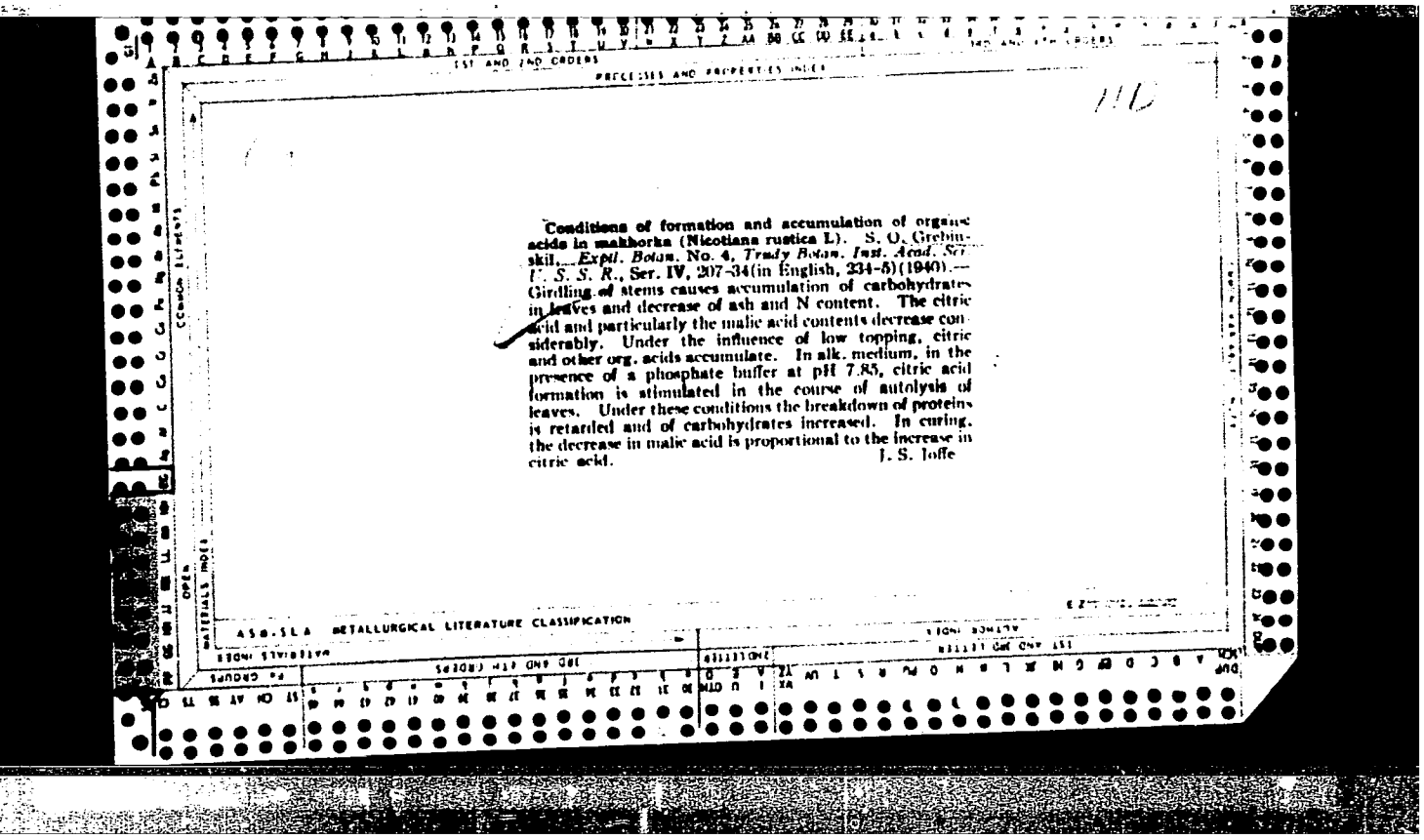
Biochemistry of Carthamus tinctorius L. S. O. Gre-binskii. *Biokhimiya Kul'turnykh Rastenii* 3, 332-47 (1968); *Khim. Referat. Zhur.* 1, No. 11 12, 57 S(1968). Besides a review of the chemistry of *Carthamus tinctorius* L. there are given data on the chem. compn. of its flower petals and seeds and especially on the compn. and properties of the oil. The effect of growth in different geographical regions on the compn. of the oil and on its content in the seeds is observed. Different kinds are analyzed according to their oil contents. The transformation of substances during the germination of seeds is discussed briefly. The industrial utilization of the oil and of the pigments from the flowers, and ways for the selection and the cultivation of the most economically profitable kinds are pointed out.
W. R. Horn

METALLURGICAL LITERATURE CLASSIFICATION

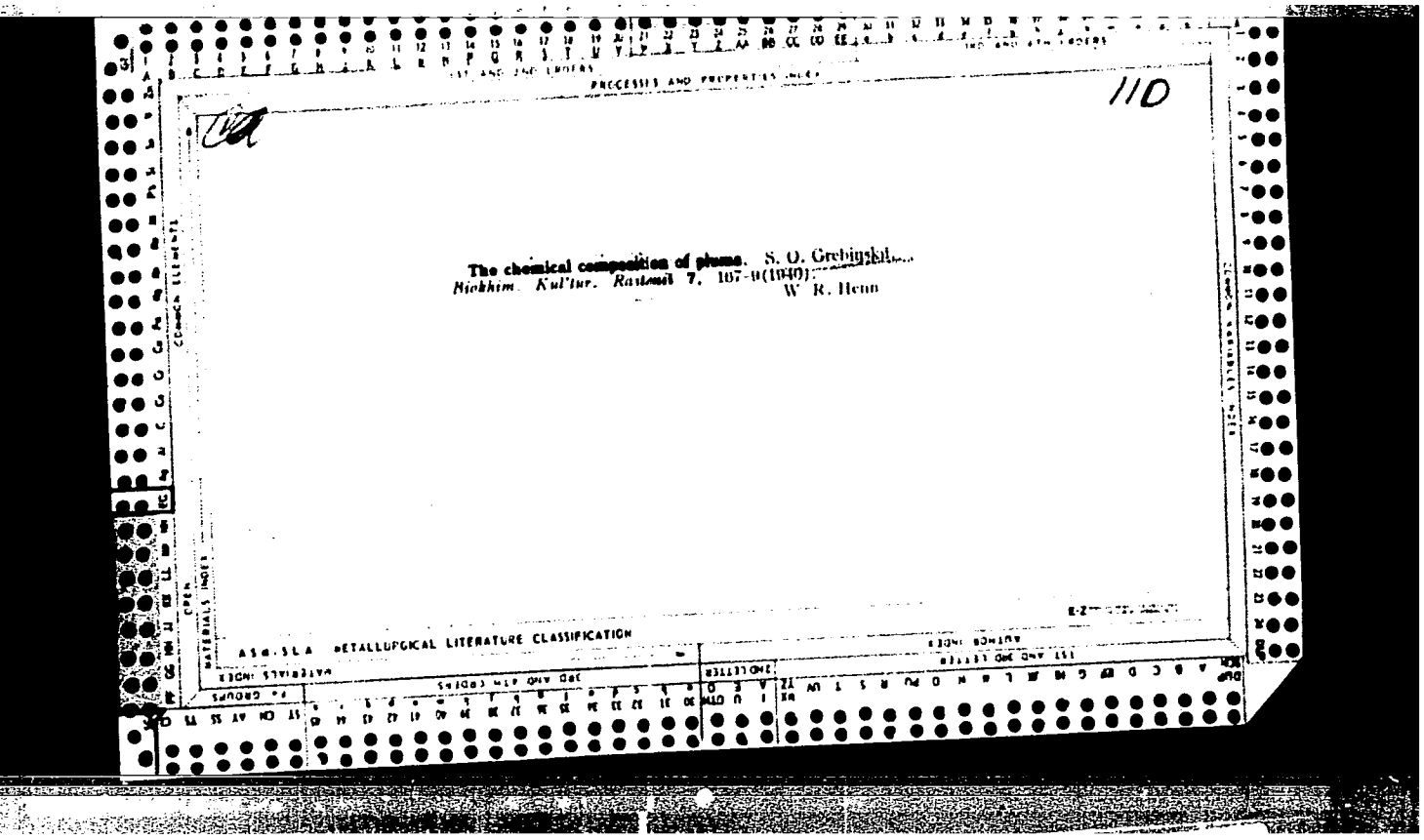


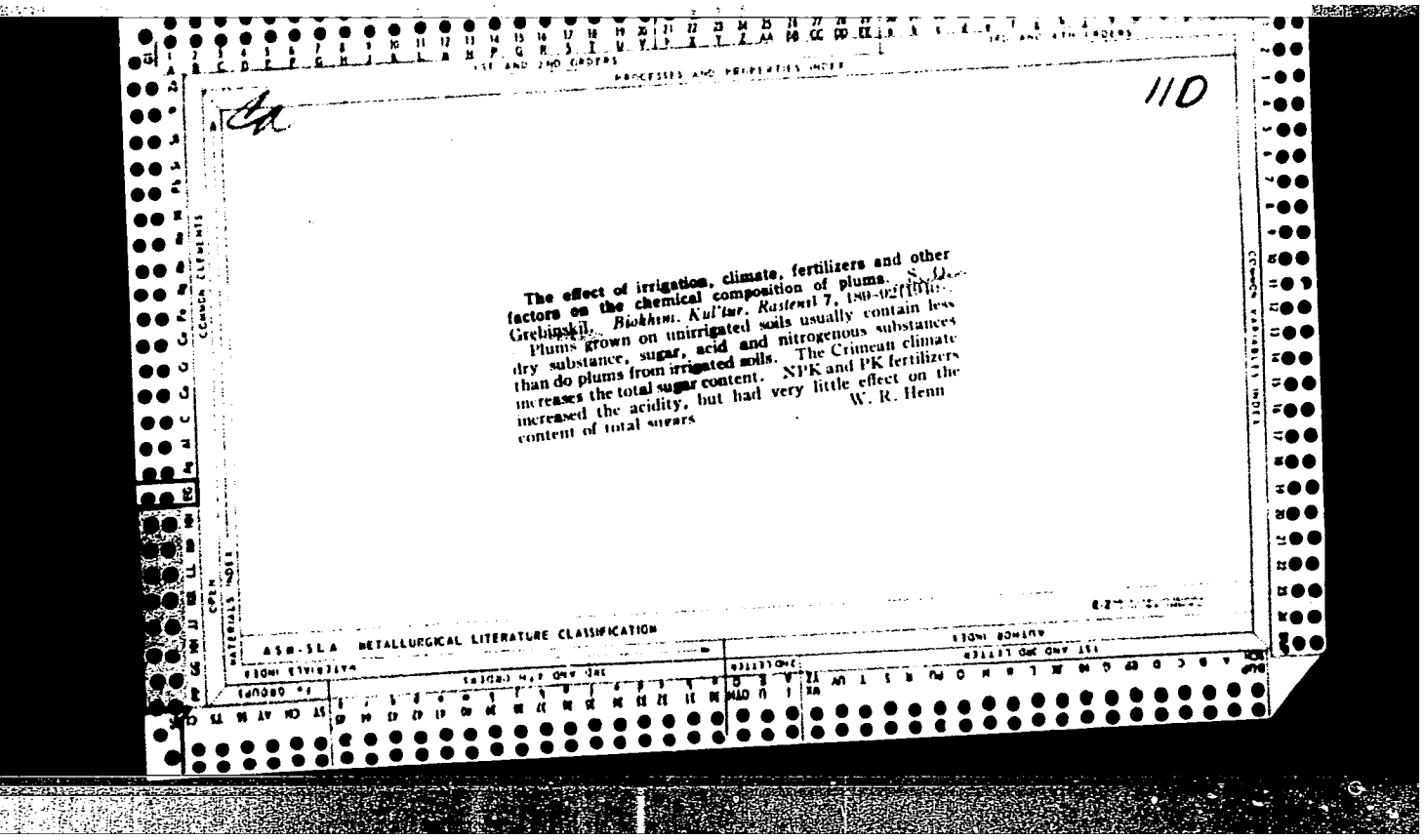
Biochemical features of alpine fodder plants. S. O. Grebinskii. *Compt. rend. acad. sci. U. R. S. S.* 24, 513-16 (1939)(in English).—*Geranium collinum* Steph. (I) and leaves of *Ligularia macrophylla* D. C. (II), used as forage, were collected at altitudes from about 1500 to 3100 m. and analyzed. The whole plant and leaves of I increased in ash, N and ratio of sol. sugars to total carbohydrates and decreased in reserve carbohydrates (sol. in 2% HCl), cellulose and total carbohydrates with increase in altitude. Similar results were obtained for II except that ash decreased with increase in altitude because of thickening of the leaves.

Nelson McKay, Jr.



Conditions of formation and accumulation of organic acids in makhorka (Nicotiana rustica L.). S. O. Grebinskii. *Exptl. Botan.* No. 4, *Trudy Botan. Inst. Acad. Sci. U. S. S. R.*, Ser. IV, 207-34 (in English, 234-5) (1940).—Girdling of stems causes accumulation of carbohydrates in leaves and decrease of ash and N content. The citric acid and particularly the malic acid contents decrease considerably. Under the influence of low topping, citric and other org. acids accumulate. In alk. medium, in the presence of a phosphate buffer at pH 7.85, citric acid formation is stimulated in the course of autolysis of leaves. Under these conditions the breakdown of proteins is retarded and of carbohydrates increased. In curing, the decrease in malic acid is proportional to the increase in citric acid. J. S. Joffe





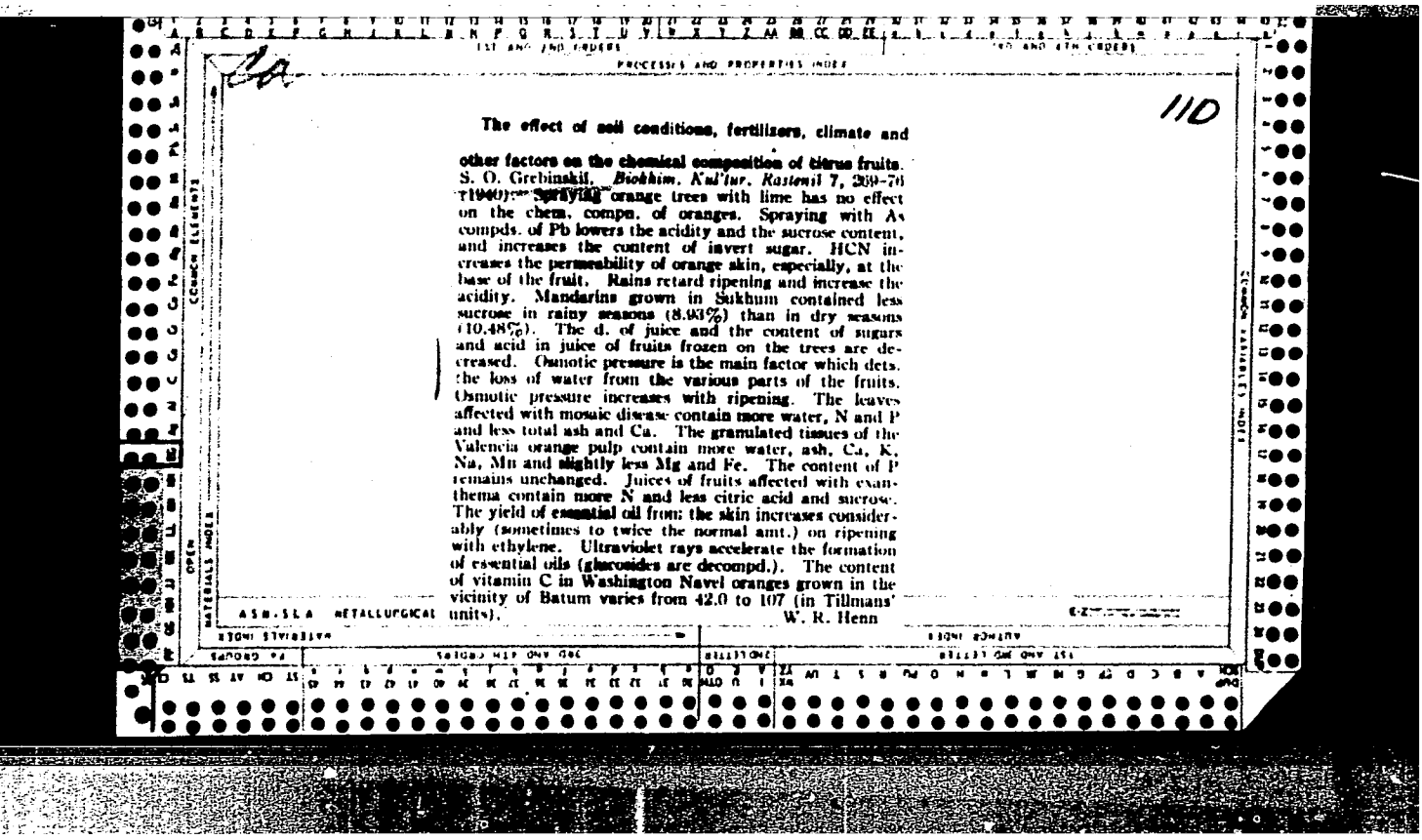
110

The effect of irrigation, climate, fertilizers and other factors on the chemical composition of plums. S. M. Grebinskii. *Biokhim. Kul'tur. Rastenii* 7, 180-92(1938).

Plums grown on unirrigated soils usually contain less dry substance, sugar, acid and nitrogenous substances than do plums from irrigated soils. The Crimean climate increases the total sugar content. NPK and PK fertilizers increased the acidity, but had very little effect on the content of total sugars.

W. R. Henn

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

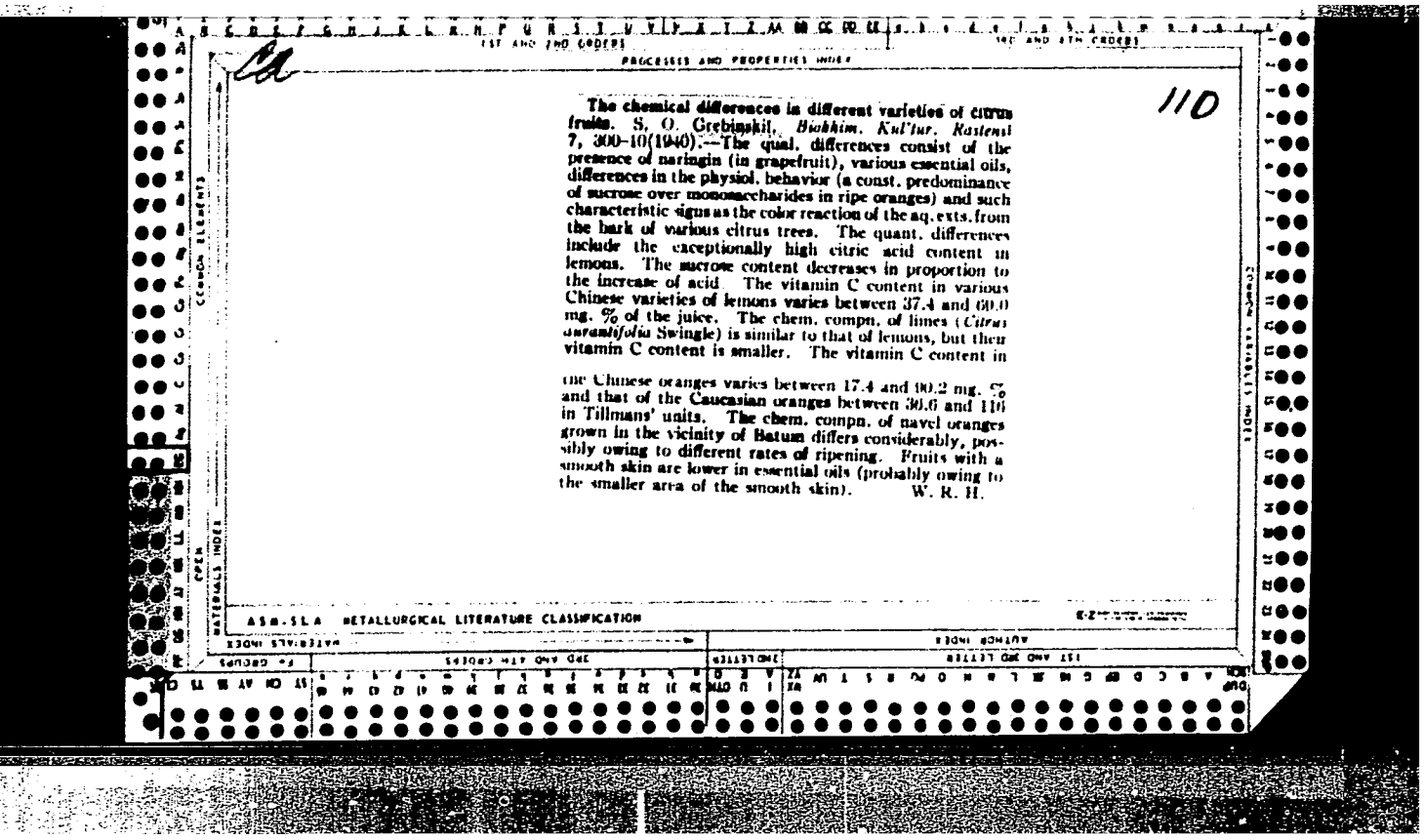


PROCESSES AND PROPERTIES INDEX

110

The effect of soil conditions, fertilizers, climate and other factors on the chemical composition of citrus fruits. S. O. Grebinskii. *Biokhim. Kul'tur. Rastenii* 7, 239–76 (1940). Spraying orange trees with lime has no effect on the chem. compn. of oranges. Spraying with As compds. of Pb lowers the acidity and the sucrose content, and increases the content of invert sugar. HCN increases the permeability of orange skin, especially, at the base of the fruit. Rains retard ripening and increase the acidity. Mandarins grown in Sukhum contained less sucrose in rainy seasons (8.93%) than in dry seasons (10.48%). The d. of juice and the content of sugars and acid in juice of fruits frozen on the trees are decreased. Osmotic pressure is the main factor which dets. the loss of water from the various parts of the fruits. Osmotic pressure increases with ripening. The leaves affected with mosaic disease contain more water, N and P and less total ash and Ca. The granulated tissues of the Valencia orange pulp contain more water, ash, Ca, K, Na, Mn and slightly less Mg and Fe. The content of P remains unchanged. Juices of fruits affected with exanthema contain more N and less citric acid and sucrose. The yield of essential oil from the skin increases considerably (sometimes to twice the normal amt.) on ripening with ethylene. Ultraviolet rays accelerate the formation of essential oils (glucosides are decompd.). The content of vitamin C in Washington Navel oranges grown in the vicinity of Batum varies from 42.0 to 107 (in Tillmans' units).

W. R. Henn

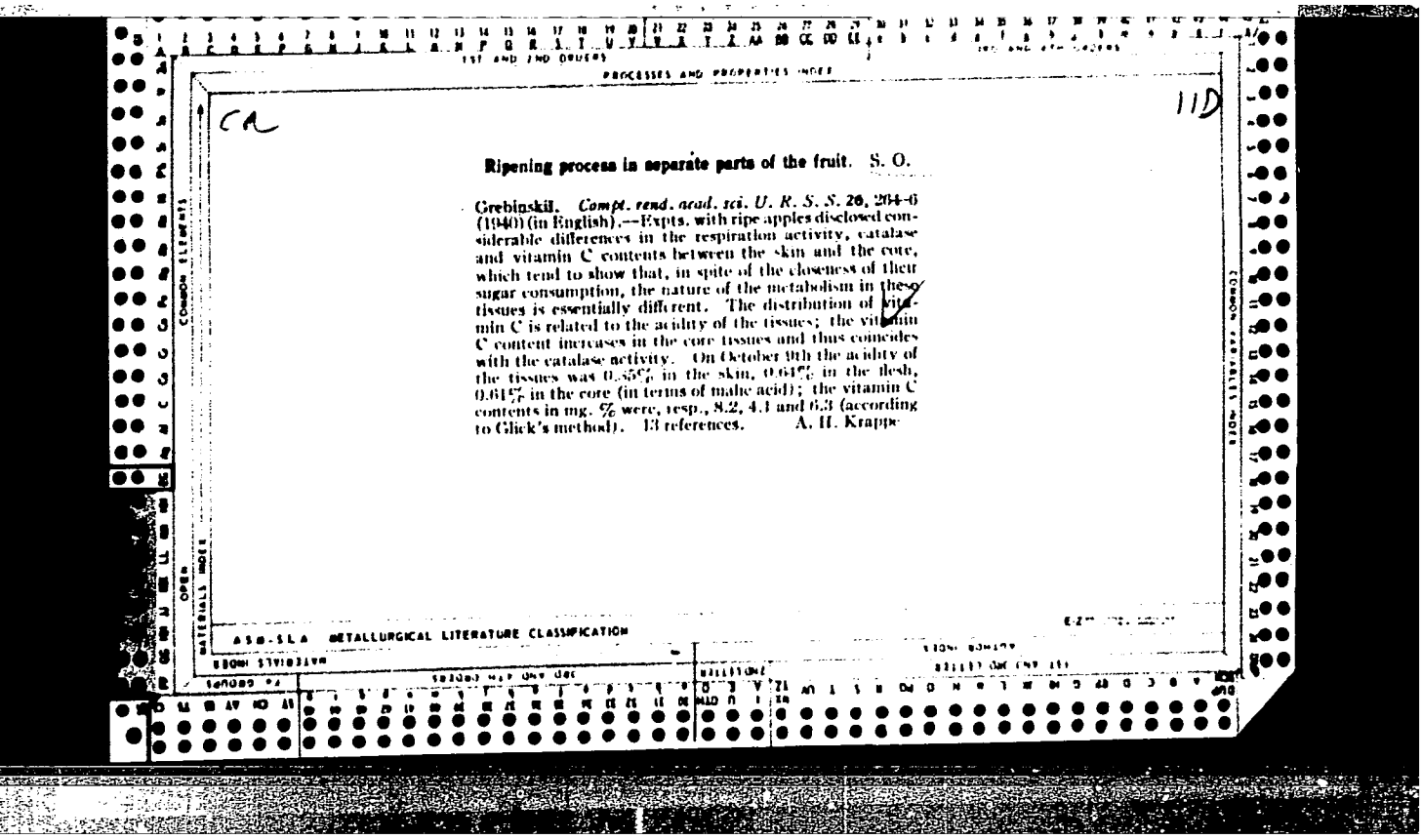


PROCESSES AND PROPERTIES INDEX

110

The chemical differences in different varieties of citrus fruits. S. O. Grebinskii. *Biokhim. Kul'tur. Rastenii* 7, 309–10(1940).—The qual. differences consist of the presence of naringin (in grapefruit), various essential oils, differences in the physiol. behavior (a const. predominance of sucrose over monosaccharides in ripe oranges) and such characteristic signs as the color reaction of the aq. exts. from the bark of various citrus trees. The quant. differences include the exceptionally high citric acid content in lemons. The sucrose content decreases in proportion to the increase of acid. The vitamin C content in various Chinese varieties of lemons varies between 37.4 and 60.0 mg. % of the juice. The chem. compn. of limes (*Citrus aurantifolia* Swingle) is similar to that of lemons, but their vitamin C content is smaller. The vitamin C content in the Chinese oranges varies between 17.4 and 90.2 mg. % and that of the Caucasian oranges between 30.6 and 110 in Tillmans' units. The chem. compn. of navel oranges grown in the vicinity of Batum differs considerably, possibly owing to different rates of ripening. Fruits with a smooth skin are lower in essential oils (probably owing to the smaller area of the smooth skin). W. R. H.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

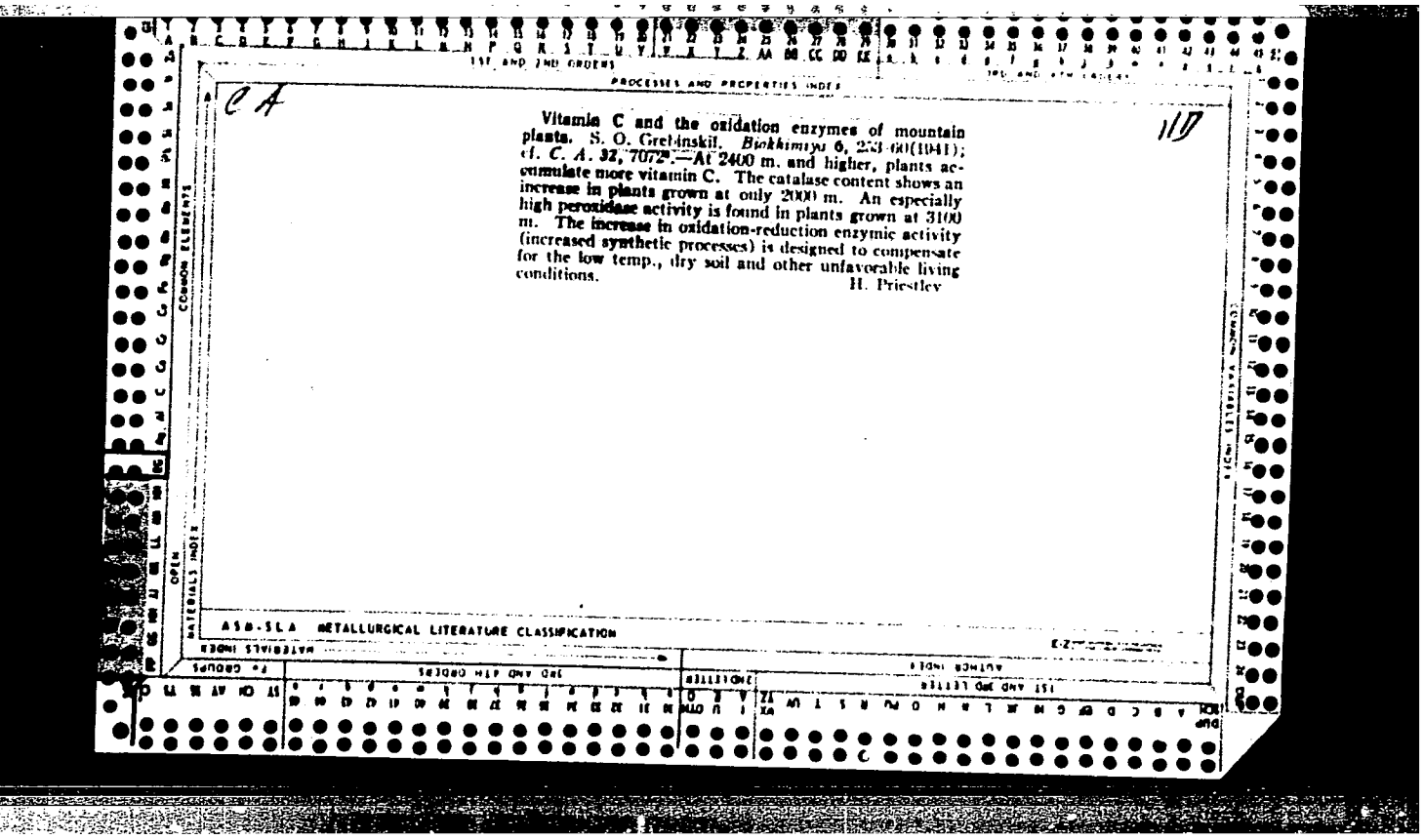


CA

11D

Ripening process in separate parts of the fruit. S. O. Grebinskii. *Compt. rend. acad. sci. U. R. S. S.* 26, 264-6 (1940) (in English).—Expts. with ripe apples disclosed considerable differences in the respiration activity, catalase and vitamin C contents between the skin and the core, which tend to show that, in spite of the closeness of their sugar consumption, the nature of the metabolism in these tissues is essentially different. The distribution of vitamin C is related to the acidity of the tissues; the vitamin C content increases in the core tissues and thus coincides with the catalase activity. On October 9th the acidity of the tissues was 0.55% in the skin, 0.61% in the flesh, 0.61% in the core (in terms of malic acid); the vitamin C contents in mg. % were, resp., 8.2, 4.1 and 6.3 (according to Glick's method). 13 references. A. H. Krappe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

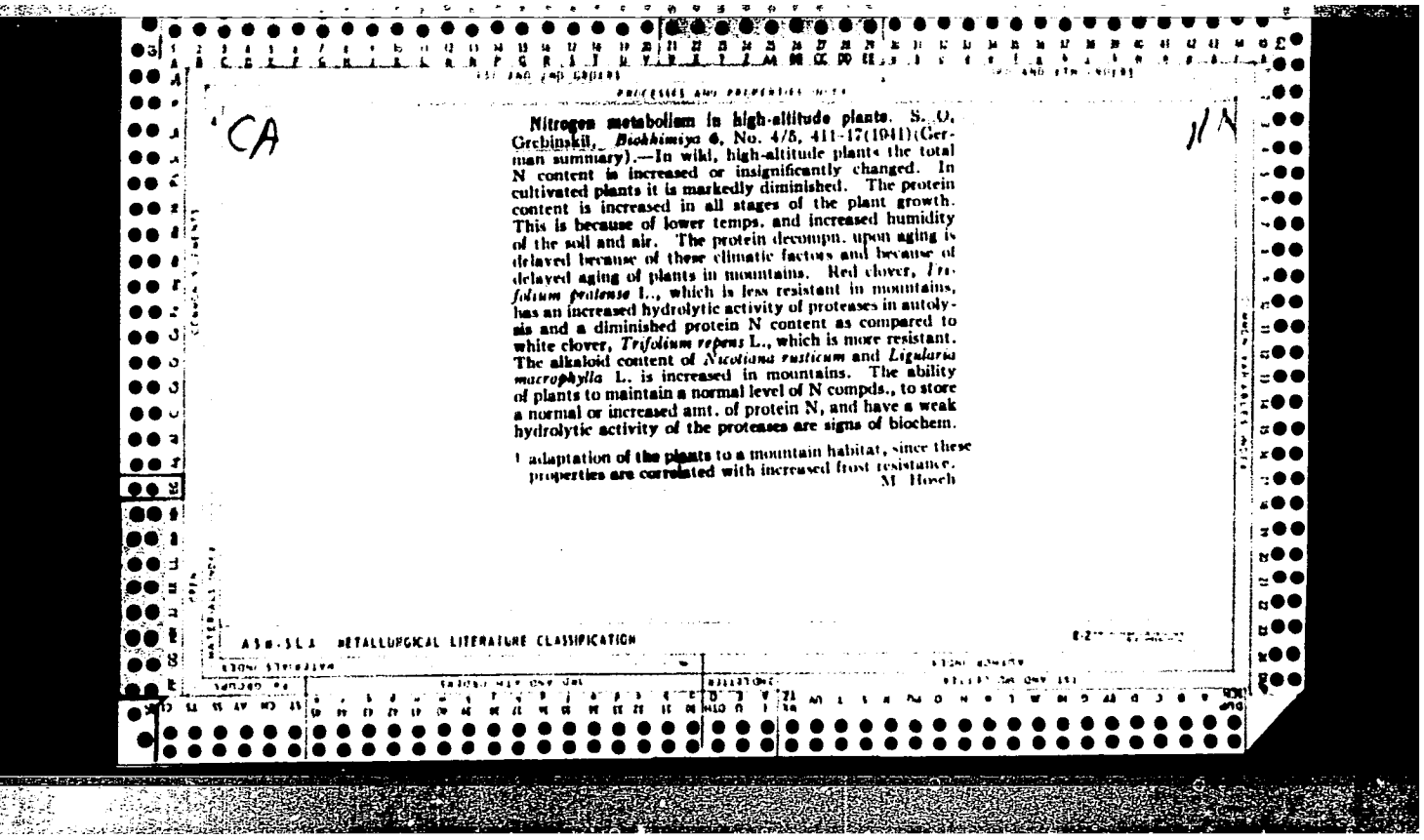


CA

110

Vitamin C and the oxidation enzymes of mountain plants. S. O. Gretdinskil. *Biokhimiya* 6, 253-60(1941); *cf. C. A.* 32, 7072⁸.—At 2400 m. and higher, plants accumulate more vitamin C. The catalase content shows an increase in plants grown at only 2000 m. An especially high peroxidase activity is found in plants grown at 3100 m. The increase in oxidation-reduction enzymic activity (increased synthetic processes) is designed to compensate for the low temp., dry soil and other unfavorable living conditions.

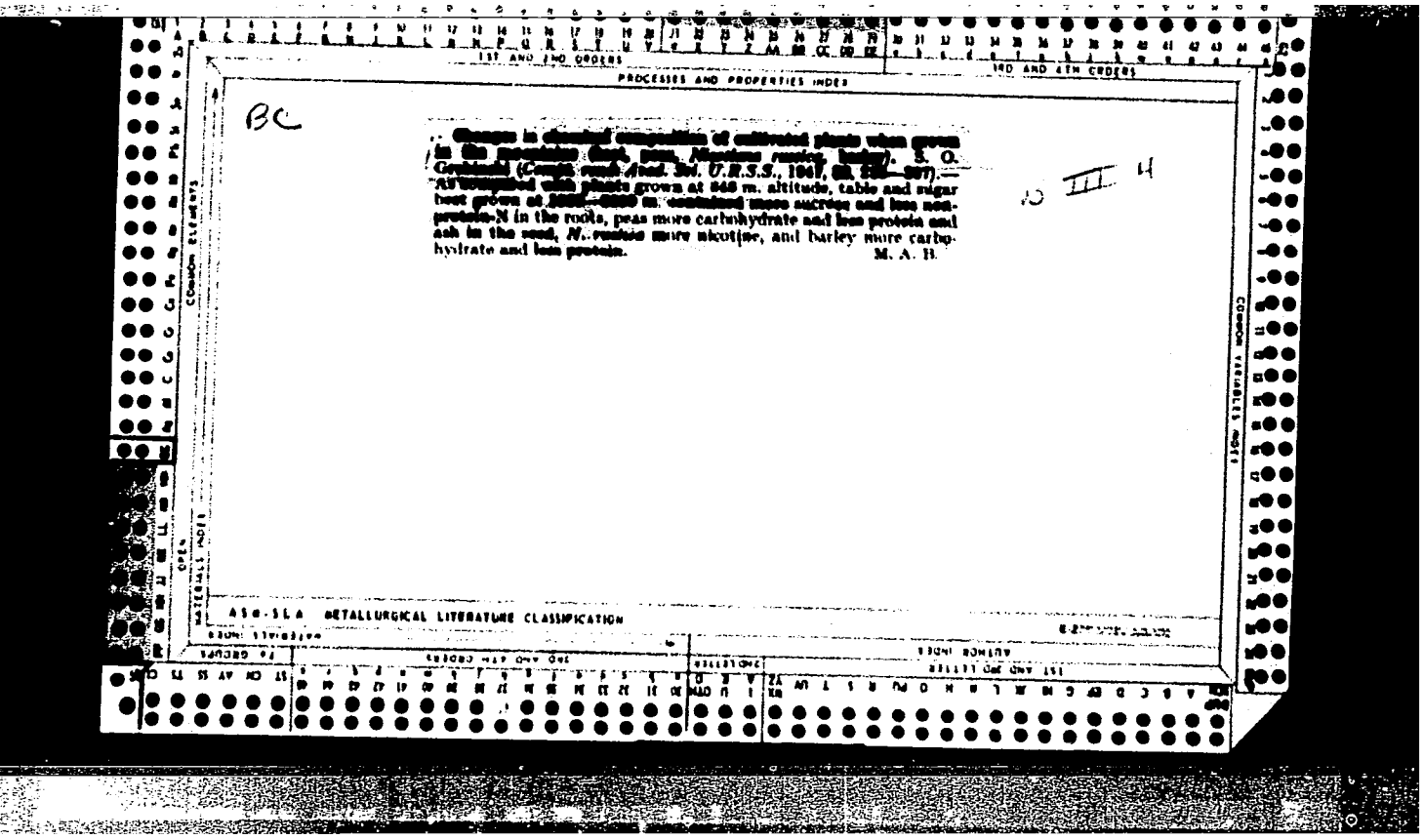
H. Priestley

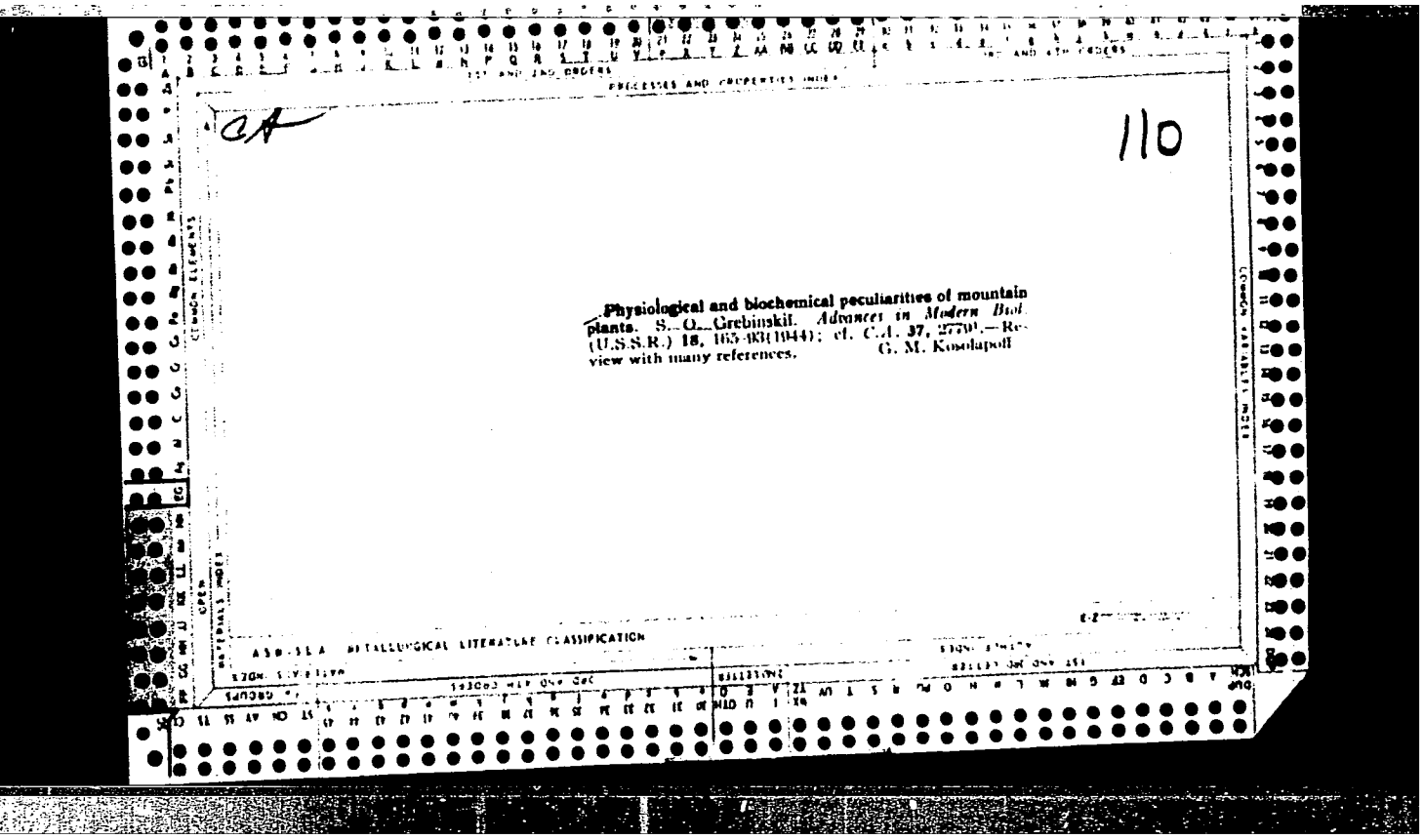


CA

Nitrogen metabolism in high-altitude plants. S. O. Grebinskiĭ. *Biokhimiya* **6**, No. 4/5, 411-17(1941)(German summary).—In wild, high-altitude plants the total N content is increased or insignificantly changed. In cultivated plants it is markedly diminished. The protein content is increased in all stages of the plant growth. This is because of lower temps. and increased humidity of the soil and air. The protein decompn. upon aging is delayed because of these climatic factors and because of delayed aging of plants in mountains. Red clover, *Trifolium pratense* L., which is less resistant in mountains, has an increased hydrolytic activity of proteases in autolysis and a diminished protein N content as compared to white clover, *Trifolium repens* L., which is more resistant. The alkaloid content of *Nicotiana rusticum* and *Ligularia macrophylla* L. is increased in mountains. The ability of plants to maintain a normal level of N compds., to store a normal or increased amt. of protein N, and have a weak hydrolytic activity of the proteases are signs of biochem. adaptation of the plants to a mountain habitat, since these properties are correlated with increased frost resistance.
M. Hoech

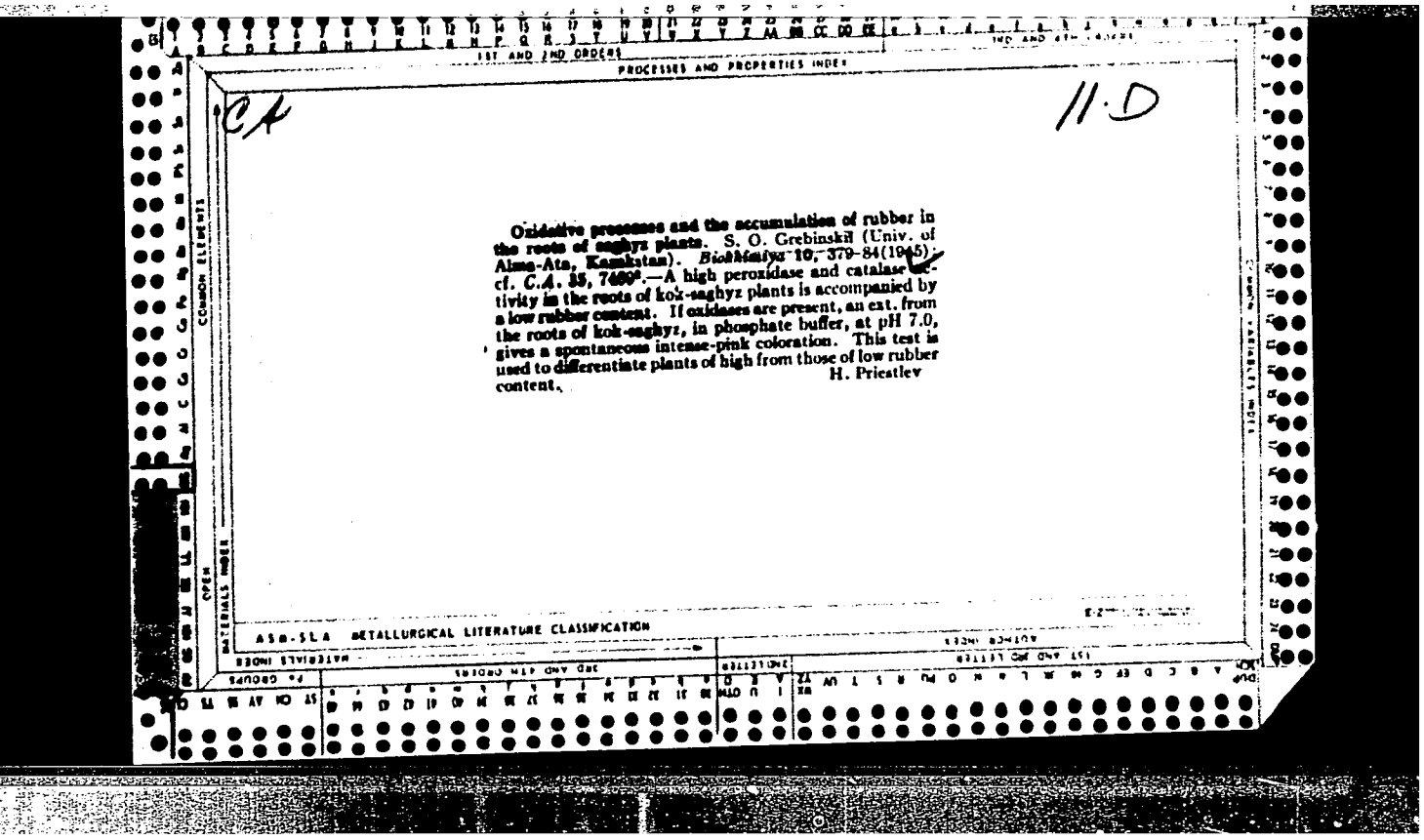
A58-SLA METALLURGICAL LITERATURE CLASSIFICATION





110

Physiological and biochemical peculiarities of mountain plants. S. O. Grebinskii. *Advances in Modern Biol.* (U.S.S.R.) 18, 165-83(1944); cf. C.A. 37, 2750.—Review with many references. G. M. Kosolapoff



GREBINSKAYA, M.I.; ARIFOV, U.A., akademik; KLEYN, G.A.; ABLYAYEV, Sh.A.

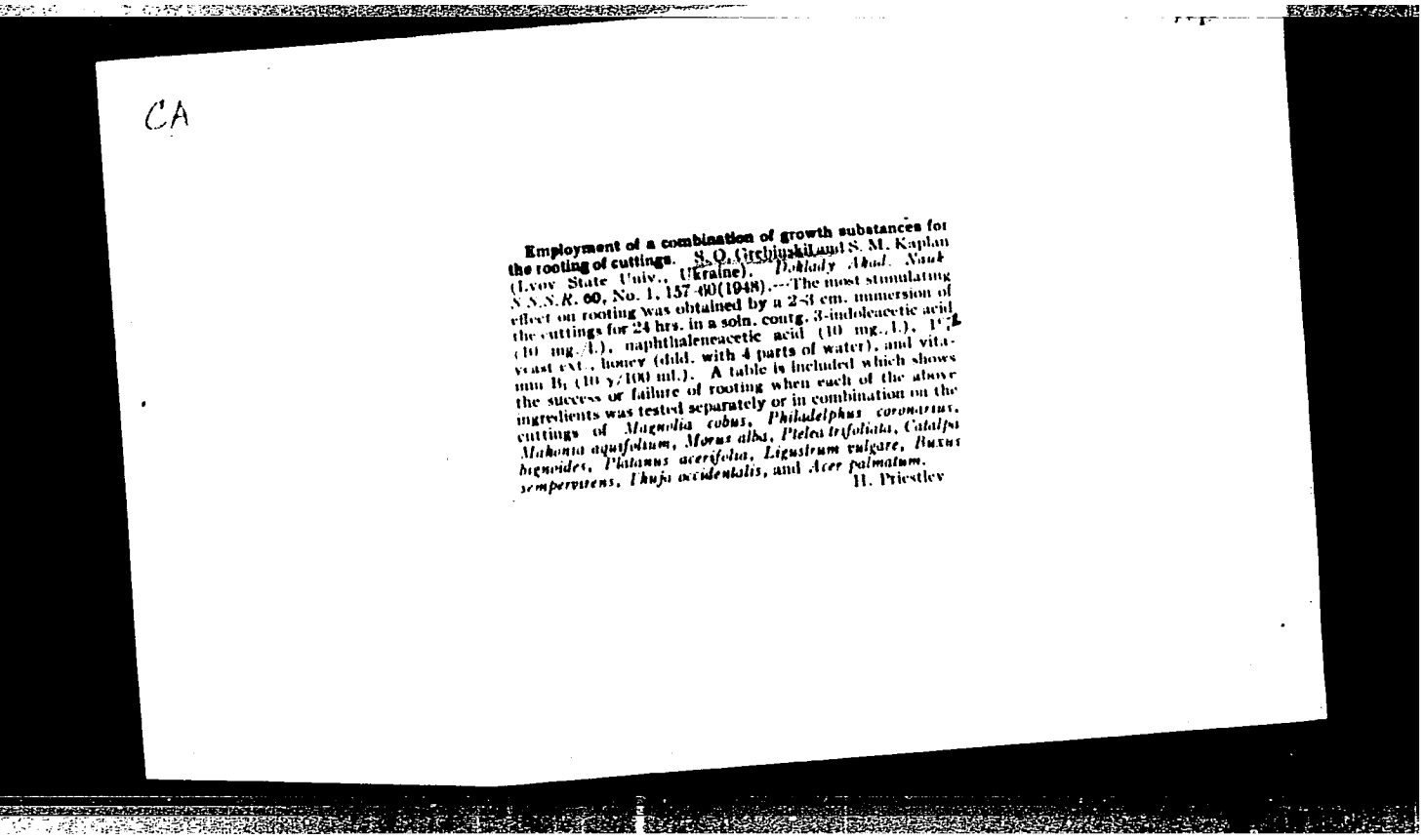
Effect of gamma rays from Co^{60} on mulberry seeds. Dokl. AN Uz.SSR no.10:17-19 '59 (MIRA 13:3)

1. Institut yadernoy fiziki AN UzSSR. 2. AN UzSSR (for Arifov).
(Mulberry) (Gamma rays--Physiological effect)

CIR

11-D

• Accumulation of colloids and pectins in sugar beet in South Kazakhstan cultures. S. O. Grebinskii. *Invest. Akad. Nauk Kazakh. S.S.R., Ser. Pochv. i Botaniki, Rastenii* No. 2 (Whole No. 30), 13-21(1947).—The roots of the plant contain a max. level of pectins in the outer layers, where the sugar content is low. Generally, sugars and pectins in a given site are present in reciprocal relation. Pectins and colloids decline with age in the beet juice. Lack of moisture hastens ripening and aging of the root, with decline of pectins and a rise of colloids. P fertilizers increase the colloid content of the root and juice. Increase of NaCl or Na_2SO_4 level in the soil increases the pectin content.
O. M. Kosolapoff



CA

Employment of a combination of growth substances for the rooting of cuttings. S. O. Girchiuskii and S. M. Kaplan (Lvov State Univ., Ukraine). *Doklady Akad. Nauk S.S.S.R.* **60**, No. 1, 157-60(1948).—The most stimulating effect on rooting was obtained by a 2-3 cm. immersion of the cuttings for 24 hrs. in a soln. contg. 3-indoleacetic acid (10 mg./l.), naphthaleneacetic acid (10 mg./l.), 1:2 yeast ext., honey (dild. with 4 parts of water), and vitamin B_1 (10 γ/100 ml.). A table is included which shows the success or failure of rooting when each of the above ingredients was tested separately or in combination on the cuttings of *Magnolia cobus*, *Philadelphus coronarius*, *Mahonia aquifolium*, *Morus alba*, *Pteleatrifoliata*, *Catalpa bignoides*, *Platanus acerifolia*, *Ligustrum vulgare*, *Buxus sempervirens*, *Thuja occidentalis*, and *Acer palmatum*.
H. Priestley

GREBINSKIY, SD.

PA156T16

USSR/Biology - Beets 1 Nov 49
Botany

Saponins in Beets," S. O. Grebinskiy, V. M. [redacted]nkova, L'vov State U imeni Franko, 2 pp

Dok Ak Nauk SSSR" Vol LXIX, No 1

Comparative table, determined by hemolytic method, of saponin content of sugar and garden beets in different parts of the root during vegetation and storage shows that unlike the sugar beet, the garden beet contains considerable saponin, not only in the tail but in the head and neck of the root. If the root is cut, saponins

156T16

USSR/Biology - Beets (Contd) 1 Nov 49

are retained only in the skin. In storage saponins in both varieties decrease slowly. Hence, by preserving the covering and tail, saponins can be retained in both table and industrial beets. Submitted by Acad N. A. Maksimov 17 Aug 49

156T16

C4

Biochemical changes in grafts of the potato family. S. O. Grebinskii, K. P. Kirsanina, and L. A. Lyukova (Univ. Lvov, Poland). *Biokhimiya* 15, 42-3(1950).—Citric acid accumulates in the leaves of tobacco grafted on tomato, whereas ascorbic acid, carbohydrates, and total N decrease. When the thorn apple is grafted on tomato, the oxalic acid content increases at the expense of malic and citric acids. There is a slight increase of catalase in the leaves of grafted plants. Such biochem. changes are characteristic of aging organisms. Grafted plants often possess a shorter life span. H. Priestley

GREBINSKIY, S.O.; YAROSHENKO, P.D., professor, redaktor; IVANOV, L.T., tekhnicheskiy redaktor.

[Basic regulatities of individual plant growth] Osnovnye zakonomernosti individual'nogo razvitiia rastenii. Khar'kov, Izd-vo Khar'kovskogo gos. univ. im. A.M.Gor'kogo, 1953. 223 p.(MLRA 7:11)
(Growth (Plants))

GREBINSKII, S.O., professor; YAROSHIN, B.I.

Vitamin C in desert plants. Dop.ta pov.L'viv.un.no.4, pt.2: 30-31 '53. (MLRA 9:11)

(Ascorbic acid) (Xerophytes)

GREBINS'KYI, S.O.

On the hormone "theory" of growth and the phytohormones. Bot.zhur.[Ukr.] 10 no.1:87-91 '53. (MLRA 6:8)

(Growth (Plants)) (Hormones (Plants))

GREBINSKIY, S.O.

Effect of various fertilizers, applied to parent-plants before crossing, on the development of characteristics in hybrid tomatoes. Dokl.AN SSSR 96 no.3:633-636 My '54. (MLRA 7:6)

1. L'vovskiy gosudarstvennyy universitet im. I.Franko. Predstavleno akademikom A.L.Kursanovym. (Hybridization, Vegetable) (Tomatoes)

GREBINSKIY, Sergey Orestovich; LAZARENKO, A.S., professor, nauchnyy redakter; GAZER, S.L., redakter izdatel'stva; PETROVA, T.N., tekhnicheskiy redakter.

[Origin of life] Proiskhozhdenie zhizni. [L'vov] Izd-vo L'vovskogo univ., 1955. 26 p.

1. Chlen-korrespondent AN USSR (for Lazarenko)
(LIFE--ORIGIN)