$\sigma = \sigma_0 - (2\sigma_0 L/b)t \sinh(\omega) = \sigma_0/(1 + 2\sigma_0 L\omega t/b)$

(σ_0 is initial stress). It follows from Equation (1) for the creep ε_c by self-diffusion that $\varepsilon_{cc} = Cpt/(1 + pt)$, where

$$p = 2\sigma_0 L\omega/b.$$

In addition to ε_{cc} there is a creep component ε_{cg} due to gliding on the grain boundaries. It is assumed that $\varepsilon_{cg} = \varepsilon_g t$. The total creep is therefore

$$\varepsilon_c = \varepsilon_g t + Cpt/(1 + pt) \tag{2}$$

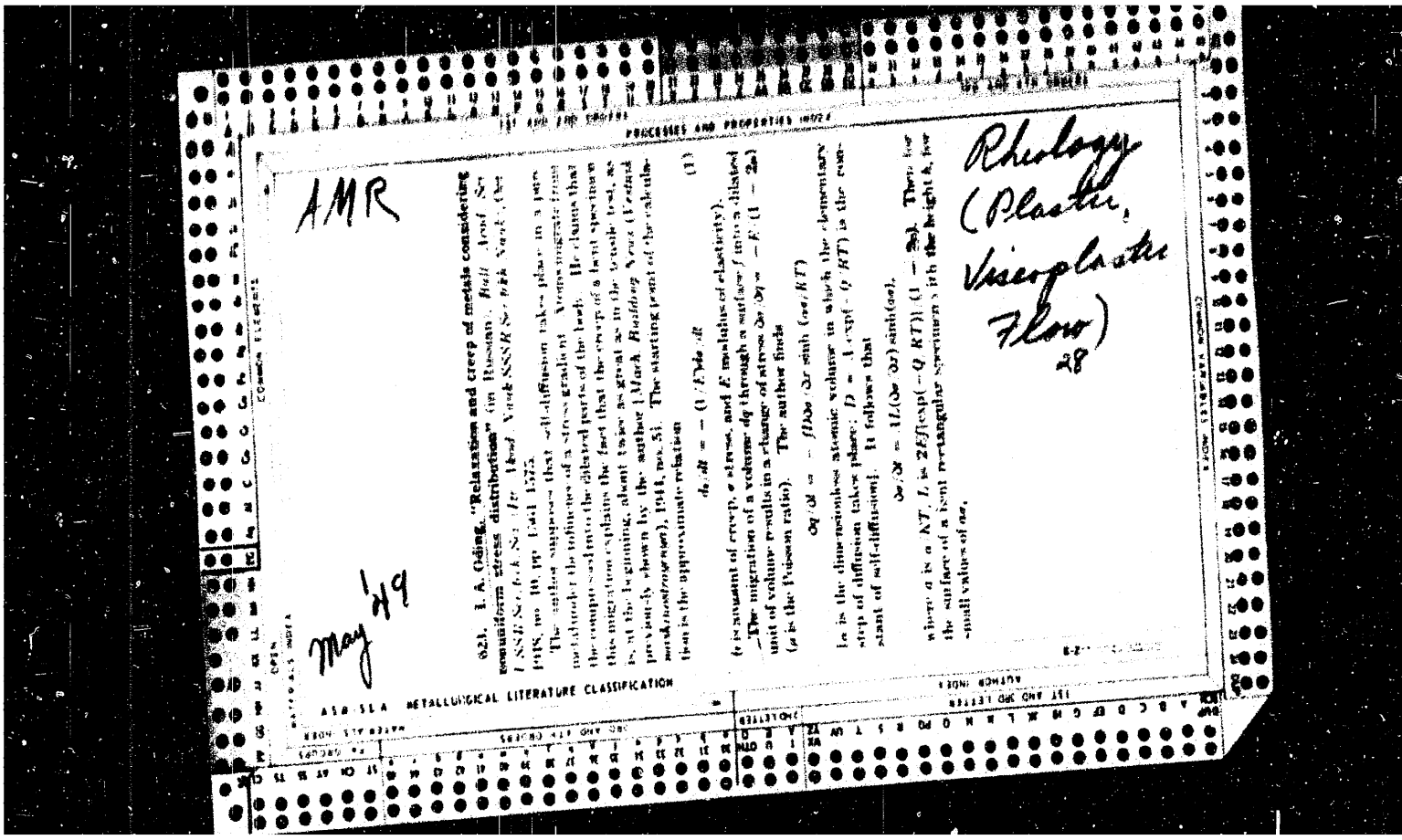
with appropriate values for p, C and ε_g. Five experimental creep curves given in the paper for different steels at high temperatures could be represented extremely well by Equation (2).

The initial portion of the relaxation curve can be represented in the form

$$\sigma = \sigma_0 \exp[-kt/(1 + pt)] \tag{3}$$

if it is assumed that the velocity of relaxation is proportional to the stress ($k = \sigma_0/(1 + pt)$); σ_0 seems to be the same as σ_0. Three experimental curves are shown to be in fairly good agreement with Equation (3). It is stated that the creep relation given by the author is the first one to be derived theoretically.

G. Masing, Germany



AMR

May '49

Rheology (Plastic, Viscoplastic Flow)

28

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

COMMON ELEMENTS

AUTHOR INDEX

1ST AND 3RD LETTER

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001237800043-6

PA 62T37

ODING, I.A.

Mar 1948

USSR/Engineering
Machinery - Construction
Stability, Structural

"Fatigue Resistance in Machine Construction," I. A. Oding, Corr Mem, Acad Sci USSR, 6 pp

"Vest Mash" No 3

In castings it is possible to increase the stability of cast parts, and thus control their internal tensions. Discusses stability at increased temperatures, surface stability of metals, stability of metals as factor in their use in construction, and briefly comments on the yet unsolved problem of stability of metals.

62T37

ODING, IVAN AVGUSTOVICH

Metod opredeleniia tsiklicheskoi viazkosti i primeneniia ego pri raschetakh kontsentratsii napriazhenii. (Vestn. Mash., 1948, no.1, p. 5-16.)

Method of determining the cyclic viscosity and its use for calculating the concentration of stresses.)

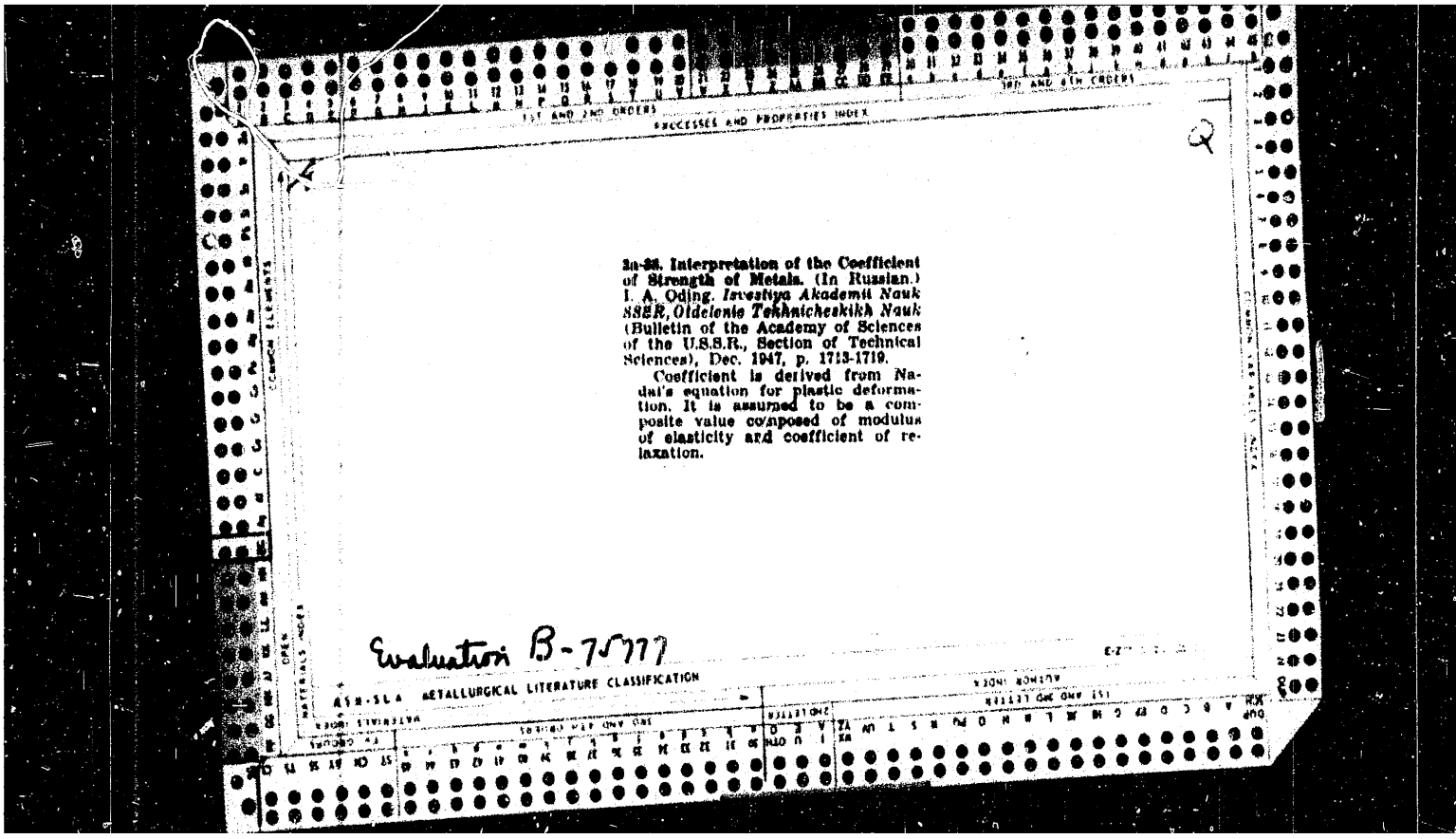
DLC: TN4. V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union Library of Congress, 1953.

ODING, I.A.

Achievements of the Soviet school of thought in the theory of metal strength. Vest.mash.27 no.11:32-38 N '47. (MLRA 9:4)

1.Chlen-korrespondent AN SSSR.
(Strength of materials) (Physical metallurgy)



1st AND 2ND ORDERS

SUCCESSES AND PROPERTIES INDEX

Q

2n-38. Interpretation of the Coefficient of Strength of Metals. (In Russian.) I. A. Oding. *Izvestiya Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk* (Bulletin of the Academy of Sciences of the U.S.S.R., Section of Technical Sciences), Dec. 1947, p. 1713-1719.

Coefficient is derived from Nadai's equation for plastic deformation. It is assumed to be a composite value composed of modulus of elasticity and coefficient of relaxation.

Evaluation B-7577

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

3RD AND 4TH ORDERS

CHUDAKOV, Ye.A., akademik, glavnyy redaktor; AKOPOV, S.A., redaktor; ARTOBOLEVSKIY, I.I., redaktor; ACHERKAN, N.S., redaktor; BEZPROZVANNYY, I.M., redaktor; GUDTSOV, N.T., redaktor; DIKUSHIN, V.I., redaktor; YEFREMOV, A.I., redaktor; ZAPOROZHETS, V.K., redaktor; ZININ, A.I., redaktor; KAZAKOV, N.S., redaktor; KIRPICHEV, M.V., redaktor; KOVAN, V.M., redaktor; KONYUSHAYA, Yu.P., redaktor; LIPGART, A.A., redaktor; MALYSHEV, V.A., redaktor; MARTENS, L.K., redaktor; MARIYENBAKH, L.M., redaktor; NIKOLAYEV, G.A., redaktor; ODING, I.A., redaktor; PATON, Ye.O., redaktor; RAMZIN, L.K., redaktor; RUBTSOV, N.N., redaktor; SAVERIN, M.A., redaktor; SEMENCHENKO, I.I., redaktor; SERENSEN, S.V., redaktor; SHAMNI, N.A., redaktor; SHELEST, A.N., redaktor; SHUKHGAL'TER, L.Ya., zamestitel' glavnogo redaktora, redaktor; YAKOVLEV, A.S., redaktor.

[Machine construction encyclopedic handbook] Mahinostroenie; entsiklopedicheskii spravochnik. Part 1. [Engineering calculations in machine construction] Inzhenernye raschety v mashinostroenii. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, Vol. 1. no.1. 1947. 548 p.
(Mechanical engineering) (MIRA 8:1)

ODING, I.A.

[Mechanical engineering, reference encyclopedia] Mashinostroenie. Entsiklopedicheskii spravochnik. Vol.4, Pt.2.[Machine construction materials] Materialy mashinostroeniia. Moskva, Gos. nauchno-tekhnicheskoe izd-vo mashinostroitel'noi lit-ry, 1947. 428 p. (MLRA 7:2)

1. Chlen-korrespondent Akademii nauk SSSR. (Materials)

ODING, IVAN AVGUSTOVICH.

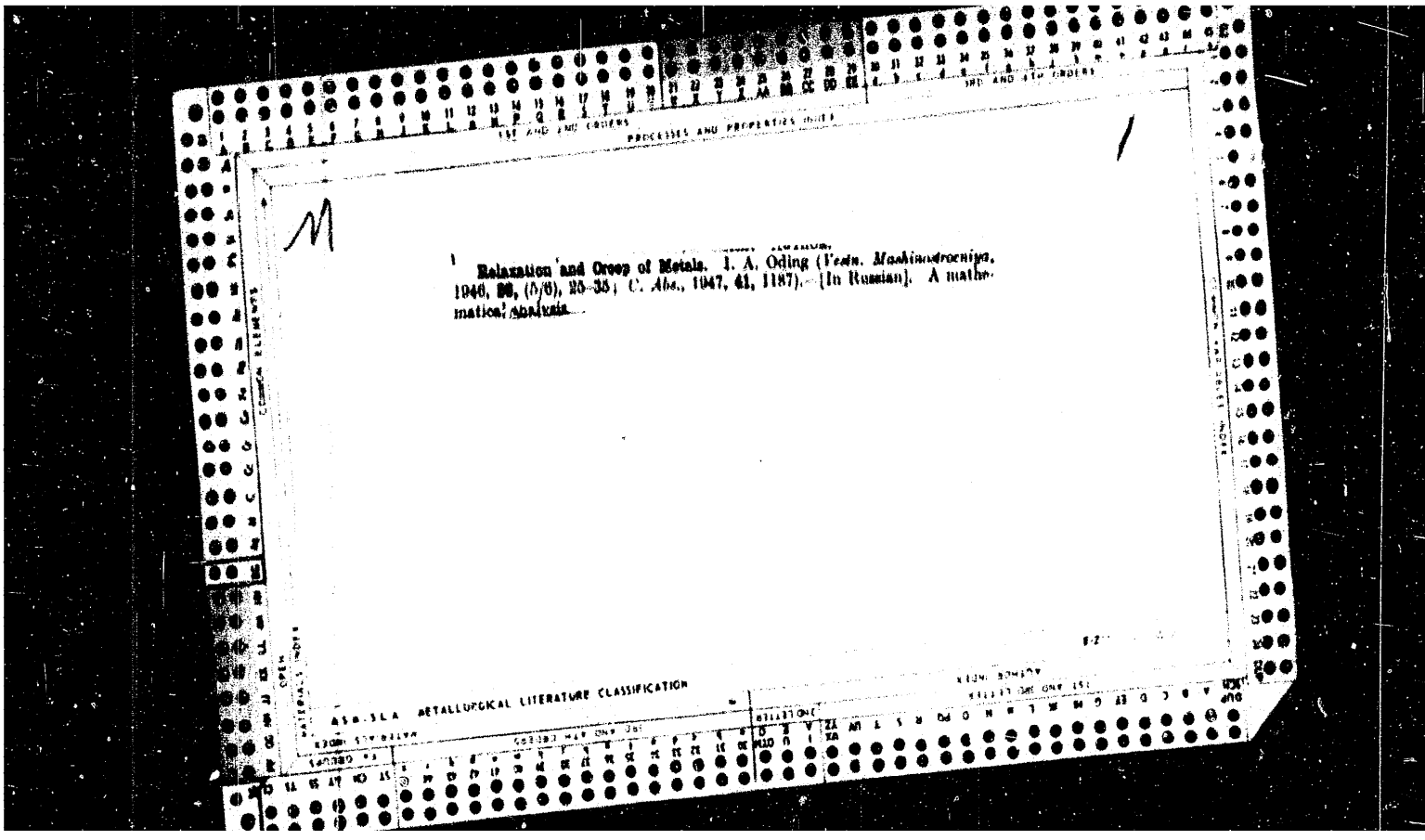
Dopuskaemye napriazheniia v mashinostroenii i tsiklicheskaia prochnost' metallov. 3. izd., ispr. Moskva, Mashgiz 1947. 184 p., diagrs.

Bibliography: p184-184.

Title tr.: Allowable stresses in machine design and strength of metals under alternating loads.

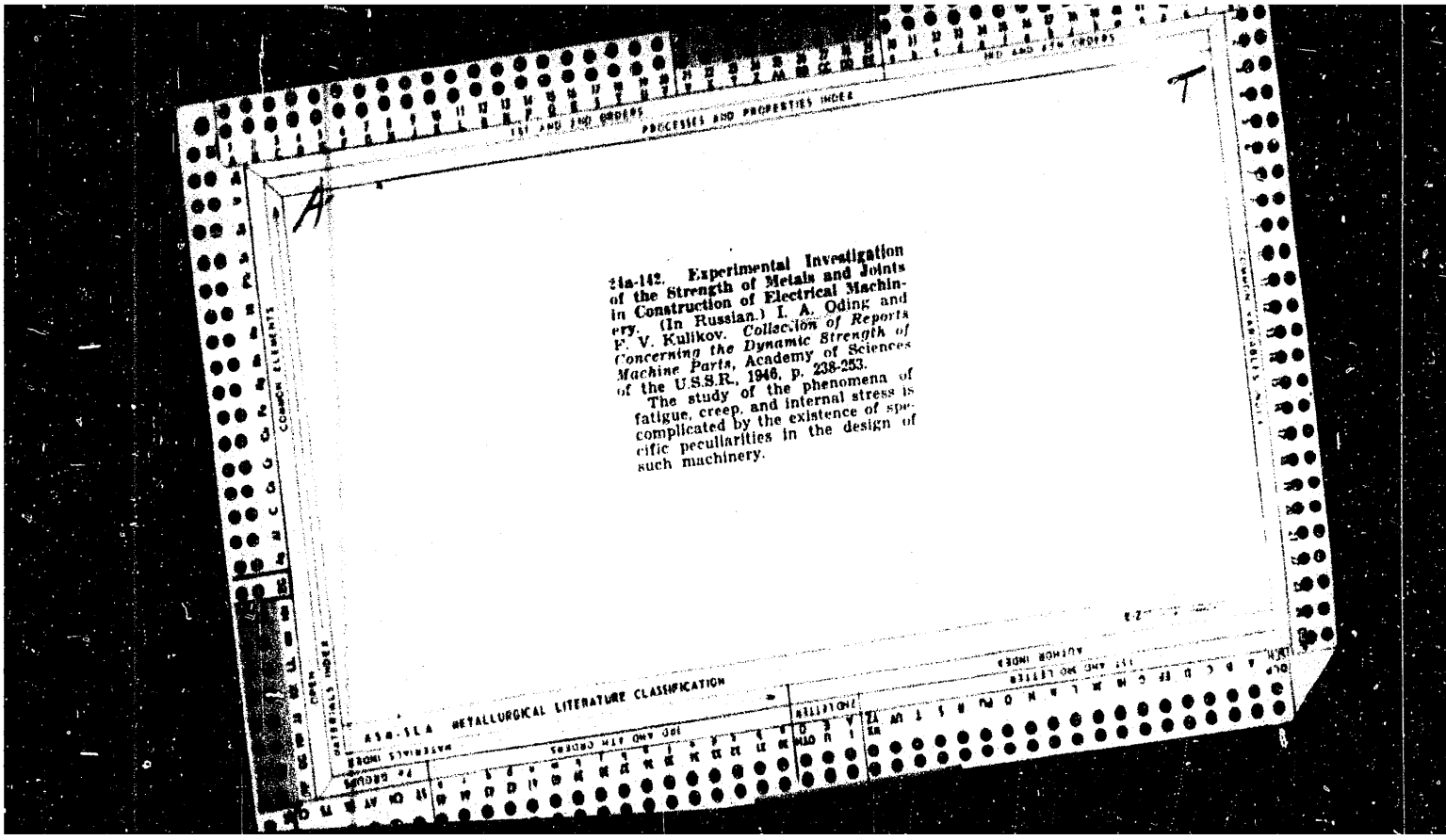
TA460.032 1947

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congrees, 1955.



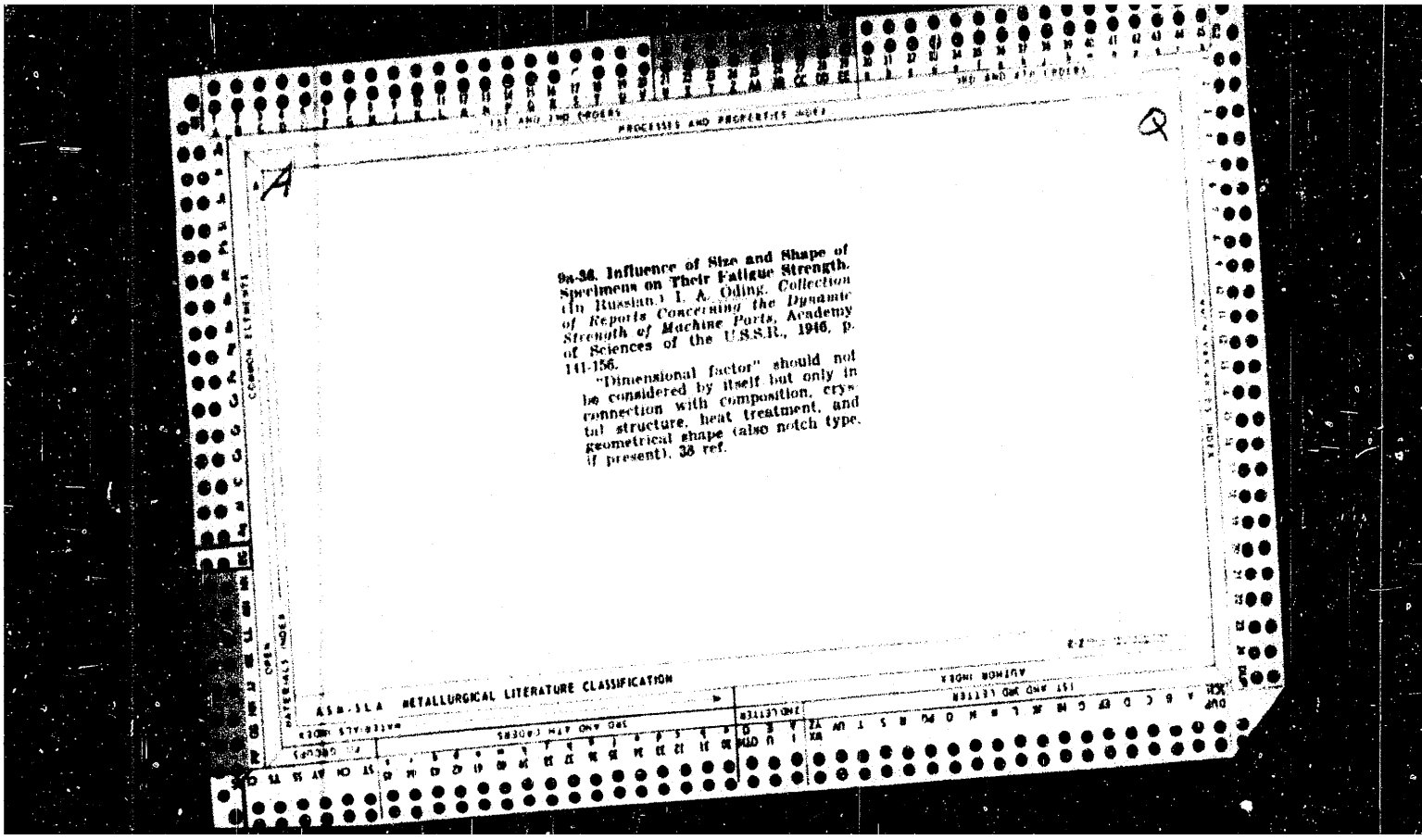
Relaxation and Creep of Metals. I. A. Oding (*Vestn. Mashinostroeniya*, 1946, **26**, (6), 25–35; *C. Abs.*, 1947, **41**, 1187).—[In Russian]. A mathematical analysis.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



21a-142. **Experimental Investigation of the Strength of Metals and Joints in Construction of Electrical Machinery.** (In Russian.) I. A. Oding and F. V. Kulikov. *Collection of Reports Concerning the Dynamic Strength of Machine Parts*, Academy of Sciences of the U.S.S.R., 1946, p. 238-253.

The study of the phenomena of fatigue, creep, and internal stress is complicated by the existence of specific peculiarities in the design of such machinery.



9a-36. Influence of Size and Shape of Specimens on Their Fatigue Strength. (In Russian.) I. A. Oding. *Collection of Reports Concerning the Dynamic Strength of Machine Parts*, Academy of Sciences of the U.S.S.R., 1946, p. 141-156.

"Dimensional factor" should not be considered by itself but only in connection with composition, crystal structure, heat treatment, and geometrical shape (also notch type, if present). 38 ref.

ODING, IVAN AVGUSTOVICH

Permissible Stresses in Engineering Work and Cyclic Strength of Metals, KWKLXXWKD published in Moscow, 1946.

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001237800043-6

ODING, Ivan Avgustovich

ODING, Ivan Avgustovich. A reference book on structural steels. Pod red. N. A. Shamina. Moskva, Mashgiz, 1946. 181 p. (Ministerstvo tiazhelogo mashinostroeniia SSSR. TSNIITMASH)

ODING, IVAN AVGUSTOVICH.

Dopuskaemye napriazheniia v mashinostroenii i tsiklicheskaia prochnost' metallov. (2 izd.) Moskva, Mashgiz, 1944. 183 p. diagrs.

First ed. pub. in 1941 under title; Ustalost metallov i zadachi mashinostroeniia. (Fatigue of metals and problems of mechanical engineering.)

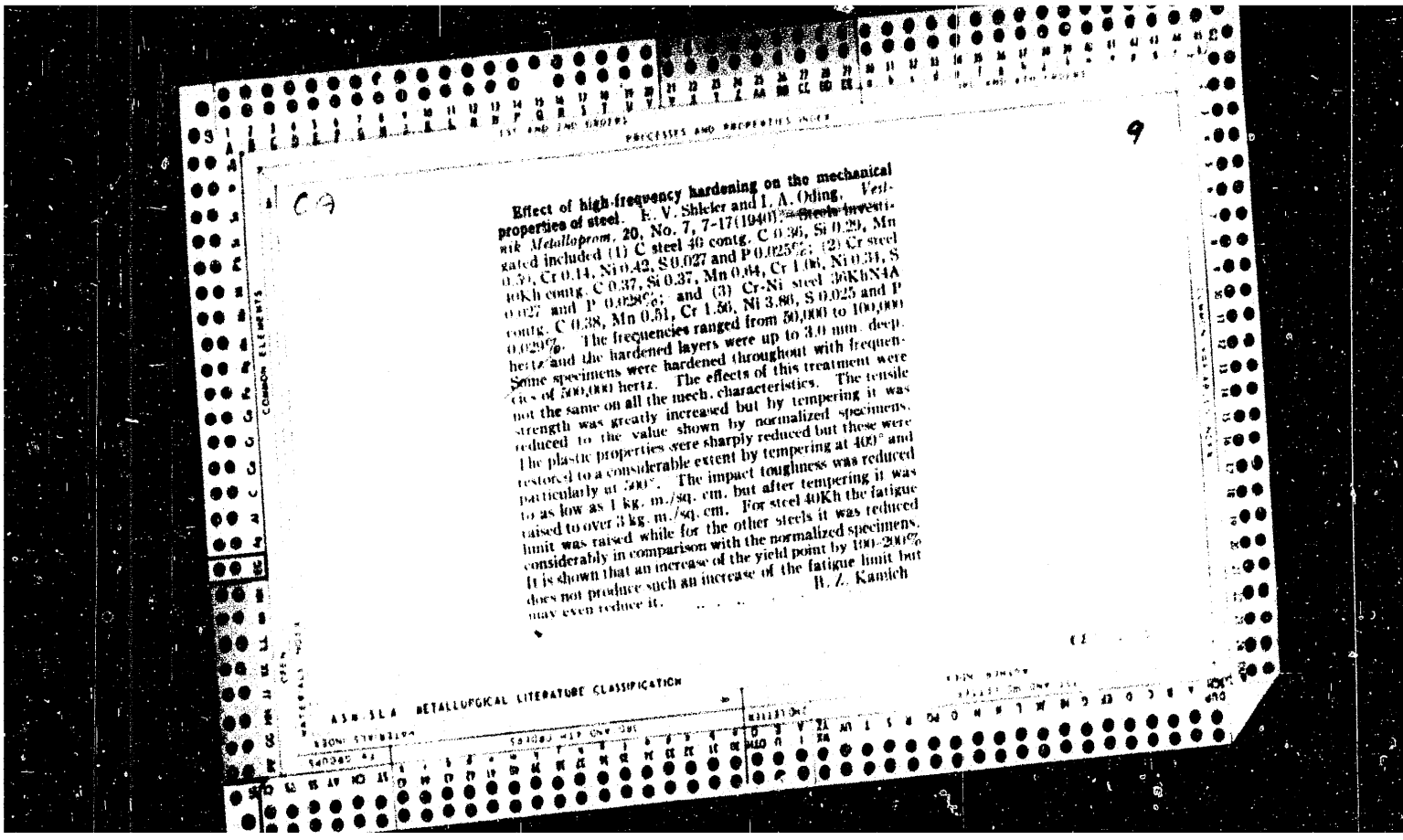
Bibliography: p. 179-183.

Allowable working stresses in mechanical engineering under cyclical variations of the strength of metals.

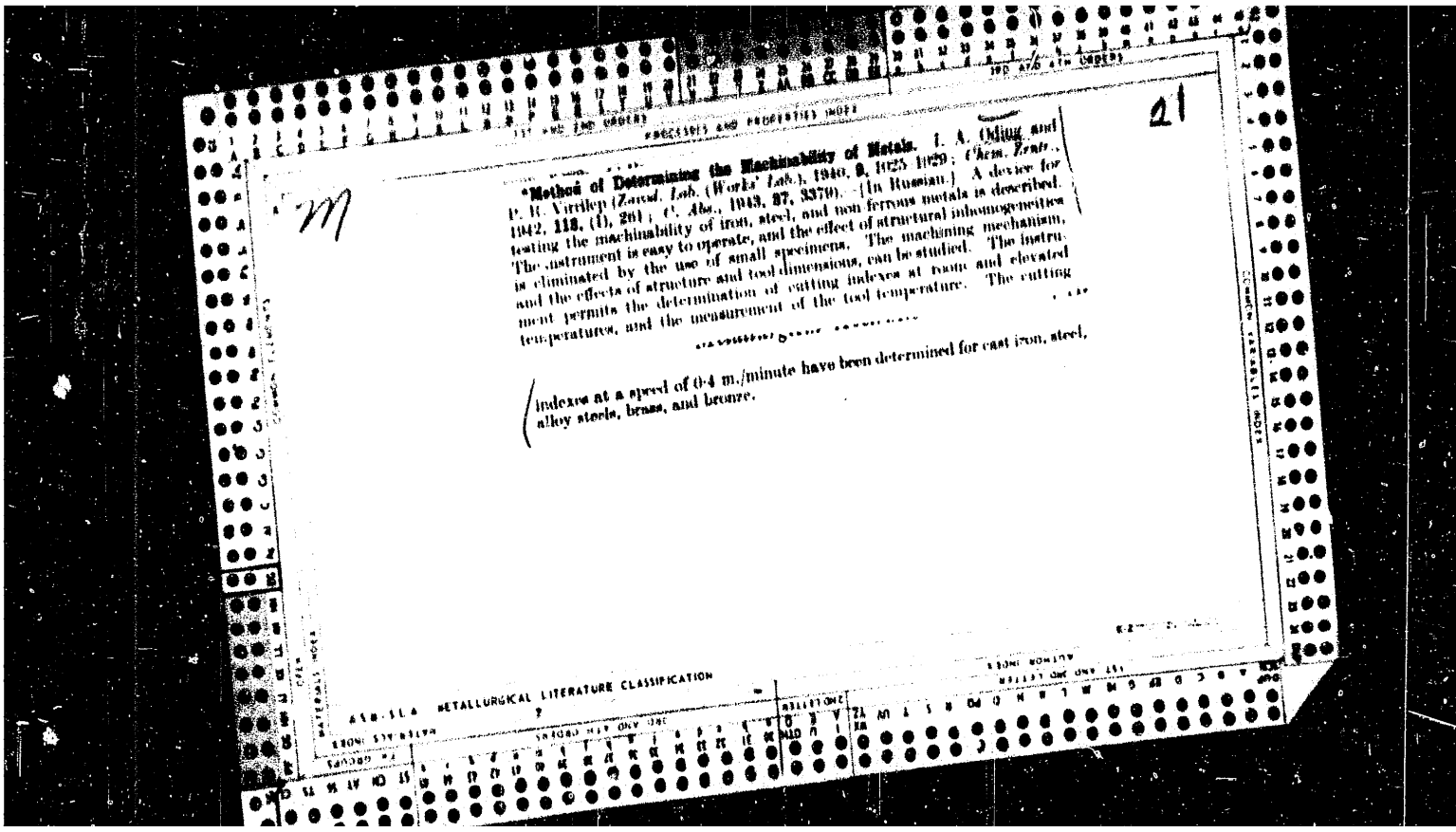
DLC: TA460.032 1944

NN

SO: Manufacturing and Mechanical Engineering in the Soviet Union Library of Congress, 1953.



Effect of high-frequency hardening on the mechanical properties of steel. E. V. Shkeler and I. A. Oding. *Vestnik Metalloprom.* 20, No. 7, 7-17(1940). Steels investigated included (1) C steel 46 contg. C 0.36, Si 0.29, Mn 0.30, Cr 0.14, Ni 0.42, S 0.027 and P 0.025%; (2) Cr steel 40Kh contg. C 0.37, Si 0.37, Mn 0.64, Cr 1.06, Ni 0.31, S 0.027 and P 0.028%; and (3) Cr-Ni steel 30KhN4A contg. C 0.38, Mn 0.51, Cr 1.50, Ni 3.80, S 0.025 and P 0.020%. The frequencies ranged from 50,000 to 100,000 hertz and the hardened layers were up to 3.0 mm. deep. Some specimens were hardened throughout with frequencies of 500,000 hertz. The effects of this treatment were not the same on all the mech. characteristics. The tensile strength was greatly increased but by tempering it was reduced to the value shown by normalized specimens. The plastic properties were sharply reduced but these were restored to a considerable extent by tempering at 400° and particularly at 500°. The impact toughness was reduced to as low as 1 kg. m./sq. cm. but after tempering it was raised to over 3 kg. m./sq. cm. For steel 40Kh the fatigue limit was raised while for the other steels it was reduced considerably in comparison with the normalized specimens. It is shown that an increase of the yield point by 100-200% does not produce such an increase of the fatigue limit but may even reduce it. B. Z. Kanich



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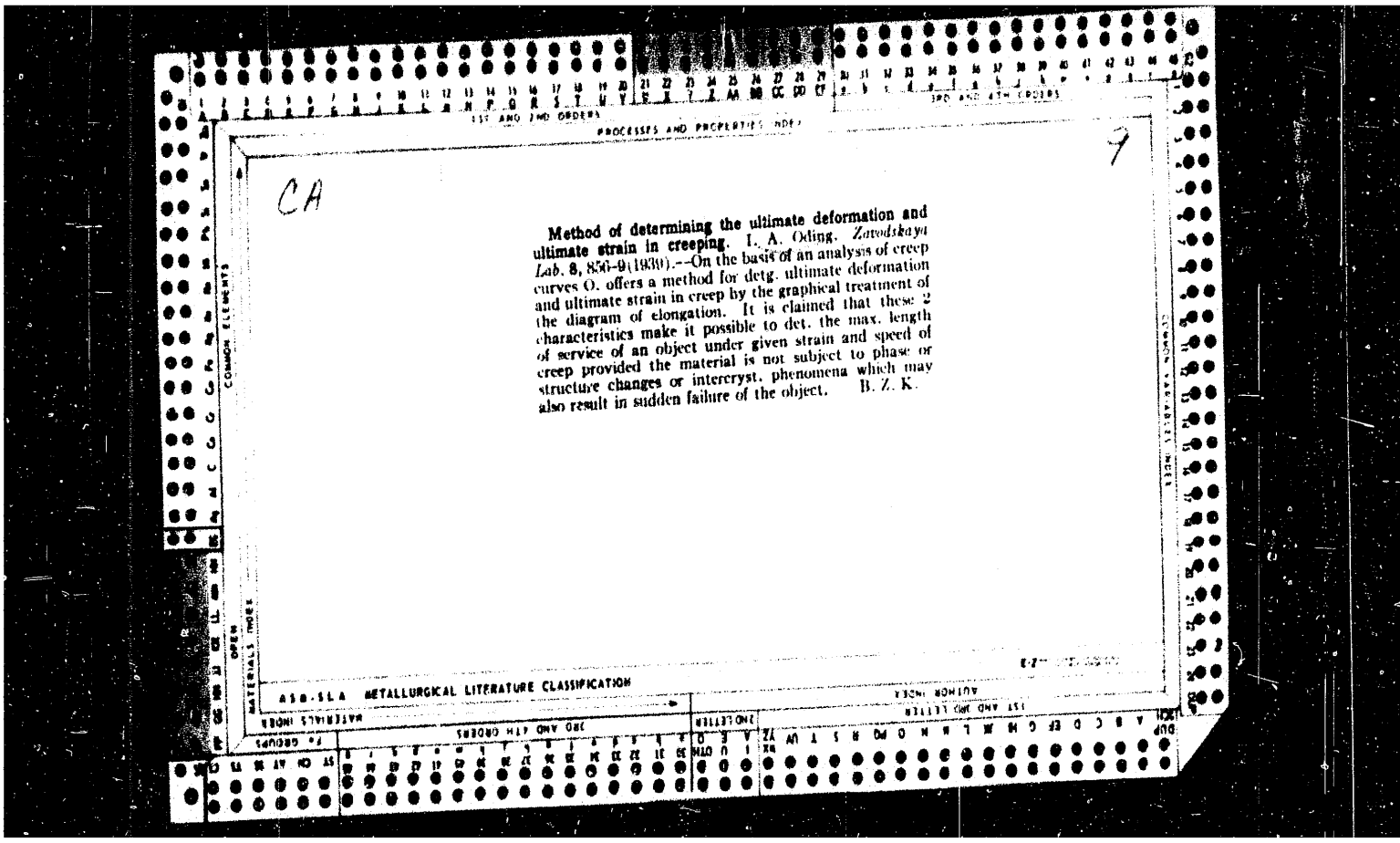
M

*Method of Determining the Machinability of Metals. I. A. Oding and P. R. Virtlep (*Zavod. Lab.* (*Works' Lab.*), 1940, **9**, 1025–1029; *Chem. Zentr.*, 1942, **113**, (I), 261; *C. Abs.*, 1943, **37**, 3370). —(In Russian.) A device for testing the machinability of iron, steel, and non ferrous metals is described. The instrument is easy to operate, and the effect of structural inhomogeneities is eliminated by the use of small specimens. The machining mechanism, and the effects of structure and tool dimensions, can be studied. The instrument permits the determination of cutting indexes at room and elevated temperatures, and the measurement of the tool temperature. The cutting

indexes at a speed of 0·4 m./minute have been determined for cast iron, steel, alloy steels, brass, and bronze.

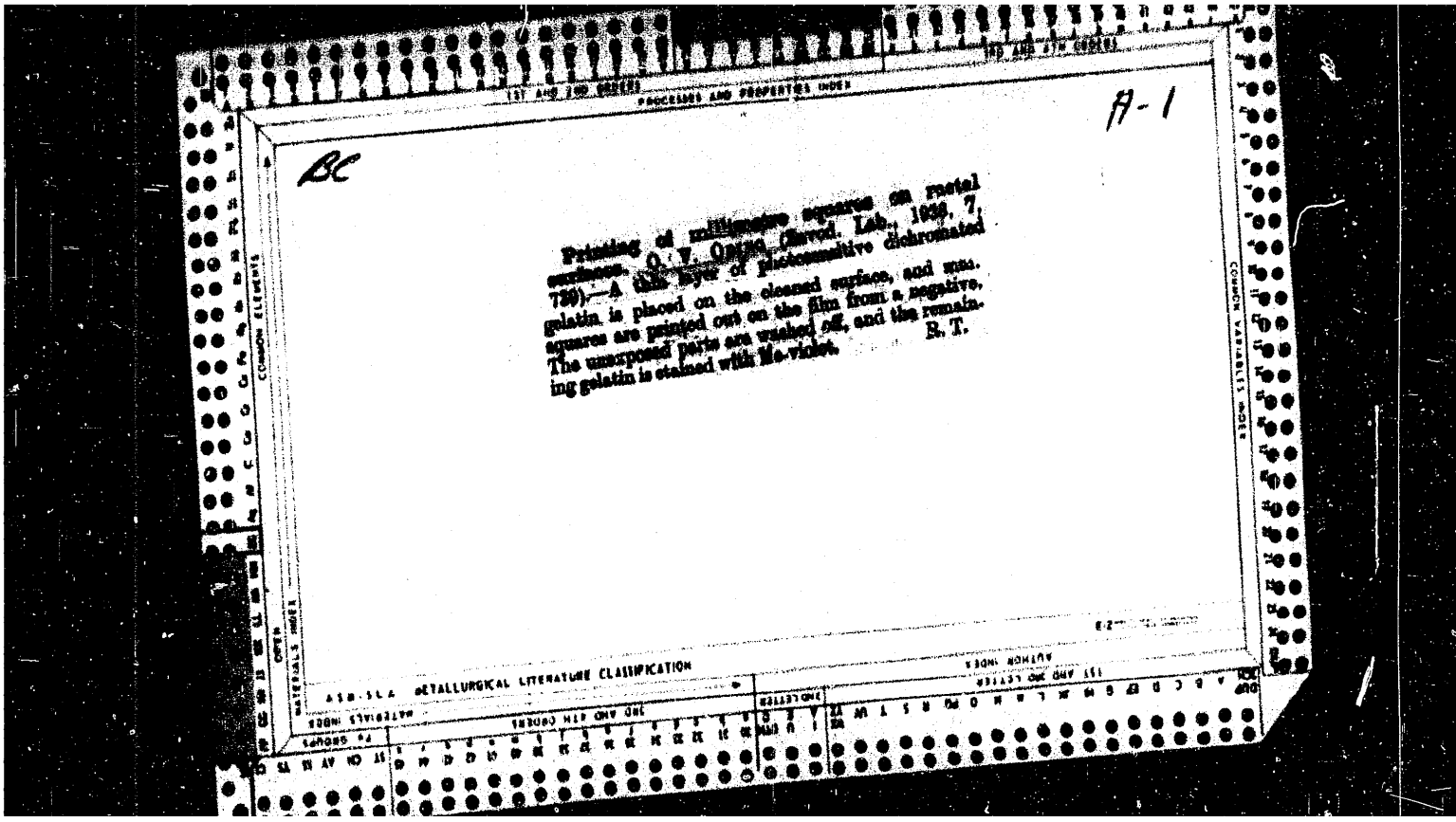
METALLURGICAL LITERATURE CLASSIFICATION

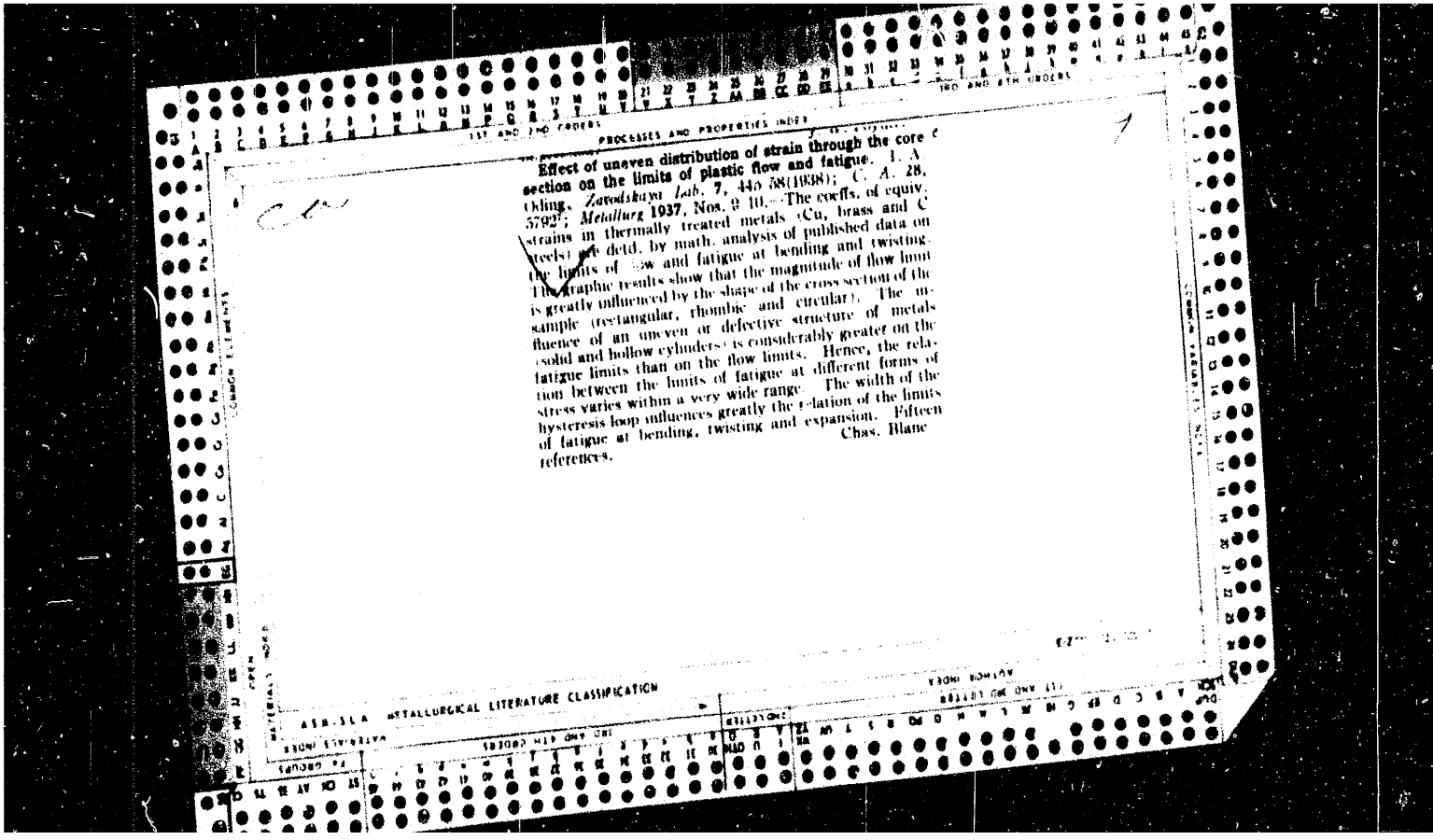


CA

7

Method of determining the ultimate deformation and ultimate strain in creeping. I. A. Oding. *Zavodskaya Lab.* **8**, 856–9 (1939).—On the basis of an analysis of creep curves O. offers a method for detg. ultimate deformation and ultimate strain in creep by the graphical treatment of the diagram of elongation. It is claimed that these 2 characteristics make it possible to det. the max. length of service of an object under given strain and speed of creep provided the material is not subject to phase or structure changes or intercryst. phenomena which may also result in sudden failure of the object. B. Z. K.



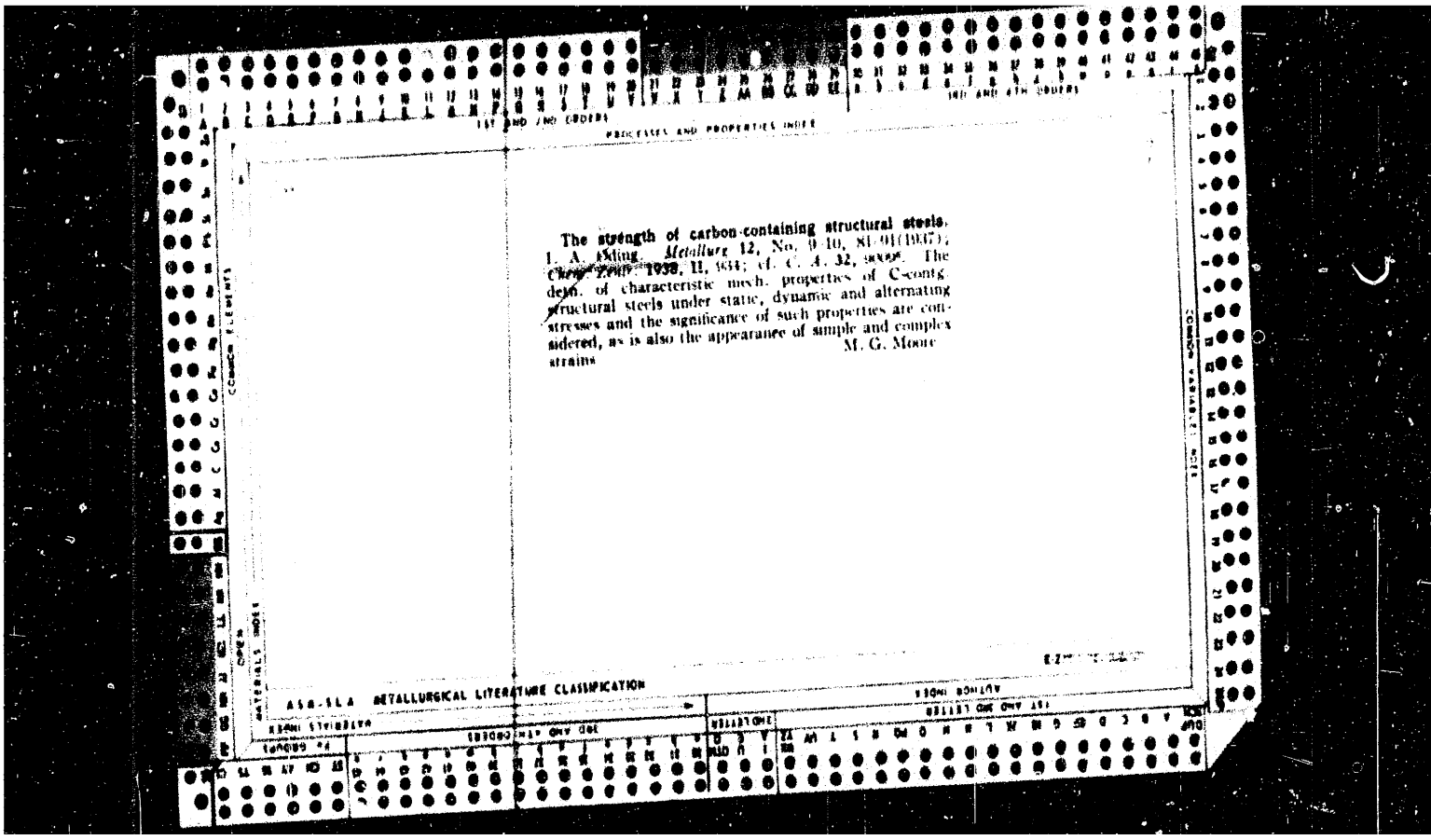


PROCESSES AND PROPERTIES INDEX

Effect of uneven distribution of strain through the core section on the limits of plastic flow and fatigue. I. A. Obling. *Zavodskaya Lab.* **7**, 445–58(1938); *C. A.* **28**, 5792; *Metallurg* **1937**, Nos. 9–10.—The coeffs. of equiv. strains in thermally treated metals (Cu, brass and C steels) are detd. by math. analysis of published data on the limits of flow and fatigue at bending and twisting. The graphic results show that the magnitude of flow limit is greatly influenced by the shape of the cross section of the sample (rectangular, rhombic and circular). The influence of an uneven or defective structure of metals (solid and hollow cylinders) is considerably greater on the fatigue limits than on the flow limits. Hence, the relation between the limits of fatigue at different forms of stress varies within a very wide range. The width of the hysteresis loop influences greatly the relation of the limits of fatigue at bending, twisting and expansion. Fifteen references.

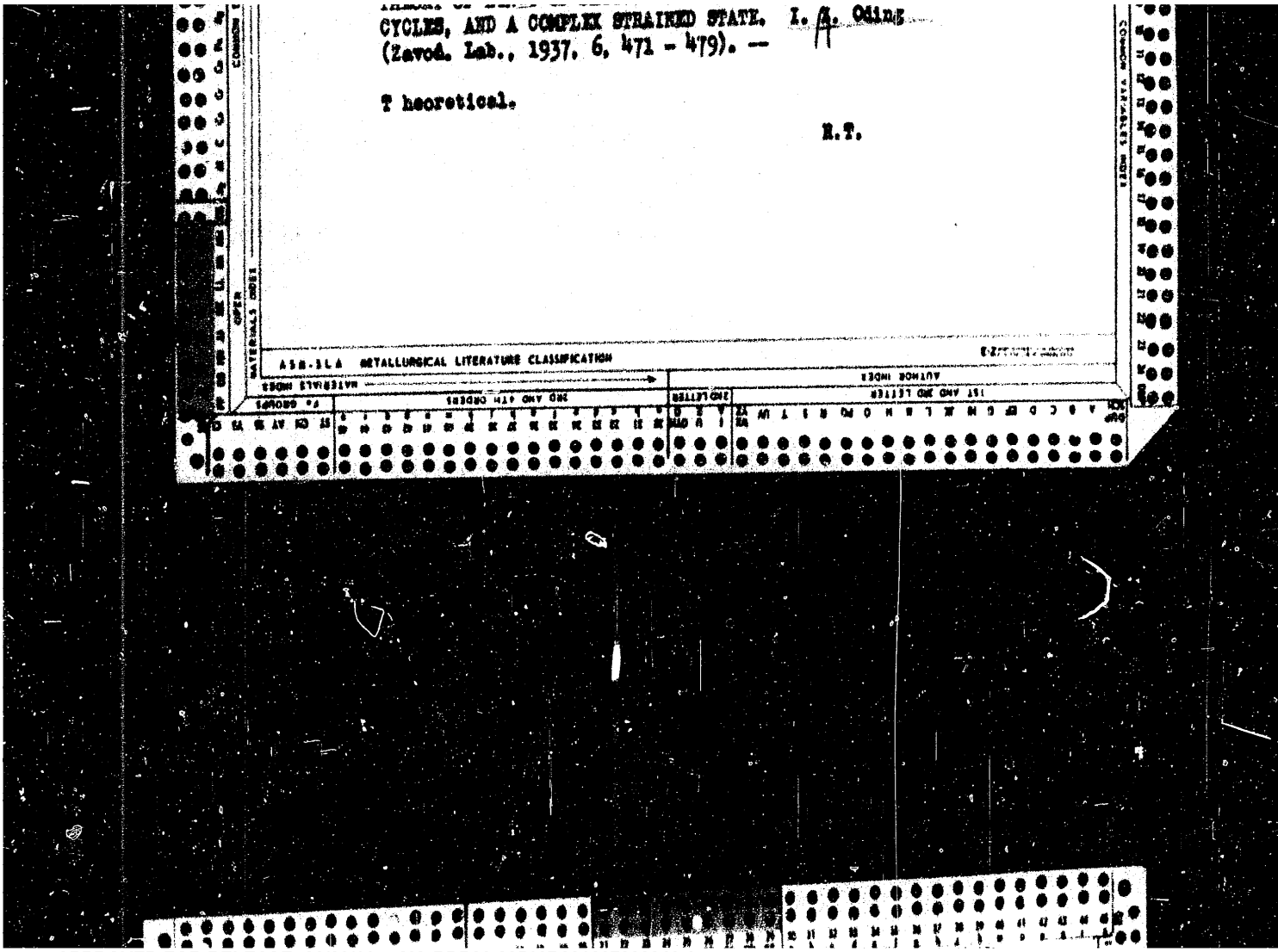
Chas. Blanc

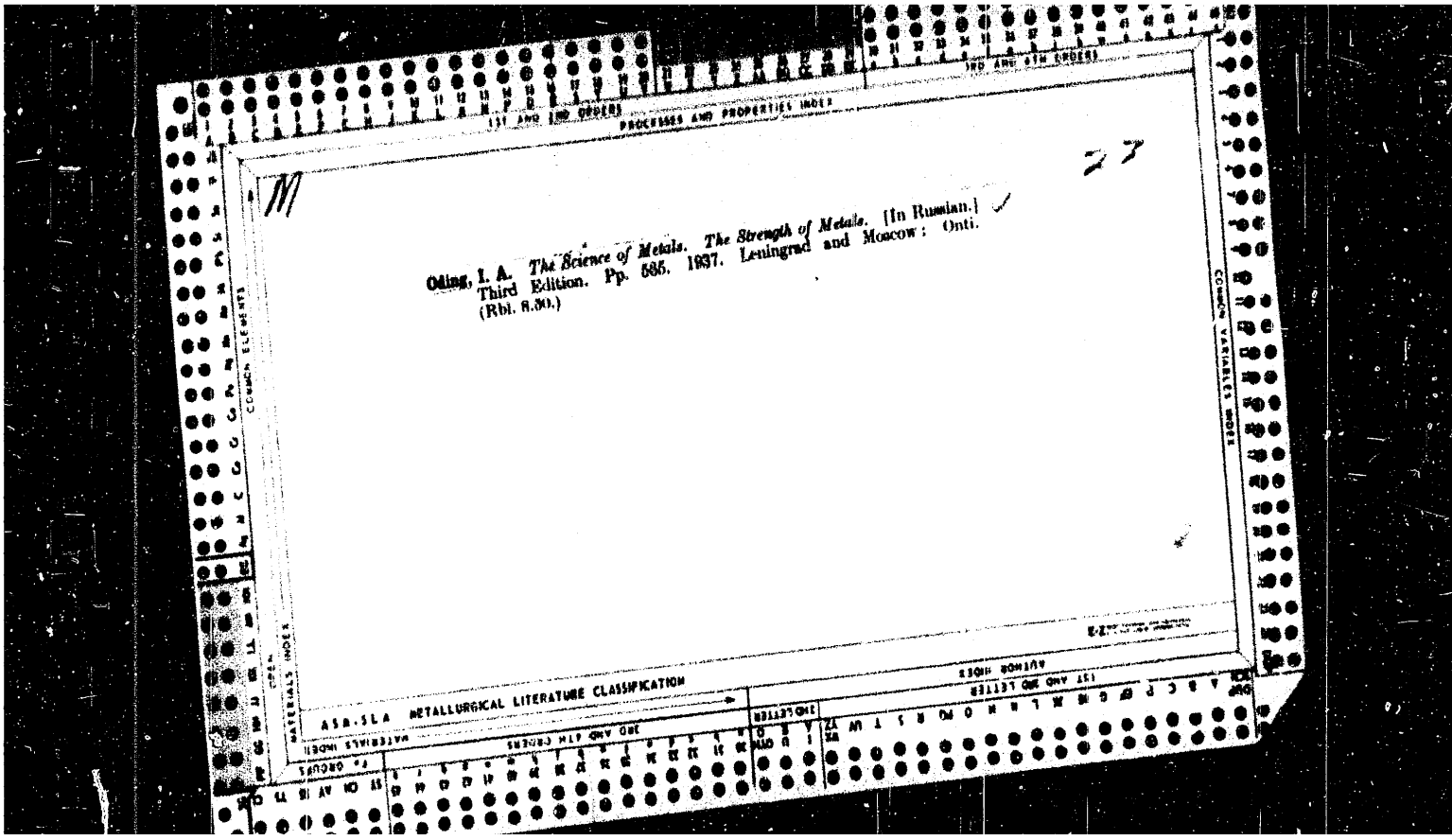
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



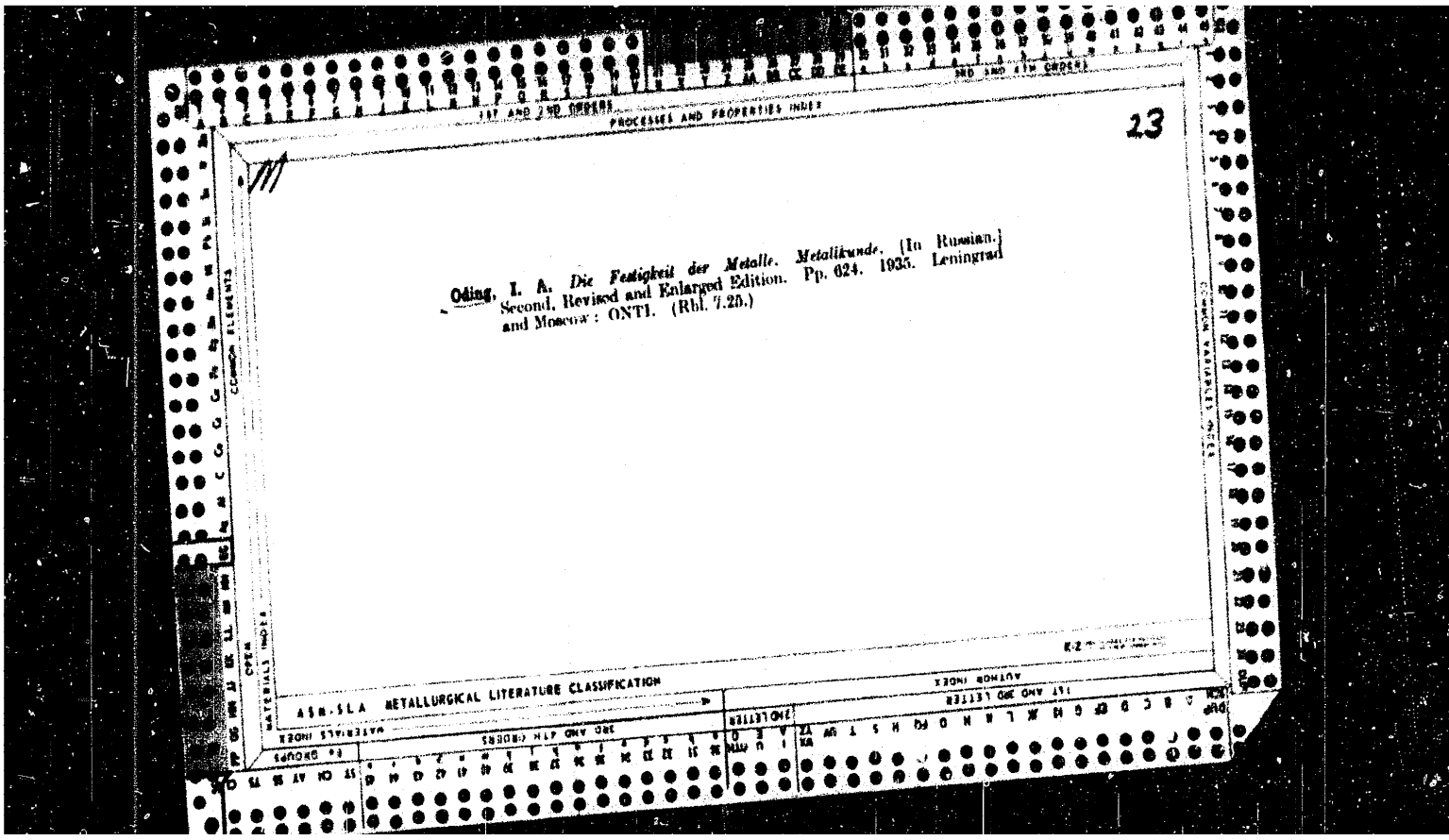
The strength of carbon-containing structural steels. I. A. Oding. *Metallurg* 12, No. 9-10, 81-91(1937); *Chem. Zentr.* 1938, II, 934; cf. C. A. 32, 9009⁸. The defn. of characteristic mech. properties of C-contg. structural steels under static, dynamic and alternating stresses and the significance of such properties are considered, as is also the appearance of simple and complex strains.

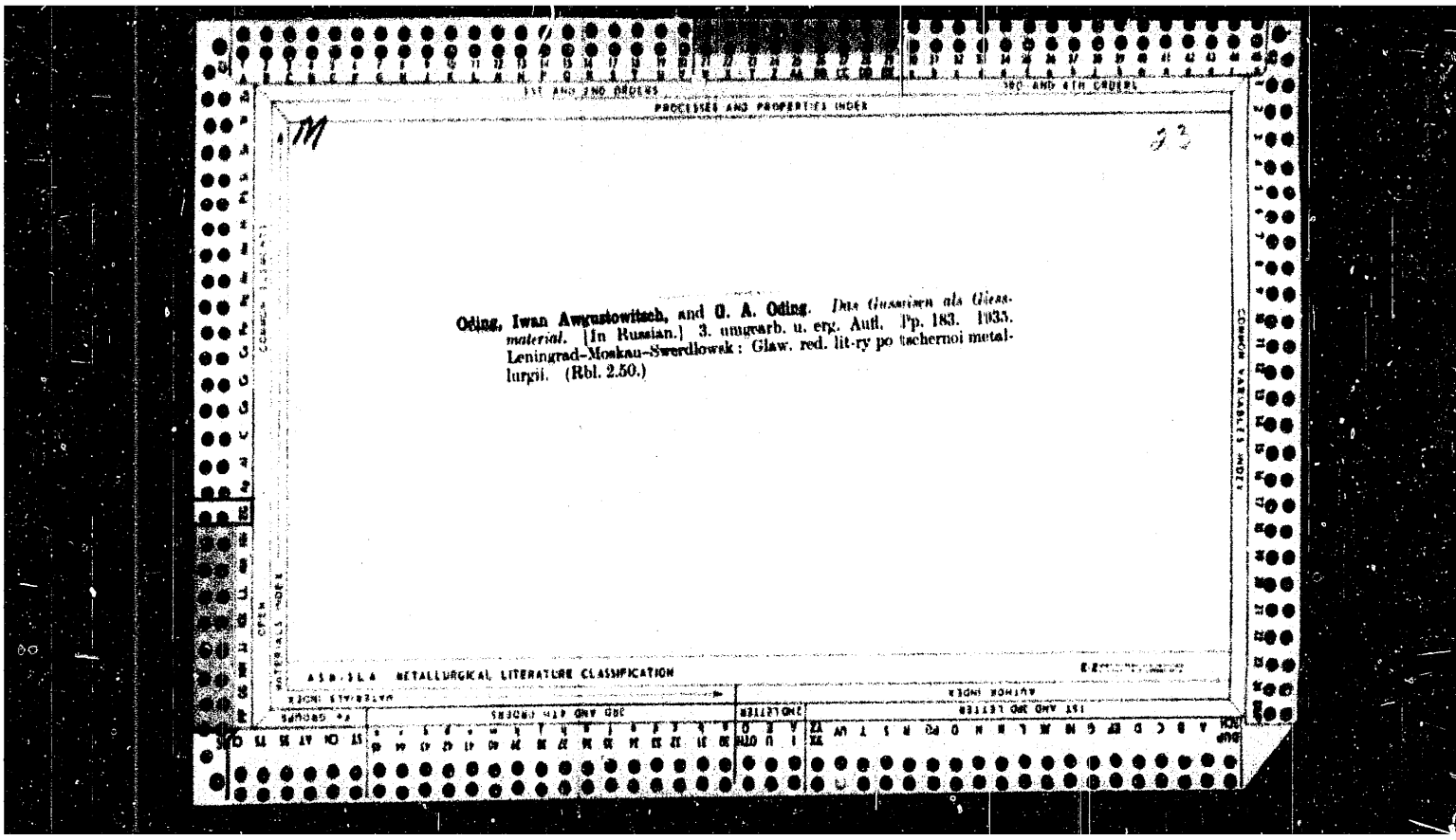
M. G. Moore





Oding, I. A. *The Science of Metals. The Strength of Metals.* [In Russian.]
Third Edition. Pp. 585. 1937. Leningrad and Moscow: Onti.
(Rbl. 8.30.)





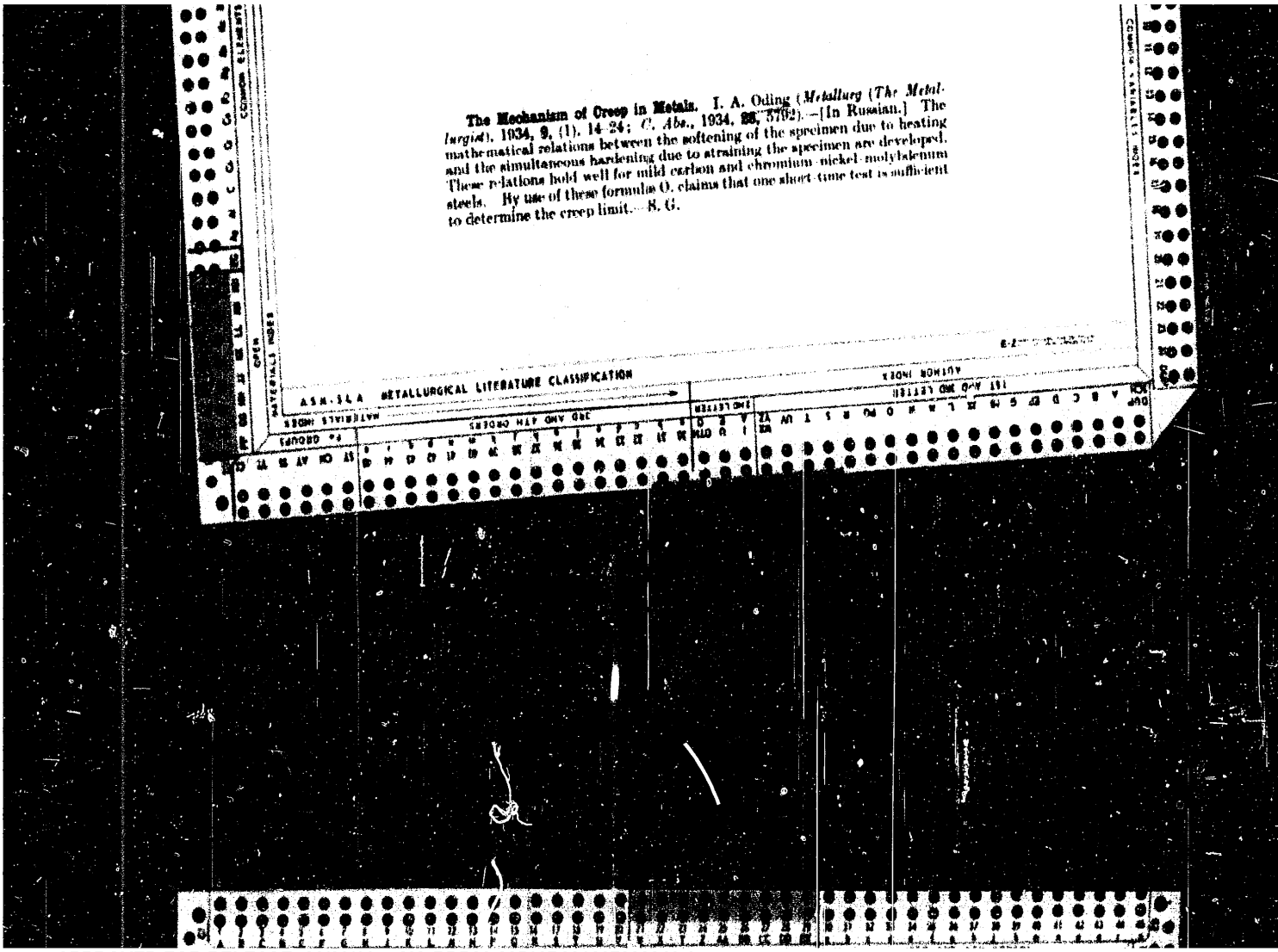
PROCESSES AND PROPERTIES INDEX

M

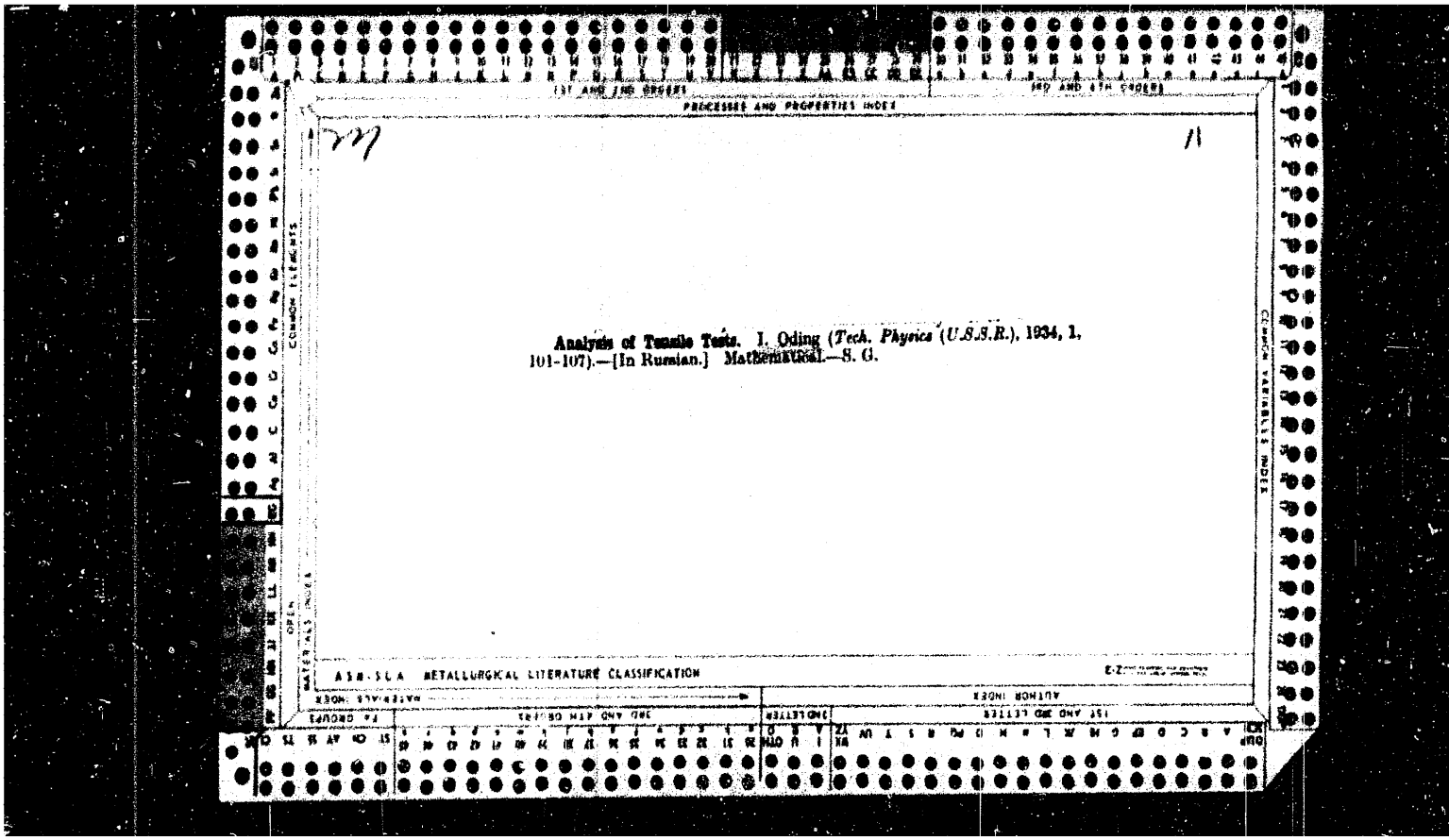
32

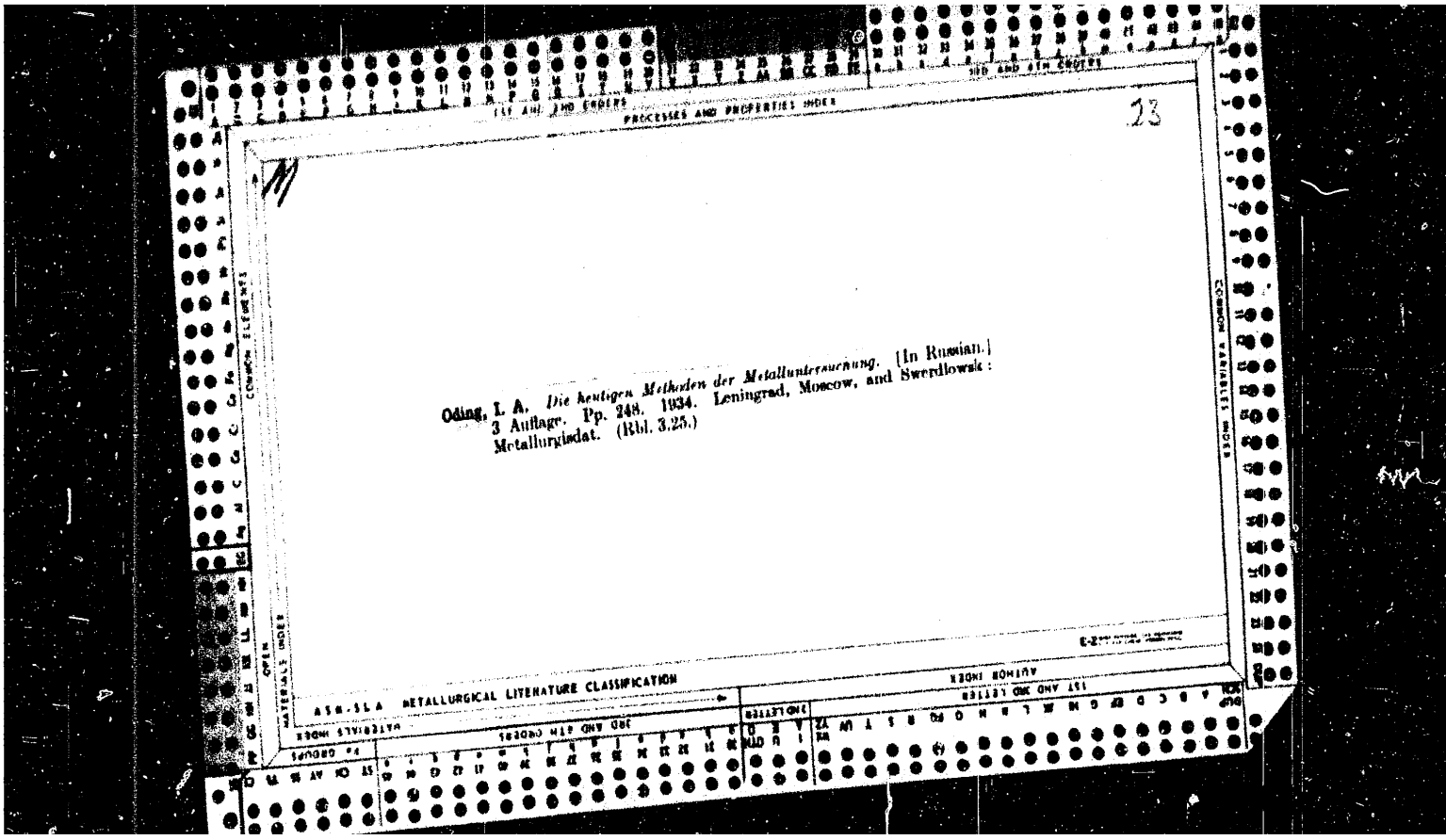
Oding, Iwan Awgustowitsch, and **O. A. Oding.** *Das Gusseisen als Giessmaterial.* [In Russian.] 3. umgearb. u. erg. Aufl. Pp. 183. 1935. Leningrad-Moskau-Swerdlowsk: Glaw. red. lit-ry po tschernoi metallurgii. (Rbl. 2.50.)

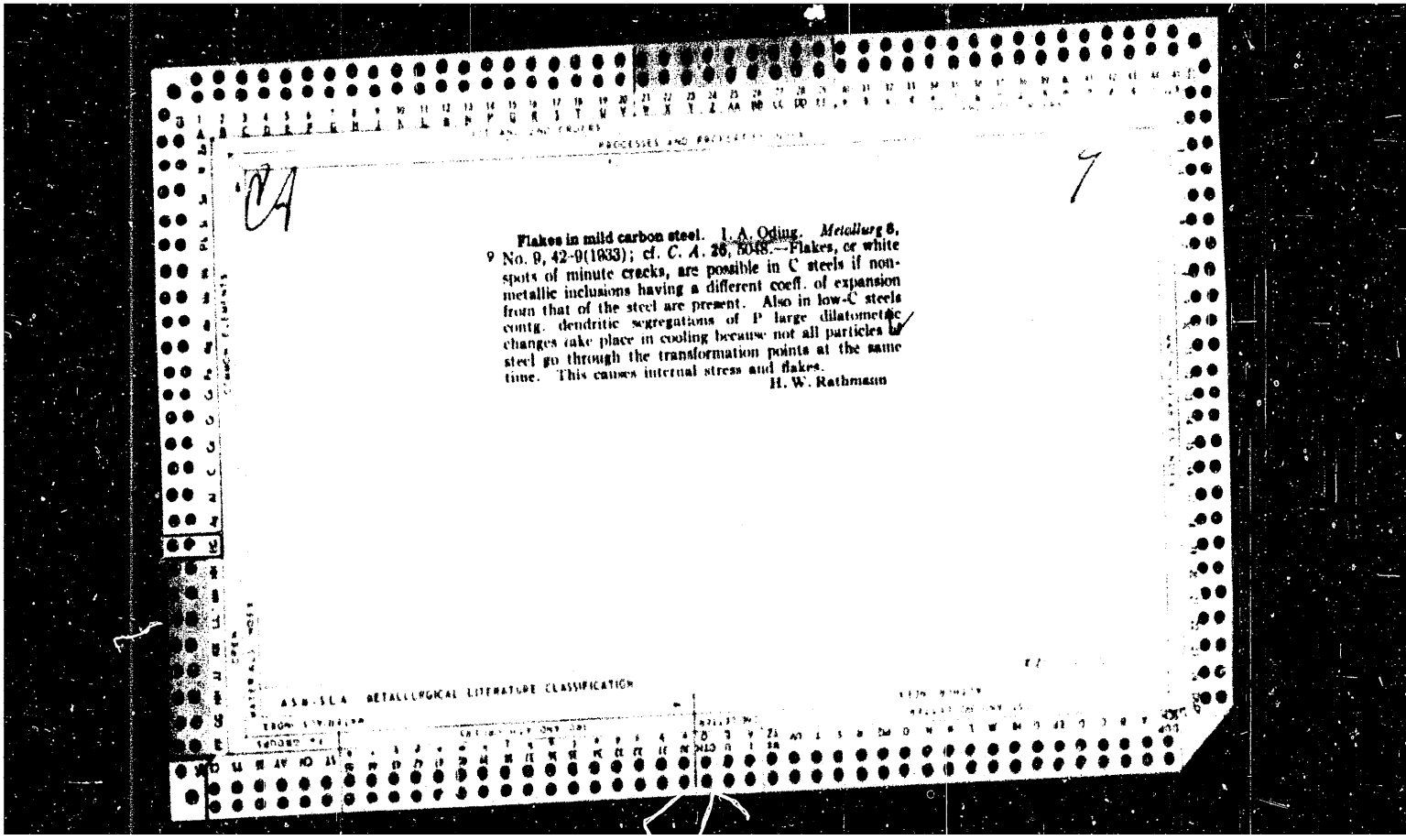
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



The Mechanism of Creep in Metals. I. A. Oding (*Metallurg* (*The Metallurgist*), 1934, **9**, (1), 14–24; *C. Abs.*, 1934, **28**, 5702).—[In Russian.] The mathematical relations between the softening of the specimen due to heating and the simultaneous hardening due to straining the specimen are developed. These relations hold well for mild carbon and chromium–nickel–molybdenum steels. By use of these formulæ O. claims that one short-time test is sufficient to determine the creep limit.—S. G.







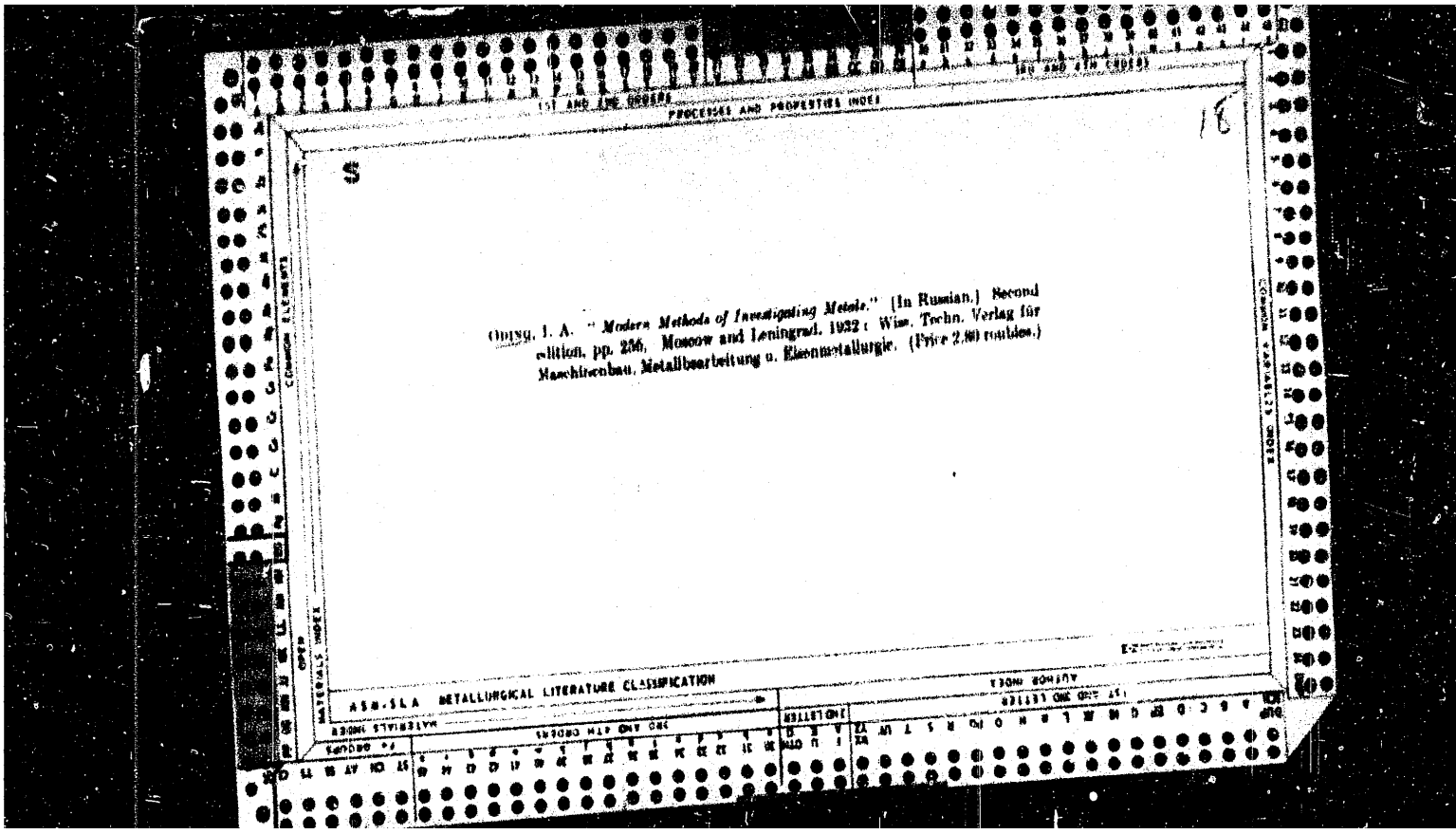
CA

9

Flakes in mild carbon steel. L. A. Oding. *Metallurg* 8, 9 No. 9, 42-9(1933); cf. *C. A.* 26, 5048.—Flakes, or white spots of minute cracks, are possible in C steels if non-metallic inclusions having a different coeff. of expansion from that of the steel are present. Also in low-C steels contg. dendritic segregations of P large dilatometric changes take place in cooling because not all particles of steel go through the transformation points at the same time. This causes internal stress and flakes.

H. W. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Oprsg, I. A. "*Modern Methods of Investigating Metals.*" [In Russian.] Second edition, pp. 256, Moscow and Leningrad, 1932: Wiss. Techn. Verlag für Maschinenbau, Metallbearbeitung u. Eisenmetallurgie. (Price 2.80 roubles.)

ABADZHI, K.I.; BOYTSOV, A.N.; VOLOSEVICH, F.P.; GOBERMAN, P.N.; KEMPINSKIY, M.M.; KUTAY, A.K.; NARINSKIY, F.I.; ODING, G.A.; TAYTS, B.A.; RUBINOV, A.D.; SHTYURMER, G.A.; BRZHEZINSKIY, M.L., kand. tekhn. nauk, retsenzent; SHALAYEVSKIY, O.V., red.; LEYKINA, T.L., red.izd-va; SPERANSKAYA, O.V., tekhn. red.

[Handbook on production control in the machinery industry] Spravochnik po proizvodstvennomu kontroliu v mashinostroenii. Izd.2., perer. i dop. Moskva, Mashgiz, 1964. 748 p. (MIRA 17:3)

ALEKHIK, S.V., doktor tekhn. nauk, prof.; GROKHOL'SKIY, K.F., kand. tekhn. nauk, dots.; ZOLOTNIKOV, I.M., kand. tekhn. nauk, dots.; KOCHUGOV, P.I., kand. tekhn. nauk, dots.; MALYSHEV, G.N., kand. tekhn. nauk, prof.; KHLEBNIKOV, M.S., kand. tekhn. nauk, retsenzent; PISAREV, N.G., kand. tekhn. nauk, dots., retsenzent; ODING, I.A., kand. tekhn. nauk, dots., retsenzent; KURENKOV, I.I., kand. tekhn. nauk, retsenzent; PROKOF'YEVA, Ye.I., inzh., retsenzent; YAKOVLEV, D.A., inzh., retsenzent; SERGEYEVA, I.N., red.

[Design of technological processes for the manufacture of billets and parts for the rolling stock of railroads; methodological manual on the technological aspects of diploma projects prepared in institutions of higher learning of railroad transportation] Proektirovanie tekhnologicheskikh protsessov proizvodstva zagotovok i detalei podvizhnogo sostava zheleznykh dorog; uchebno-metodicheskoe posobie po tekhnologicheskoi chasti diplomnogo proektirovaniia v vuzakh zheleznodorozhnogo transporta. Moskva, Vses. zaochnyi in-t inzhenerov zhel-dor. transporta. Pt.1. 1964. 202 p.
(MIRA 18:1)

ABADZHI, K.I.; BOYTSOV, A.N.; VOLOSEVICH, F.P.; GOBERMAN, P.N.; KUTAY, A.K.; MARINSKIY, F.I.; ODING, G.A.; RUBINOV, A.D.; SHTYURMER, G.A.; BRZHEZINSKIY, M.L., kandidat tekhnicheskikh nauk, retsenzent; PETROV, V.I., inzhener, retsenzent; KEMPINSKIY, M.M., inzhener, redaktor; LEYKINA, T.L., redaktor izdatel'stva; POL'SKAYA, R.G., tekhnicheskiy redaktor

[Reference manual for production control in machine building] Spravochnik po proizvodstvennomu kontroliu v mashinostroenii. Pod obshchei red. A.K.Kutai. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 670 p. (MLRA 9:12)
(Machinery industry)

Oding, G. A.

2579* Relation Between Position of Martensitic Point and State of the Austenite. Zavisimost' polozheniia martensitnoi tochki ot sostoianiia austenita. (Russian.) G. A. Oding. *Metallovedenie i obrabotka metallov*, 1955, no. 4, [illegible]

Intensiveness of austenitic transformation. Effect of rate of cooling. Stresses in individual austenitic grains. Graphs. 9 ref.

MG

Chem. Tech. Sci

ODING, G. A.

B. T. R.
Vol. 3 No. 5
May 1954
Metals—Metallography, Transformations, and Structures

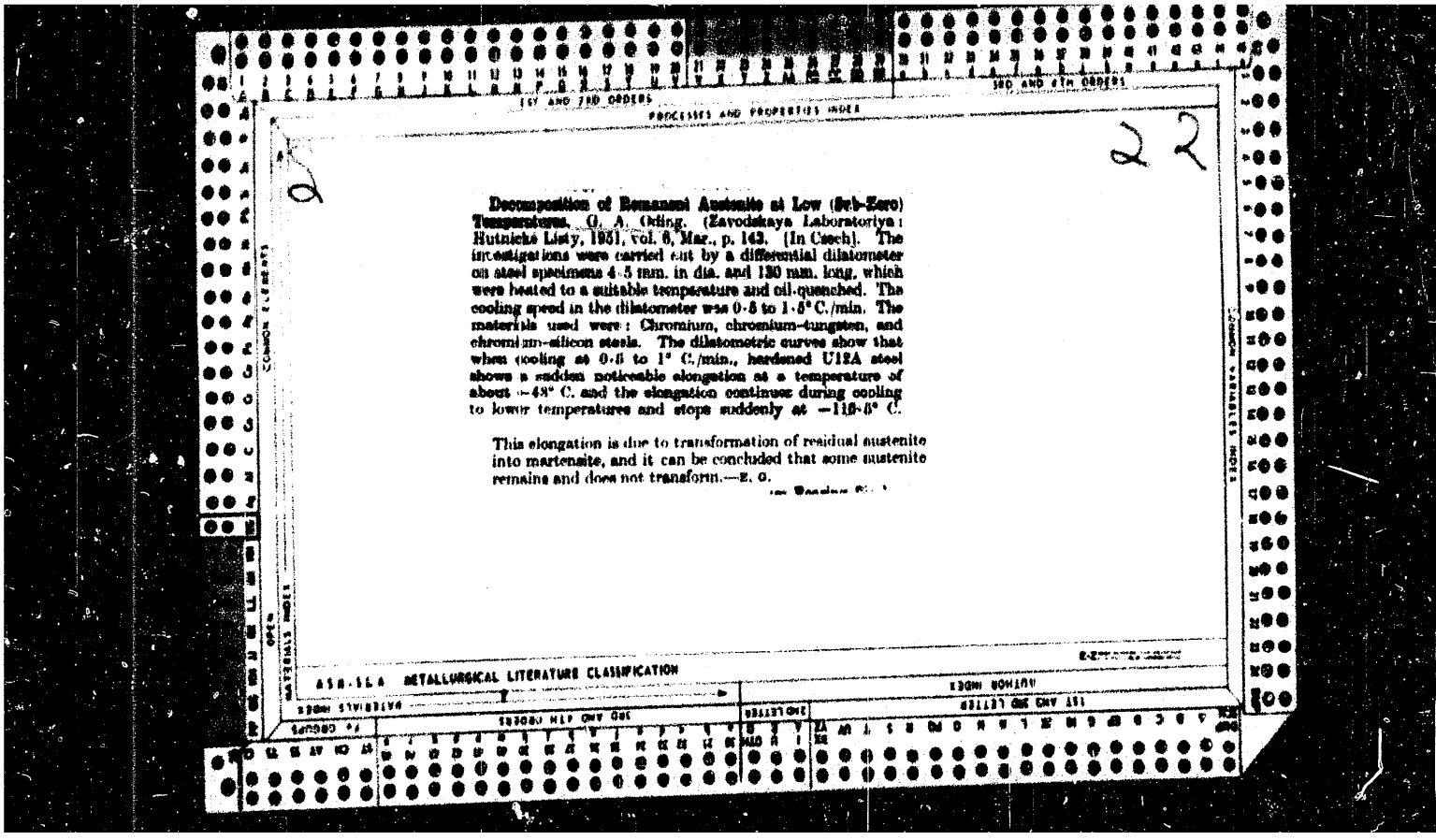
7028 Contribution to the Problem of the Austenite-Martensite Transformation/ G. A. Oding. *Henry Brutcher, Altadena, Cal., Translation no. 3046*, 6 p. (From *Vestnik Mashinostroeniya*, v. 32, no. 3, 1952, p. 69-71.)
Study of martensite transformation over entire temperature range of this transformation at a cooling rate not in excess of 5 F per minute based on dilatometric method. Table, graphs. 8 ref.

ODING, G. A.

Iron-Nickel Alloys

Martensite transformation in iron-nickel alloy. Vest. mash. 31, no. 10, 1951.

9. Monthly List of Russian Accessions, Library of Congress, September, 1952, 1953. Unclassified.



Decomposition of Remanent Austenite at Low (Sub-Zero) Temperatures. O. A. Oding. (Zavodskaya Laboratoriya: Hutnicke Listy, 1951, vol. 6, Mar., p. 143. [In Czech]. The investigations were carried out by a differential dilatometer on steel specimens 4–5 mm. in dia. and 130 mm. long, which were heated to a suitable temperature and oil-quenched. The cooling speed in the dilatometer was 0·5 to 1·5° C./min. The materials used were: Chromium, chromium-tungsten, and chromium-silicon steels. The dilatometric curves show that when cooling at 0·5 to 1° C./min., hardened U12A steel shows a sudden noticeable elongation at a temperature of about −48° C. and the elongation continues during cooling to lower temperatures and stops suddenly at −118·5° C.

This elongation is due to transformation of residual austenite into martensite, and it can be concluded that some austenite remains and does not transform.—E. G.

CA

Transformation of residual austenite at negative temperatures. G. A. Oding. *Zavodskaya Lab.* 16, 475–9(1950).—A recording differential dilatometer was used with specimens 130 mm. long and 4.5 mm. in diam. The specimens were previously oil-quenched to 20° from the hardening temp., and were then cooled at 0.5 to 1.5°/min. Transformation of residual austenite to martensite was indicated by expansion of the specimen. In steel U12A transformation occurred uniformly in the range −48 to −116.5°, but a subsequent dilatometric study during heating to 400° showed that some residual austenite remained after the low temp. treatment. Steels KhG, KhVG, 9KhS, and ShKh15 behaved in a similar manner except that the rate of austenite transformation varied with temp. The hardness of the cooled steels remained about 2 points Rockwell hardness above that of uncooled steels during tempering up to about 250°. Above this temp. the uncooled steels were about 2 points harder in the range studied (up to 350°).

A. G. Guy

ODING, G. A.

PA 46/49T29

USSR/Engineering
Tools, Cutting
Steel

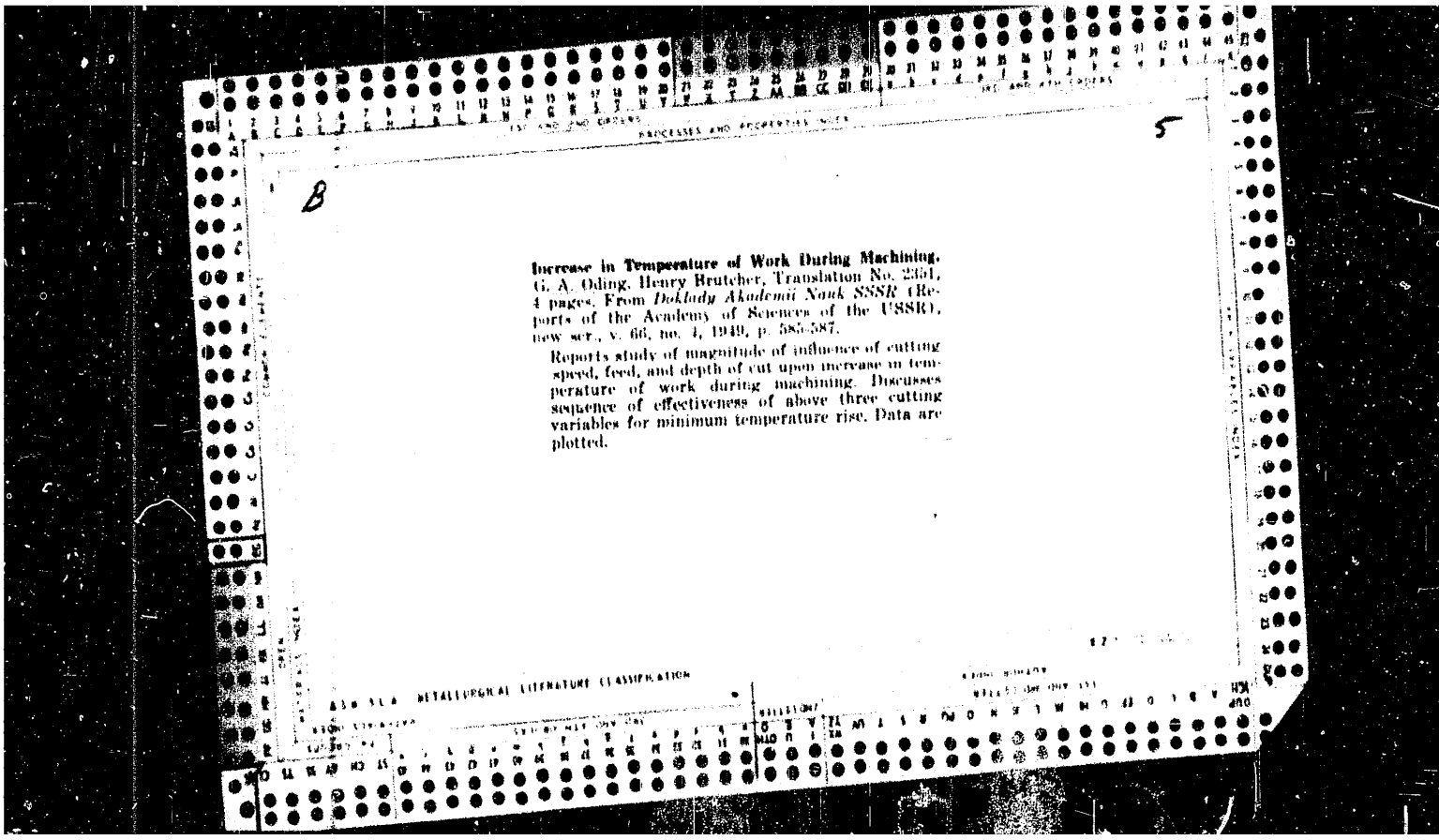
Jun 49

"Heating During the Cutting Operation," G. A. Oding, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 4

Using samples of type 35 carbon steel, author found that heating of the working surface, through which heat forming during cutting is transmitted throughout the piece, increases with increase in cutting depth, and decreases with increase in feed and cutting speed. Submitted by Acad I. I. Artobolevskiy, 4 Jan 49

46/49T29



Increase in Temperature of Work During Machining. G. A. Oding. Henry Brutcher, Translation No. 2351, 4 pages. From *Doklady Akademii Nauk SSSR* (Reports of the Academy of Sciences of the USSR), new ser., v. 66, no. 4, 1949, p. 585-587.

Reports study of magnitude of influence of cutting speed, feed, and depth of cut upon increase in temperature of work during machining. Discusses sequence of effectiveness of above three cutting variables for minimum temperature rise. Data are plotted.

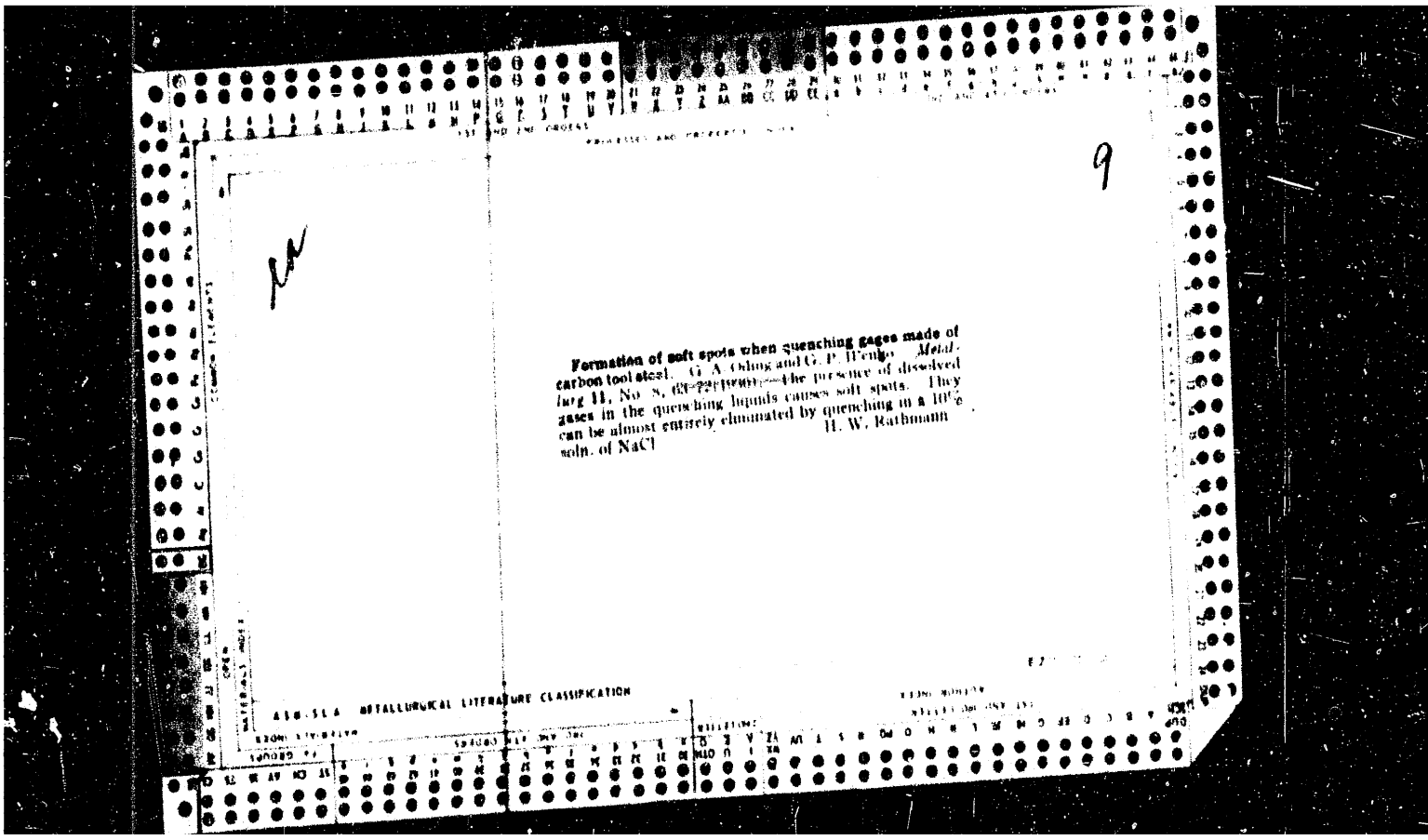
GDENG, G. A.

Trebovaniia, pred'iavliaemye k metallu pri izgotovlenii izmeritel'nogo instrumenta. (Vestn. Mash., 1949, no. 5, p. 35-38)

(Quality of metal for manufacturing measuring instruments.)

DLC: TN4.V4

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.



9

Formation of soft spots when quenching gages made of carbon tool steel. G. A. Oding and G. P. Wenkin. *Metallurg* 11, No. 8, [illegible]—The presence of dissolved gases in the quenching liquids causes soft spots. They can be almost entirely eliminated by quenching in a 10% soln. of NaCl
H. W. Rathmann

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Heat treatment of the steel "XB5" for cutting knives of machine tools for marking graduations. G. A. Oding and N. V. Govorova. *Kach. Stal* 4, No. 6, 30-4 (1936); *Chem. Zentr.* 1937, I, 2214. Studies are reported to det. the most satisfactory heat-treatment for increasing the hardness of steel contg. 1.37% C, 0.28% Mn, 0.42% Cr and 5.27% W. By heating the steel to 900–950° with subsequent cooling in air followed by a second heating to 820° with quenching in water of room temp. a Rockwell hardness of 66–68 units was obtained, the steel showing a needle-like martensite structure with a great deal of finely imbedded carbide. An annealing treatment at 180–200° produced no essential improvement in the product.

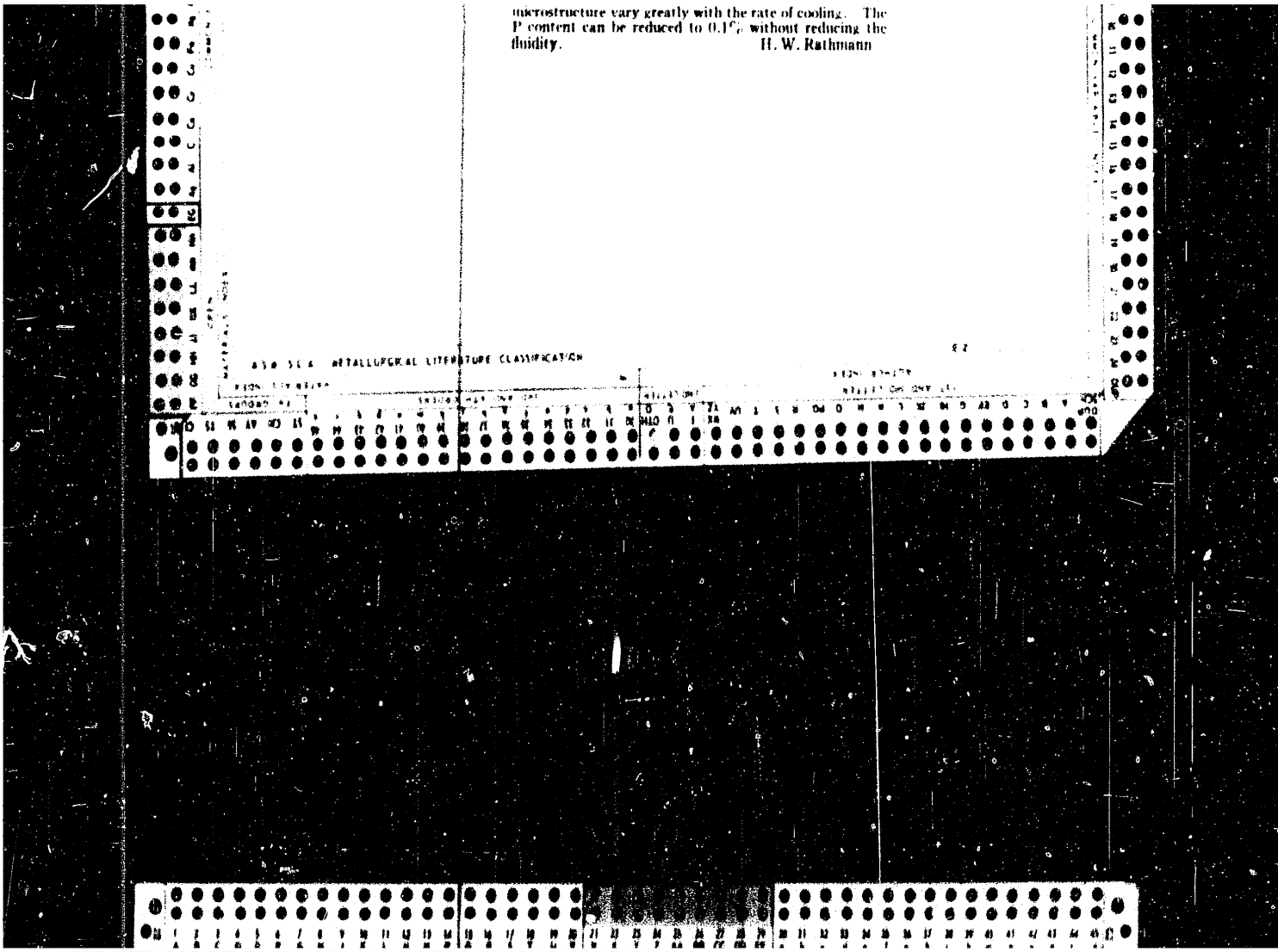
M. G. Moore

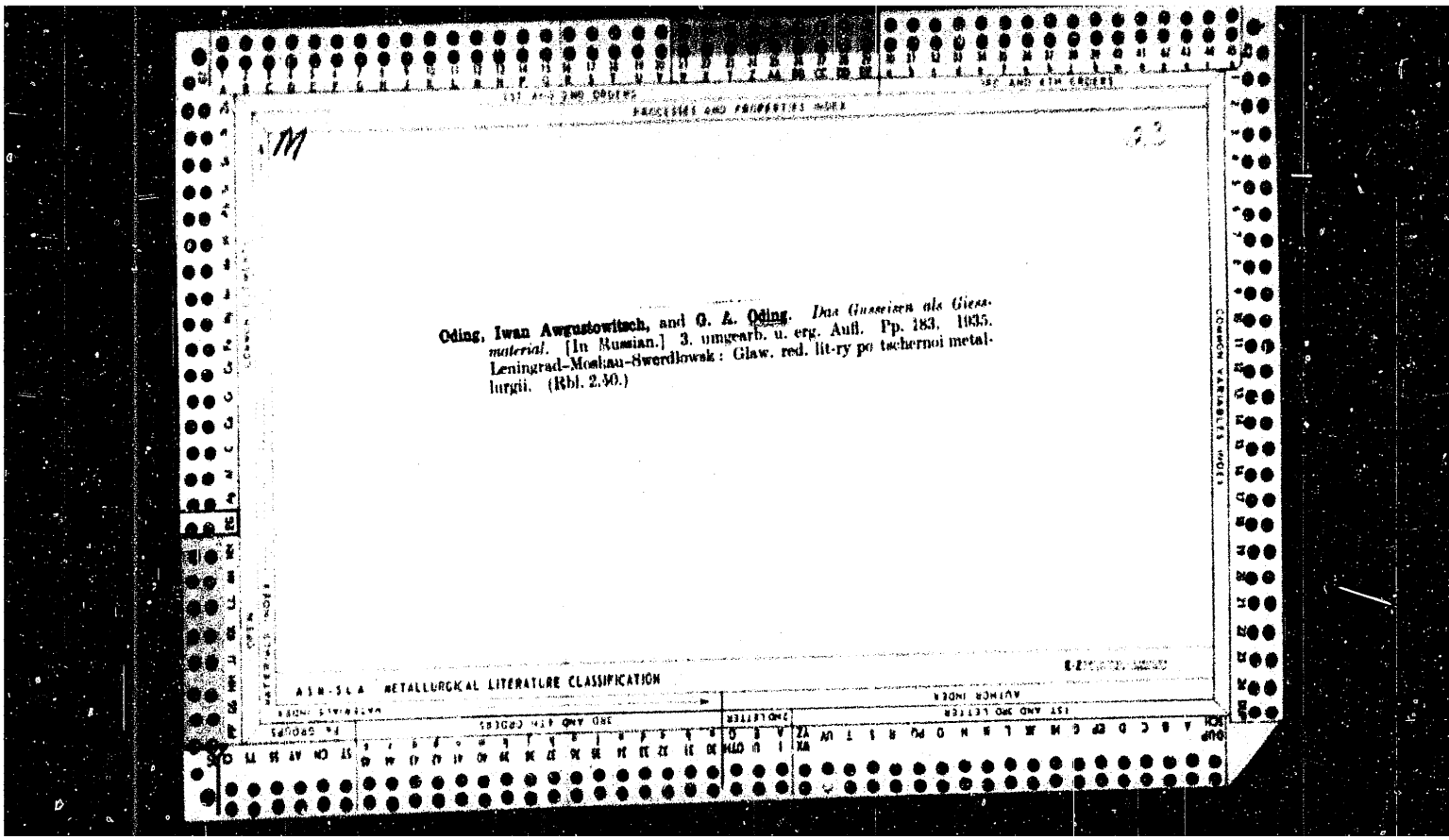
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

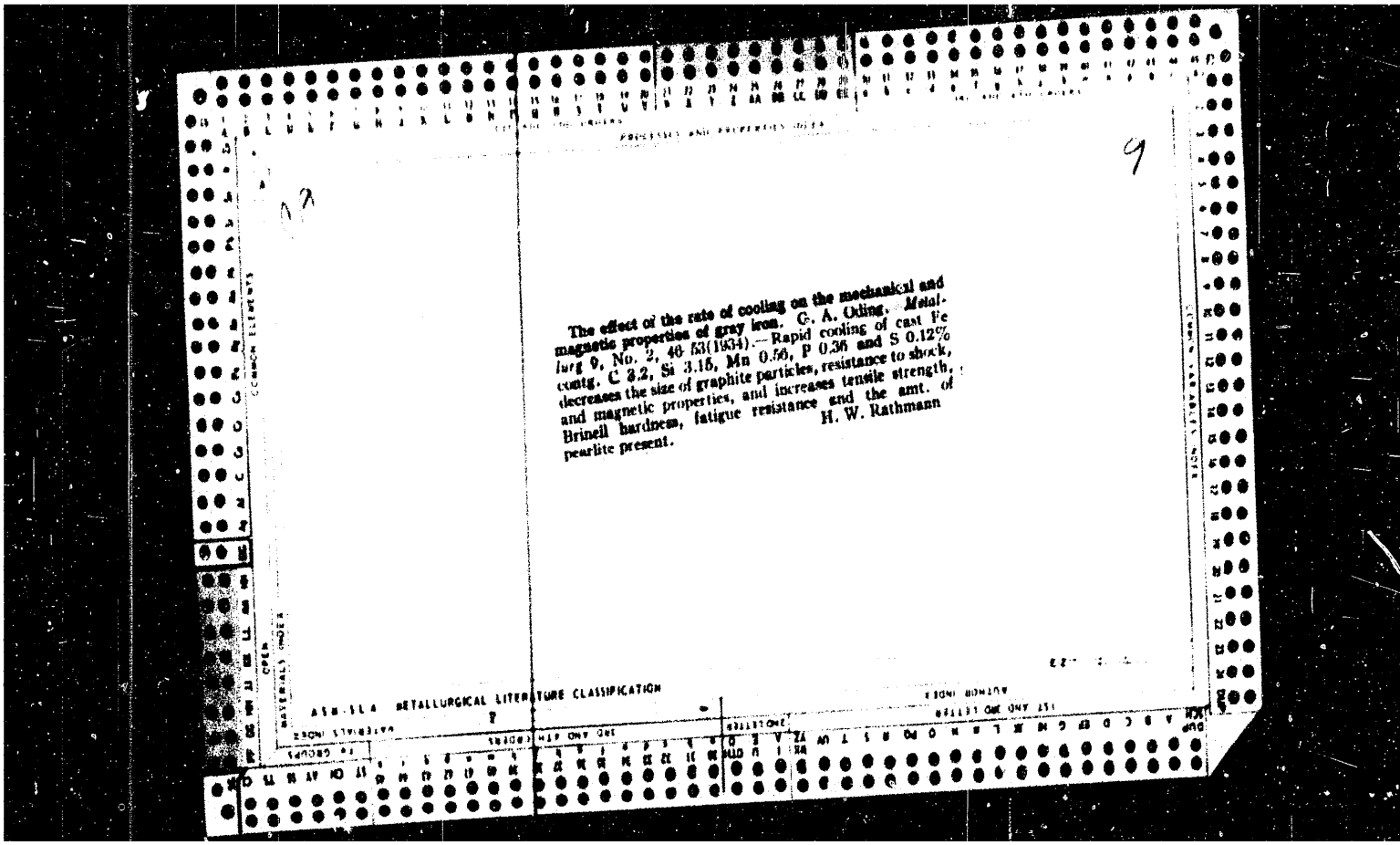
microstructure vary greatly with the rate of cooling. The P content can be reduced to 0.1% without reducing the fluidity.

H. W. Rathmann





Oding, Iwan Awgustowitsch, and **G. A. Oding.** *Das Gusseisen als Giess-material.* [In Russian.] 3. umgearb. u. erg. Aufl. Pp. 183. 1935. Leningrad-Moskau-Swerdlowsk: Glaw. red. lit-ry po tschernoi metallurgii. (Rbl. 2.50.)



The effect of the rate of cooling on the mechanical and magnetic properties of gray iron. G. A. Oding. *Metallurg* 9, No. 2, 46-53(1934).—Rapid cooling of cast Fe contg. C 3.2, Si 3.15, Mn 0.56, P 0.36 and S 0.12% decreases the size of graphite particles, resistance to shock, and magnetic properties, and increases tensile strength, Brinell hardness, fatigue resistance and the amt. of pearlite present.
H. W. Rathmann

YEGOROV, A.M.; GDINTS, Z.K.

Calculating the temperature dependences of weak electrolyte dissociation constants. Sbor. nauch. trud. Gintsvetmeta no.23:241-246 '65.

Temperature dependence of the instability constants of certain complex ions. Ibid.:247-251 (MIRA 18:12)

YEGOROV, A.M.; ODINETS, Z.K.

Approximate calculation of the dependence of metal hydroxide solubility products on temperature. Sbor. nauch. trud. Gintsvetmeta no.19:308-313 '62. (MIRA 16:7)

(Hydroxide) (Solubility)
(Metals, Effect of temperature on)

YEGOROV, A.M.; ODINETS, Z.K.; Prinimala uchastiye: KUZNETSOVA, M.G., laborant

Behavior of the sulfides of copper, zinc, lead, and iron during roasting in presence of sodium chloride. Sbor. nauch. trud. Gintsvetmeta no.19:293-307 '62. (MIRA 16:7)

(Nonferrous metals--Metallurgy)
(Sulfides--Metallurgy)

YEGOROV, A.M.; ODINETS, Z.K.

Certain conclusions from V.I.Kuznetsov's hypothesis of analogies.
Zhur.neorg.khim. 7 no.3:706-708 Mr '62. (MIRA 15:3)
(Chemistry, Analytical)

VANYUKOV, A.V.; ODINETS, Z.K.

Distribution of ferrous sulfide between matte and slag. Izv. vys. ucheb. zav.; tsvet. met. 3 no.4:45-48 '60. (MIRA 13:9)

1. Krasnoyarskiy institut tsvetnykh metallov. Kafedra metallurgii tyazhelykh tsvetnykh metallov.
(Nonferrous metals--Metallurgy) (Iron sulfide)

Concerning Metal Distribution Between Matte and Slag

SOV/149-60-1-10/27

ASSOCIATION: Krasnoyarskiy institut tsvetnykh metallov. Kafedra metallurgii tyazhelykh tsvetnykh metallov (Krasnoyarsk Institute of Nonferrous Metals. Chair of Metallurgy of Heavy Nonferrous Metals)

SUBMITTED: June 27, 1959

Card 6/6

Concerning Metal Distribution Between Matte and Slag

7772
SOV/149-60-1-10/27

sharply with an increase of oxygen in the system, due to the weakening of the copper bond with the sulfide melt and the formation of iron micro-groups with variable valence containing sulfides. The greatest portion of nickel at the equilibrium point is located in the matte nuggets entangled in the silicate layer. The quantity of dissolved nickel does not exceed hundredths or even thousandths of one percent. A considerable quantity of dissolved nickel in actual plant slags is due to incomplete matte reactions and reversed slag oxidation in the tuyere area. A considerable portion of metal is lost because of mechanically entrained matte nuggets. A basic measure to counteract these losses of Co, Ni, and Cu is to reduce the oxygen content in the system matte-slag-gas phase, and better smelting conditions (superheating, greater slag fluidity, increase in interface tension, longer settlement time, etc.). There are 5 tables; and 17 references, 13 Soviet, 3 German, 1 U.S. The U.S. reference is: A. M. Aksoy, S. D. Thesis, M.I.T. (Ref.).

Card 5/6

Calculation results are given by the authors in numerous tables with following comments and conclusions. The distribution of cobalt between slag and matte is basi- basically a cation exchange according to

$$[Co] + (Fe^{2+}) \rightleftharpoons [Fe] + (Co^{2+}),$$

the equilibrium of which in a neutral atmosphere follows in a satisfactory way the ideal law of acting masses. If cobalt were transferred into slag (as, for instance, during the nickel-matte refining) the temperature must be kept higher, as the value of the constant increases with higher temperatures. The distribution of copper is determined by the solubility of its sulfide. The copper content in the slag changes within the range of a few hundredths or tenths of a percent depending upon smelting conditions and components. The percentage of dissolved copper rises

studied not considered. At the metal-slag interface sulfur and metal cross the boundary jointly while a cation exchange takes place between oxides. Matte is considered as an atomic solution, and the equation of the constant represents the atomic portions of iron and of other metal.

$$K_{Me} = \frac{(a_{Me^{++}})\,[a_{Fe}]}{(a_{Fe^{++}})\,[a_{Me}]} \qquad (3)$$

The distribution coefficients were calculated according to the ratio:

$$K_p = \frac{(\%Me)}{[\%Me]} \qquad (4)$$

propose the use of radioactive Au^{198} which is insoluble in slag; consequently its presence in the latter is only possible in the form of matte nuggets carrying this isotope. Using this tracer, the influence of slag, matte, and gas phase on Ni, Cu, and Co distribution among these phases was studied. The slag-matte interaction is of an electrochemical nature, and the distribution of metals between smelting products can be expressed by the equations

$$[Me] + (Fe^{2+}) \rightleftarrows (Me^{n+}) + [Fe]; \quad (1)$$

$$[Me] - 2e \rightleftarrows (Me^{2+}); [S] + 2e \rightleftarrows (S^{2-}), \quad (2)$$

where square brackets indicate the concentration in matte, while parenthesis indicates that in slag. In the calculation of dissociation constants it was assumed that the slag is in full state of ionic dissociation, and the cation part of iron or other metal being

18.3100

77721
SOV/149-60-1-10/27

AUTHORS: Vanyukov, A. V., Odinets, Z. K.

TITLE: Concerning Metal Distribution Between Matte and Slag

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Tsvetnaya metallurgiya, 1960, Nr 1, pp 73-83 (USSR)

ABSTRACT: The present work deals with distribution of Cu, Ni, Co in the state of equilibrium between matte and slag. Ideal law of mass action in systems consisting of slag, matte, and gas is not always valid; moreover, constants are variable depending on changes in phase composition. A slight increase in dissolved oxygen causes a greater solubility of metals. The matter is complicated by fine matte dispersions in the slag, which cannot be easily eliminated. An interesting method in this direction is high temperature centrifugation of slags. B. V. Lipin has made considerable contributions (Non-Ferrous Metals, Nr 9, 1957) to this procedure. However, perfect separation cannot be achieved in small crucibles at low speeds of 500-1,000 rpm. Therefore, the authors

Card 1/6

ODINETS, Z. K. Cand Tech Sci -- (diss) "Study of the distribution of copper, nickel, and cobalt between [redacted] the matte and the slag." Mos, 1959. 12 pp (Min of Higher Education USSR. Krasnoyarsk Inst of Nonferrous Metals im M. I. Kalinin. Chair of Metallurgy of Heavy Metals), 150 copies (KL, 47-59, 115)

On the Form of Metal Losses in Slags

(iv) since increasing the temperature lowers the proportion of mechanically entrapped matte inclusions without significantly increasing the quantity of metals dissolved in the slag, it appears that in order to lower the total metal content of the waste slags the melt should be overheated.

There are 9 figures, 5 tables and 24 references, 16 of which are Soviet, 7 English and 1 German.

ASSOCIATION: Moskovskiy institut tsvetnykh metallov i zolota. Kafedra metallurgii tyazhelykh tsvetnykh metallov. (Moscow Institute of Non-ferrous Metals and Gold. Chair of Metallurgy of Heavy Non-ferrous Metals)

SUBMITTED: July 16, 1958

Card 8/8

On the Form of Metal Losses in Slags

slags can be considerably reduced by application of preliminary sulphiding treatment during the sintering process and by improving the quality of the sintered agglomerate. It is also necessary to limit to a minimum the Fe_3O_4 content in the raw agglomerate by sintering in a tube furnace. Lowering of the magnetite content in the sinter cake entering the reverberatory copper smelting furnace can be attained by introducing a reducer in the bottom hearth of the sintering furnace. The practice of introducing the converter slags containing a large proportion of magnetite in the reverberatory furnace is not to be recommended;

(iii) losses of Ni and Cu in the slags occur mainly by way of the mechanically entrapped matte inclusions. These losses become smaller under conditions which favour the coalescence of the sulphide droplets and their separation from the slag. The fact that with increasing acidity of the slag the mechanical losses of metals decrease indicates that in some cases the surface properties which govern the process of coalescence are of primary importance;

The results of the present investigation show that:
(i) in a neutral atmosphere, the quantities of Ni and Cu dissolved in the slag amount to little more than 0.001 and 0.01% respectively. Owing to higher solubility of CoS and the reversibility of the reaction

$$CoS + (FeO) \rightleftarrows FeS + (CoO) ,$$

the amount of Co dissolved in the slag is considerably higher and can exceed 0.1%;
(ii) the quantity of metals dissolved in the slag depends to a large extent on the Fe_3O_4 content of the matte and on the composition of the gaseous phase. The higher the Fe_3O_4 content of the matte and the higher the proportion of O_2 present in the gaseous phase the higher is the proportion of metals dissolved in the slag. Presence of oxygen-bearing nickel compounds in industrial slags obtained during smelting of nickel oxide ores can be explained either by the fact that the sulphiding reaction does not proceed to completion, or by the entrapment of the burden fines in the slag. This means that nickel losses in the

The effect of acidity of the slag is shown in Figure 3: left - dissolved Ni (1) and Cu (2), mechanical losses of Co (5); right - dissolved Co (3), mechanical losses of Cu (4). Figure 4 shows the effect of the sulphur content of the matte with a constant metal content on the quantity of metals dissolved in the slag: Curve 1 - Ni, Curve 2 - Cu and Curve 3 - Co. The effect of the metal content of the matte (at constant S content) on the distribution of metals in the slag is shown in Figure 5: left - dissolved Ni (1) and Cu (2) and mechanical losses of Co (5); right - dissolved Co (3) and mechanical losses of Cu (4) and Ni (6). The effect of temperature is shown in Figure 6: left - dissolved Ni (1) and Cu (2); right - dissolved Co (3) and mechanical losses of Cu (4) and Co (5). Figure 7 shows the effect of the oxygen content of the matte on the quantity of copper dissolved (Curve 1) and mechanically entrapped (Curve 2) in the slag. The effect of the temperature, matte composition and replacing FeO by CaO on the solubility of FeS in the slag is shown in Figure 8, that of the acidity of the slag, matte composition and temperature is illustrated in Figure 9.

in Figure 1 and the results are reproduced graphically. To check the reliability of the radioactive tracer technique, one series of experiments with a nickel matte was repeated under the same conditions using the following method. A small, cylindrical crucible provided with a small orifice half way up its wall was placed in a larger crucible. The nickel matte was placed in the small crucible below the level of the orifice. Slag was placed in both crucibles, its level in the large crucible being slightly larger than in the small one. It was assumed that small dimensions of the orifice in the smaller crucible would prevent the matte inclusions finding their way to the slag contained in the large crucible, so that the total metal content of this slag would correspond to metals dissolved in the slag. As can be seen from Table 5, there was a close agreement between the results obtained by the two different methods.

The effect of replacing FeO by CaO on the distribution of Cu, Ni and Co in the slag of constant acidity at 1 300 °C is shown in Figure 2. Scale on the left side - dissolved Ni (Curve 1) and Cu (Curve 2). Scale on the right side - dissolved Cu (3), mechanical losses of Cu (4) and Co (5).

in the slag that had been melted in contact with a matte of a given composition. On the assumption (later verified experimentally) that gold is not soluble in slag, a radio-active isotope Au^{198} had been introduced into all the experimental mattes. On the completion of each experiment in which matte of a given composition was melted under purified argon (partial oxygen pressure less than 0.6×10^{-11} atm) in contact with one of the experimental slags, the radioactivity of the slag was therefore proportional to the amount of the matte inclusions mechanically entrapped in the slag. On the assumption that the composition of the matte inclusions was the same as that of the original material, the quantity of metals carried by these inclusions was calculated from the known values of the radioactivity of the slag and the matte. The total metal content of the slag was determined by chemical analysis and the quantity of metals dissolved in the slag was found by difference. The experimental apparatus is illustrated diagrammatically

Card 3/8

On the Form of Metal Losses in Slags

the effect of various factors on the relative concentration of nickel, copper and cobalt in the matte and in the slag. The composition of the experimental slags is given in Table 1. They were synthetised by melting under nitrogen, in iron crucibles, calculated quantities of fayalite, pure SiO_2 powder and reactive CaO calcined at 900 °C, the final product being ground to 60 mesh. Fayalite was prepared in the same manner from ferric oxalate and pure SiO_2 powder and according to the results of microscopic examination no magnetite was present in the final product. The experimental mattes were prepared from pure sulphides melted in alumina crucibles under purified argon. The iron and nickel sulphides were obtained by passing H_2S over "Armco" iron shavings and nickel powder at 700 and 900 °C, respectively. The copper and cobalt sulphides were prepared by direct fusion of the components in graphite crucibles. The chemical analysis of the sulphides is given in Table 2.

Radioactive tracer technique was used for determination of the form in which the investigated metals were present

AUTHORS: Vanyukov, A.V. and Odinets, Z.K. SOV/149-58-5-4/18

TITLE: On the Form of Metal Losses in Slags (O forme poter' metallov so shlakami)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, 1958, Nr 5, pp 27 - 37 (USSR)

ABSTRACT: Waste slags constitute the main source of losses of metals during their extraction by pyrometallurgical methods. According to a rough estimate, lowering of the nickel content in the waste slags produced by the Yuzhural'-nikel Combine by only 0.01% would result in an annual saving of 3.5 million roubles. There are indications that metals can be present in slags in the form of dissolved sulphides, mechanically entrapped matte inclusions and various silicates and oxides, but data on the quantitative relationship between these various forms of metal losses are lacking. Solubility of FeS, CaS and MgS in slags is said to be high, that of ZnS limited, while data on the solubility of NiS, Cu_2S and CoS are contradictory.

Card1/8 The object of the present investigation was to determine

ODINETS, Ye.V., nauchnyy sotrudnik

Replantation of teeth; experimental study. Stomatologiia 42 no.2: 46-49 Mr-Ap'63 (MIRA 17:3)

1. Iz kliniki chelyustno-litsevoy khirurgii (zaveduyushchiy nauchnyy sotrudnik Ye.V.Odinets) Ukrainskogo nauchno-issledovatel'skogo instituta ortopedii i travmatologii (direktor dotsent I.P.Alekseyenko) i kafedry khirurgicheskoy stomatologii (zaveduyushchiy - prof. Yu.I.Bernadskiy) Kiyevskogo meditsinskogo instituta.

ODINETS, Ye.V.

Transplantation of teeth in chronic periodontitis. Probl. stom. 5:208-212 '60. (MIRA 15:2)

1. Kiyevskiy meditsinskiy institut.
(TEETH--DISEASES) (TEETH--TRANSPLANTATION)

Reactivity of the vinyl group in ... S/079/62/032/004/002/010
D204/D301

A, the first stage consists of the formation of $CH_2^+—CH(AlCl_3)—SiCl_3$,

which then reacts with C_6H_6 to give $C_6H_5CH_2CH_2SiCl_3 + AlCl_3$. This is confirmed by the anomalous addition of the aromatic radical to the β-C. Successive replacement of Cl by CH_3 makes the formation of the carbonium ion less probable. Experimental details are fully described and physical properties of the addition products are given. There are 1 table and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: G.H. Wagner, D.L. Bailey, A.N. Pines, M.L. Dunham and D.B. McIntile, Ind. Eng. Ch., 45, 367, 1953; L.H. Sommer, R.E. VanStrien F.C. Whitmore, J. Am. Chem. Soc., 71, 3056, 1949; M Kanazashi, Bull Chem. Soc. Japan, 1953, 493.

SUBMITTED: April 24, 1961

Card 2/2

36082
S/079/62/032/004/002/010
D204/D301

AUTHORS: Andrianov, K.A., Zhdanov, A.A., and Odinets, V.A.

TITLE: Reactivity of the vinyl group in substituted silanes in addition reactions with benzene, in the presence of aluminum chloride

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 4, 1962, 1126-1130

TEXT: Addition reactions of C_6H_6 to $CH_2 = CHSiCl_3$ (A), $CH_2 = CH Si(Me)Cl_2$ (B), $CH_2 = CHSi(Me)_2Cl$ (C), and $CH_2 = CHSiMe_3$ (D) were studied, to determine the effect of substituents on the reactivity. All reactions were carried out over 4½ hours at 75°C, in the presence of $AlCl_3$. Additions took place across the double bond to give $PhCH_2CH_2SiCl_3$, $PhCH_2CH_2Si(Me)Cl_2$ and $PhCH_2CH_2Si(Me)_2Cl$ in the cases of A, B and C respectively. The reactivity decreased from A to C and D did not react at all. The reaction mechanism is discussed in terms of displacements of π-electrons of the vinyl group by the Cl and CH_3 groups in compounds A, B, C and D. It is suggested that in

Card 1/2

31193

S/079/61/031/012/007/011
D258/D301

The addition of aromatic ...

Pines, M. L. Dunham, Ind. Eng. Ch., no. 2, 368, (1953); R. E. Richard, H. W. Thompson, J. Chem. Soc., (1949), 124.

SUBMITTED: November 29, 1960

X

Card 3/3

The addition of aromatic ...

$$C_6H_5CH_2CH_2\text{-}\ Si(CH_3)Cl_2 + CH_2{=}\ CHSi(CH_3)Cl_2 \xrightarrow{AlCl_3} \left[Cl_2(CH_3)Si(CH_2)_2\right]_2 C_6H_4 \qquad (2)$$

The primary addition products were converted to the corresponding silane diols by acetylation with CH_3COOK and subsequent hydrolysis. The infrared-spectra of all these diols confirm the presence of $Si\text{-}CH_3$ groups (1258 cm^{-1}), of an aromatic nucleus and of SiOH grcups (830 - 880 cm^{-1}). The authors conclude that the phenyl compound adds on in the ß-position (with respect to Si). The syntheses of the primary addition products are then described: The melting points of the benzene, toluene, chlorobenzene, and diphenyl derivatives were 80-81, 70, 89-91, and 132-134°C respectively. There are 4 figures, 1 table and 3 references: 1 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: G. H. Wagner, D. L. Bailey, A. H.

Card 2/3

31193

S/079/61/031/012/007/011
D258/D301

5.3700

AUTHORS: Andrianov, K. A., Zhdanov, A.A., and Odinets, V. A.

TITLE: The addition of aromatic derivatives to vinyl methyl dichlorosilane

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 12, 1961, 4033-4038

TEXT: The authors showed that the addition of either benzene, toluene, chlorobenzene or diphenyl to vinyl methyl dichlorosilane yields the corresponding (ß-aryl ethyl)-methyldichlorosilanes and also a higher boiling by-product: $ArH + CH_2 = CHSi(CH_3)Cl_2 \xrightarrow{AlCl_3} ArCH_2CH_2si(CH_7)Cl_2$ ... (1). The by-product was isolated in the case of benzene and identified as bis-(2-dichloromethyl silyl ethyl)-benzene, formed on further reaction of the primary product with a second molecule of the silane:

Card 1/3

Synthesis of liquid 1,n-hexamethyl- ...

activation energy of viscous flow is hardly dependent on the polar groups. Substitution of the hydrogen atom at the nucleus by methyl or chlorine, however, always increases the activation energy. The activation energy of flow depends on the number of silicon atoms in the polymers under study. The polar properties of the radicals investigated decreases in the order $-C_2H_4C_6H_4Cl > -C_2H_4C_6H_4CH_3 > -C_2H_4C_6H_5$. There are 12 figures, 2 tables, and 12 references: 7 Soviet and 5 non-Soviet. The three references to English-language publications read as follows: C. C. Currie, Industr. and Engng. Chem. 46, 2331 (1954); L. H. Sommer, R. P. Pioch, J. Amer. Chem. Soc. 75, 6337 (1953); L. H. Sommer, W. D. English, G. R. Ansul, D. N. Vivona, J. Amer. Chem. Soc. 77, 2485 (1955).

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences USSR)

SUBMITTED: December 12, 1960

Card 3/6

Synthesis of liquid 1,n-hexamethyl- ...

phenyl-ethyl)-methyl-dichloro silane ($ClC_6H_4C_2H_4(CH_3)SiCl_2$, b.p. 124°-126°C (2 mm Hg). The synthesis of these compounds is described in Ref. 11 (K. A. Andrianov, et al. Zh. obshch. khimii (in print)). The liquid polymers were obtained by the joint hydrolysis of toluene solution of mixtures of these compounds with trimethyl-chloro silane (b.p. 58°-59°C) at 90-95°C. Polymers of varying degrees of polymerization, according to the reactant ratio, may be isolated from the reaction mixture (Table 1). Hydrolysis of ethereal solution of (phenyl)-methyl-dichloro silane yielded cyclic polymers also: tri(phenyl-ethyl)-trimethyl cyclotrisiloxane $[C_6H_5C_2H_4(CH_3)SiO]_3$ and tetra(phenyl-ethyl)-tetramethyl cyclotetrasiloxane $[C_6H_5C_2H_4(CH_3)SiO]_4$. Evaluation of the infrared spectra of the compounds investigated indicates that the addition of the vinyl aromatic nucleus takes place in β position, giving β-substituted derivatives. The density of the liquids was determined pycnometrically. Viscosity measurements were carried out by standard methods with an Ostwald-Pinkevich viscosimeter. Data on the activation energy of viscous flow and the temperature coefficients of the viscosity are shown in Table 2. It was found that for the lowest-molecular members of the homologous series the

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27491
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B117/B101

15.8170

AUTHORS: Andrianov, K. A., Zhdanov, A. A., and Odinets, V. A.

TITLE: Synthesis of liquid 1,n-hexamethyl-poly(phenyl-ethyl)-methyl siloxanes and investigation of their properties

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 9, 1961, 1615-1624

TEXT: The lowest-molecular members of the polymerhomologous series of 1,n-hexamethyl-poly(phenyl-ethyl)-methyl siloxanes were synthesized and their properties studied. The work was undertaken to study the dependence of the polar properties of these liquid organo-silicon polymers on various polar substituents at the benzene ring. The polar properties were studied on the basis of the activation energy of viscous flow and the temperature dependence of the viscosity. The flowing initial substances were used for the synthesis: (phenyl-ethyl)-methyl-dichloro silane $(C_6H_5C_2H_4(CH_3)SiCl_2$, b.p. 90°-92°C (5 mm Hg)), (tolyl-ethyl)-methyl-dichloro silane $(CH_3C_6H_4C_2H_4(CH_3)SiCl_2$, b.p. 103°-105°C (2 mm Hg), (chloro-

Card 1/6

Chloromethylation of Aryl-aliphatic Disiloxanes. Synthesis of Chloromethylbenzyldimethylchlorosilane and its Derivatives

SOV/20-130-1-20/69

yields. The end product obtained had all properties of the alkylchlorosilane halides. By hydrolysis with water, it readily forms the disiloxane. Bis-(chloromethylbenzyl)-tetramethyldisiloxane was isolated as a consequence of this reaction (see Scheme). By the action of potassium acetate on this latter substance in acetic medium, bis-(acetoxymethylbenzyl)-tetramethyldisiloxane was formed. On hydrolysis of the latter compound, the acetate group is split off. In the first stage, bis-(oxymethylbenzyl)-tetramethyldisiloxane develops which afterwards decomposes by the catalytic action of the alkali during distillation. Toluyl methanol and polydimethylsiloxanes with functional end groups as shown in the scheme are probably formed. Table 1 shows the properties of the substances synthesized. A. V. Topchiyev and N. S. Nametkin are mentioned in the paper. There are 1 table and 8 references, 5 of which are Soviet.

SUBMITTED: September 30, 1959

Card 2/2

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SOV/20-130-1-20/69

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AUTHORS: Andrianov, K. A., Corresponding Member AS USSR, Zhdanov, A. A., Odinets, V. A.

TITLE: Chloromethylation of Aryl-aliphatic Disiloxanes. Synthesis of Chloromethylbenzyldimethylchlorosilane and Its Derivatives

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 1, pp 75-78 (USSR)

ABSTRACT: The authors proved that the chloromethylation of the benzyl group bound to silicon can be successfully used for the synthesis mentioned in the subtitle (see Scheme). This reaction proceeds well in fuming hydrochloric acid. Paraform is used as an agent of chloromethylation. The chloromethylation in the presence of zinc chloride is accompanied by secondary processes. They form viscous, nondistillable products containing diphenyl-methane groups (see Scheme). The isolation of pure chloromethylbenzyldimethylchlorosilane from the reaction mixture was attained by hydrolysis with excess water while the disiloxane mixture was split by strong sulfuric acid in the presence of ammonium chloride (see Scheme). The total yield in chloromethylbenzyldimethylchlorosilane was 60% of the benzyldimethylchlorosilane reacted, and 30% of the quantity used respectively. Direct fractionation of the chloromethylation products purified with water in the vacuum delivered smaller

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disiloxane was precipitated (40%). It forms easily the dinitrophenylhydrazone which contains 11.44 % nitrogen, and thus indicates the presence of two ketone groups in the molecule of the synthesized compound. The molecular refraction of this siloxane was found to be 4 units higher than that of E. Warrick (Ref 6), (A. D. Petrov (Ref 5) found it to be higher by two units in 4-substituted silanes with one group). The data obtained show that the acylation of benzyldimethylchlorosilane is also possible with the anhydrides of the dicarboxylic acids and the acid chlorides of the monocarboxylic acids without a noticeable destruction of the compounds taking part in the reaction under the influence of hydrogen chloride. The properties of the compounds obtained are given in the table. There are 1 table and 7 references, 4 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: July 11, 1958

SOV/79-29-8-57/81

5(3)
AUTHORS: Andrianov, K. A., Odinets, V. A., Zhdanov, A. A.

TITLE: On the Acylation Reaction of the Aryl Aliphatic Disiloxanes. II. Synthesis of Silicon-organic Aromatic Ketones and Difunctional Ketocarboxylic Acids

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2702 - 2706 (USSR)

ABSTRACT: As the authors showed in a previous paper (Ref 1), benzyldimethylchlorosilane easily reacts with acetic anhydride in the presence of $AlCl_3$ while bis-(4-acetobenzyl)-tetramethyldisiloxane is formed with a yield of 50%. In the present paper this reaction was used in the synthesis of silicon dicarboxylic acid and aromatic ketones. Benzyldimethylchlorosilane and the acylating compounds (succinic acid - phthalic anhydride and benzoylchloride) were used as a basis (Scheme 1). By means of the reaction the best yield was achieved in a benzene medium (50-60%). The acylation of benzyldimethylchlorosilane with benzoylchloride leads to the aromatic diketone according to scheme 2. Bis-(benzoylbenzyl)-tetramethyl-

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On the Reaction of Acylation of Arylaliphatic Disiloxanes. Synthesis of Bis-(4,4'-Acetobenzyl)-tetramethyl-disiloxane

SOV/79-29-3-21/75

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: April 3, 1958

Card 3/3

disiloxane has the properties of aliphatic-aromatic ketones and forms the dinitro-phenyl hydrazone in which case the reaction proseeds via both carbonyl groups. On oxidation of the bis-(acetobenzyl)-tetramethyl-disiloxane with sodium hypobromide in alkali the toluic acid is formed which was identified in the form of its methyl ester. A comparatively easy separation of the benzyl carboxy-group is connected with the displacement of the reactivity in the system of the conjugated nuclear bonds. In consequence of it a decrease of the electron density on the silicon nucleus and subsequent rupture of the Si-C-bond takes place under the influence of nucleophilic agents. When using alkaline potassium solution, the oxidation is complete and terephthalic acid is formed. The formation of the p-toluic and terephthalic acid indicates that the aceto-group comes into para-position with respect to the methylene group during the Friedel-Crafts reaction. Properties of the compounds synthesized are given in the table. There are 1 table and 6 references, 4 of which are Soviet.

5 (3)

AUTHORS: Andrianov, K. A., Odinets, V. A., Zhdanov, A. A., SOV/79-29-5-21/75

TITLE: On the Reaction of Acylation of Arylaliphatic Disiloxanes (O reaktsii atsilirovaniya arilalifaticheskikh disiloksanov). Synthesis of Bis-(4,4'-Acetobenzyl)-tetramethyl-disiloxane (Sintez bis-(4,4'-atsetobenzil)-tetrametildisiloksana)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1499-1503 (USSR)

ABSTRACT: The authors concluded from the formation of benzyl methyl chloro-silanes and acylation of benzyl-trimethyl silane that the Friedel-Crafts reaction may be successfully applied to the synthesis of various benzyl siloxane derivatives in which the aromatic nucleus is separated from the silicon atom by the methylene group. Experiments indicated that benzyl-dimethyl-chloro-silane is not destroyed in the presence of aluminum chloride and can be used as initial product for the synthesis of bis-(acetobenzyl)-tetramethyl-disiloxane. The benzyl-dimethyl-chloro silane was prepared according to the Grignard reaction from dimethyl-dichloro-silane and benzyl magnesium chloride. The synthetic bis-(acetobenzyl)-tetramethyl-

structure requires very high temperatures (Ref 7). Consequently the stability of the polymers obtained by hydrolysis of phenyl- and chlorophenyl-trichlorosilanes against is, contrary to thermal conversions, determined by steric cycles. There are 3 tables and 7 references, 3 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: June 25, 1957

an average polymerization degree of n = 5. Irrespective of the small melting range, they possess a considerable polydispersion. This might be the cause of the difficult separation of crystalline products from polychloro phenyl siloxanes. Only in the case of polypentachloro phenyl siloxane 4 crystalline fractions could be separated. These individual crystalline polymers have a steric-cyclic structure $(Cl_5C_6SiO_{1,5})_n$. Cyclic products not only of steric but also of planar structure are probably formed there. The thermoplastic proportion of the polymers obtained on hydrolysis of phenyl- and chloro phenyl-trichloro silanes in the case of water excess are due to the formation of cyclic products of steric structure. Such cyclic products have no functional groups and can therefore be transformed into builtup or builtup-steric higher polymer structures by opening of the cycles only. As was shown by the thermal aging of the polyorganosiloxanes obtained from trifunctional monomers, the breaking of the

$$-\overset{|}{\underset{|}{Si}}-O$$

bond in polymers possessing chain links of $(RSiO_{1,5})_n$-

5(3)
AUTHORS: Andrianov, K. A., Odinets, V. A. SOV/62-59-3-12/37

TITLE: On the Reaction of Chloro Phenyltrichloro Silane Hydrolysis in Aqueous Media (O reaktsii gidroliza khlorfeniltrikhlorsilanov v vodnykh sredakh)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 3, pp 460-465 (USSR)

ABSTRACT: In the present paper the hydrolysis of chloro phenyl-trichloro silanes in aqueous media at 36-38° was investigated. In all experiments solid, brittle polymers were obtained which are easily soluble in organic solvents and possess distinctly marked melting points. After long heating at 200° they retain their thermoplastic properties and good solubility. The analysis of the polymers obtained with regard to the functional groups indicated the absence of chlorine and the hydroxyl groups combined with the silicon atoms. X-ray investigations revealed the occurrence of a crystalline phase. The polymers melt within a small temperature range which is typical of crystalline substances (Table 1). On the basis of analytical data and the determination of the molecular weight the polychloro phenyl siloxanes obtained represent polymers with

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ANDRIANOV, K.A.; ZHDANOV, A.A.; ODINETS, V.A.

Condensation of silicon organic dicarboxylic keto acids with glycol. Vysokom.soed. 1 no.5:704-710 My '59.
(MIRA 12:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Glycols) (Silicon organic compounds)

ODINETS, V. A.

L. M. Volkova, K. A. Andrianov, G. Ye. Golubkov, L. N. Makarova, and V. A. Odinets, "The Introduction of Polar Groups into Organic Radical at the Silicon Atom."

Report presented at the Second All-Union Conference on the Chemistry and Practical Application of Silicon-Organic Compounds held in Leningrad from 25-27 September 1958.
Zhurnal prikladnoy khimii, 1959, Nr 1, pp 238-240 (USSR)

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 950

Abstract: 70-80° over 10-15 hours. The following I have been prepared (the value of n, the position of Cl in the nucleus, bp in ° C/mm, and d_{20}^{20} are given in that order): 1, 3 (IV), 90-95/10, 1.4102; 2, 1, 3, 105-110/10, 1.4801; 3, 1, 3, 5, 123-125/10, 1.5530; 4, 1, 2, 3, 5, 135-137/10, 1.6210; 5, 1, 2, 3, 4, 5, 147-150/10, --. To one gram-atom of Mg turnings, heated to 36-38°, add dropwise 20 gms C_2H_5Br at 38-40°; after initiation of the reaction, add one mole of C_2H_5Br, and 100 gms toluene. Heat 2 hours at 70-80°, filter and distill; III is obtained. A similar method can be used in the preparation of the remaining compounds of the type II.

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ODINETS V.A.

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 950

Author: Andrianov, K. A., and Odinets, V. A.

Institution: Academy of Sciences USSR

Title: Synthesis of Chlorophenylethyldichlorosilanes

Original Periodical: Azv. AN SSSR, Section on Chemical Sciences, 1956, No 4, 457-460

Abstract: The reaction of $Cl_nC_6H_{5-n}SiCl_3$ (I) with C_2H_5MgBr yields compounds of the type $Cl_nC_6H_{5-n}(C_2H_5)SiCl_2$ (II); of the latter the following have been prepared (the value of n, the position of Cl in the benzene nucleus, the yield in percent, bp in ° C/mm, n_D^{20}, and d_4^{20} are given in that order): 1, 3 (III), 70.3, 116-118.7, 1.5270, 1.2947; 2, 1, 3, 53.7, 130-132/10, 1.5450, 1.4381; 3, 1, 3, 5, 41, 142-144/12, 1.5481, 1.4921; 4, 1, 2, 3, 5, 30, 123-125/3, 1.5618, 1.5396; 5, 1, 2, 3, 4, 5, 23, 145-147/3, 1.5650, 1.5996. The starting I are obtained by the chlorination of one mole of $C_6H_5SiCl_3$ in the presence of anhydrous $FeCl_3$ (0.5 weight percent based on the chloride) at

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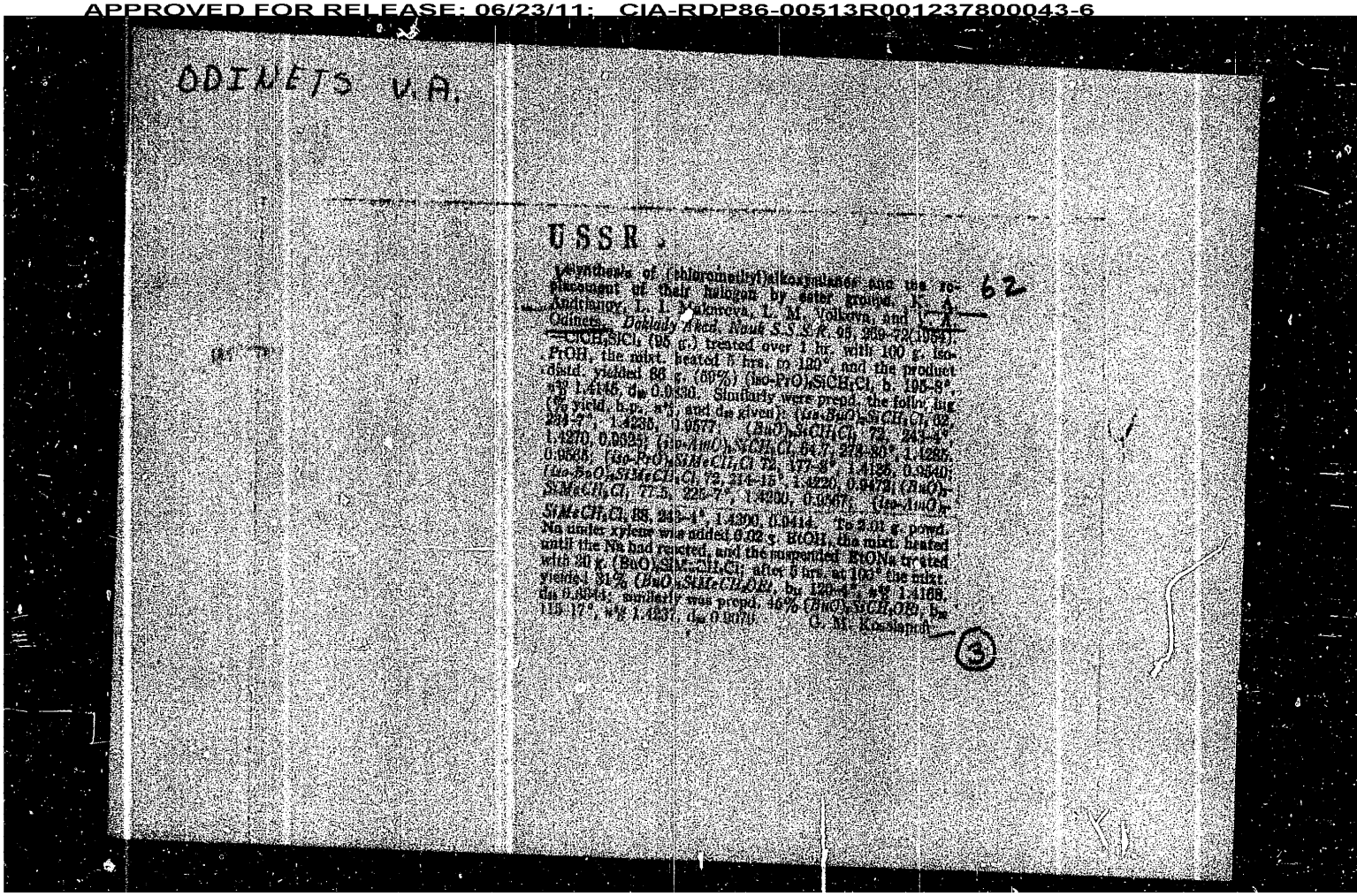

ODINETS V.A.

USSR

Synthesis of (chloromethyl)alkoxysilanes and the replacement of their halogen by ester groups. K. A. Andrianov, L. I. Yakimova, I. M. Volkova, and [illegible] Odinets. *Doklady Akad. Nauk S.S.S.R.* 98, 269-72(1954). —$ClCH_2SiCl_3$ (95 g.) treated over 1 hr. with 100 g. iso-PrOH, the mixt. heated 8 hrs. to 120°, and the product distd. yielded 86 g. (69%) $(iso\text{-}PrO)_3SiCH_2Cl$, b. 105-8°, n_D^{20} 1.4146, d_4^{20} 0.9930. Similarly were prepd. the following (% yield, b.p., n_D^t, and d_4^t given): $(iso\text{-}BuO)_3SiCH_2Cl$, 62, 249-2°, 1.4288, 0.9577; $(BuO)_3SiCH_2Cl$, 72, 243-4°, 1.4270, 0.9825; $(iso\text{-}AmO)_3SiCH_2Cl$, 64, 270-80°, 1.4285, 0.9588; $(iso\text{-}PrO)_2SiMeCH_2Cl$, 72, 177-8°, 1.4126, 0.9340; $(iso\text{-}BuO)_2SiMeCH_2Cl$, 72, 214-15°, 1.4220, 0.9479; $(BuO)_2SiMeCH_2Cl$, 77.5, 225-7°, 1.4280, 0.9567; $(iso\text{-}AmO)_2SiMeCH_2Cl$, 85, 243-4°, 1.4300, 0.9414. To 3 gm. g. powd. Na under xylene was added 9.02 g. BuOH, the mixt. heated until the Na had reacted, and the suspended $BuONa$ treated with 20 g. $(BuO)_2SiMeCH_2Cl$; after 8 hrs. at 103° the mixt. yielded 91% $(BuO)_2SiMeCH_2OBu$, bp 120-4°, n_D^{20} 1.4188, d_4^{20} 0.8944; similarly was prepd. 46% $(BuO)_3SiCH_2OBu$, bp 115-17°, n_D^{20} 1.4231, d_4^{20} 0.9078. G. M. Kosolapoff

ODINETS, R.N., otv. red.

[Trace elements in animal husbandry and plant culture]
Mikroelementy v zhivotnovodstve i rastenievodstve.
Frunze, Izd-vo "Ilim," 1964. 102 p. (MIRA 18:2)

1. Akademiya nauk Kirgizskoy SSR, Frunze. Institut biokhimii i fiziologii.

ODINETS, R.N., ILIBEZOVA, YE.P. (USSR)

"Some Questions of Strontium Metabolism in Sheep."

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

ODINETS, R.N.

"Precursors" of fat in cow's milk. Dokl. AN Tadzh.SSR.no.15:77-81 '56. (MLRA 9:10)

1. Institut zoologii i parazitologii AN Kirgizskoy SSR.
(Milk--Composition)

11F

CA ODINETS, R. N.

Sulfur and nitrogen metabolism in pregnant sheep. V. G. Yakovlev, R. N. Odinets, G. N. Ozerova, and K. I. Kanygina. *Doklady Akad. Nauk S.S.S.R.* 74, 991–4 (1950).—When pregnant sheep are fed 50 g. keratin (from wool hydrolysis) instead of 70 g. linseed cake in the diet, a somewhat higher (than control) yield of wool is obtained from the animals on shearing and indications of better S assimilation are obtained. However, the control groups show better degree of deposition of S in the organism.
G. M. Kosolapoff

ODINETS, P.L.

Method of producing conditioned reflexes for the study of the vestibular apparatus. Fiziol. zh. SSSR 39 no.3:367-373 May-June 1953.
(CLML 25:1)

1. Department of Comparative Physiology and Pathology of Higher Nervous Activity of the Institute of Experimental Medicine of the Academy of Medical Sciences USSR.

Characteristics of Behaviour of Sulphur of Irkutsk Coals During Their Separation in Heavy Liquids.

phur in this type of coal is less thermostable. There are 3 Figures, 5 Tables and 8 Soviet References.

ASSOCIATION: Irkutskiy gosudarstvennyy universitet (Irkutsk State University)

Characteristics of Behaviour of Sulphur of Irkutsk Coals During Their Separation by Heavy Liquids

when there is either a very small quantity or no mineral sulphur in the coal (fractions 1.26 - 1.24 and 1.26). Separation of organic sulphur in the presence of large quantities of mineral sulphur is very difficult. Similar observations were made by E. S. Krym et al. (Ref.7) who tested coals from the Donets basin, and by L. P. Ukhov (Ref. 8) during the semi-coking of Kiselevskiye coals. The content of organic sulphur increases slightly in semi-coke. This can be explained by the sharp decrease in the mineral sulphur content and the formation of a considerable quantity of decomposition products of mineral sulphur compounds. This could not be observed during the semi-coking of the 1.40 fraction of Delyurskiy coal because these contain a much smaller quantity of mineral sulphur. It was also found that the organic sul-

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Characteristics of Behaviour of Sulphur of Irkutsk Coals During Their Separation in Heavy Liquids

1.35, 1.30, 1.28, 1.26, 1.25, 1.24. In this way, for each type of coal a number of fractions with different quantitative yields were prepared. Percentage yields of these fractions are given in Table 4, and results of the separations in Fig.1. The area of each figure represents the total of the yields of all fractions. Reasons for the variations in the yields of the fractions are stated (when taking into account their equal degree of metamorphosis and identical petrographic structure). Further investigations concern fractions with anomalous content of mineral and organic sulphur. The different forms of sulphur and ash were determined in all fractions (Table 4). Results were given in the form of a graph (Fig.2). The fraction 1.40 - 1.25 and 1.24 of Vladimir' coal were of greatest interest because in these fractions the ratio of the mineral to the organic sulphur differed to a large degree from the ratio in the starting material. Results obtained during the semi-coking and coking of these fractions, and when analysing the sulphur content in the solid products, are given in Table 5. The organic sulphur is separated completely