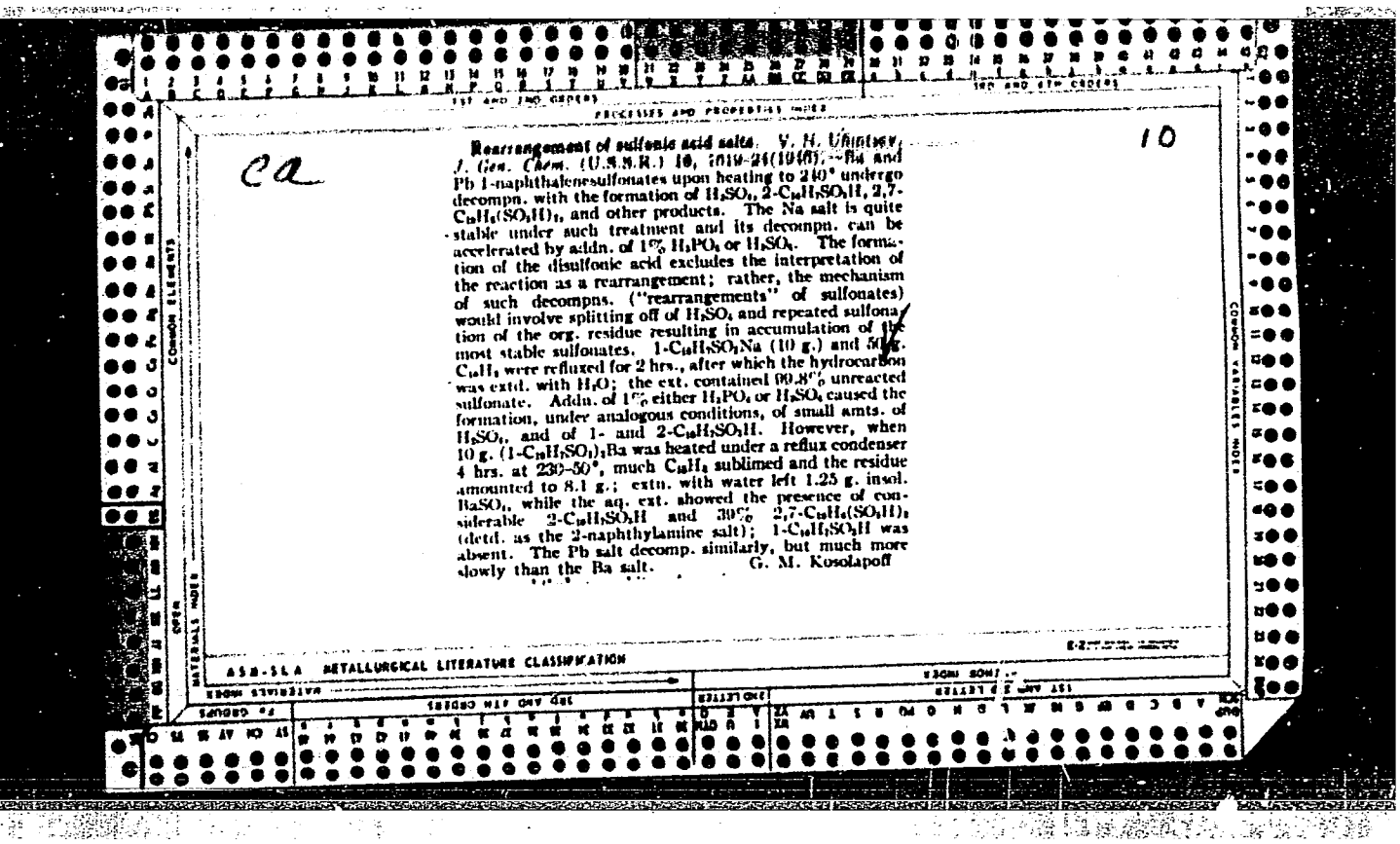
UFINTZEV, V. N.

"On the Action of Potassium Hydroxide on 2-Methyl-1,4-Naphtoquinone-3-Sulphonic Acid." On the Mechanism of the Action of Vitamin K." by V N Ufintzev (p. 1024)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 7



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Rearrangement of sulfonic acid salts. V. N. Ufimtsev, *J. Gen. Chem.* (U.S.S.R.) 10, 1019–24(1940).—Ba and Pb 1-naphthalenesulfonates upon heating to 240° undergo decompn. with the formation of H_2SO_4, 2-$C_{10}H_7SO_3H$, 2,7-$C_{10}H_6(SO_3H)_2$, and other products. The Na salt is quite stable under such treatment and its decompn. can be accelerated by addn. of 1% H_3PO_4 or H_2SO_4. The formation of the disulfonic acid excludes the interpretation of the reaction as a rearrangement; rather, the mechanism of such decompns. ("rearrangements" of sulfonates) would involve splitting off of H_2SO_4 and repeated sulfonation of the org. residue resulting in accumulation of the most stable sulfonates. 1-$C_{10}H_7SO_3Na$ (10 g.) and 50 g. $C_{10}H_8$ were refluxed for 2 hrs., after which the hydrocarbon was extd. with H_2O; the ext. contained 99.8% unreacted sulfonate. Addn. of 1% either H_3PO_4 or H_2SO_4 caused the formation, under analogous conditions, of small amts. of H_2SO_4, and of 1- and 2-$C_{10}H_7SO_3H$. However, when 10 g. $(1\text{-}C_{10}H_7SO_3)_2Ba$ was heated under a reflux condenser 4 hrs. at 230–50°, much $C_{10}H_8$ sublimed and the residue amounted to 8.1 g.; extn. with water left 1.25 g. insol. $BaSO_4$, while the aq. ext. showed the presence of considerable 2-$C_{10}H_7SO_3H$ and 30% 2,7-$C_{10}H_6(SO_3H)_2$ (detd. as the 2-naphthylamine salt); 1-$C_{10}H_7SO_3H$ was absent. The Pb salt decomp. similarly, but much more slowly than the Ba salt. G. M. Kosolapoff

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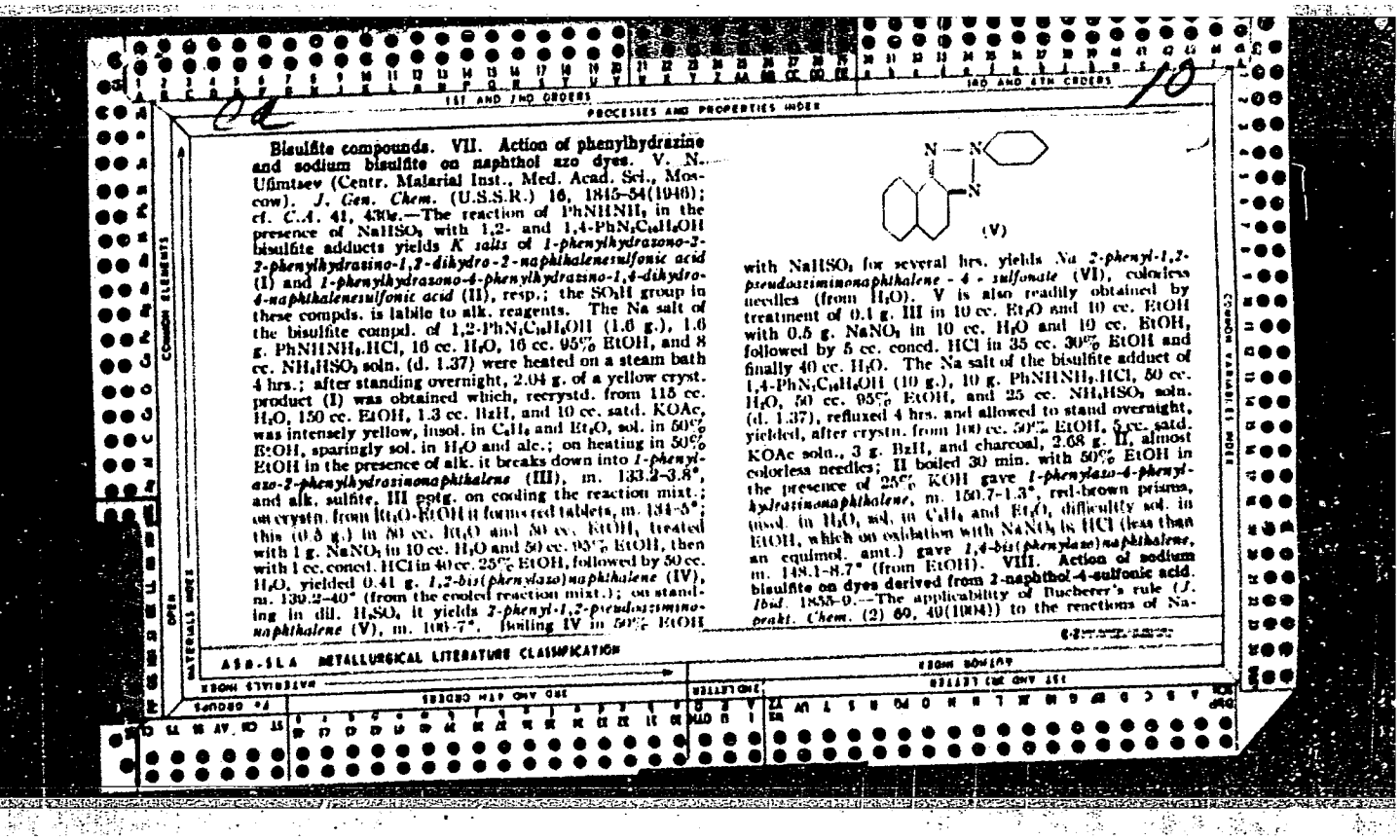

PROCESSES AND PROPERTIES INDEX

Bisulfite compounds. VII. Action of phenylhydrazine and sodium bisulfite on naphthol azo dyes. V. N. Ufimtsev (Centr. Malarial Inst., Med. Acad. Sci., Moscow). *J. Gen. Chem.* (U.S.S.R.) 16, 1845–54(1946); cf. *C.A.* 41, 4386e.—The reaction of $PhNHNH_2$ in the presence of $NaHSO_3$ with 1,2- and 1,4-$PhN_2C_{10}H_6OH$ bisulfite adducts yields *K salts* of *1-phenylhydrazono-2-2-phenylhydrazino-1,2-dihydro-2-naphthalenesulfonic acid* (I) and *1-phenylhydrazono-4-phenylhydrazino-1,4-dihydro-4-naphthalenesulfonic acid* (II), resp.; the SO_3H group in these compds. is labile to alk. reagents. The Na salt of the bisulfite compd. of 1,2-$PhN_2C_{10}H_6OH$ (1.6 g.), 1.6 g. $PhNHNH_2.HCl$, 16 cc. H_2O, 16 cc. 95% EtOH, and 8 cc. NH_4HSO_3 soln. (d. 1.37) were heated on a steam bath 4 hrs.; after standing overnight, 2.04 g. of a yellow cryst. product (I) was obtained which, recrystd. from 115 cc. H_2O, 150 cc. EtOH, 1.3 cc. BzH, and 10 cc. satd. KOAc, was intensely yellow, insol. in C_6H_6 and Et_2O, sol. in 50% EtOH, sparingly sol. in H_2O and alc.; on heating in 50% EtOH in the presence of alk. it breaks down into *1-phenylazo-2-phenylhydrazinonaphthalene* (III), m. 133.2–3.8°, and alk. sulfite. III pptg. on cooling the reaction mixt.; on crystn. from Et_2O-EtOH it formed tablets, m. 134–5°; this (0.5 g.) in 50 cc. H_2O and 50 cc. EtOH, treated with 1 g. $NaNO_2$ in 10 cc. H_2O and 50 cc. 95% EtOH, then with 1 cc. concd. HCl in 40 cc. 25% EtOH, followed by 50 cc. H_2O, yielded 0.41 g. *1,2-bis(phenylazo)naphthalene* (IV), m. 139.2–40° (from the cooled reaction mixt.); on standing in dil. H_2SO_4 it yields *2-phenyl-1,2-pseudoazoiminonaphthalene* (V), m. 106–7°. Boiling IV in 50% EtOH

(V)

with $NaHSO_3$ for several hrs. yields *Na 2-phenyl-1,2-pseudoazoiminonaphthalene-4-sulfonate* (VI), colorless needles (from H_2O). V is also readily obtained by treatment of 0.1 g. III in 10 cc. Et_2O and 10 cc. EtOH with 0.5 g. $NaNO_2$ in 10 cc. H_2O and 10 cc. EtOH, followed by 5 cc. concd. HCl in 35 cc. 30% EtOH and finally 40 cc. H_2O. The Na salt of the bisulfite adduct of 1,4-$PhN_2C_{10}H_6OH$ (10 g.), 10 g. $PhNHNH_2.HCl$, 50 cc. H_2O, 50 cc. 95% EtOH, and 25 cc. NH_4HSO_3 soln. (d. 1.37), refluxed 4 hrs. and allowed to stand overnight, yielded, after crystn. from 100 cc. 50% EtOH, 5 cc. satd. KOAc soln., 3 g. BzH, and charcoal, 2.68 g. II, almost colorless needles; II boiled 30 min. with 50% EtOH in the presence of 25% KOH gave *1-phenylazo-4-phenylhydrazinonaphthalene*, m. 150.7–1.3°, red-brown prisms, insol. in H_2O, sol. in C_6H_6 and Et_2O, difficultly sol. in EtOH, which on oxidation with $NaNO_2$ in HCl (less than an equimol. amt.) gave *1,4-bis(phenylazo)naphthalene*, m. 148.1–8.7° (from EtOH). VIII. **Action of sodium bisulfite on dyes derived from 2-naphthol-4-sulfonic acid. bisulfite on dyes derived from 2-naphthol-4-sulfonic acid.** Bucherer's rule (*J. Ibid.* 1855–9.—The applicability of Bucherer's rule to the reactions of Na-

HSO_3 with the coupling products of 2,4-$HOC_{10}H_6SO_3H$ (I) with diazotized $PhNH_2$, sulfanilic acid, *p*-phenetidine, and naphthionic acid was tested. The *di-K salt of 1-(4-sulfophenylazo)-2-naphthol-4-sulfonic acid* (II) was prepd. by coupling sulfanilic acid with the K salt of I analogously to the prepn. of Orange II, isolated by salting out with KCl, and purified by soln. of 30 g. in 200–300 cc. H_2O with 8 g. KOH, followed by addn. of 15 cc. 80% AcOH. II (1 g.) in 20 cc. hot H_2O was treated with 10 cc. $NaHSO_3$ soln. (d. 1.32); after 20 min. reduction was complete, and the cooled soln., acidified with 10 cc. concd. HCl, yielded 0.02 g. 1-amino-2-naphthol-4-sulfonic acid; the filtrate, after boiling 30 min. and cooling in ice, gave an addnl. 0.306 g., for a total yield of 85%. II (10 g.) in 200 cc. boiling water was treated with 50 cc. $NaHSO_3$ soln. (d. 1.32) and boiled 0.5 hr., then neutralized with 30% NaOH to a weakly alk. reaction; the inorg. salts were sepd. by concn. and pptn. with EtOH; the mother liquor was treated with 5 cc. 15% $Ba(OAc)_2$, filtered, and the filtrate evapd. to dryness to yield 0.82 g. *Na K 1-amino-2-naphthol-N,4-disulfonate* as a yellowish micro-cryst. powder, purified by crystn. from 85% EtOH, when it seps. as a *dihydrate*. When this salt (0.37 g.) is heated on a water bath in 10 cc. H_2O with 1 cc. concd. HCl 10 min. it yields 91% *1-amino-2-naphthol-4-sulfonic acid* on cooling. Qual. expts. with the remaining azo compds. (mentioned above) showed a similar ease of cleavage at he azo group under the influence of hot $NaHSO_3$ solns. The sulfanilic acid deriv. was the only one subjected to the detailed study because of the relative ease of purifications involved. One of the striking qual. characteristics of the reaction is the rapid decolorization of the hot solns. with $NaHSO_3$; in the 1st few min. it is still possible to detect small amts. of the bisulfite compd. by a drop test with NaOH soln. (orange color changes to red), but this amt. is very minute and yields neg. results by the usual Bucherer-Ullmann test (alternate boiling in acid, NaOH, and again acid). The reduction also proceeds in the cold, but is much slower than in boiling solns. The slowness of the crystn. of the reduction product in the cold, in comparison with the isolation from hot soln., shows that the primary reduction product is the sulfoamino acid, which then breaks down to the amino acid. Such sulfoamino compds. may form in many other instances of bisulfite treatments of azo dyes, but are overlooked because of the ease of hydrolysis.

G. M. Kosolapoff

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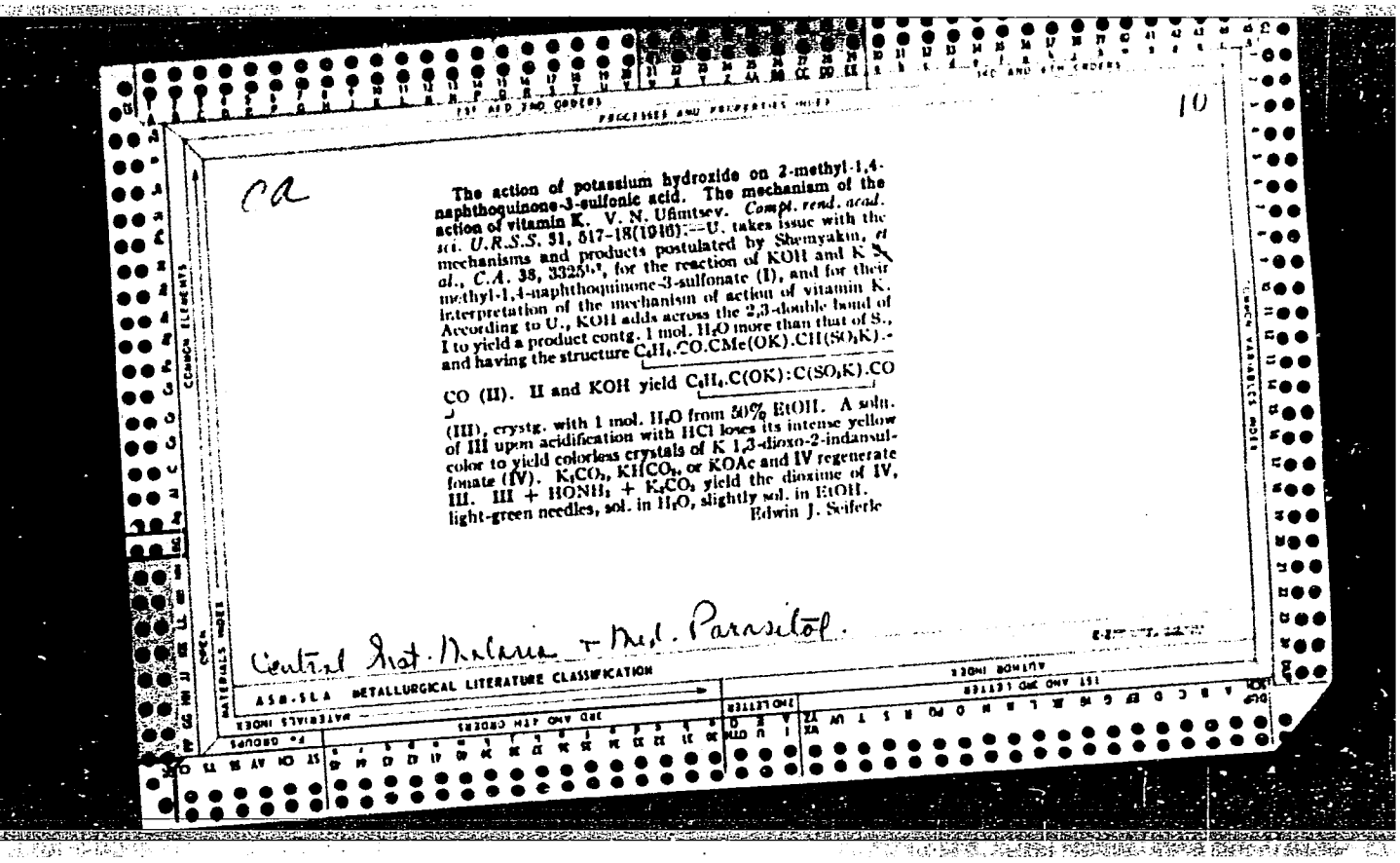

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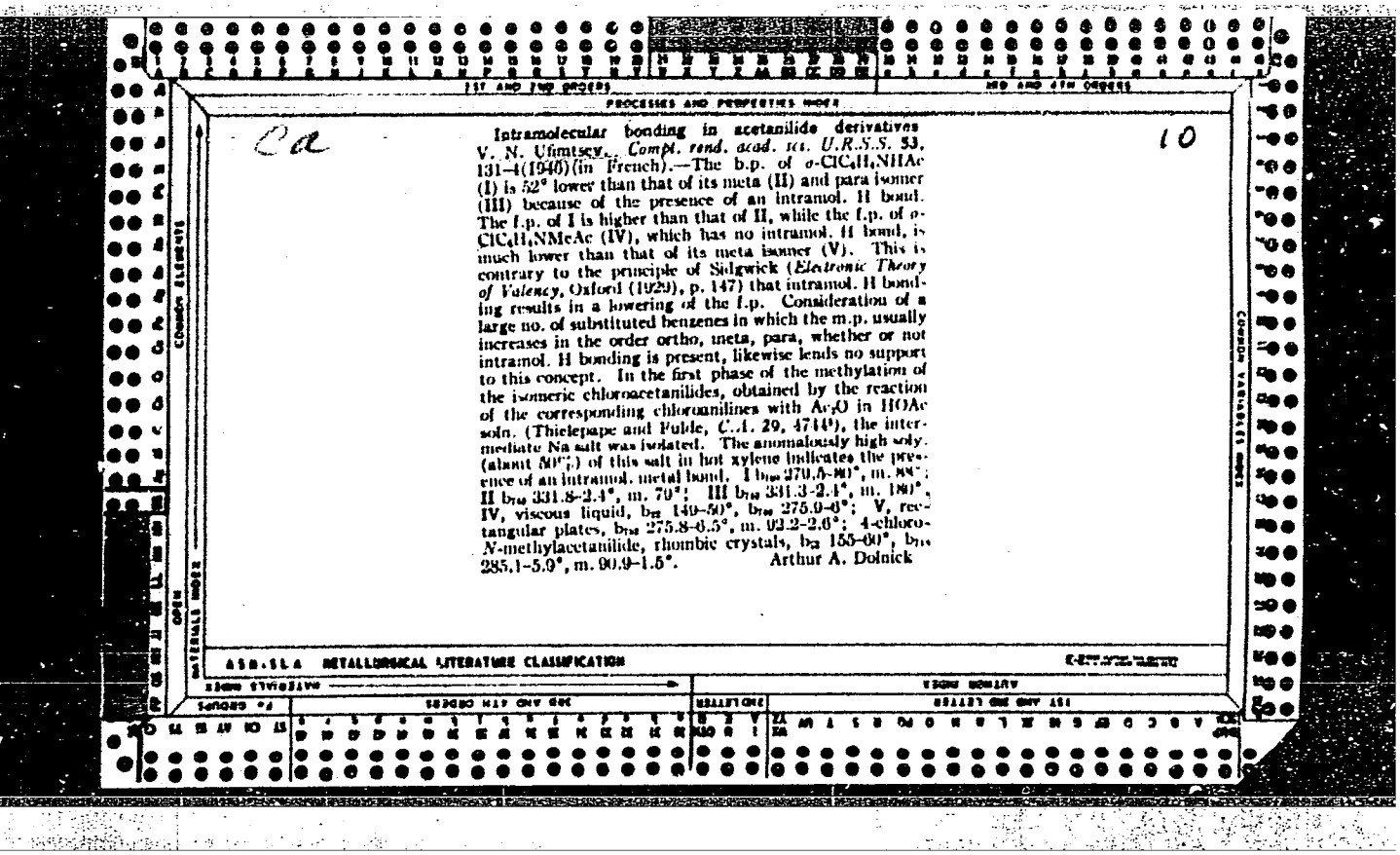
The action of potassium hydroxide on 2-methyl-1,4-naphthoquinone-3-sulfonic acid. The mechanism of the action of vitamin K. V. N. Ufimtsev. *Compt. rend. acad. sci. U.R.S.S.* 51, 517-18(1946).—U. takes issue with the mechanisms and products postulated by Shemyakin, *et al.*, *C.A.* 38, 3325[6], for the reaction of KOH and K 2-methyl-1,4-naphthoquinone-3-sulfonate (I), and for their interpretation of the mechanism of action of vitamin K. According to U., KOH adds across the 2,3-double bond of I to yield a product contg. 1 mol. H_2O more than that of S., and having the structure $C_6H_4.CO.CMe(OK).CH(SO_3K).CO$ (II). II and KOH yield $C_6H_4.C(OK):C(SO_3K).CO$ (III), crystg. with 1 mol. H_2O from 50% EtOH. A soln. of III upon acidification with HCl loses its intense yellow color to yield colorless crystals of K 1,3-dioxo-2-indansulfonate (IV). K_2CO_3, $KHCO_3$, or KOAc and IV regenerate III. III + $HONH_2$ + K_2CO_3 yield the dioxime of IV, light-green needles, sol. in H_2O, slightly sol. in EtOH.

Edwin J. Seiferle

Central Inst. Malaria + Med. Parasitol.



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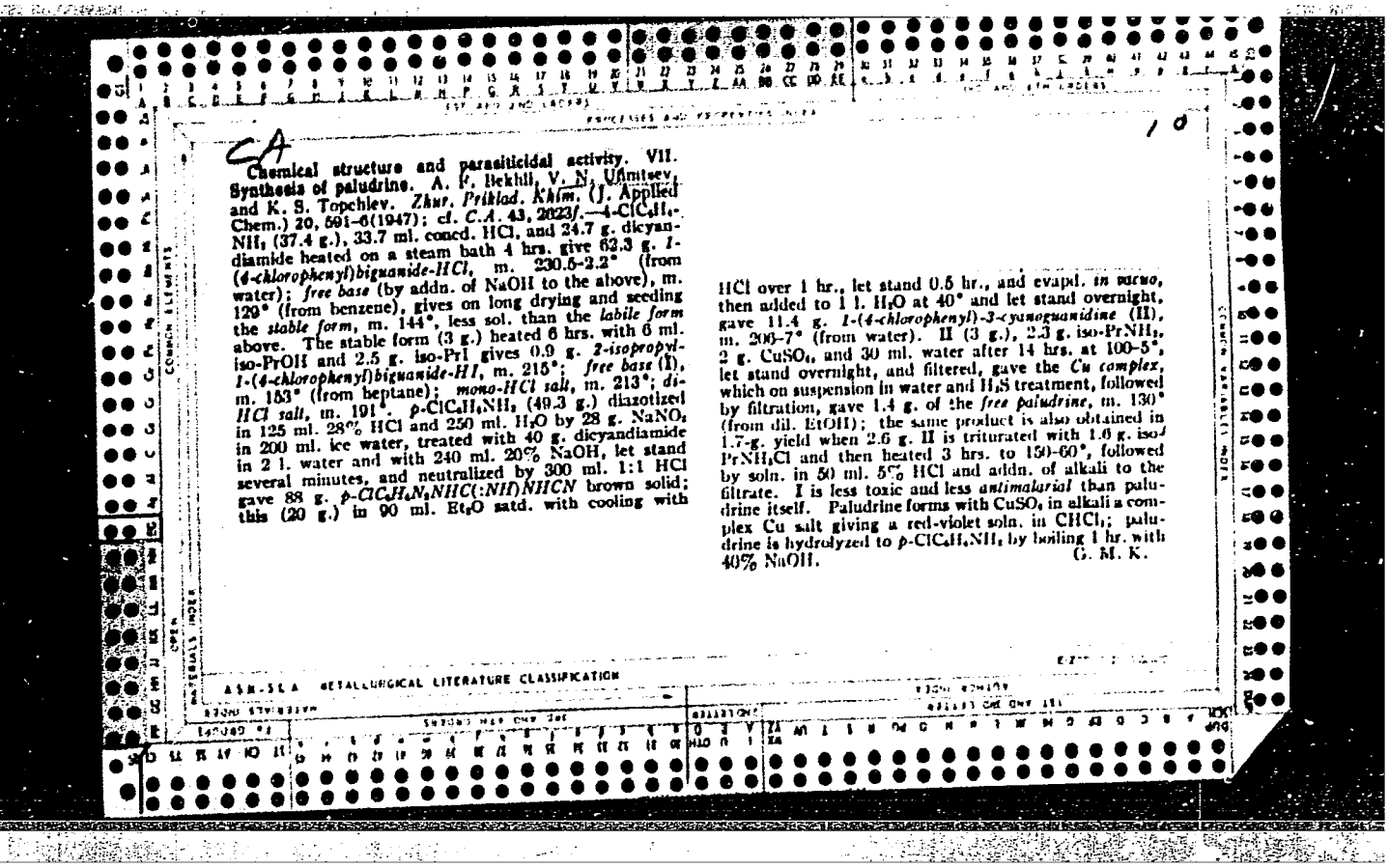
Intramolecular bonding in acetanilide derivatives V. N. Ufimtsev. *Compt. rend. acad. sci. U.R.S.S.* 53, 131–4(1940)(in French).—The b.p. of *o*-ClC_6H_4NHAc (I) is 52° lower than that of its meta (II) and para isomer (III) because of the presence of an intramol. H bond. The f.p. of I is higher than that of II, while the f.p. of *o*-ClC_6H_4NMeAc (IV), which has no intramol. H bond, is much lower than that of its meta isomer (V). This is contrary to the principle of Sidgwick (*Electronic Theory of Valency*, Oxford (1929), p. 147) that intramol. H bonding results in a lowering of the f.p. Consideration of a large no. of substituted benzenes in which the m.p. usually increases in the order ortho, meta, para, whether or not intramol. H bonding is present, likewise lends no support to this concept. In the first phase of the methylation of the isomeric chloroacetanilides, obtained by the reaction of the corresponding chloroanilines with Ac_2O in HOAc soln. (Thielepape and Pulde, *C.A.* 29, 4744), the intermediate Na salt was isolated. The anomalously high solv. (about 50%) of this salt in hot xylene indicates the presence of an intramol. metal bond. I b_{760} 270.5–80°, m. 88°; II b_{760} 331.8–2.4°, m. 79°; III b_{760} 331.3–2.1°, m. 180°; IV, viscous liquid, b_{23} 140–50°, b_{760} 275.9–6°; V, rectangular plates, b_{23} 275.8–6.5°, m. 93.2–2.6°; 4-chloro-*N*-methylacetanilide, rhombic crystals, b_{23} 155–60°, b_{760} 285.1–5.9°, m. 90.9–1.5°. Arthur A. Dolnick



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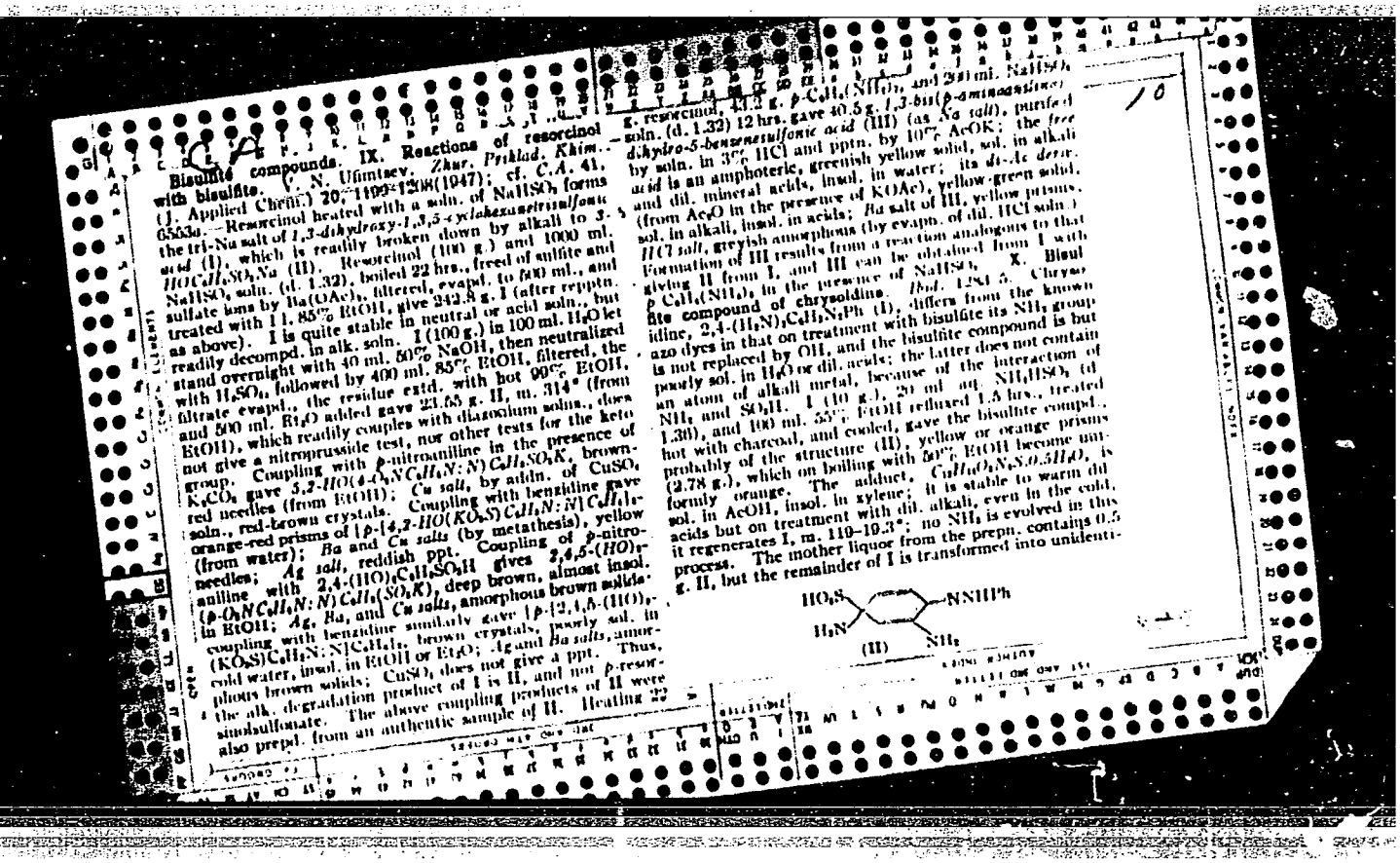
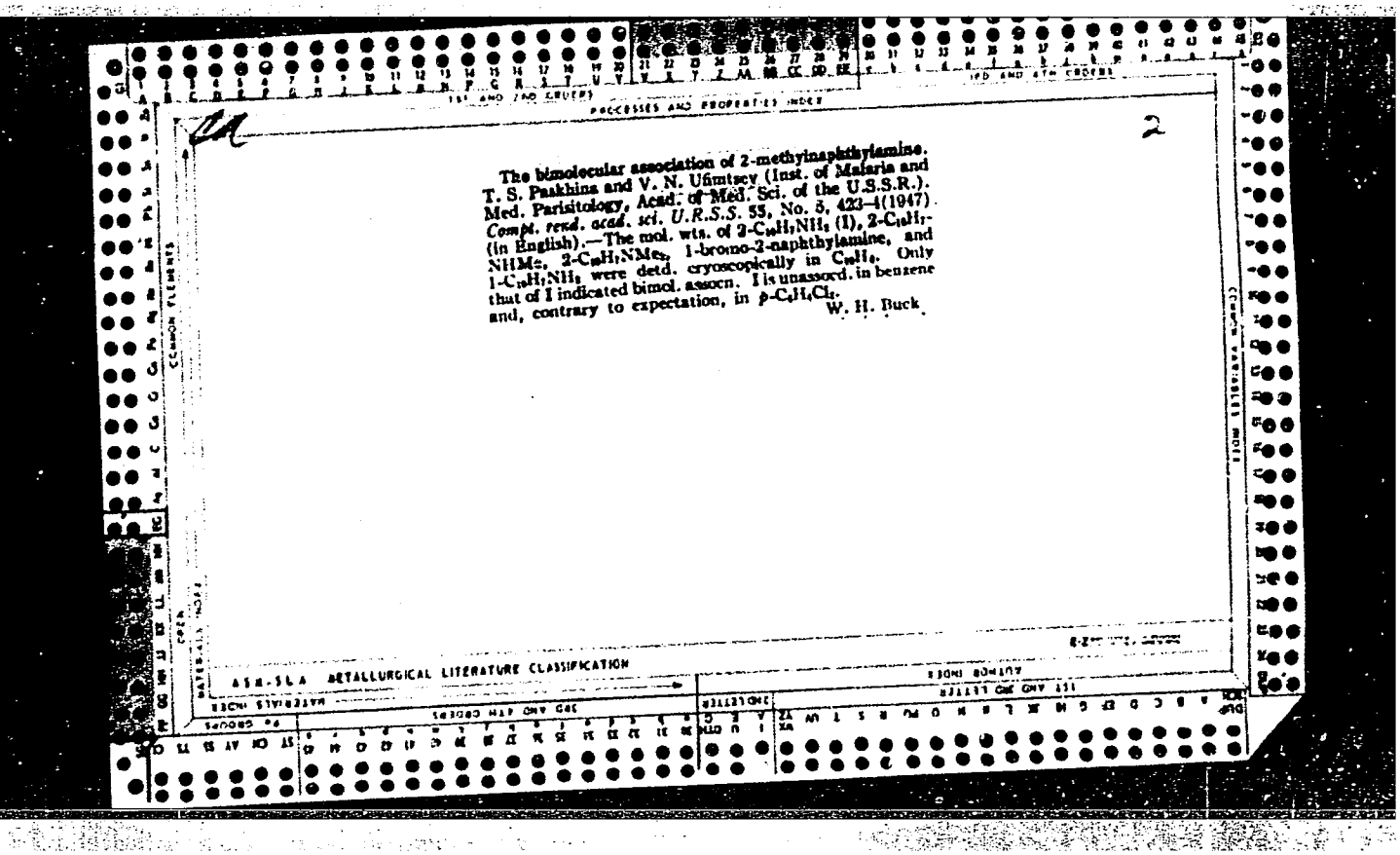
Chemical structure and parasiticidal activity. VII. Synthesis of paludrine. A. P. Bekhli, V. N. Ufimtsev, and K. S. Topchiev. *Zhur. Prikład. Khim.* (J. Applied Chem.) 20, 591–6(1947); cf. *C.A.* 43, 2023*f*.—4-ClC$_6$H$_4$NH$_2$ (37.4 g.), 33.7 ml. concd. HCl, and 24.7 g. dicyandiamide heated on a steam bath 4 hrs. give 62.3 g. *1-(4-chlorophenyl)biguanide-HCl*, m. 230.5–2.2° (from water); *free base* (by addn. of NaOH to the above), m. 129° (from benzene), gives on long drying and seeding the *stable form*, m. 144°, less sol. than the *labile form* above. The stable form (3 g.) heated 6 hrs. with 6 ml. iso-PrOH and 2.5 g. iso-PrI gives 0.9 g. *2-isopropyl-1-(4-chlorophenyl)biguanide-HI*, m. 215°; *free base* (I), m. 153° (from heptane); *mono-HCl salt*, m. 213°; *di-HCl salt*, m. 191°. *p*-ClC$_6$H$_4$NH$_2$ (49.3 g.) diazotized in 125 ml. 28% HCl and 250 ml. H$_2$O by 28 g. NaNO$_2$ in 200 ml. ice water, treated with 40 g. dicyandiamide in 2 l. water and with 240 ml. 20% NaOH, let stand several minutes, and neutralized by 300 ml. 1:1 HCl gave 88 g. *p-ClC$_6$H$_4$N$_5$NHC(:NH)NHCN* brown solid; this (20 g.) in 90 ml. Et$_2$O satd. with cooling with HCl over 1 hr., let stand 0.5 hr., and evapd. *in vacuo*, then added to 1 l. H$_2$O at 40° and let stand overnight, gave 11.4 g. *1-(4-chlorophenyl)-3-cyanoguanidine* (II), m. 200–7° (from water). II (3 g.), 2.3 g. iso-PrNH$_2$, 2 g. CuSO$_4$, and 30 ml. water after 14 hrs. at 100–5°, let stand overnight, and filtered, gave the *Cu complex*, which on suspension in water and H$_2$S treatment, followed by filtration, gave 1.4 g. of the *free paludrine*, m. 130° (from dil. EtOH); the same product is also obtained in 1.7-g. yield when 2.6 g. II is triturated with 1.6 g. iso-PrNH$_3$Cl and then heated 3 hrs. to 150–60°, followed by soln. in 50 ml. 5% HCl and addn. of alkali to the filtrate. I is less toxic and less *antimalarial* than paludrine itself. Paludrine forms with CuSO$_4$ in alkali a complex Cu salt giving a red-violet soln. in CHCl$_3$; paludrine is hydrolyzed to *p*-ClC$_6$H$_4$NH$_2$ by boiling 1 hr. with 40% NaOH. G. M. K.



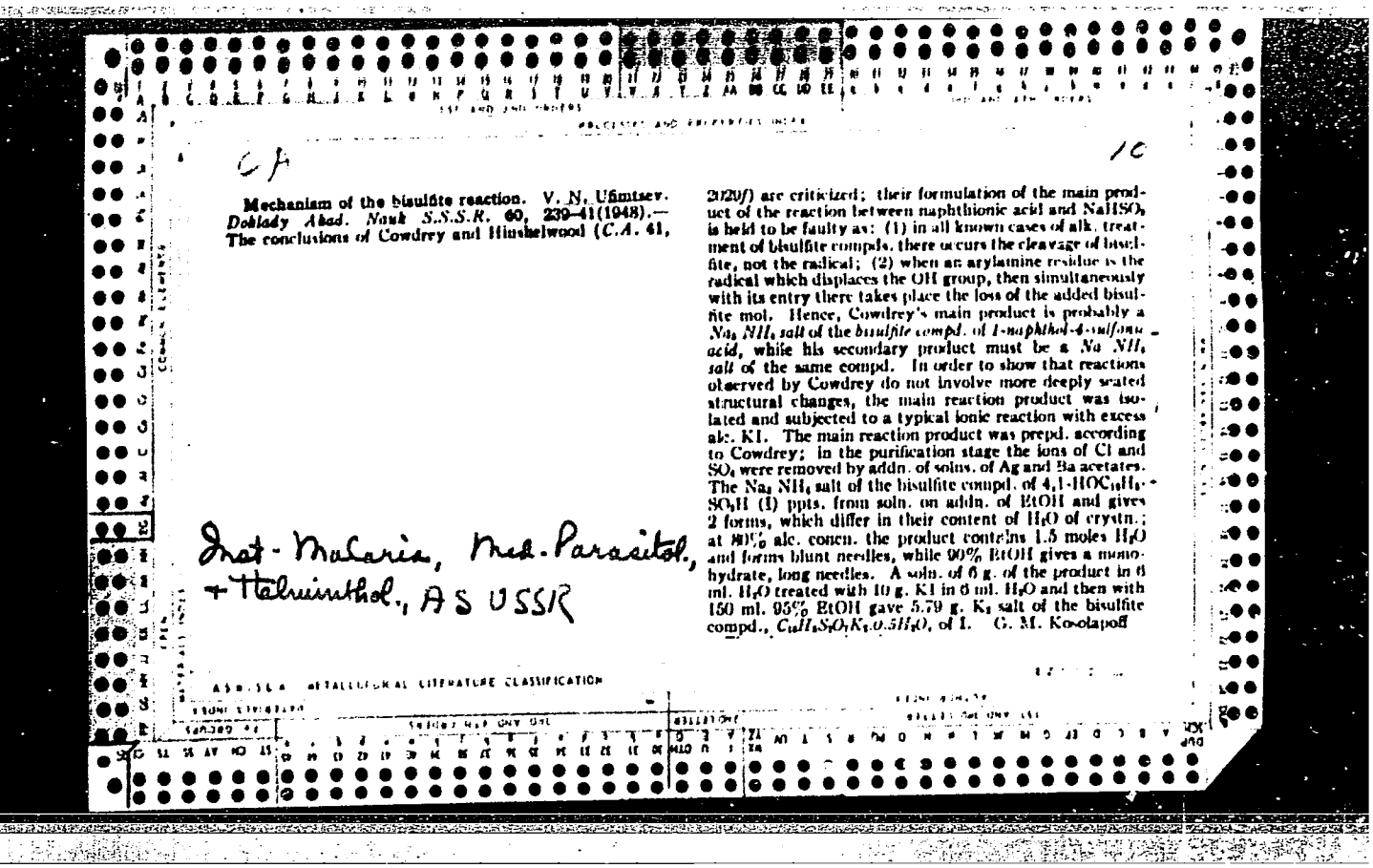
fied water-sol. products. XI. Bisulfite compound of 1,4-naphthoquinone. *Ibid. Zhur. Obshchei Khim.* (J. Gen. Chem.) 18, 1305-8(1948); *cf. Vorozhtsov* 4, 10, 2800. Reaction of 1,4-naphthoquinone (I) with KHSO$_3$ or NaHSO$_3$ results in addn. of 2 moles of bisulfite; the product has the structure of the Na or K salt of *1,4-dihydro-1,4-dihydroxy-1,4-naphthalenedisulfonic acid* (II) and has the usual properties of bisulfite compds. Treatment with alkali results in I and 1,3-diketo-2-hydrindilene-sulfonic acid (III). "Complexes or adducts" described by Buchvar, *et al.* (*C.A.* 41, 747g), could not be separated from I. I (2.2 g.) in 15 ml. EtOH was treated with 4.4 ml. 40% NaHSO$_3$ soln. (d. 1.32), the solvents removed by evacuation *in vacuo*, the residue in 25 ml. water treated with 25 ml. Ba(OAc)$_2$ soln. (43.20 g. in 100 ml.) to slight excess of Ba, the filtrate concd. *in vacuo*, treated with charcoal, and refiltered; addn. of 200 ml. 95% EtOH gave 1.05 g. *di-Na salt* of II, colorless prisms, which, in soln., fails to give visible reaction with: AgNO$_3$, BaCl$_2$, Ba(OAc)$_2$, H$_2$SO$_4$, FeCl$_3$, fuchsin, or diazonium salts; addn. of caustic alkalies or carbonates gives I and III. The *di-K salt* of II, prepd. similarly using KHSO$_3$, forms colorless needles behaving like the Na analog; 2.64 g. in 10 ml. water, let stand overnight with 2.8 g. KOH in 30 ml. water and blown with air 1 hr., yielded 0.71 g. *di-K salt* of III (monohydrate), yellow needles (from 70% EtOH); addn. of HCl to its warm aq. soln. gave plates of the *mono-K salt*. XII. Bisulfite compound of the methylphenylhydrazone of 1,4-naphthoquinone. *Ibid. Zhur. Prikład Khim.* (J. Applied Chem.) 20, 1280-7 (1947).—1,4-O:C$_6$H$_4$:NNMePh (1.82 g.) [*cf.* McPherson, *Am. Chem. J.* 22, 301 (1899)] in 10 ml. EtOH, treated (warm) with 3.7 ml. NaHSO$_3$ soln. (d. 1.32), refluxed 15 min., filtered, and cooled, gave the bisulfite adduct, *1-(methylphenylhydrazono)-4-hydroxy-1,4-dihydro-4-naphthalenesulfonic acid*, as the Na salt (0.44 g.), yellow prisms (from 88% EtOH), sol. in water, less sol. in EtOH, insol. in Et$_2$O, stable in neutral and acid aq. solns., rapidly decompd. by cold alkalies or carbonates, yielding the original hydrazone.

G. M. Kosolapoff



The bimolecular association of 2-methylnaphthylamine. T. S. Pashkina and V. N. Ufimtsev (Inst. of Malaria and Med. Parisitology, Acad. of Med. Sci. of the U.S.S.R.). *Compt. rend. acad. sci. U.R.S.S.* 55, No. 3, 423–4(1947) (in English).—The mol. wts. of 2-$C_{10}H_7NH_2$ (I), 2-$C_{10}H_7NHMe$, 2-$C_{10}H_7NMe_2$, 1-bromo-2-naphthylamine, and 1-$C_{10}H_7NH_2$ were detd. cryoscopically in C_6H_6. Only that of I indicated bimol. assocn. I is unassocd. in benzene and, contrary to expectation, in *p*-$C_6H_4Cl_2$.

W. H. Buck



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Mechanism of the bisulfite reaction. V. N. Ufimtsev. *Doklady Akad. Nauk S.S.S.R.* 60, 239-41(1948).—The conclusions of Cowdrey and Hinshelwood (*C.A.* 41, 2020*f*) are criticized; their formulation of the main product of the reaction between naphthionic acid and $NaHSO_3$ is held to be faulty as: (1) in all known cases of alk. treatment of bisulfite compds. there occurs the cleavage of bisulfite, not the radical; (2) when an arylamine residue is the radical which displaces the OH group, then simultaneously with its entry there takes place the loss of the added bisulfite mol. Hence, Cowdrey's main product is probably a *Na_2 NH_4 salt* of the *bisulfite compd. of 1-naphthol-4-sulfonic acid*, while his secondary product must be a *Na NH_4 salt* of the same compd. In order to show that reactions observed by Cowdrey do not involve more deeply seated structural changes, the main reaction product was isolated and subjected to a typical ionic reaction with excess alc. KI. The main reaction product was prepd. according to Cowdrey; in the purification stage the ions of Cl and SO_4 were removed by addn. of solns. of Ag and Ba acetates. The Na_2 NH_4 salt of the bisulfite compd. of 4,1-$HOC_{10}H_6$-SO_3H (I) ppts. from soln. on addn. of EtOH and gives 2 forms, which differ in their content of H_2O of crystn.; at 80% alc. concn. the product contains 1.5 moles H_2O and forms blunt needles, while 90% EtOH gives a monohydrate, long needles. A soln. of 6 g. of the product in 6 ml. H_2O treated with 10 g. KI in 6 ml. H_2O and then with 150 ml. 95% EtOH gave 5.79 g. K_2 salt of the bisulfite compd., $C_{10}H_8S_2O_7K_2.0.5H_2O$, of I. G. M. Kosolapoff

Inst. Malaria, Med. Parasitol., + Helminthol., AS USSR

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Bisulfite compounds. XIV. Structure of the bisulfite compound of 2-methyl-1,4-naphthoquinone and its reaction with phenylhydrazine. V. N. Ufimtsev and M. I. Chernyak. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 21, 1883-7(1951); cf. *C.A.* 43, 2580f.—The *bisulfite compd.* of *2-methyl-1,4-naphthoquinone* reacts normally with *PhNHNH*$_2$; on standing, a mixt. of the components in H_2O in the presence of AcOH yields brown-orange needles of the hydrate $C_{11}H_{11}O_5N_2SNa.5H_2O$, which, treated with cold EtOH and pptd. with Et_2O, yields the bright yellow-green *anhyd. deriv.*; this can also be obtained from the hydrate on vacuum drying and treatment with EtOH. The K salt of the bisulfite adduct reacts similarly, yielding the *K analog*, yellow needles in anhyd. form, orange-red mass in the hydrated form (not analyzed for H_2O content). The reaction with PhNHNH$_2$ does not prove the presence of a carbonyl group in the compd. since the reaction may proceed by replacement of the OH group of the bisulfite adduct by a PhNHNH residue, which with alkali yields the phenylhydrazone of the original carbonyl compd. (tautomeric with the azo deriv. of the corresponding naphthol). The bisulfite adduct of 1,5-HOC$_{10}$H$_6$SO$_3$H could not be acetylated by hot Ac_2O; the same holds for the bisulfite adducts of resorcinol and of 2-methyl-1,4-naphthoquinone, thus disproving the contention of Bochvar, *et al.* (*C.A.* 43, 166h), concerning the structure of these adducts. G. M. K.

UFIMSTEF, V.N.

Chem

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Bisulfite compounds. XV. The structure of compounds from alizarin blue dye. V. N. Ufimtsev. *J. Gen. Chem. U.S.S.R.* 22, 723–5(1952)(Engl. translation).—See *C.A.* 47, 5403a. XVI. The bisulfite compound of 1-amino-8-naphthol-2,4-disulfonic acid. V. N. Ufimtsev and M. I. Chernyak. *Ibid.* 683–4.—See *C.A.* 47, 5403e. H. I. W.

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UFIMTSEV, V.N.

Mobility of halogen in the naphthalene nucleus. V. N. [illegible] and M. M. Mannechkina (K. E. Voroshilov Sci. Research Inst. Org. [illegible]ermed. and Dyes, Moscow). Doklady Akad. Nauk S.S.S.R. 92, 581-4(1953).—Isomeric nitrobromonaphthalenes were heated in sealed tubes with piperidine 1-5 hrs. at [illegible] and the amt. of AgBr produced by the Br ion was detd. The 2- and 4-nitro-1-bromo derivs. react rapidly even at 100°; the 1-nitro-2-bromo deriv. was less active (cf. McLeish and Campbell, C.A. 31, 7017). 2-Bromo-3-nitro deriv. is intermediate between 1-nitro-2-bromo and 8-nitro-1-bromo derivs. although it is very weakly active at 50°. Addn. of $CuSO_4.5H_2O$ greatly accelerates and promotes the activity of the Br in this compd. All other derivs. do not react at 100°. 1-Bromo-3-, 4-, 5-, and 8-nitro derivs. do not react in 1 hr. at 150°. 5-nitro-1-bromo deriv. reacts to an extent of 24.5% in 1 hr. at 200°. In 1 hr. the 5-nitro-1-bromo deriv. gave 9.5% conversion at 100°, 29.3% at 125°, 84% at 170°, 91.4% at 175°, and 97.1% at 200°. At 125° in 1 hr. 10.3% 1-Br-$C_{10}H_7$ and 21.7% 2-Br$C_{10}H_7$ react; at this temp. the following % conversions were observed in 1 hr.: 3-nitro-1-bromo 53.8%; 5-nitro-1-bromo 39.3%; 6-nitro-1-bromo 30.5%; 7-nitro-1-bromo 33.3%; 8-nitro-1-bromo 91.8%; 3-nitro-2-bromo 99.9%; 4-nitro-2-bromo 84%; 5-nitro-2-bromo 54.5%; 6-nitro-2-bromo 54.7%; [illegible]bromo 24.8%; 8-nitro-2-bromo 45.6%. The following [illegible] were obtained for some derivs. whose [illegible] differed from previously known values: 2-nitro [illegible] 100.4°, 4-nitro-1-bromo, m. 8[illegible]; [illegible] m. 100.1-1.0°; 4-nitro-2-bromo, [illegible] m. [illegible]9°; 2-bromo, m. [illegible]; 30.9°; 5-nitro-1-bromo, 121.6-1[illegible] 128.0-0.4°; 7-nitro-1-bromo, m. [illegible] 83.2 [illegible] bromo, m. 98.2-8.[illegible]; 3-nitro-2-bromo, m. [illegible] nitro-2-bromo, m. [illegible] 7.2°, 6-nitro-2-bromo, m. [illegible] 145-5.5°; 8-nitro-2-bromo, m. 130.4-10[illegible]; 3-bromo-1-naphthylamine, m. 73.2-3.7°; 3-bromo-1-acetnaphthalide, m. 210-10.5°; [illegible]bromo-2-naphthylamine, m. 104-4.5°. Nitration of the latter according to Hodgson and Elliott gives the 4-nitro, rather than 2-nitro deriv. (cf. C.A. 30, 7560[illegible]); [illegible] m. [illegible] 299.5-300.0°, and 4-nitro-3-[illegible]naphthylamine, m. [illegible] 3.0°. [illegible] M. Kosolapoff

UFIMTSEV, V.N.

USSR/Scientists - Chemistry

Card 1/1 : Pub. 151 - 37/37

Authors : Rodionov, V. M.; Vorozhtsov, N. N.; Smirnova, A. F.; Shchetinina, L. A.; Shestov, A. P.; Korolev, A. I.; Lukashevich, V. O.; and Ufimtsev, V. N.

Title : In memory of Evgeniy Alekseevich Ivanov

Periodical : Zhur. ob. khim. 24/3, 579-580, Mar 1954

Abstract : Eulogy is presented honoring the passing of E. A. Ivanov, chief of the Central Laboratory of the Dorogomilov-Frunze Chemical Plant, scientist in the field of organic semi-products and dyes, recipient of Stalin premium. Illustration.

Institution: .....

Submitted : .....

UFimtsev, V. N.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 18/45

Authors : Ufimtsev, V. N., and Malafeyeva, M. M.

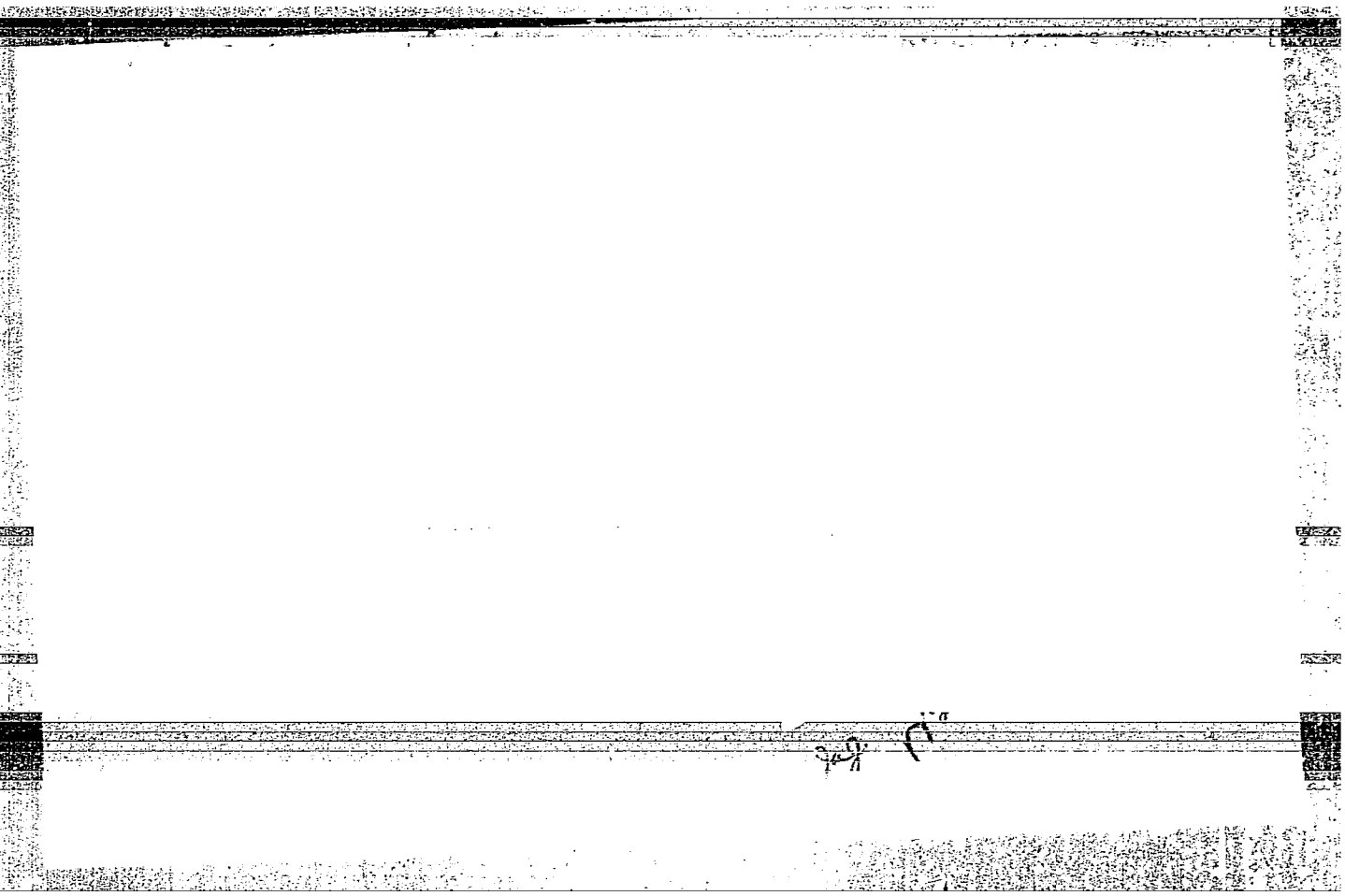
Title : Mobility of halogen in the benzene nucleus

Periodical : Dok. AN SSSR 99/4, 555-558, Dec 1, 1954

Abstract : The effect of nitro groups on Br activity in a benzene nucleus is explained. The method by which the activity of Br was determined is briefly described. It was established that the entry of one nitrogroup into m-position increases the activity of Br but the halogen of the m-nitrobromobenzene remains non-reactive; whereas the entry of two nitrogroups into m-position sharply increases the halogen activity. Ten references: 6-USSR; 1-USA; 2-German and 1-French (1888-1953). Tables; graphs.

Institution : The K. E. Voroshilov Scientific Research Institute of Organic Semi-Products and Dyes

Presented by: Academician A. V. Topchiev, June 25, 1954

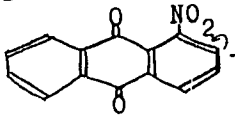


AUTHORS: Dashevskaya, L. D., Ufimtsev, V. N. SOV/79-29-1-60/74

TITLE: Investigations in the Field of Dyes for Acetate Silk and Synthetic Fibers (Issledovaniya v oblasti krasiteley dlya atsetatnogo shelka i sinteticheskikh volokon). II. Disperse Dyes-Derivatives of 1-Alkylamino-anthraquinone-2-carboxylic Acid (II. Dispersnyye krasiteli-proizvodnyye 1-alkilamino-antrakhinon-2-karbonovoy kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 1, pp 285-287 (USSR)

ABSTRACT: The chloric anhydride of 1-nitro-anthraquinone-2-carboxylic acid



—COCl (I) has two reaction groups: the chlorine atom in the acid halide group and the nitro group in position 1 of the anthraquinone nucleus which are both capable of reactions, especially with amino compounds. The nitro group which is mobile in this case is under the influence of completion and activation of the acid halide group which is in ortho-position and very reactive. In the case of reaction of this chloride anhydride with amino diglycol ($H_2NCH_2CH_2OCH_2CH_2OH$) β'-oxy-ethyl-

Card 1/3

Investigations in the Field of Dyes for Acetate Silk and Synthetic Fibers. II. Disperse Dyes -Derivatives 1-Alkylamino-anthraquinone-2-carboxylic Acid

β-oxy-ethyl amide of the 1-(β'-oxy-ethyl-β-oxy-ethyl-amino)-anthraquinone-2-carboxylic acid which can be used as a pink dye for acetate silk. In the case of reactions of compound (I) with other amines the nitro group showed a lesser activity than the halogen of the chloric anhydride group. The nitro group does not react with diethyl amine. In the case of a further synthesis of the thus formed weakly colored diethyl amide with primary aliphatic amines, the nitro group reacts also by formation of blue-red disperse dyes which in position 1 of the anthraquinone nucleus and in the carboxyl group have the radicals of various amines. This behavior is explained by difficulties with respect to spatial distribution of the carbonyl group of the anthraquinone nucleus. The pink or red dyes synthesized which can be used for acetate silk have similar properties. There are 2 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute for Organic

SOV/79-29-1-60/74

Investigations in the Field of Dyes for Acetate Silk and Synthetic Fibers. II. Disperse Dyes – Derivatives of 1-Alkylamino-anthraquinone-2-carboxylic Acid

Intermediate Products and Dyes)

SUBMITTED: November 19, 1957

Card 3/3

GRINEVA, N.I.; TISHCHENKO, A.D.; UFIMTSEV, V.N.

Dyes for acetate silk and synthetic fibers. Part 3: Oxidation of styrene and dimethinecyanine dyes, derivatives of indoline. Zhur.-ob.khim. 32 no.6:1919-1922 Je '62. (MIRA 15:6)

1. Nauchno-issledovatel'skiy institut organicheskikh polproduktov i krasiteley.
(Dyes and dyeing—Rayon) (Indoline)

GRINEVA, N.I.; PUCHKOVA, V.V.; [illegible]TSEV, V.N.

Derivatives of ceramidine. Part 1: Dehydration of 1,4-diarylaminoanthraquinones. Zhur.ob.khim. 33 no.2:597-600 F '63. (MIRA 16:2)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.
(Anthraquinone) (Dehydration (Chemistry))

GRINEVA, N.I.; SADOVSKAYA, V.L.; PRIMTSEV, V.N.

Synthesis of 2-phenylindole and its 1-methyl derivative. Zhur. ob.khim. 33 no.2:552-553 F '63. (MIRA 16:2)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley, Moskva.
(Indole)

YEFREMOVA, T.K., nauchnyy sotrudnik; UFIMTSEV, V.P.

Dust control measures in the mechanized longwalls of Chelyabinsk Basin. Ugol' 37 no.3:55-58 Mr '62. (MIRA 15:2)

1. Gorno-geologicheskiy institut Ural'skogo filiala AN SSSR (for Yefremova). 2. Glavnyy inzh. tresta Kopeyskugol' (for Ufimtsev).
(Chelyabinsk Basin--Mine dusts)

UFIMTSEV, V. V.

An Attachment for the Hygrostat. Meteorol. i gidrologiya, No 8, 1953, pp 47-48

The proposed attachment to the hygrostat is designed to be successfully used not only for the mass verification of hair hygrometers but also for the verification of aircraft meteorographs, radiosondes, and hygrographs. In a hygrostat with such an attachment the capacity is doubled and a more unifrom means for all instruments under simultaneous examination is attained; in addition, greater facilities are created for the installation of pens and pointers, and the operation of taking down the readings during testing is simplified and made more precise. (RZhGeol, No 5, 1954)

SO: Sum. No. 568, 6 Jul 55

UFIMTSEV, Ye.

Success is achieved by cooperation. Izobr.i rats. no.7:30-31 Jl '60. (MIRA 13:8)

1. Rukovoditel' tsekhovogo obshchestvennogo konstruktorskogo byuro Uralvagonzavoda, g.Nizhniy Tagil.
(Nizhniy-Tagil--Founding)

KLASSEN, V.I.; TIKHONOV, S.A.; Prinimali uchastiye: KRAYEVSKAYA, R.S.; UFIMTSEVA, G.S.

Mechanical carrying out of pulp particles during flotation. TSvet. met. 37 no.9:4-8 S '64. (MIRA 18:7)

UFINTSEVA, K.A., FRIDLAND, V.M., YEROKHINA, A.A., ROZOV, N.N, NOGINA, N.A., IVANOVA, Ye. N. (Prof. Dr. Agr. Sci); and NOSIN, V.A. (Cand. Agr. Sci.).

"Brief Description of the Soils in the Areas of New Land Reclamation," Published in- An aid to Agricultural Specialists in the Reclamation of Virgin and Fallow Lands, Sbornik Materialov, i Statey, Vol. 1, pp 25-144, 1954.

Tranlsation No. 431, 30 Jun 1955.

BOGATYREV, K.P.; VADKOVSKAYA, O.A.; GERASIMOV, I.P.; GERASIMOV, Iv.P.; YEROKHINA, A.A.; IVANOVA, Ye.N.; LETKOV, L.A.; LIVEROVSKIY, Yu.A.; LOBOVA, Ye.V.; NOGINA, N.A.; ROZOV, N.N.; RUDNEVA, Ye.N.; TKACHENKO, V.I.; UFIMTSEVA, K.A.; FRIIDLAND, V.M.

Academician L.I.Prasolov; obituary. Izv.AN SSSR Ser.geog. no.2: 73-78 Mr-Ap '54. (MLRA 7:5)

(Prasolov, Leonid Ivanovich, 1875-1954)

KORZUN, Mikhail Adamovich; MAKEYEV, Oleg Vladimirovich; NOGINA, Nina Alekseyevna; UFIMTSEVA, Klavdiya Andreyevna; SUMKIN, A.N., red.; KRYLOV, A.F., tekhn.red.

[Soil zoning in the Lake Baikal portion of Siberia] Pochvennoe raionirovanie Baikal'skoi Sibiri. Ulan-Ude, Buriatskii kompleksnyi nauchno-issl.in-t, 1960. 66 p. (MIRA 14:3)
(Baikal Lake region--Soils)

UFIMTSEVA, K.A., nauchnyy sotrudnik; IVANOVA, Ye.N., prof., otv.red.; TIKHOMIROV, V.N., red.izd-va; TIKHOMIROVA, S.G., tekhn.red.

[Steppe and wooded-steppe soils of the Buryat A.S.S.R. and their agricultural characteristics] Stepnye i lesostepnye pochvy Buriatskoi ASSR i ikh agroproizvodstvennaia kharakteristika. Moskva, 1960. 149 p. (MIRA 13:7)

1. Akademiya nauk SSSR. Pochvennyy institut imeni V.V.Dokuchayeva.
2. Pochvennyy institut im. V.V.Dokuchayeva (for Ufimtseva).
3. Zaveduyushchiy otdelom geografii i kartografii pochv Pochvennogo instituta AN SSSR (for Ivanova).
(Buryat-Mongolia--Soils)

IVANOVA, Ye.N.; ROZOV, N.N.; YERONINA, A.A.; NOGINA, N.A.; NOSIN, V.A.; UFIMTSEVA, K.A.; Prinimali uchastiye: IVANOVA, Ye.N.; ROZOVYY, N.N.; BUDINA, I.F.; VISHNEVSKAYA, I.V.; GERASIMOV, I.P.; KARAVAYEVA, N.A.; KOSHELEVA, I.T.; NAUMOV, Ye.M.; SEMINA, Ye.V.; SOKOLOV, I.A.; SOKOLOVA, T.A.; TARGUL'YAN, V.O.

New materials on general geography and soil classification of the polar and boreal belts of Siberia. Pochvovedenie no.11:7-23 N '61. (MIRA 14:12)

(Siberia, Northern--Soils--Classification)
(Siberia, Northern--Geography)

UFIMTSEVA, K.A.

Mountain taiga soils in Transbaikalia. Pochvovedenie no.3:51-61 Mr '63.
(MIRA 16:3)

1. Pochvennyy institut imeni V.V.Dokuchayeva.
(Transbaikalia—Soils)

ADAMESKU, R.A.; UFIMTSEVA, M.P.; KUDRYAVTSEV, I.P.; GEL'D, P.V.

Texture formation furing the annealing of strongly deformed silicon iron. Izv. vys. ucheb. zav.; chern. met. 8 no.5:133-139 '65. (MIRA 18:5)

1. Ural'skiy politekhnicheskiy institut.

OLENOVICH, N.L.; UFIMTSEVA, S.N.; ROGACHKO, M.M.

Separation and determination of gallium, indium, cadmium, and zinc by paper partition chromatography. Zhur. anal. khim. 20 no.12:1368-1370 '65. (MIRA 18:12)

1. Odesskiy gosudarstvennyy universitet imeni I.I. Mechnikova.
Submitted January 18, 1965.

KAZANKOV, M.V.; UFIMTSOV, V.N.

Direct introduction of the alkylamino group into anthrapyridones and polycyclic quinones. Zhur. ob. khim. 34 no.12:4124-4125 D '64 (MIRA 18:1)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

UFIMTZEV, V. N.

"Investigations in the Field of Nitro Compounds. VII. On the Action of Phenylhydrazine and Bisulphite on the Naphthalenic Azodyes." by V. N. UFimtzev (p. 1849)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 11

SOV/5-58-4-17/43

AUTHORS: Adamovich, A.F., Zonenshayn, L.P., Sulidi-Kondrat'yev, Ye.D., Uflyand, A.K.

TITLE: New Data on the Stratification of the Sandy Clay Strata of the Western Sayan (Novyye dannyye po stratigrafii peschano-slantsevykh tolshch Zapadnogo Sayana)

PERIODICAL: Byulleten' Moskovskogo obshchestva ispytateley prirody, Otdel geologicheskiy, 1958, Nr 4, p 144 (USSR)

ABSTRACT: This is a summary of a report given by the author at a meeting of the Moscow Society of Naturalists on 11 March 1958. In 1957, the authors of this article, together with O.A. Semenova, A.E. Kalis and others, tried to analyze the stratification of the sandy clay strata of the Western Sayan. They reached the conclusion that there are three different series; the lower series consists of the Syutkhol'skaya and Urskaya formations; the second series of a frequent, sometimes rhythmic alternation of green sandstones, siltstones and argillites; the third series, of the Shignetskaya formation. The names

Card 1/2

New Data on the Stratification of the Sandy Clay Strata of the Western Sayan

of the following scientists are also mentioned: G.M. Vladimirskiy, A.G. Sivov, I.K. Bazhenov, N.A. Batov, as having worked in this field.

1. Geology 2. Earth--Structural analysis 3. Sand--Geology
4. Clays--Geology

ACC NR: AP6034490 SOURCE CODE: UR/0210/66/000/006/0050/0059

AUTHOR: Zonenshayn, L. P.; Natapov, L. M.; Uflyand, A.K.

ORG: All-Union Aerogeological Trust, Moscow (Vsesoyuznyy aerogeologicheskiy tres[illegible])

TITLE: Structure of the Aldan branch of the Priverkhoyansk foredeep

SOURCE: Geologiya i geofizika, no. 6, 1966, 50-59

TOPIC TAGS: geologic exploration, anticline, geologic survey, ~~[illegible]~~, foredeep, ~~[illegible]~~ tectonics

ABSTRACT: The structure of the Aldan branch of the Priverkhoyansk foredeep is described. Steep flexures alternating with gently sloping echelon brachysynclines characterize the boundary region between the Verkhoyansk folded region and the Priverkhoyansk foredeep. The limiting folds are oriented at a steep angle to the foredeep strike, plunging east-southeast. These folds can be traced within the inner zone of the foredeep. A system of narrow anticlines, separated by broad synclines is also found in the inner zone of the foredeep. The entire Verkhoyansk complex consists of Permian-Cretaceous formations. The outer zone of the foredeep is composed of Jurassic and Cretaceous formations superposed on a Lower Paleozoic basement. The inner and

Card 1/2 UDC: 553.98:551.70+551.24(571.56)

ACC NR: AP6034490

outer zones are separated by a marginal suture-type deep-seated fault. Orig. art. has: 1 figure

SUB CODE: 08/ SUBM DATE: 23Apr64/ ORIG REF: 012/ OTH REF: 006

Card 2/2

UFLYAND, A.K.

Tectonics and the history of the development of the northeastern end of the Palmyrides (Syria). Geotektonika no.3:20-36 My-Je '65. (MIRA 18:6)

1. Vsesoyuznyy aerogeologicheskiy trest Gosudarstvennogo geologicheskogo komiteta SSSR, Moskva.

UFLYAND, A.K.

Development of swell-like uplifts in the northern part of the Arabian plateau as revealed by a study in northern Syria. Sov. geol. 8 no.2:131-137 F '65. (MIRA 18:12)

ROZENTSVEYG, S.A.; UFLYAND, N.Yu.; SHCHERBAKOVA, Z.V.

Adsorption of sulfur in iron in alkali solutions. Zhur. fiz. khim. 36 no.3:557-561 Mr '62. (MIRA 17:8)

1. Gosudarstvennyy soyuznyy nauchno-issledovatel'skiy institut.

UFLYAND, N.Yu.; POZIN, Yu.M.; ROZENTSVEYG, S.A.

Effect of electrolyte concentration on the behavior of the oxide-nickel electrode. Part 1. Zhur. fiz. khim. 39 no.2, 341-344 F '65. (MIRA 18:4)

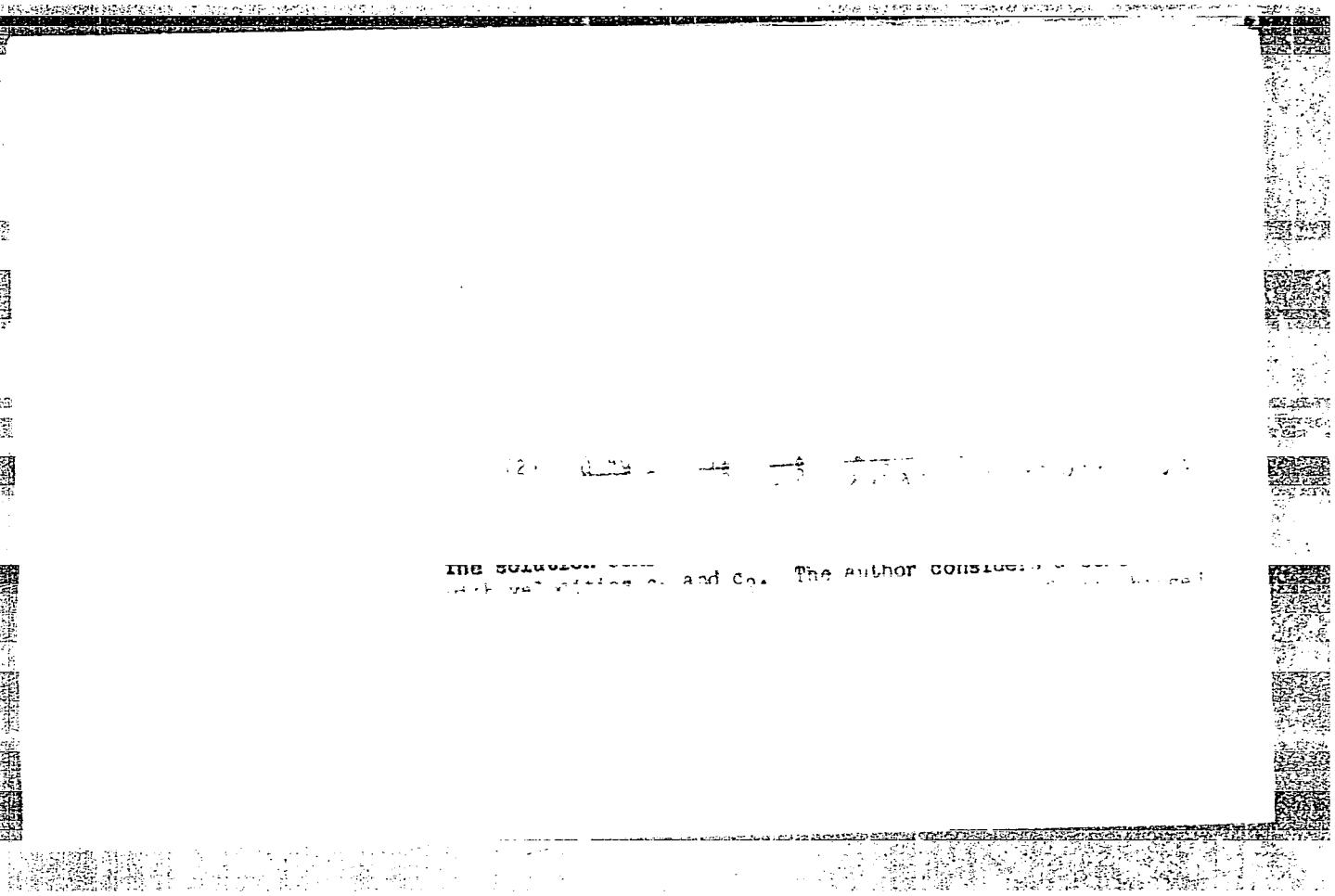
1. Nauchno-issledovatel'skiy akkumulyatornyy institut.

RUKHOVETS, A.N.; UFLYAND, Ya.S.

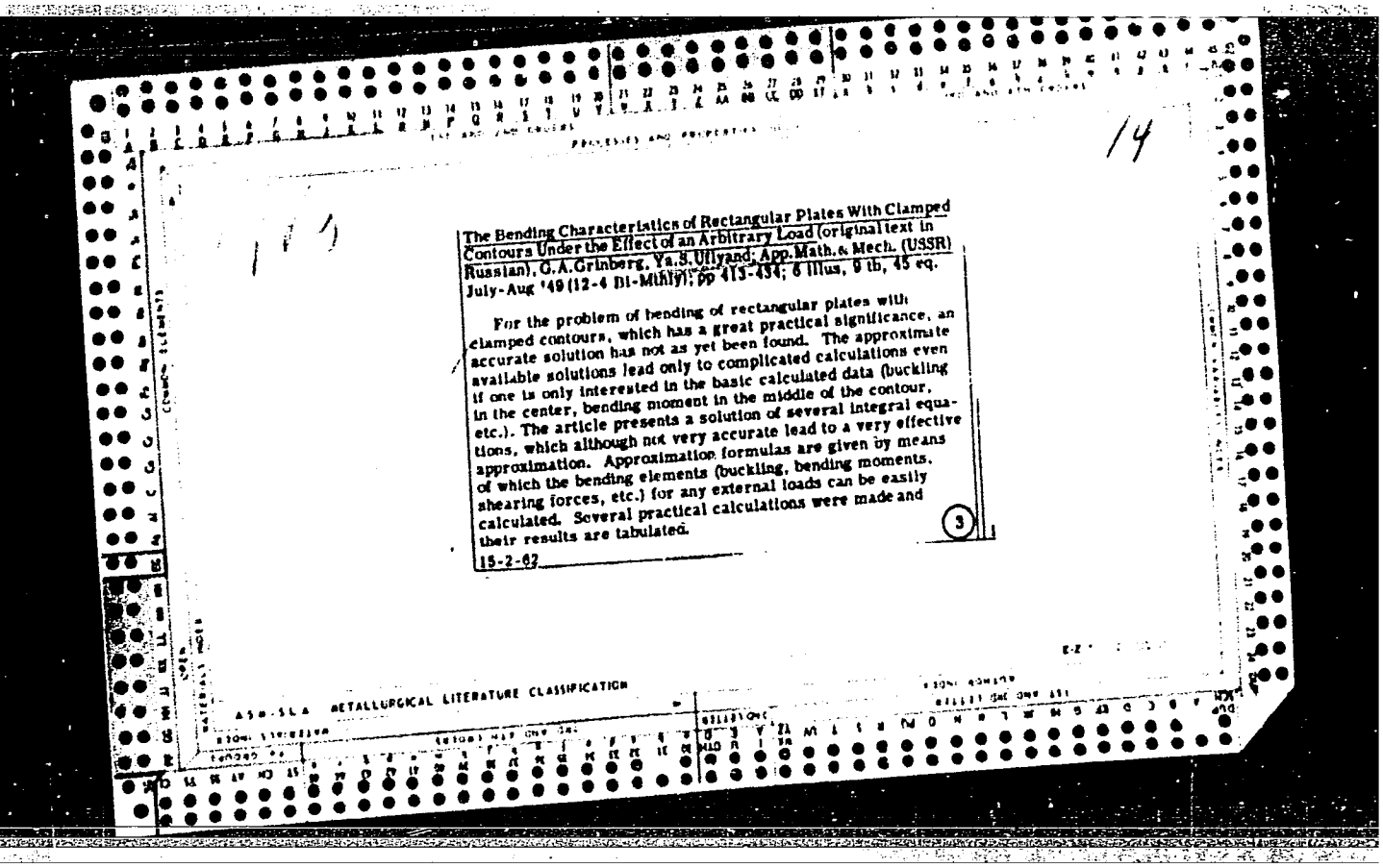
Electrostatic field of a pair of thin spherical shells (axisymmetrical problem). Zhur. tekh. fiz. 35 no.9:1532-1536 S '65.

(MIRA 18:10)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.



solutions of (2) converge to the corresponding equilibrium solutions of (1). The transient state, however, can be found only from (2). The same effects are considered for the lateral vibrations of a plate, and analogous results are found.



The Bending Characteristics of Rectangular Plates With Clamped Contours Under the Effect of an Arbitrary Load (original text in Russian), G.A.Grinberg, Ya.S.Ufiyand; App.Math.& Mech. (USSR) July-Aug '49 (12-4 DI-MiMiY); pp 413-434; 6 illus, 0 tb, 45 eq.

For the problem of bending of rectangular plates with clamped contours, which has a great practical significance, an accurate solution has not as yet been found. The approximate available solutions lead only to complicated calculations even if one is only interested in the basic calculated data (buckling in the center, bending moment in the middle of the contour, etc.). The article presents a solution of several integral equations, which although not very accurate lead to a very effective approximation. Approximation formulas are given by means of which the bending elements (buckling, bending moments, shearing forces, etc.) for any external loads can be easily calculated. Several practical calculations were made and their results are tabulated.

15-2-62

UFLIAND, Ia. S.

USSR/Physics Jul/Aug 49
Elastic Theory
Mathematics

"Bending of a Rectangular Plate With Supported Edges Under Arbitrary Load," G. A. Grinberg Ya. S. Uflyand, Leningrad Physicotech Inst, Acad Sci USSR, 31 pp

"Priklad Matemat i Mekh" Vol XIII, No 4 Submitted 11 Feb 49

Problem of bending of a rectangular plate with reinforced edges, which has great practical importance, has not been solved accurately up to now. Approximate solutions lead to cumbersome calculations. Reduces problem to the solution of an integral equation which admits of a very close approximation. Derives approximate formular which may be used to calculate bending elements (sags of bending moments, intersecting forces) for various external loads.

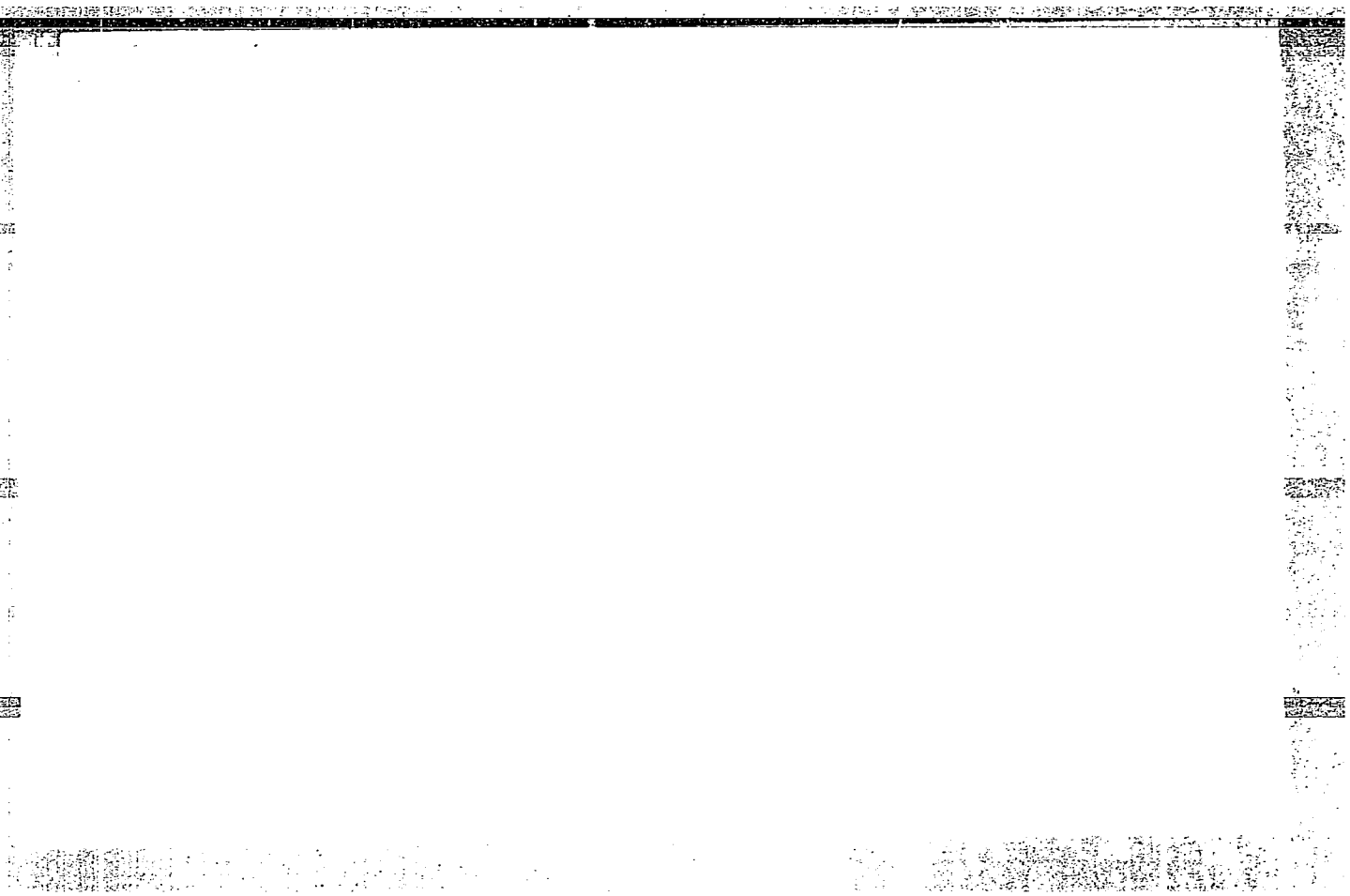
PA 61/49T90

UFLAND, YA. S

26902

Krucheniya Prizmaticheskogo Sterzhnya S Profilem, Ogranichennym Dugami Dvukh Peresekayushchikhsya Ikhsya Okruzhanostey. Doklady Akad. Nauk SSSR, Novaya Seriya, T. LXVIII, No. 1, 1949, S. 17-20

SO: LETOPIS NO. 34



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001857820008-2"

UFLYAND, YA. S.

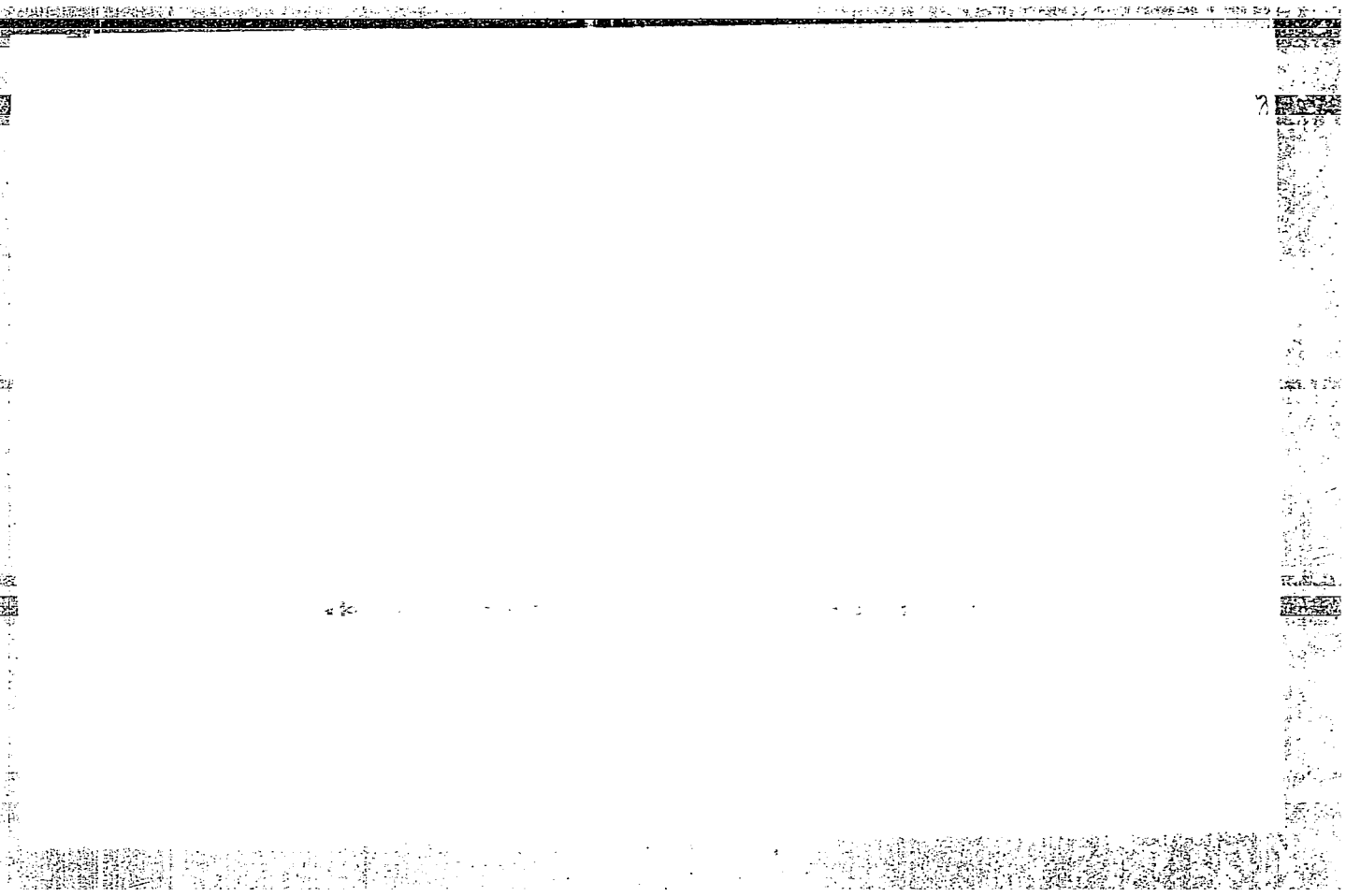
Bipoliarnye koordinaty v teorii uprugosti. Moskva, Gostekhizdat, 1950. 232 p., diagrs. (Sovremennye problemy mekhaniki)

Bibliography: p. 231-232.

Title tr.: Bipolar coordinates in the theory of elasticity.

QA556.U3

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



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001857820008-2"

PA 165T104

UFLYAND, Ya. S.

USSR/Physics - Elasticity
Vibrations

1 Jun 50

"One Case of Bending in a Rectargular Plate," Ya. S. Uflyand, Leningrad Physicotech Inst, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXII, No 4, pp 655-657

Considers thin elastic plate in form of rectangle bent by arbitrary transverse load q(x,y). Three sides are clamped, but fourth is free. Problem has never been considered before. Finds solution as boundary-value problem. Submitted 27 Mar 50 by Acad A. F. Ioffe.

165T104

[redacted]

UFLYAND, Ya. S. PA 174T67

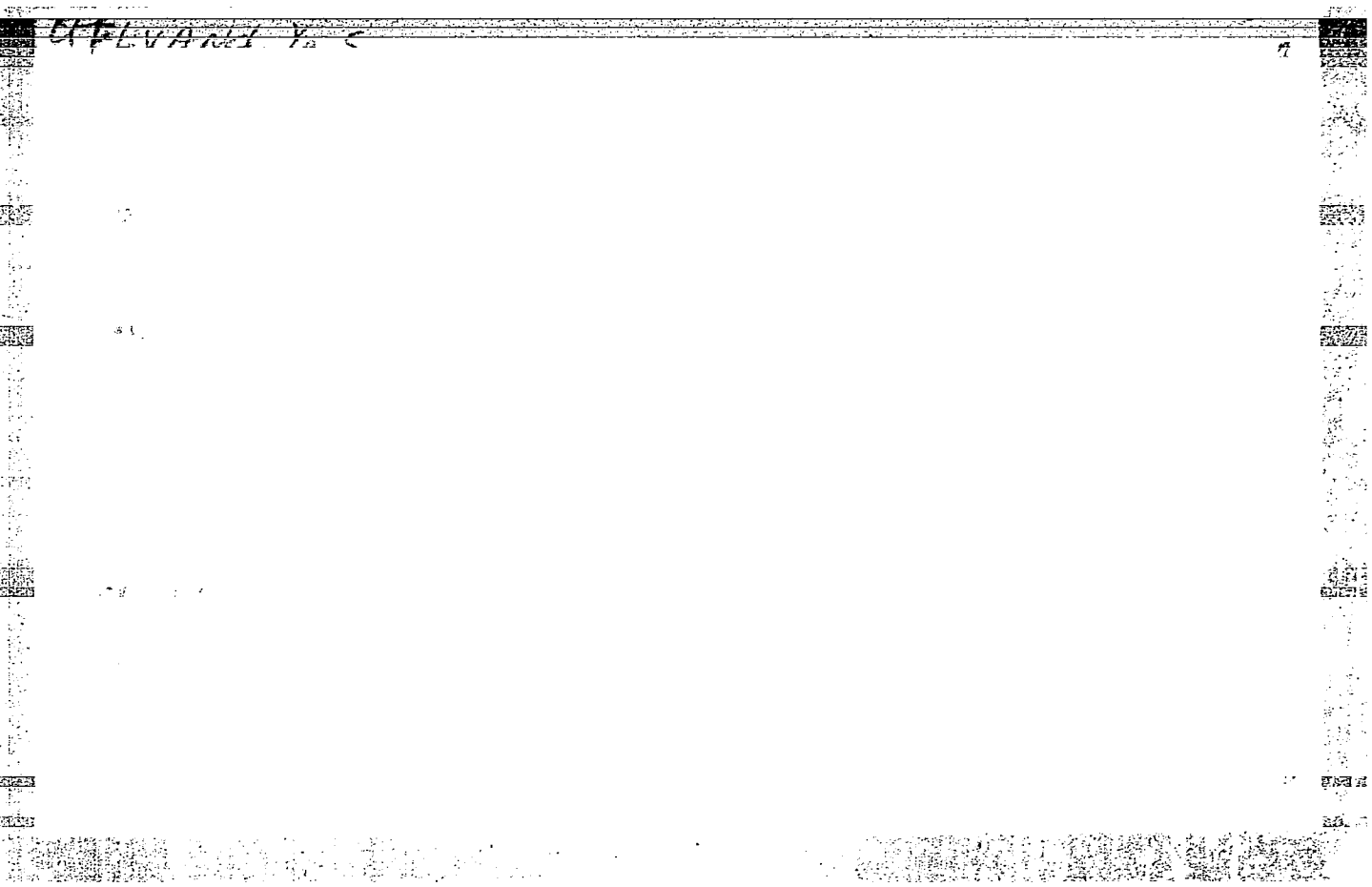
USSR/Physics - Flexure (Bend) 21 Sep 50
Plates

"Solving the Problem of Flexure in Rectangular and Sectorial Plates for Certain Boundary Conditions," Ya. S. Uflyand, Leningrad Physicotech Inst, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXIV, No 3, pp 437-439

Considers rectangular plate one of whose sides, for example x = 0, is clamped and its opposite side (x = a) rest freely; here the other sides can be constructed in any manner. Submitted 11 Jun 50 by Acad A. F. Ioffe.

174T67



UFLYAND, Y. S.

USSR/Mathematics - Transformation, Mellin 21 May 52

"Application of the Mellin Transformation to the Problem Concerning the Flexure in a Thin Elastic Wedge-Shaped Plate," Y. S. Uflyand, Leningrad Polytech Inst imeni M. I. Kalinin

"Dok Ak Nauk SSSR" Vol LXXXIV, No 3, pp 463-465

Considers a wedge-shaped region in polar coordinate (r,θ) and the deflection $w(r,\theta)$ satisfying the usual eq and boundary conditions. Proceeds to set $\overline{w}$ in integral form and solve by means of the Mellin transformation, taking boundary conditions into consideration. Submitted by Acad A. F. Ioffe 17 Mar 52. 225T53

UFLYAND, Ya. S.
UFLYAND

4000

Grinberg, G. A., Lebedev, N. N., and Uflyand, Ya. S. A method of solution of a general biharmonic problem for a rectangular region with given values of the function and its normal derivative on the contour. Akad. Nauk SSSR. Prikl. Mat. Meh. 17, 73–86 (1953). (Russian)

The boundary value problem in question is the determination of $w(x, y)$ such that

$$\Delta\Delta w=\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)w=Q(x, y),$$

in a domain D, and $w=f(s)$, $\partial w/\partial\nu=g(s)$, on the boundary of D, where ν denotes the outer normal and Q, f, g are given functions. Section 1 describes the general method of approximation, which consists essentially in determining the harmonic function $\Delta w-\Delta w_0$ (where w_0 is any chosen particular solution of $\Delta\Delta w_0=Q(x, y)$ in D) as a linear combination $\sum_{n=0}^{\infty}a_n\psi_n$ of an orthonormal ($\iint_D\psi_m\psi_n dxdy=0$ if

Mathematical Reviews
May 1954
Analysis

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Leningrad Polytech Inst.

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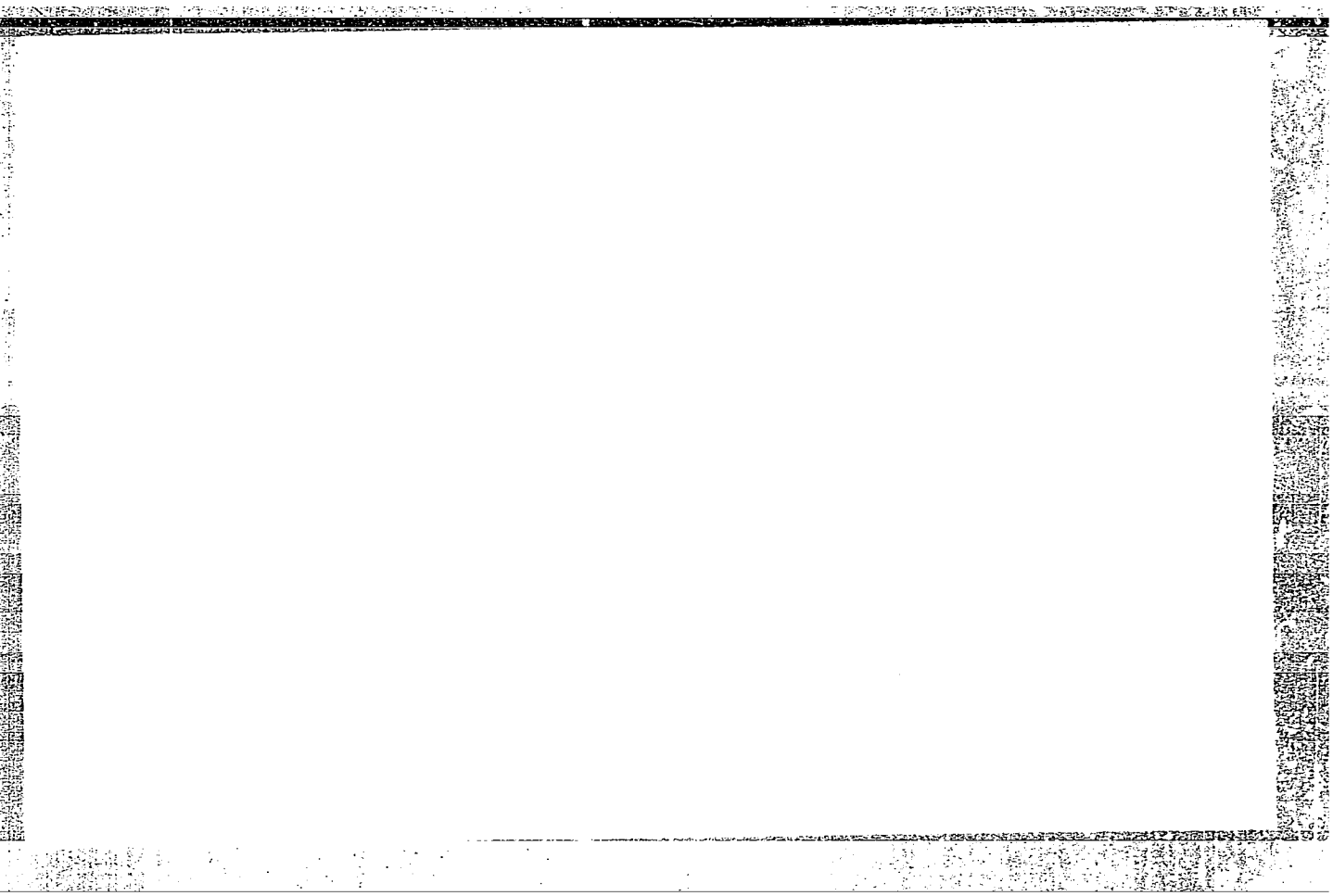
3/2 Grinberg, G.A, Lebedev, N.N, & Ufliyand, Ya.S.

$m \neq n$, $=1$ if $m=n$) complete sequence of functions ψ_m, which are harmonic in D [see Grinberg, Doklady Akad. Nauk SSSR (N.S.) 76, 661–664 (1951); these Rev. 13, 184; this method is similar to that proposed by Miranda, Rend. Sem. Mat. Univ. Roma (4) 1, 262–266 (1937)]. Given an orthonormal sequence of harmonic functions for D, numerical approximations for Δw, which is of direct interest in the theory of plates, may be calculated. If approximations to w are desired, a knowledge of Δw, plus the boundary conditions above, enable one to determine w by solving either a Dirichlet or a Neumann problem. Section 2 contains the explicit construction and tables of a suitable orthonormal sequence of harmonic functions for a rectangular domain. Sections 3 and 4 contain applications to various problems of a square plate under symmetrically placed concentrated loads and to the plane problem of the theory of elasticity.

J. B. Diaz (College Park, Md.)

USSR

The theory of nonequilibrium chromatography. S. E. Bresler and Ya. S. Ufimtsev. *Zhur. Tekh. Fiz.* 23, 1443–51 (1953).—A differential equation is written for the condition that the adsorption on the grains of the adsorbent is not an equil. value, but trails by a time τ. This equation is $\tau(\partial^2 c/\partial t^2) - (\partial c/\partial t) - (w/qk) - (\partial c/\partial x) = 0$, where w is the velocity of the liquid in ml./sec., q the cross section of the column, k a const. (the sum of the adsorption const. and the coeff. of porosity), and c the concn. This equation was solved by means of Laplace transfers both for the case of frontal and of elutive chromatography. S. Pakswer



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R001857820008-2"

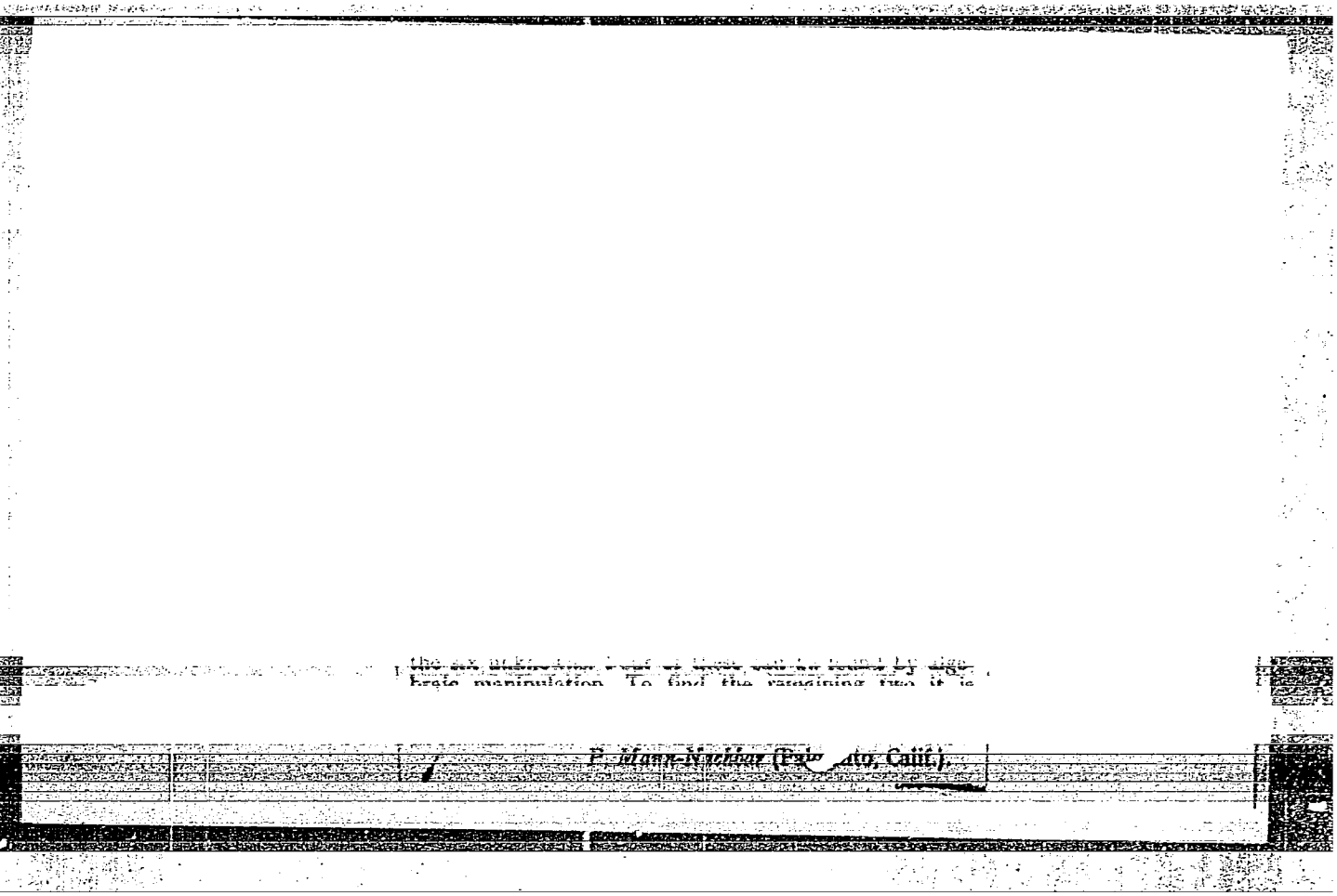
LEBEDEV, N.N.; SKAL'SKAYA, I.P.; UFLYAND, Ya.S.; AKILOV, G.P., redaktor; VOLCHOK, K.M., tekhnicheskiy redaktor.

[Collection of problems in mathematical physics] Sbornik zadach po matematicheskoy fizike. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1955. 420 p. (MLRA 8:10)
(Mathematical physics)

GRINBERG, G.A. (Leningrad); POKROVSKIY, A.N. (Leningrad); UFLYAND, Ya.S. (Leningrad)

Characteristic state of stress of an elastic thin wedge-shaped plate with a fixed and a free side. Inzh.sbor. 22:193-198 '55. (MLRA 9:5)

1. Leningradskiy politekhnicheskiy institut imeni M.I. Kalinina. (Elastic plates and shells) (Strains and stresses)



UFLYAND, Ye.S.

Category : USSR/Radiophysics - Radiation of Radio Waves. Antennas I-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4488

Author : Grinberg, G.A., Lebedev, N.N., Skal'skaya, I.P., Uflyand, Ye.S.
Inst : Leningrad Physicotechnical Institute, Academy of Sciences, USSR, Leningrad
Title : Electromagnetic Field of Linear Radiator, Located Inside and Ideally-Conducting Parabolic Screen

Orig Pub : Zb. eksperim. i teor. fiziki, 1956, 30, No 3, 528-543

Abstract : Analysis of the problem of the reflection of an electromagnetic wave from a conducting screen, shaped like a parabolic cylinder. The source of oscillation is considered to be linear and placed inside the cylinder, and the current in the source is $I = I_0 e^{i\omega t}$ where I_0 = const is the amplitude of the current and ω is the angular frequency. It is shown that the results obtained in previously-published works are not sufficiently well founded. An accurate solution of the problem is given and is reduced to the solution of an equation with separable variables; the fundamental difficulty lies in a suitable choice of the partial solutions,

Card : 1/3

satisfying all the requirements, including the radiation condition at infinity and the correct behavior at the source. The author considers first the case when the source of oscillation is located along the focal line. The partial solution to the problem is found in the form $u = A^{(1)}_{\nu}(\alpha) \cdot B^{(1)}_{\nu}(\beta)$, where u is the secondary electric field and (α, β) are the parabolic coordinates; $A^{(1)}_{\nu}(\alpha)$ and $B^{(1)}_{\nu}(\beta)$ are expressed in terms of degenerate hypergeometric functions; the real part of the parameter ν varies in the range $-1/2 < R\{\nu\} < 0$. It is possible to assume that the general solution is of the form

$$u(\alpha, \beta) = \int_{-\delta-i\infty}^{-\delta+i\infty} C(\nu) A^{(1)}_{\nu}(\alpha) \cdot B^{(1)}_{\nu}(\beta) d\nu$$

where $0 < \delta < 1/2$. On the surface of the parabolic screen ($\beta = \beta_0$), the electric field E vanishes, i.e., $u = -E_0$, where E_0 is the field of the source. This leads to the equation

$$\int_{-\delta-i\infty}^{-\delta+i\infty} C(\nu) A^{(1)}_{\nu}(\alpha) B^{(1)}_{\nu}(\beta_0) d\nu = -E_0$$

The unknown function $C(\nu)$ is thus found by expanding the field of

Category : USSR/Radiophysics - Radiation of Radio Waves. Antennas I-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4488

the source in the integral in terms of the functions $A^{(1)}(\alpha)$. It is proved, that the solution obtained is a general solution of the problem. It is shown that for the case of high frequencies, the solution assumes a form corresponding to the geometrical-optics approximation. The solution is generalized to include the case of arbitrary location of the source along the axis of the cylinder. Bibliography, 10 titles.

Card : 3/3

UFLYAND, Ya. S.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematicl Congress, Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Uflyand, Ya. S. (Leningrad). On the Solution of One Mixed Problem in the Theory of Elasticity for a Half Space. 213

UFLYAND, Ya. S. Doc Phys-Math Sci -- (diss) "~~Some~~ Certain problems of the theory of elasticity ~~which can be~~ solved by means ~~with the help~~ of integral transformations." Len, 1957. 17 pp 20 cm. (Min of Higher Education USSR. Leningrad Polytechnical Inst im M.A. Kalinin), 100 copies

(KL, 21-57, 98)

Uflend, Ya. S.

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/4 PG - 564
AUTHOR UFLAND Ja. S.
TITLE The contact problem of elasticity theory for a punch which is round in the plan for existing cohesion.
PERIODICAL Priklad.Mat.Mech. 20, 578-587 (1956)
reviewed 2/1957

The author gives a rigorous solution of the mixed problem of the theory of elasticity for the half space $z \geqslant 0$, when in the domain $z = 0$, $r < a$ ($r = \sqrt{x^2 + y^2}$) the displacements u,v,w are given and in the domain $z = 0$, $r > 0$ the stresses σ_z, τ_{zx}, τ_{zy}. The elastic displacements are expressed by the four harmonic functions ϕ_i (i=0,1,2,3) of Papkovič - Neuber. For the solution there are introduced toroidal coordinates α, β and φ by the relation $r + iz = a \operatorname{th} \frac{\alpha+i\beta}{2}$. The six boundary conditions $[u]_{\beta=0} = u_0(\alpha,\varphi),\ldots$ are completed by two further relations (since four harmonic functions ϕ_i are at one's disposal):

1. $[F]_{\beta=0} = \sum_{n=0}^{\infty} F_n r^n e^{in\varphi}$, where $F = \phi_0 + x\phi_1 + y\phi_2 + z\phi_3$

and F_n are unknown constants,

2. $$\left[(1-2\nu)\phi_3 - \phi_4\right]_{\beta=\pi} = \left(x\frac{\partial\phi_1}{\partial z} + y\frac{\partial\phi_2}{\partial z}\right)_{\beta=\pi},$$

where ν is the Poisson coefficient.
These relations lead at once to two separated boundary value problems for the determination of ϕ_1 and ϕ_2:

$$\Delta\phi_1 = 0, \quad 4(1-\nu)\left[\phi_1\right]_{\beta=0} = 2\mu u_0 + \left.\frac{\partial F}{\partial x}\right|_{\beta=0}, \quad 2(1-\nu)\left[\frac{\partial\phi_1}{\partial z}\right]_{\beta=\pi} = \tau_{xo}$$

$$\Delta\phi_2 = 0, \quad 4(1-\nu)\left[\phi_2\right]_{\beta=0} = 2\mu u_0 + \left.\frac{\partial F}{\partial y}\right|_{\beta=0}, \quad 2(1-\nu)\left[\frac{\partial\phi_2}{\partial z}\right]_{\beta=\pi} = \tau_{yo}.$$

In order to satisfy the remaining boundary conditions and the relations 1. and 2., then ϕ_3 and ϕ_4 must be determined from the following system:

$$\Delta\phi_3 = 0, \qquad \Delta\phi_4 = 0,$$

$$\left[\frac{\partial\phi_4}{\partial z}\right]_{\beta=0} = \frac{\mu}{2(1-\nu)}\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right)(xu_0 + yv_0)\Big|_{\beta=0}$$

μ - modulus of shear

$$\left[(3-4\nu)\,\phi_3 - \phi_4\right]_{\beta=0} = 2\mu w_0 + \left[x\frac{\partial\phi_1}{\partial z} + y\frac{\partial\phi_2}{\partial z}\right]_{\beta=0}$$

$$\frac{\partial}{\partial z}\left[2(1-\nu)\,\phi_3 - \phi_4\right]_{\beta=\pi} = \sigma_0 + \left[x\frac{\partial^2\phi_1}{\partial z^2} + y\frac{\partial^2\phi_2}{\partial z^2}\right]_{\beta=\pi} - 2\nu\left[\frac{\partial\phi_1}{\partial x} + \frac{\partial\phi_2}{\partial y}\right]_{\beta=\pi}$$

$$\left[(1-2\nu)\,\phi_3 - \phi_4\right]_{\beta=\pi} = \frac{1}{2(1-\nu)}\left[x\tau_{xo} + y\tau_{yo}\right]_{\beta=\pi} .$$

For the solution of this boundary value problem the author applies the particular solution of the Laplace equation in toroidal coordinates

$$\sqrt{\operatorname{ch}\alpha + \cos\beta}\; e^{\pm\beta\tau}\, P^{m}_{-\frac{1}{2}+i\tau}(\operatorname{ch}\alpha)\, e^{im\varphi} ,$$

where P are Legendre functions, and he finds ϕ_3 and ϕ_4 in the form

Priklad.Mat.Mech. 20, 578-587 (1956) CARD 4/4 PG - 564

$$\Phi_{3,4}(\alpha,\beta,\varphi)=\sqrt{\operatorname{ch}\alpha+\cos\beta}\cdot\sum_{m=-\infty}^{\infty}e^{im\varphi}\int_{0}^{\infty}\left[A^{m}_{3,4}(\tau)\operatorname{ch}\beta\tau+B^{m}_{3,4}(\tau)\operatorname{sh}\beta\tau\right]P^{m}_{-\frac{1}{2}+i\tau}(\operatorname{ch}\alpha)\,d\tau.$$

Then this solution method is applied to the following concrete problem: external forces effect on a rigid punch with circular basis which is connected with cohesion with the elastic half space $z \geq 0$. It is asked for the stresses in the half space and for the relation between the displacements of the punch and the external forces. It is stated that a force effecting in the base plane which is directed to the center of the basis does not only effect a translation but also a torsion. A force couple in the plane of an axial section also effects translation besides of rotation.

INSTITUTION: Leningrad.

UFLYAND, Ya.S.

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/3 PG - 694
AUTHOR UFLAND Ya.S.
TITLE The axialsymmetric problem of elasticity theory for a half space under boundary conditions which are separated by a circle periphery.
PERIODICAL Doklady Akad.Nauk 110, 531-535 (1956)
reviewed 4/1957

The author considers the equilibrium of an elastic half space ($z \geq 0$) under the following conditions: inside of the circle $r = a$ the displacements and outside of it the tensions are given. Besides of this the problem is assumed to be axialsymmetric. The displacements u_r and u_z are expressed in cylindric coordinates by the harmonic functions of Papkovič - Neiber:

$$(1) \qquad 2\mu u_r = \frac{\partial F}{\partial r}, \quad 2\mu u_z = -\frac{\partial F}{\partial z} + 4(1-\nu)\phi, \quad F = \omega + z\phi,$$

where $\omega = \omega(r,z)$, $\phi = \phi(r,z)$, $\Delta\omega = \Delta\phi = 0$, μ - modulus of shear, ν - Poisson coefficient. Furthermore:

$$(2) \qquad \left.\frac{\partial \varphi}{\partial z}\right|_{\substack{z=0 \\ r<a}} = f_1(r) \qquad \left[(3-4\nu)\phi - \varphi\right]_{\substack{z=0 \\ r<a}} = f_2(r); \qquad \varphi = \frac{\partial \omega}{\partial z}$$

and

$$\frac{\partial}{\partial z}\left[2(1-\nu)\phi-\varphi\right]_{\substack{z=0\\ r>a}} = f_3(r) \qquad \left[(1-2\nu)\phi-\varphi\right]_{\substack{z=0\\ r>a}} = f_4(r).$$

Two functions ϕ and φ which are harmonic in the half space and satisfy (2) and (3) must be determined. The interior and the exterior of the circle z = 0, r = a are the coordinate surfaces $\beta = 0$ and $\beta = \pi$ of the toroidal coordinate system

$$z + ir = ai \operatorname{cth}\frac{\alpha+i\beta}{2} \qquad (0 \leq \alpha < \infty).$$

Therefore φ and ϕ can be written in the form of integral representations in terms of the Legendre functions $P_{-1/2+i\tau}(\operatorname{ch}\alpha)$

$$\varphi = \sqrt{\operatorname{ch}\alpha - \cos\beta}\int_0^\infty \left[A(\tau)\operatorname{ch}\beta\tau + B(\tau)\operatorname{sh}\beta\tau\right] P_{-1/2+i\tau}(\operatorname{ch}\alpha)\, d\tau,$$

Doklady Akad.Nauk 110, 531-533 (1956) CARD 3/3 PG - 694

$$\phi = \sqrt{\operatorname{ch}\alpha - \cos\beta} \int_0^\infty \left[C(\tau)\operatorname{ch}\beta\tau + D(\tau)\operatorname{sh}\beta\tau\right] P_{-1/2+i\tau}(\operatorname{ch}\alpha)\,d\tau .$$

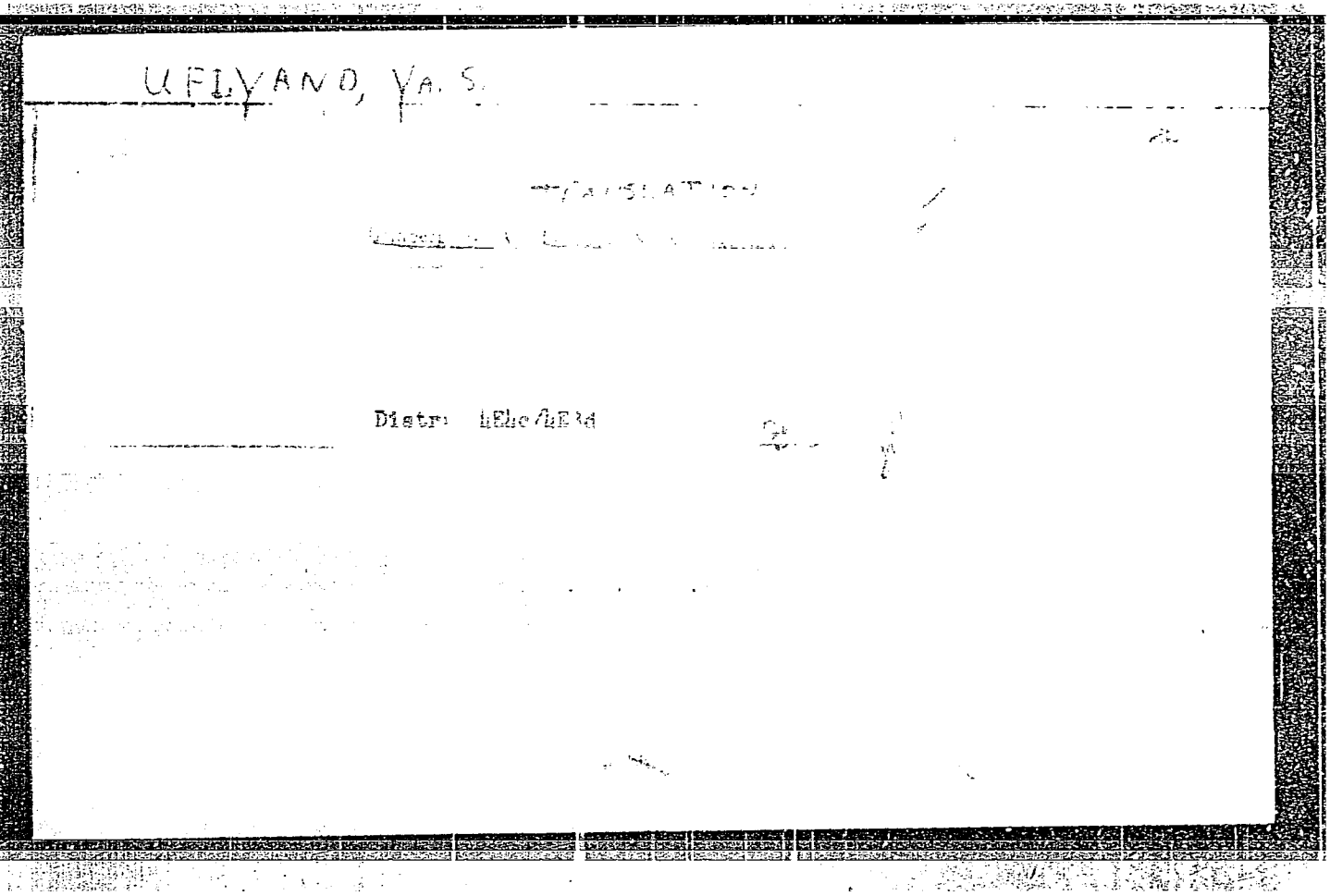
If (2) and (3) are written in new coordinates too, then the defining equations for A,B,C,D are obtained.
The results are applied to the determination of the pressure which is performed by a plane round punch on an elastic half space in presence of cohesion. If the vertical displacement of the punch is w and the vertical force effecting in the axis of the punch is P, then it holds

$$P = \frac{4\mu w\, a\, \ln(3-4\nu)}{1-2\nu} .$$

INSTITUTION: Physical-technical Institute, Acad.Sci. USSR.

UFLYAND, Yakov Solomonovich (Leningrad Physico-Tech Inst, AS, USSR) awarded sci degree of Doc Physico-Math Sci for the 26 Jun 57 defense of dissertation: "Certain problems in the theory of elasticity, solved with the aid of integral transformations" at the Council, Leningrad Polytech Inst imeni Kalinin; Prot No 11, 10 May 58.

(BMVO, 10-58,21)



SOV/124-58-11-12973

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 11, p 159 (USSR)

AUTHOR: Uflyand, Ya. S.

TITLE: The Fundamental Mixed Problem of the Theory of Elasticity for a Halfspace With a Rectilinear Border Between Boundary Conditions (Osnovnaya smeshannaya zadacha teorii uprugosti dlya poluprostranstva s pryamolineynoy granitsey razdela krayevykh usloviy)

PERIODICAL: Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t, 1957, Nr 12, pp 22-27

ABSTRACT: The author provides a method for the solution of the problem of the elastic equilibrium of an isotropic homogeneous halfspace ($y \geq 0$) the boundaries of which are subjected in part ($x > 0$) to given displacements (u, v, w) and in part ($x < 0$) to given stresses (σ_y, τ_{yz}, τ_{yx}). It is shown that, by means of integral Fourier transforms (relative to the coordinate z) and Kontorovich-Lebedev transforms (relative to the coordinate r) the system of the mixed boundary conditions for the Papkovich-Neuber functions is transformed into a linear algebraic system in the space of representation. Having solved that system and having accomplished

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The Fundamental Mixed Problem of the Theory of Elasticity (cont.)

thereupon the inversion (in the course of which one must surmount a certain specific difficulty encountered in connection with the regularization of the function under the integral), it is in principle possible to obtain a presentation of the solution in a Fourier and Kontorovich-Lebedev integral. An example is given (without, however, carrying it through to completion) wherein the action of a concentrated normal force on an elastic halfspace is analyzed, assuming that a part of the boundary of the halfspace ($x > 0$) is rigidly clamped. There are numerous typographical errors in the formulas. [The theory of the integral Kontorovich-Lebedev transform is expounded in sufficient detail in the book: Grinberg, G. A. Izbrannyye voprosy matematicheskoy teorii elektricheskikh magnitnykh yavleniy (Selected Problems of the Mathematical Theory of Electrical and Magnetic Phenomena). Moscow-Leningrad, Izd-vo AN SSSR, 1948, Sections 55 and 56.]

N. A. Rostovtsev

LUR'YE, A.I.; UFLYAND, Ya.S.

"Fourier's transforms" by I. Sneddon. Usp.mat.nauk 12 no.2(74):252-254 Mr.-Apr '57. (MLRA 10:7)
(Transformations (Mathematics))

AUTHORS: Lebedev, N.N., Uflyand, Ya.S. (Leningrad) SOV/40-22-3-4/21

TITLE: An Axial Symmetric Problem of Compression of an Elastic Layer (Osesimmetrichnaya kontaktnaya zadacha dlya uprugogo sloya)

PERIODICAL: Prikladnaya matematika i mekhanika, 1958, Vol 22, Nr 3, pp 320 - 326 (USSR)

ABSTRACT: In elasticity theory it is in general supposed for the solution of compression problems that the body standing under the influence of any rigid punch forms an elastic half space. In the present paper now the considerably more difficult problem is investigated in which a punch of axial symmetrical form influences on an elastic layer. It is assumed that the punch is loaded by a pure axial force. Furthermore the friction between the punch and the layer as well as the friction between the layer and the base plate which is assumed to be rigid is neglected. But it is pointed out that this neglect can also be omitted.

With the method developed in the paper it is possible to express by an auxiliary function the sought displacements of the elastic medium and the stresses occurring therein. This auxiliary function is the solution of a Fredholm integral

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An Axial Symmetric Problem of Compression of an Elastic Layer SOV/40-22-3-4/21

equation with a continuous symmetric kernel.
For the special case of a punch with a plane basis several numerical results are given in form of tables. Also for the case of a punch without plane basis and under unsymmetric load the possibilities for the solution are considered but not carried out in detail.
There are 3 tables, 1 figure, and 4 references, 3 of which are Soviet, and 1 is English.

SUBMITTED: July 3, 1957

Card 2/2

UFLYAND, Ya.S.

Spatial problem in the theory of elasticity for unlimited bodies weakened by plane cuts. Trudy LPI no.192:60-70 '58. (MIRA 11:6)

(Elastic solids)

74(10) SOV/20-123-6-10/50

AUTHOR: Uflyand, Ya. S.

TITLE: A Mixed Problem for an Elastical Layer
(Smeshannaya zadacha dlya uprugogo sloya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 991-993
(USSR)

ABSTRACT: The present paper gives an exact solution of the spatial problem of the theory of elasticity for an unlimited layer $(-\infty < x, y < \infty , 0 \leq z \leq h)$. The elastical displacements (u,v,w) are given for one boundary plane $(z = 0)$ of this layer, and the stresses $(\sigma_z, \tau_{zx}, \tau_{yz})$ - for the other. In order to solve this problem, u, v, w are represented by 4 harmonic functions $(\Phi_0, \Phi_1, \Phi_2, \Phi_3)$ of P. F. Pankovich (Ref 1) and G. Neyber (Ref 2):

$$2\mu u = -\frac{\partial F}{\partial x} + 4(1-\nu)\,\Phi_1 , \quad 2\mu v = -\frac{\partial F}{\partial y} + 4(1-\nu)\,\Phi_2$$

$$2\mu w = -\frac{\partial F}{\partial z} + 4(1-\nu)\,\Phi_3 , \quad F = \Phi_0 + x\Phi_1 + y\Phi_2 + z\Phi_3$$

Card 1/3

μ denotes the modulus of rigidity, ν - Poisson's (Puasson) coefficient. The author also gives expressions for the stresses figuring in the boundary conditions of the problem:

$u|_{z=0} = u_0(r, \varphi)$, $v|_{z=0} = v_0(r, \varphi)$, $w|_{z=0} = w_0(r, \varphi)$

$\sigma|_{z=h} = \sigma(r, \varphi)$, $\tau_{zx}|_{z=h} = \tau_x(r, \varphi)$, $\tau_{yz}|_{z=h} = \tau_y(r, \varphi)$

r, φ , z denote the cylindrical coordinates. Moreover, the 2 additional conditions $F|_{z=0} = 0$ and $\Phi|_{z=h} = 0$ have to be taken into account. Therefrom separate boundary conditions for the functions Φ_1 and Φ_2 can be deduced. After the functions Φ_1 and Φ_2 are found, the boundary problem for the harmonic functions Φ_0 and Φ_3 has to be solved. This mixed problem of the potential theory can be solved exactly by means of an integral Hankel (Khankel') transformation. The harmonic functions Φ_0 and Φ_3 are sought as expansions with respect to Bessel (Bessel') functions. The coefficients figuring in this system

A Mixed Problem for an Elastical Layer

SOV/20-123-6-10/50

can be calculated by means of a system of linear algebraic equations. The whole problem can practically be reduced to the solving of a system of 2 equations. As an example, the author investigates a layer of fixed basis ($z = 0$), which is deformed by the tangential force T applied in the point (0, 0, h) in the direction of the axis Ox. An expression is found for the tangential stress $\tau_0 = \tau_{zx}|_{z=0}$. There are 4 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Physico-Technical Institute of the Academy of Sciences, USSR)

PRESENTED: August 4, 1958, by N. I. Muskhelishvili, Academician

SUBMITTED: July 8, 1958

Card 3/3

SOV/179-59-2-23/40

AUTHOR: Uflyand, Ya. S. (Leningrad)

TITLE: A Mixed Problem in the Theory of Elasticity for a Wedge (Smeshannaya zadacha teorii uprugosti dlya klina)

PERIODICAL: Izvestiya Akademii nauk SSSR OTN, Mekhanika i mashinostroyeniye, 1959, Nr 2, pp 156-158 (USSR)

ABSTRACT: An accurate solution is given for the plane deformation of a wedge, one boundary of which is subjected to a prescribed stress, and the other to a prescribed displacement. The solution is obtained using the Papkovich-Neyber representation (Refs 2 and 3) and the Mellin transform. The general formulae obtained in this way are then applied to the problem of a wedge, one boundary of which ($\theta = 0$) is rigidly fixed and a concentrated force P is applied to

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A Mixed Problem in the Theory of Elasticity for a Wedge

the point $r = a$ of the other boundary ($\theta = \alpha$, Fig 1).
There are 2 figures and 5 Soviet references.

SUBMITTED: October 16, 1958.

20333 S/124/61/000/005/021/032
A005/A130

24 4280 1103

AUTHOR: Uflyand, Ya. S.

TITLE: The concentration of stresses in an elastic layer weakened by a plane annular aperture

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 5 1961, 5, abstract 5V23. (Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t, 1959, no. 8. 56 - 61)

TEXT: The solution of the axisymmetric equilibrium problem of an unlimited elastic layer weakened by an annular aperture of radius a placed in the plane center is reduced to a system of integral equations of the form:

$$\int_0^\infty B_1(\lambda) \frac{\lambda h + \operatorname{ch} \lambda h \operatorname{sh} \lambda h}{\lambda h \operatorname{sh}^2 \lambda h} J_0(\lambda r)\, d\lambda = 0 \quad (r > a)$$

$$\int_0^\infty \lambda B_1(\lambda) \frac{\operatorname{sh}^2 \lambda h - \lambda^2 h^2}{\lambda h \operatorname{sh}^2 \lambda h} J_0(\lambda r)\, d\lambda = q \quad (r < a)$$

Card 1/2

The concentration of stresses in an...

where q are constant stretching stresses applied to the boundary planes of the layer. By means of the N. N. Lebedev method (see, for instance, Dokl. AN SSSR, 1957, v. 114, no. 3), these equations are reduced to a regular Fredholm equation which is solved by the numerical method. The measure of the increase in concentration of stresses in the layerweakened by an annular aperture is determined by means of comparison with the corresponding problem for an unlimited space.

F. Shapiro

[Abstracter's note: Complete translation]

Card 2/2

24.4200 also 1327,2607

S/044/61/000/004/019/033
C111/C222

AUTHOR: Uflyand, Ya.S.

TITLE: Tension concentration in an elastic layer weakened by a plane round slit

PERIODICAL: Referativnyy zhurnal. Matematika, no. 4, 1961, 62, abstract 4 B 318. ("Nauchno-tekhn. inform. byul. Leningr. politekhn. in-t", 1959, no. 8, 56-61)

TEXT: The author investigates the elastic equilibrium of a layer weakened by a round slit and which is stretched by a load distributed uniformly over the boundary planes of the layer. After a separation of the uniform state of tension and introduction of the functions of Papkovich-Neuber the solution of the problem is reduced to the determination of two harmonic functions which satisfy boundary conditions of mixed type. The coefficients of the developments of these functions in terms of eigenfunctions of the problem are determined from paired integral equations the solution of which can be expressed by quadratures with the aid of an auxiliary function which satisfies a Fredholm equation

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with a symmetric continuous kernel. The author gives results of numerical calculations and asymptotic formulas for the stress distribution in the neighborhood of the boundary of the slit.

[Abstracter's note : Complete translation.]

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UFLYAND, Ya.S. (Leningrad)

Elastic equilibrium of an unlimited body weakened by an exterior circular aperture. Prikl. mat. i mekh. 23 no.1:101-108 Ja-F '59. (MIRA 12:2)

(Elasticity)

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AUTHOR: Uflyand, Ya. S.

SOV/20-129-5-9/64

TITLE: The Torsion of an Elastic Layer

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 5, pp 997-999 (USSR)

ABSTRACT: The author investigates the equilibrium of an unbounded layer which is subjected to torsion by the twisting of a stamp connected with it. The cylindrical coordinates (r, φ, z) are introduced, one boundary surface $(z = h)$ of the layer is fixed, and the other $(z = 0)$ is subjected to torsion at $r < a$. The problem is then reduced to determining the only non-vanishing component of the shift $u_\varphi = u(r,z)$, which satisfies the equation $\frac{\partial^2 u}{\partial r^2} + \frac{1}{r}\frac{\partial u}{\partial r} - \frac{u}{r^2} + \frac{\partial^2 u}{\partial z^2} = 0$ and the boundary conditions $u|_{z=h} = 0$; $u|_{z=o} = \varepsilon r$, $(r < a)$; $\frac{\partial u}{\partial z}\Big|_{z=o} = 0$, $(r > a)$. Here ε denotes the angle of twisting of the stamp and a - its radius. The above equation and the corresponding boundary conditions are satisfied by $u(r,z) = \int_0^\infty A(\lambda) \frac{\operatorname{sh}\lambda(h-z)}{\operatorname{sh}\lambda h} J_1(\lambda r)\, d\lambda$, where $A(\lambda)$

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is an unknown function of the integration parameter. By substitution one obtains two integral equations, which may be reduced to a Fredholm equation with continuous kernel. After some further steps an integral equation is obtained for determining the function $\varphi(t)$. For the moment of force applied to the stamp one finds $M = 4\pi\mu \int_0^a t\varphi(t)dt$, where the unknown value ε of the angle of twisting may be expressed by a given value of the moment of force. In order to be able to solve the last-mentioned integral equation numerically, a sum is substituted for the integral, after which the method of successive approximations is employed. The results obtained by the calculations are given in a table. The result found for one semispace agrees with a known result obtained by N. A. Rostovtsev (Ref 6). There are 1 table and 6 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences of the USSR)

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The Torsion of an Elastic Layer SOV/20-129-5-9/64

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Card 3/3

PUPYREV, V.A. (Leningrad); UFLYAND, Ya.S. (Leningrad)

Some contact problems for an elastic layer. Prikl. mat. i mekh. 24 no.4:683-690 Jl-Ag '60. (MIRA 13:9)
(Elasticity)

S/057/60/030/05/01/014
B012/B056

AUTHORS: Uflyand, Ya. S., Chekmarev, I. B.

TITLE: Investigation of a Non-steady Flow of a Conducting Liquid in a Plane Channel With Mobile Borders 21

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 5, pp. 465 - 471

TEXT: The exact solution of a one-dimensional non-steady problem of magnetohydrodynamics for a plane-parallel layer in the magnetic cross field is given. The plates bounding this layer in this case move with given velocities. It is shown that, when solving similar problems, the currents induced in the medium surrounding the liquid (channel walls) must be taken into account. First, the general solution of the problem is offered, after which the problem is subdivided into a symmetric and an antisymmetric one. The problems of the type under investigation are found to be interrelated with certain boundary problems of mathematical physics, which have a mixed spectrum of eigenvalues. In conclusion, it is pointed out that in perfectly conductive channel walls the spectrum of the

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