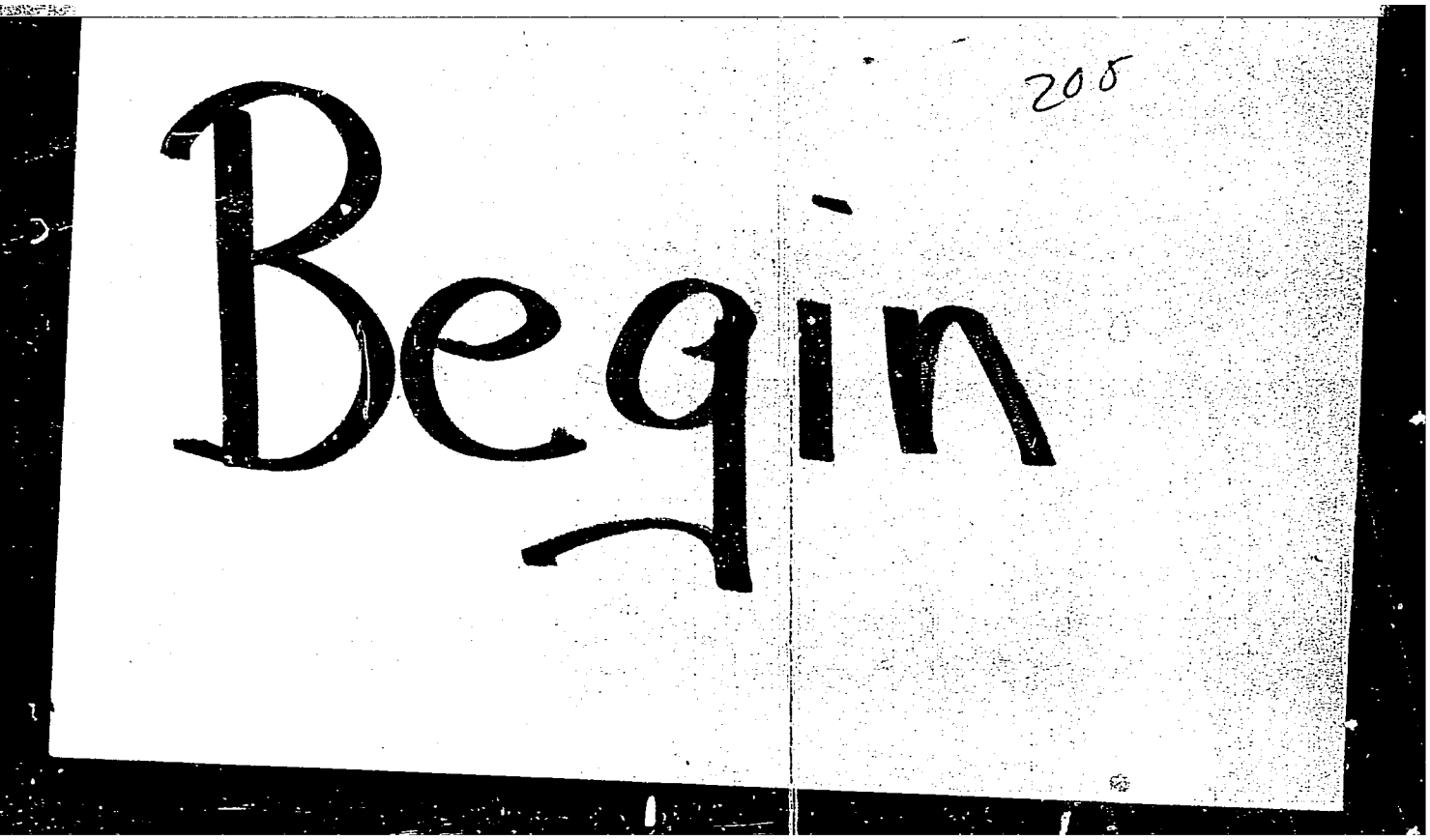
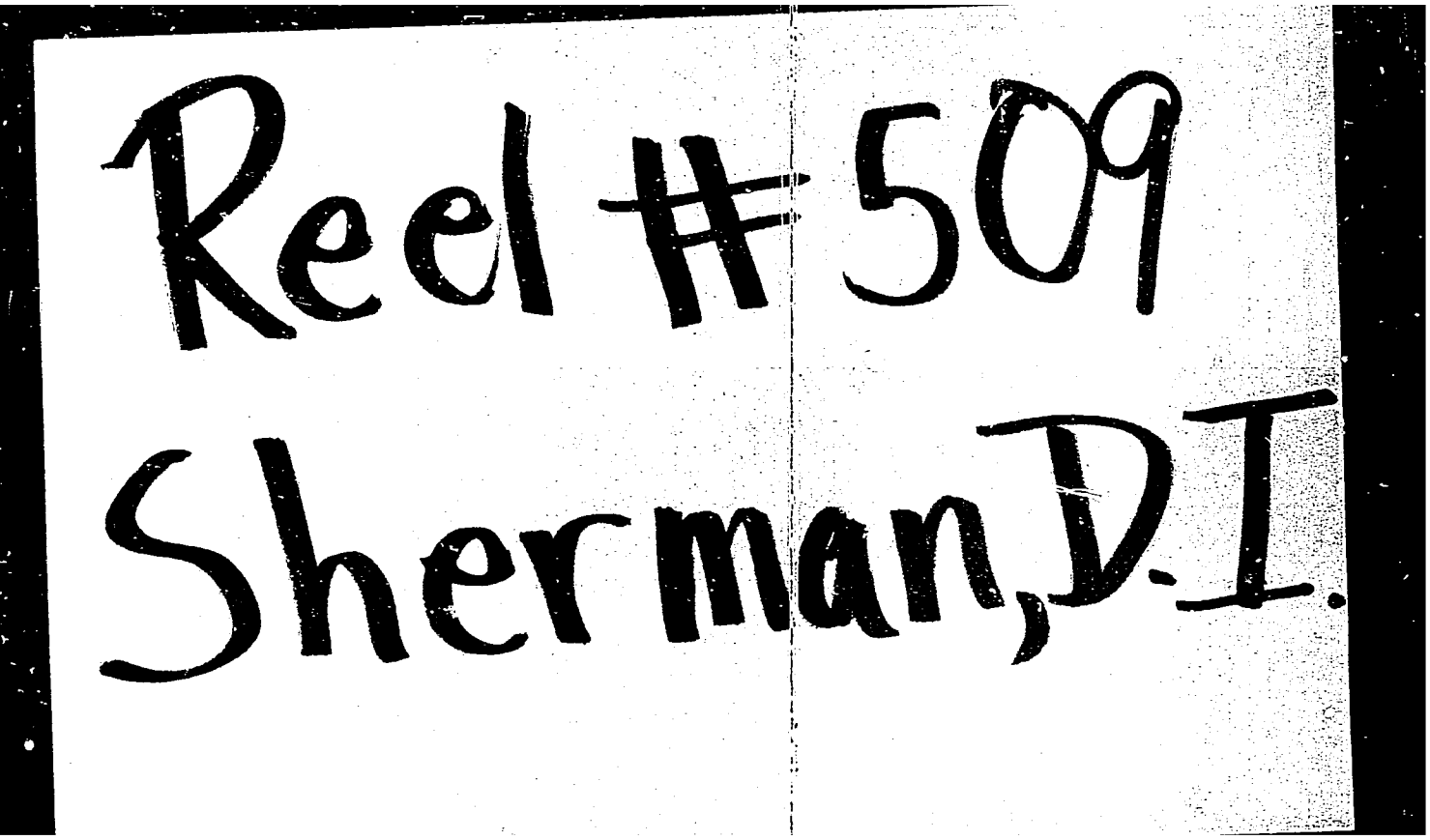
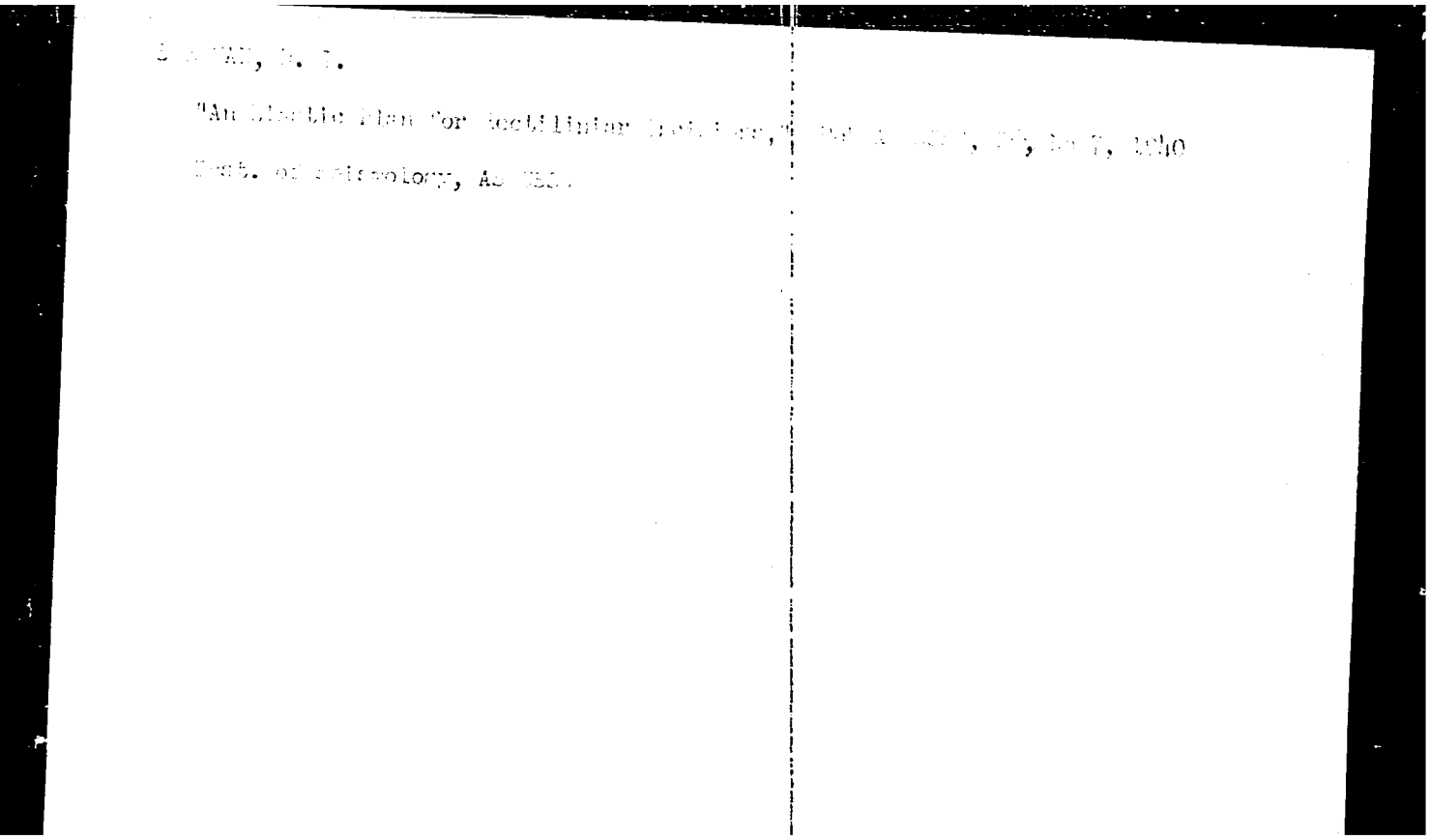






[illegible]

"A [illegible] of the Potential Theory and the Elasticity Theory for a Plane having a [illegible] of [illegible]ectilinear Intersections," [illegible] 27, No 4, 1940

Inst. of [illegible], AS [illegible]

[redacted], . . .

"[redacted] of the Fundamental Problem of the Theory of Static Plane [redacted] of the Theory of Elasticity," Dok AN SSSR 27, No 9, 1940.

[redacted], Ac [redacted]

[redacted]

[redacted], . . I.

"[redacted] of the Static Theory of the Elasticity of Multiply [redacted] Spaces - on the Solution of the Second Fundamental Problem of the Static Plane Theory of Elasticity," Dok AN SSSR, 25, No 1, 1940.

[redacted], of Construction, AN SSSR

[redacted], L. I.

"A Remark Concerning Dirichlet's Problem." Dok AN SSSR, 29, No 4, 1940.

[redacted] Leningrad, AS USSR

[redacted], N. I.

"A New Solution to the Problem Involving Planes of the Elasticity Theory for an Anisotropic Medium," Dok AN SSSR 32, No 5, 1941

Inst Seismology, AS USSR

[redacted], N. I.

"Concerning the Reduction of a Class of Problems on the Integral Equation of Fredholm," Dok AN 32, No 9, 1941

Inst Seismology, AS USSR

SHERMAN, D.I.

Serman, D. I. On the propagation of waves in a fluid layer covering an elastic half-space. Acad. Sci. URSS. Publ. [Trudy] Inst. Séismolog. no. 115, 43 pp. (1945). (Russian)

Dans ce mémoire l'auteur étudie le problème de détermination des ondes superficielles de Rayleigh sur les limites des milieux considérés. Le problème est effectivement résolu dans le cas particulier de présence d'une force périodique superficielle appliquée sur la surface de séparation de deux milieux ou sur la limite supérieure de la couche fluide. Les formules obtenues sont discutées, et les oscillations principale et résiduelle, à des distances suffisamment grandes des points d'application de la force périodique superficielle, sont calculées. *V. A. Kostitzin* (Paris).

[redacted], M. I.

"Concerning Certain Problems of the Static Theory of Elasticity for the Half-Space /z e/ and for Two Interconnected Half-Spaces /z e/ with Different Elastic Properties." Iz. Ak. Nauk SSSR, Otdel. Tekh. Nauk, No. 9, 1945. Submitted 7 Jun 1945.

Report U-1582, 6 Dec 1951.

SHERMAN, D.

Sherman, D. On the reduction of the plane problem of the theory of potential to an integral equation. Bull. Acad. Sci. URSS. Sér. Math. [Izvestia Akad. Nauk SSSR] 9, 357–362 (1945). (Russian, English summary)

Let S be a finite plane domain whose boundary L consists of a finite number of closed curves of continuous curvature. The author considers the problem of determining a function $u(x, y)$ harmonic in S and satisfying on L a differential condition of the form $a(s)\partial u/\partial x+b(s)\partial u/\partial y+c(s)u=f(s)$, or more generally of the form

$$\sum_{k=0}^{m}\sum_{j=0}^{k}a_{kj}(s)\frac{\partial^k u}{\partial x^{k-j}\partial y^j}=f(s),$$

where $a_{kj}(s)$ and $f(s)$ are suitably restricted functions of the arc length; he reduces the problem to the solution of a Fredholm equation. *E. F. Beckenbach.*

Source: Mathematical Reviews, Vol 8, No. 2

SHERMAN, D.

Sherman, D. On some problems of the theory of stationary oscillations. Bull. Acad. Sci. URSS. Sér. Math. [Izvestia Akad. Nauk SSSR] 9, 363–370 (1945). (Russian. English summary)

The method of the paper reviewed above is extended to treat similarly the problem of determining solutions of the differential equation $\Delta u + \lambda^2 u = 0$, with boundary condition the same as in the former problem. — *E. F. Beckenbach.*

Source: Mathematical Reviews, Vol 8, No. 2

SHERMAN D. I.

1000

Sherman, D. I. Certain problems of the theory of potential. Appl. Math. Mech. [Akad. Nauk SSSR. Prikl. Mat. Mech.] 9, 479–488 (1945). (Russian. English summary) [MF 15441]

The author shows how the potential function $u(x, y)$ which is regular in the finite simply-connected region S and which satisfies the boundary condition $a(s)u_x+b(s)u_y=f(s)$ on the continuously curved boundary L of S can be found as the solution of an equivalent Fredholm equation. Assuming $a^2(s)+b^2(s)=1$ all along L, two cases arise according to whether in the representation $a=\cos\omega(s)$, $b=\sin\omega(s)$ the function $\omega(s)$ increases by a nonpositive or by a positive multiple of 2π when the contour L is described once in the positive sense. In the first case the boundary-value problem always has a solution, in the second case there are non-trivial solutions of the homogeneous problem.

By the same method Poincaré's problem, where the boundary condition is $du/dn+p(s)du/ds+q(s)u=f(s)$, is reduced to a Fredholm equation, and so are certain singular integral equations. *M. Golomb* (Lafayette, Ind.).

Source: Mathematical Reviews, 1948, Vol 9, No. 3

SHUMAN, B. I.

Institute of Mechanics, Academy of Sciences, USSR. "Concerning One Case of Variation of an Elastic Half-Space." Iz. Ak. Nauk SSSR, Otdel. Tekh. Nauk, No. 10-11, 1945. Submitted 16 Jul 1945.

Report U-1582, 6 Dec 1951.

Smirnov, V. I.

"On Diffraction of Elastic Waves," O.M. Acad Sci USSR, 30 Sep 45, Vol 48, No 9. pp 624-629.

A short mathematical paper on the calculation of the vector components of a steady vibration propagated in an elastic medium.

[redacted], S. I.

"On Poincare's Problem in the Theory of Potential," Dok AN SSSR 49, No 9, 1945.

Inst. Mech., AN SSSR

SHERMAN, D. I.

★Sc'ermann, D. I. Oscillation du demi-espace é'stique aux déplacements ou aux forces extérieures données à la frontière. Acad. Sci. URSS. Publ. [Trudy] Inst. Séismolog. no. 118, 47 pp. (1946). (Russian)

This paper contains a new method of solution of the three-dimensional problem of propagation of vibrations in an elastic half-space when either the displacements or external forces are specified on the boundary. For simplicity, initial displacements and velocities are assumed to vanish. The method of solution is based on a direct application of Fourier integrals. After a sequence of transformations on scalar and vector potentials both boundary value problems are reduced to a consideration of certain quadruple integrals, which yield a qualitative analysis of the phenomenon of wave propagation. *I. S. Sokolnikoff* (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 8 No.6

USSR/Mathematics Feb 1946
Potential theory

"The General Problem of the Potential Theorem," D. I. Sherman, 14 pp

"Izv Ak Nauk Ser Mat" Vol X, No 2

Determination of a function $u(x,y)$ harmonic in a finite (simply or multiply connected) domain S in the plane $z = x + iy$, satisfying certain conditions on the boundary L of S.

13T94

SHERMAN, D. I.

Sherman, D. I. [illegible] elastic oscillations in the case of given displacements on the boundary of the medium. Appl. Math. Mech. [Akad. Nauk SSSR. Prikl. Mat. Mech.] 10, 617–622 (1946). (Russian. English summary)

The elastic medium fills a finite multiply-connected domain S in the complex plane bounded by nonintersecting and nonosculating closed curves. Consideration of the oscillations arising from given displacements on the boundary gives rise to a pair of second order partial differential equations in the longitudinal and transverse potentials subject to prescribed boundary conditions involving first partial derivatives of the potentials. Potentials of a form leading to the solution of a system of Fredholm integral equations with kernels containing the frequency λ of oscillations as a parameter are sought. The existence of solutions for $\lambda=0$ is established, and hence, by a theorem of Tamarkin [Ann. of Math. (2) 28, 127–152 (1927)], solutions for almost all λ exist. *T. C. Doyle* (Hanover, N. H.).

[illegible]l Reviews, Vol No. 6

SHERMAN, D. I. FA 15T7

USSR/Oscillations - Theory Feb 1947
Mathematics, Applied

"The Dirichlet and Neuman Problems in the Theory of Steady Oscillations," D. I. Sherman, 8 pp

"Prik Mate i Mekh" Vol XI, No 2

Reduction of the problems of the multi-connected domain to the Fredholm equations, which differ somewhat from the hitherto known integral equations for the same problems and make possible direct establishment of the existence of the solution.

15T7

SHERMAN, D. I.

Scherman, D. J. Sur une méthode de résoudre certains problèmes de la théorie de l'élasticité pour les domaines doublement connexes. C. R. (Doklady) Acad. Sci. URSS (N.S.) 55, 697–700 (1947).

Let the elastic medium occupy a doubly connected domain S in the plane $z=x+iy$. The boundary L of S consists of two simple closed curves L_1 and L_2 having no points in common. Suppose L_1 is in the interior of L_2 and denote by S_1 and S_2 two simply connected domains bounded by L_1 and L_2, respectively. The domain S_1 is then infinite. The determination of stresses throughout the domain S, when forces are prescribed on L, can be reduced to the search for two functions $\varphi(z)$ and $\psi(z)$, regular in S, and satisfying on L the condition $\varphi(t)+t\overline{\varphi'(t)}+\overline{\psi(t)}=f(t)$, where t is a variable point on L and $f(t)$ is a known function. The author indicates a method of reducing the solution of this problem to an analogous problem for a simply connected domain and is led to one integral equation of Fredholm type for a certain auxiliary function defined over one of the curves L_1 or L_2. *I. S. Sokolnikoff* (Los Angeles, Calif.)

Source: Mathematical Reviews, 1948, Vol 9, No. 2

SHERMAN, D. I. PA 58T92

May 1947

USSR/Physics
Vibration
Mathematics, Applied

"Several Particular Cases of a General Problem in the Theory of Vibrations," D. I. Sherman, Inst Mechanics, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVI, No 6

Contains number of mathematical formulas designed to prove that for any function $u(x, y; \lambda)$ satisfying the equation $\Delta u - \lambda^2 u = 0$,

$$u(x, y; \lambda) = Re\left[\frac{1}{\pi i}\int_{\zeta} v(s, \lambda)\frac{dt}{g} + \sum_{k=0}^{m+n} c_k(\lambda)^{ike} I_k(\lambda\rho)\right]$$

58T92

SHERMAN, D.I.

Serman, D. I. On the state of stress in some shrink-fitted members. Izvestiya Akad. Nauk SSSR. Otd. Tehn. Nauk 1948, 1371–1388 (1948). (Russian)

The paper contains a solution of the following two-dimensional elastic problem. A long hollow prismatic body whose section by a plane normal to the axis of the prism is a square (with rounded corners) with a circular hole at the center of the square, is shrink-fitted on a solid circular shaft. The elastic properties of the shaft are identical with those of the prism, and the lateral surface of the prism is free of stress. What is the state of stress in the member so formed? If the boundary of the square in the (x, y)-plane is L, and that of the circular hole is γ, the solution of the problem, following Muschelišvili, reduces to the search for four functions $\varphi_j(z)$ and $\psi_j(z)$ $(j=1, 2)$ of a complex variable $z=x+iy$, analytic in the regions S_j, where S_1 is a doubly-connected region bounded by L and γ and S_2 is the circular region bounded by γ.

The functions φ_i and ψ_i are determined by the following boundary conditions:

$$\varphi_1(t)+t\overline{\varphi_1'(t)}+\overline{\psi_1(t)}=0$$

on L;

$$\varphi_1(t)+t\overline{\varphi_1'(t)}+\overline{\psi_1(t)}=\varphi_2(t)+t\overline{\varphi_2'(t)}+\overline{\psi_2(t)},$$
$$\kappa\varphi_1(t)-t\overline{\varphi_1'(t)}-\overline{\psi_1(t)}=\kappa\varphi_2(t)-t\overline{\varphi_2'(t)}-\overline{\psi_2(t)}+2kt$$

on γ, where κ and k are constants determined by the elastic properties of the medium and by the amount of shrink along γ. The author reduces the problem (by means of analytic continuation) to the determination of only two functions $\varphi(z)$ and $\psi(z)$, analytic in the region S_1+S_2, of the form

$$\varphi(z)=\frac{1}{2\pi i}\int_L\frac{\omega(t)}{t-z}dt;\quad \psi(z)=\frac{1}{2\pi i}\int_L\frac{\overline{\omega(t)}-t\omega'(t)}{t-z}dt,$$

where $\omega(t)$ satisfies a certain integral-differential equation and bars denote conjugate values. The solution of the latter equation is obtained in the form of an infinite series. A calculation of the distribution of normal stress along γ, contained in the paper, illustrates the practical value of the function-theoretic methods of solution of elastic problems.

I. S. Sokolnikoff (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 10. No. 6

SHERMAN, D. I.

PA76T45

USSR/Engineering May 1948
Wing Theory
Mathematics, Applied

"The Prandtl Equation in the Theory of a Wing of Finite Span," D. I. Sherman, Inst of Mech, Acad Sci USSR, 6 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 5

Presents solutions for Prandtl's integral differential singular equation for case when function p(x) is rational. Also presents approximate method for solving the equation which will hold true for any value of the function b(x). Submitted 2 Feb 1948.

76T45

PA 14/49T23

USSR/Engineering Sep 48
Stresses

"The Tension States in Some Pressed Parts," D. I. Sherman, Mech Inst, Acad Sci USSR, 18 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 9

A hollow prismatic body whose section is a plane perpendicular to its axis, is of quadrate shape. It is weakened by a symmetrically located circular hole and by mounting on a solid circular shaft. Tightness of fit is given. Elastic properties of both bodies are considered identical. Lateral surface of the prismatic body is assumed to be free

14/49T23

USSR/Engineering (Contd) Sep 48

from external forces. Calculates stress distribution in body. Concludes by considering case, when elastic properties of parts are not identical.

Submitted 8 Mar 48.

14/49T23

SHERMAN, D. I.

[redacted]

[redacted] M., V. I.

"On Some Three-Dimensional Problems of the Theory of Potential," Prik. Mat. i Mekh., 12, No 3, 1948.

Inst. of Mech., AS USSR

SHERMAN, D. I.

Šerman, D. I. On methods of solving certain singular integral equations. Akad. Nauk SSSR. Prikl. Mat. Meh. 12, 423–452 (1948). (Russian)

This is a study of systems of the form

$$(1)\quad \sum_{j=1}^{n}\left\{a_{kj}(t_0)\omega_j(t_0)+b_{kj}(t_0)(\pi i)^{-1}\int_L (t-t_0)^{-1}\omega_j(t)dt\right\}=f_k(t_0)$$

$(k=1, 2)$, where L is a simple, closed, "smooth" curve (in the complex plane of $z=x+iy$), bounding a finite simply-connected region S; the $\omega_j(t)$ are the unknowns and the a_{kj}, b_{kj}, f_k are assigned, suitably differentiable on L; the integrals are in the sense of principal values. On letting $c_{kj}=a_{kj}-b_{kj}$, $d_{kj}=a_{kj}+b_{kj}$, one forms determinants $\Delta_1=|(c_{ij})|$, $\Delta_2=|(d_{ij})|$. The extensive literature relating to equations of type (1), and of other similar types, is largely concerned with transformations into regular Fredholm equations of the second kind, when Δ_1, Δ_2 (or other analogous functions) are distinct from zero on L. One of the novel features of this work is that one of the determinants is allowed to vanish at some points of L (the other one is assumed not 0 on L). Specifically, it is assumed that $\Delta_1(t)$ has a simple zero at $t=\alpha$ (on L) and the coefficients are analytic at $t=\alpha$ (the latter condition can be lightened). It is shown that a reduction to regular Fredholm equations is possible and that (1) has a solution ω_j $(j=1, 2)$ continuous on L. Such results are extended to systems

$$(2)\quad \sum_{j=1}^{n}\left\{a_{kj}(t_0)\omega_j(t_0)+(\pi i)^{-1}b_{kj}(t_0)\int_L (t-t_0)^{-1}\omega_j(t)dt+T_j^k\right\}=f_k(t_0)$$

$(k=1, 2)$, where $T_j^k=\int_L \omega_j(t)K_{kj}(t, t_0)dt$; here the $K_{kj}(t, t_0)$ (and the coefficients) are Hölder on L, in t, in t_0, and are analytic at the point $t_0=\alpha$, at which Δ_1 has a zero of multiplicity m. The system (1) is also studied when the a_{kj}, b_{kj} are constants and L is an open arc. *W. J. Trjitzinsky.*

Source: Mathematical Reviews, Vol 10 No. 3

SHERMAN, D. I.

Šerman, D. I. On a case in the theory of singular equations. Doklady Akad. Nauk SSSR (N.S.) 59, 647–650 (1948). (Russian)

The author studies the equation

$$(1)\quad A(t_0)w(t_0)+(\pi i)^{-1}B(t_0)\int (t-t_0)^{-1}w(t)dt + \int w(t)K(t,t_0)dt = f(t_0),$$

where integration is along a simple "smooth" contour L; t, t_0 are on L; the coefficients are essentially of a Hölder class on L. In previous literature (1) has been transformed into a regular Fredholm equation of the second kind, predominantly under the supposition that (2) $A^2-B^2\neq 0$ on L. The author gives a new method for effecting such a transformation when (2) does not hold. The case actually carried out is the one when $A-B$ has just one simple zero on L. The question of equivalence of the resulting Fredholm equation and of (1) is examined. The results obtained can be extended to systems of equations analogous to (1).

W. J. Trjitzinsky (Urbana, Ill.).

Source: Mathematical Reviews, Vol 9 No. 8

SHERMAN, D. I. PA 55/49T83

USSR/Physics Dec 48
Beams - Stress Analysis
Theory of Elasticity

"One Torsion Problem," D. I. Sherman, Inst of Mech, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXIII, No 5

Gives a method to solve special problems in the theory of elasticity and hydrodynamics relating to torsion and curvature in hollow prism-shaped beams, the cross sections of which are areas with double connections, problems in the theory of elasticity for similar areas, and other problems

55/49T83

USSR/Physics (Contd) Dec 48

including the more general case where an ellipse is placed asymmetrically with regard to a circle. Submitted by Acad L. S. Leybenzon 14 Oct 48.

55/49T83

SHERMAN, D. I.

PA 149T42

USSR/Engineering - Mechanics Sep/Oct 49
Elasticity

"Theory of Steady Vibrations of a Medium for Given External Forces on Its Boundary," D. I. Sherman, Moscow Inst of Mech, Acad Sci USSR, 4 pp

"Prik Mat i Mekh" Vol XIII, No 5

Discusses steady vibrations of an elastic medium filling a finite simply connected region lying in the complex plane when effective external forces are acting upon the curve bounding the region. Submitted 11 May 46.

149T42

SHERMAN, D.I.

Šerman, D. I., and Narodeckiĭ, M. Z. On the torsion of some prismatic hollow bodies. Akad. Nauk SSSR. Inženernyĭ Sbornik 6, 17-46 (1950). (Russian)

The authors consider two prismatic hollow bars with the following cross-sections: 1) an ellipse with a concentric circular hole, and 2) a square with rounded edges with a concentric circular hole. In both cases the bars are twisted by a moment M acting on the outside contour. The problems are solved by conformal mapping, which, due to the fact that the cross-section is a doubly connected region, presents considerable difficulty. The method employed was developed by Šerman [Doklady Akad. Nauk SSSR 63, 499–502 (1948); these Rev. 10, 651]. The obtained stress function, and hence the expressions for the stresses are in a form of complicated series. To make them useful for practical applications the authors tabulate for both cases up to two coefficients of the series for several dimension ratios. *T. Leser.*

Source: Mathematical Reviews, Vol 13 No. 9

SHERMAN, D. I. 158T97

USSR/Physics - Mechanics
Elasticity

Mar/Apr 50

"Problem of Conformal Reflection," M. Z. Narodetskiy, D. I. Sherman, Moscow, 6 pp

"Priklad Matemat i Mekh" Vol XIV, No 2

Gives approximate, but sufficiently effective, solution of problem of conformal reflection, in a doubly connected region S in the complex z-plane against a circular ring. Submitted 31 Dec 49.

158T97

SHERMAN, D. I.

Šerman, D. I. On the stresses in a twisted circular beam weakened by a prismatic cavity. Izvestiya Akad. Nauk SSSR Otd. Tehn. Nauk 1951, 969–995 (1951). (Russian)

Saint Venant's torsion problem for a long circular beam weakened by a rectangular prismatic cavity with rounded corners is solved by the introduction of an auxiliary function which assumes on the circular boundary the same values as the complex torsion function. The auxiliary function is shown to satisfy a Fredholm integral equation whose kernel can be replaced, with a known degree of approximation, by a degenerate kernel. Thus the determination of the auxiliary function is reduced to the solution of a system of linear algebraic equations. Once the auxiliary function is known, the torsion function can be computed. Although the convergence of the approximating process is not fully established in the paper, extensive numerical computations testify to the remarkable effectiveness of the proposed method, even when it is applied to a thin-walled section.

I. S. Sokolnikoff (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol. 13 No. 3

SHERMAN, D. I.

(2) Struct

Šerman, D. I. Torsion of an elliptic cylinder stiffened with a circular rod. Akad. Nauk SSSR. Inženernyĭ Sbornik 10, 81–108 (1951). (Russian)

A detailed solution of Saint-Venant's torsion problem is given for a homogeneous and isotropic elliptical beam reinforced by a circular rod. The rod is welded onto the cylinder along the lateral surface, and the axes of the rod and beam coincide. This is a generalization of the corresponding torsion problem for an elliptical beam weakened by a cylindrical cavity, solved by D. I. Šerman and M. Z. Naŭodeckiĭ [same Sbornik 6, 17–46 (1950); these Rev. 13, 886].

I. S. Sokolnikoff (Los Angeles, Calif.)

Mathematical Reviews
Vol. 15 No. 4
Apr. 1954
Mechanics

SHERMAN, D. I.

Šerman, D. I. On a case of regularization of singular equations. Akad. Nauk SSSR. Prikl. Mat. Meh. 15, 75–82 (1951). (Russian)

In an earlier note [Doklady Akad. Nauk SSSR (N.S.) 59, 647–650 (1948); these Rev. 9, 442] the author indicated a new method of transforming the singular equation (in the sense of principal values)

$$(1)\quad A(t_0)w(t)+\frac{1}{\pi i}B(t_0)\int_L \frac{w(t)}{t-t_0}dt+\int_L w(t)G(t,t_0)dt=f(t_0)$$

into a Fredholm integral equation. Here L is a closed, suitably smooth curve, bounding a bounded, simply connected domain; t, t_0 are points on L; A, B, G, f are given on L and are of Hölder classes. This transformation was possible when the functions $A \pm B$ vanish at some points of L. In this earlier work it was assumed that $A(t_0)$, $B(t_0)$, $G(t, t_0)$, $f(t_0)$ are analytic in t_0 at those points. In the present work the author studies (1), adapting the method of his preceding note to the regularisation of (1) under less restrictive conditions on the coefficients involved. *W. J. Trjitzinsky.*

Source: Mathematical Reviews, Vol 13 No.

USSR/Physics - Stresses in Plates May/Jun 51

"Stresses in a Ponderable Half-Plane Weakened by Two Circular Apertures," D. I. Sherman, Moscow, Inst Mech, Acad Sci USSR

"Prik Matemat i Mekh" Vol XV, No 3, pp 297-316

Considers elastic isotropic and homogeneous half-plane possessing 2 openings circular in form which are sufficiently far removed from the margin. Cf. G. V. Kolosov's "Application of Complex Variables to the Theory of Elasticity," 1935, Moscow, and N. I. Muskhelishvili's "Certain Basic Problems in the Mathematical Theory of Elasticity," 1949, Moscow. Especial interest is in the stress near boundary of apertures. Submitted 16 Mar 51.

185T104

SHERMAN, D. I.

Mathematical Reviews
Vol. 15 No. 4
Apr. 1954
Mechanics

Šerman, D. I. On stresses in a plane heavy medium with two identical symmetrically placed circular openings. Akad. Nauk SSSR. Prikl. Mat. Meh. 15, 751–761 (1951). (Russian)

A homogeneous and isotropic elastic material fills the semi-infinite triply-connected domain S, bounded by the straight line L_0 parallel to the X-axis, and by two non-intersecting circles L_1 and L_2 with equal radii R. The centers of the circles lie on the X-axis at a distance f from L_0. The material filling S is acted on by a uniform gravitational force in the direction of the Y-axis, and the boundaries L_0, L_1, L_2 are free of external loads. A solution of this two-dimensional elastostatic problem, in the neighborhood of L_1 and L_2, is obtained under the hypothesis that $R \ll f$. The author utilizes the Muskhelishvili formulations of such problems.

I. S. Sokolnikoff (Los Angeles, Calif.).

SHERMAN, D. I.

Mining Engineering

State of pressure in pillars between chambers. Resilient, ponderous mass, weakened by tw[illegible] elliptical holes. Part. 1. Izv. AN SSSR Otd. Tekh. nauk no. 6, 1952.

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

[illegible], [illegible]; [illegible]

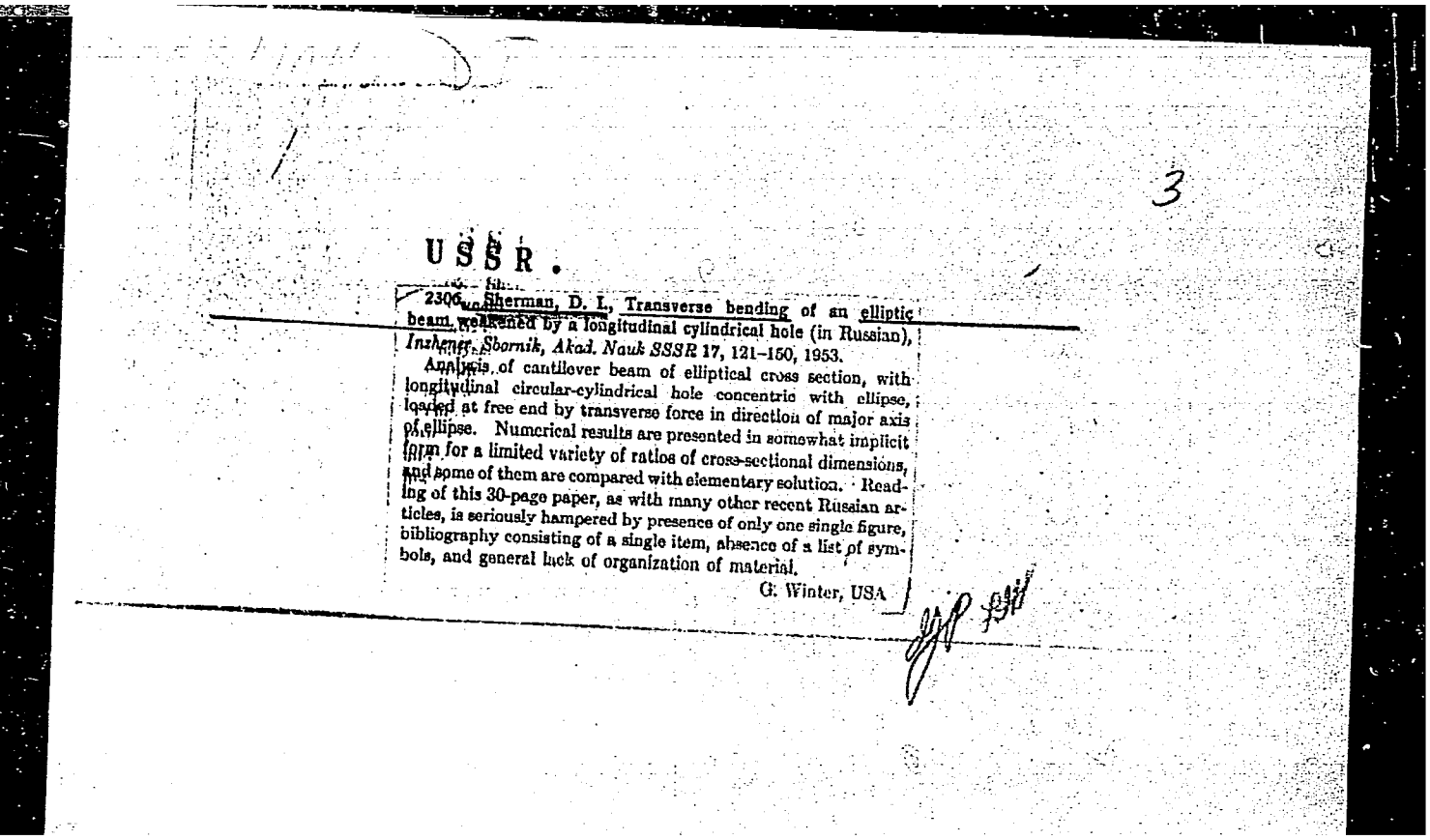
Torsion

Torsion of a round bar, weakened by two longitudinal, cylindrical holes. Inzh. sbor. No. 11, 1952

9. Monthly List of Russian Accessions, Library of Congress, November 1958, Uncl.

SHTAYN, D. I.

"Torsion of a Circular Bar Weakened by Two Longitudinal Cylindrical Circular Cavities," by D.I.Sherman and S.E.Stepanov. Mathematical Review, Vol 14, No 4, pp. 341-430, April 1953.



USSR.

2306 Sherman, D. I., Transverse bending of an elliptic beam weakened by a longitudinal cylindrical hole (in Russian), *Inzhenr. Sbornik, Akad. Nauk SSSR* 17, 121–150, 1953.

Analysis of cantilever beam of elliptical cross section, with longitudinal circular-cylindrical hole concentric with ellipse, loaded at free end by transverse force in direction of major axis of ellipse. Numerical results are presented in somewhat implicit form for a limited variety of ratios of cross-sectional dimensions, and some of them are compared with elementary solution. Reading of this 30-page paper, as with many other recent Russian articles, is seriously hampered by presence of only one single figure, bibliography consisting of a single item, absence of a list of symbols, and general lack of organization of material.

G. Winter, USA

SHERMAN, D. I.

Mathematical Reviews
Vol. 15 No. 3
March 1954
Analysis

LL

Serman, D. I. On properties of infinite systems of equations in problems of torsion of certain doubly connected profiles. Akad. Nauk SSSR. Prikl. Mat. Meh. 17, 470–476 (1953). (Russian)

The Saint-Venant torsion problems for a circular cylinder weakened by a symmetrically located longitudinal circular cavity or by two longitudinal circular cavities have been reduced by the author [Doklady Akad. Nauk SSSR (N.S.) 63, 499–502 (1948); these Rev. 10, 651] and by R. D. Stepanov and Šerman [Akad. Nauk SSSR. Inženernyĭ Sbornik 11, 127–150 (1952); these Rev. 14, 430] to the solution of certain Fredholm integral equations. The solution of the integral equations was made to depend on the solution of two systems of linear algebraic equations in infinitely many unknowns. This note gives a demonstration that these systems are completely regular and hence admit of an estimate of the error resulting from truncating the systems.

I. S. Sokolnikoff (Los Angeles, Calif.).

EH
7-21-54

SHERMAN, D. I.

3

Serman, D. I. On a connection of the fundamental problem of the theory of elasticity with a singular case of a problem of Poincaré. Akad. Nauk SSSR. Prikl. Mat. Meh. 17, 685–692 (1953). (Russian)

The determination of two harmonic functions φ and ψ in a finite multiply connected domain from the boundary conditions

$$\frac{\partial \varphi}{\partial x}+\frac{\partial \psi}{\partial y}=f_1(s), \quad \frac{\partial \varphi}{\partial y}-\frac{\partial \psi}{\partial x}=f_2(s),$$

where the $f(s)$ are prescribed functions of the arc-parameter s on the boundary C of the domain, is reduced to the solution of a Fredholm integral equation. The boundary C consists of the exterior simple closed contour C_0 and several interior simple closed contours C_i not having common points, and the $f(s)$ are assumed to satisfy Hölder's condition on C.

I. S. Sokolnikoff (Los Angeles, Calif.).

SHERMAN, D I.

62

Šerman, D. I. On a singular problem from potential theory. Doklady Akad. Nauk SSSR (N.S.) 94, 25–28 (1954). (Russian)

Let S be a bounded simply connected domain in the plane of $z=x+iy$, whose frontier L is a suitably smooth closed contour L; the origin is taken in S. One is to find u, v, harmonic in S, continuous with their first partials on $S+L$, such that on L

(1) $u_x-v_y+a_{11}u+a_{12}v=f_1$, $u_y+u_x+a_{11}u+a_{12}v=f_2$,

where the coefficients are assigned, suitably differentiable functions of arc s; $G=a_{11}+a_{21}=a_{21}-a_{12}$ at no point of L. Here u and v are sought in terms of certain potentials, whose real densities satisfy a Fredholm system. The author leaves open the question as to whether two harmonic functions are expressible in the form considered, as well as the question as to the conditions under which problem (1) can be solved.

W. J. Trjitzinsky (Urbana, Ill.).

[redacted], . . .

The rotation of a circular cylinder, armoured with elyptic rod. "Inzhinernyy Sbornik" By Academy of Science of the USSR, Department of Technical Sciences, Institute of Mechanics. 1955.

SHERMAN,D.I. (Moscow)

Torsion of a circular cylinder reinforced by an elliptical rod.
Inzh.sbor. no.21:79-96 '55. (MLRA 8:11)

1. Institut mekhaniki Akademii Nauk SSSR
(Torsion)

SHERMAN, D. I.

USSR/ Engineering - Theory of elasticity

Card 1/1 Pub. 22 - 10/52

Authors : Sherman, D. I.

Title : On the bending of a circular plate partly rigidly fixed and partly supported along its contour

Periodical : Dok. AN SSSR 101/4, 623-626, Apr 1, 1955

Abstract : A theoretical analysis is presented of the physical deformations (bending) sustained by a circular plate under a uniformly distributed load, when the plate is partly rigidly fixed and partly supported along its contour. Three USSR references (1936-1952).

Institution : Acad. of Sc., USSR, Institute of Mechanics

Presented by: Academician N. I. Muskhelishvili, January 5, 1955

SHERMAN, D.I.

Bending of a circular plate partially supported and partially free along its circumference. Dokl.AN SSSR 105 no.6:1180-1183 D '55. (MLRA 9:4)

1.Institut mekhaniki Akademii nauk SSSR. Predstavlene akademikom N.I.Muskhelishvili.

(Elastic plates and shells)

SOV/124-57-5-5859

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 5, p 120 (USSR)

AUTHOR: Sherman, D. I.

TITLE: Effective Integral-equation Methods Applied to Some Elasticity Problems (Effektivnyye metody integral'nykh uravneniy v primenenii k nekotorym zadacham teorii uprugosti)

PERIODICAL: Tr. 3-go Vses. Matem. s"yezda. Vol I. Moscow, AN SSSR, 1956, p 216

ABSTRACT: Bibliographic entry

Card 1/1

SHERMAN, D.I. (Moskva)

Solving some problems in torsion, bending and plane theory of elasticity for multiconnected regions [in Ukrainian with summaries in Russian and English]. Prykl. mekh. 3 no.4:363-377 '57. (MIRA 11:2)

1.Institut mekhaniki AN SRSR.
(Strains and stresses)
(Elastic solids)

AUTHOR: Sherman, D. I. 20-114-4-15/63

TITLE: On a Problem in the Theory of Elasticity With Mixed Homogeneous Conditions (Ob odnoy zadache teorii uprugosti so smeshannymi odnorodnymi usloviyami)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4, pp. 733-736 (USSR)

ABSTRACT: An elastic, isotropic and homogeneous medium may satisfy a finite and simply connected domain which is located in the plane of the complex variables $z = x + iy$. Further, S is assumed to be surrounded by a sufficiently smooth closed contour L. The coordinate source is assumed to be contained in the domain S. On the boundary L the normal components v_n of the displacement vector and the tangential components of the stress vector T may be assumed. The components of the stress tensor and the displacement vector occurring in the medium are determined. For the purpose of simplification the author confines himself to a simply connected domain S. This problem is here reduced to a new and much simpler system of Fredholm equations and the nuclei are expressed immediately by elementary functions. Such systems of integral equations

Card 1/3

On a Problem in the Theory of Elasticity With Mixed Homogeneous Conditions

20-114-4-15/63

can be interpreted in a comparatively simple manner by means of modern computation methods.
The assumed boundary values of the orders v_n and T themselves are expressed in the known manner by the two functions $\varphi(z)$ and $\Psi(z)$ of the complex variables z. These two functions are regular in the domain S. The problem is reduced to their determination from two real boundary conditions. The boundary conditions, after some transformations, are explicitly given. After lengthy transformations a system of Fredholm's integral equations is obtained for the unknown densities. The nuclei occurring therein are steady functions of the arguments s and s_0, where s denotes the length of the arc. In conclusion the author once more proves the solubility of this system of Fredholm's integral equations. This system of equations always has a unique solution.
There are 4 references, 4 of which are Soviet.

ASSOCIATION: Institut mekhaniki Akademii nauk SSSR (Mechanical Institute of the AS USSR)

On a Problem in the Theory of Elasticity With Mixed Homogeneous Conditions 20-114-4-15/63

PRESENTED: December 26, 1956, by L. I. Sedov, Member, Academy of Sciences, USSR

SUBMITTED: October 16, 1956

Card 3/3

SHERMAN, D.I. (Moskva)

Stressed state of a twisted square beam with a symmetrical circular hollow. Prykl.mekh. 4 no.3:250-262 '58. (MIRA 13:8)

1. Institut mekhaniki AN SSSR.
(Girders)

16(1);10(2) PHASE I BOOK EXPLOITATION SOV/2659

Akademiya nauk SSSR. Institut mekhaniki

Inzhenernyy sbornik, t. 25 (Engineering Symposium, Vol. 25) Moscow, Izd-vo AN SSSR, 1959. 218 p. Errata slip inserted. 2,200 copies printed.

Ed.: A.A. Il'yushin; Ed. of Publishing House: D.M. Ioffe; Tech. Ed.: Ye. V. Makuni.

PURPOSE: This book is intended for applied mathematicians, physicists and engineers.

COVERAGE: The book is a collection of articles published by the Department of Engineering Sciences of the Institut mekhaniki (Institute of Mechanics) of the Academy of Sciences, USSR. The articles discuss various aspects of the mechanics of materials and of fluid mechanics, such as stress and bending of beams, shells, plates and reels, supersonic gas flows, vibrarions, etc. The problems are treated in a highly thecretical, i.e., mathematical, manner. References are given at the end of each article.

TABLE OF CONTENTS:
Card 1/5

Engineering Symoposium, Vol. 25 SOV/2659

Card 2/5

Engineering Symoposium, Vol. 25 SOV/2659

Karpychev, V.A. On the Displacement of a Water-Oil Contact in Formations With Bottom Water 208

AVAILABLE: Library of Congress

Card 5/5

LK/gmp
12-29-59

24(6) PHASE I BOOK EXPLOITATION SOV/2250

Akademiya nauk SSSR. Institut fiziki zemli

Nekotoryye voprosy mekhaniki deformiruyemykh sred (Some Problems in the Mechanics of Deformable Media). Moscow, Izd-vo AN SSSR, 1959. 219 p. (Series: Its: Trudy, Nr. 2 (169)) Errata slip inserted. 2,000 copies printed.

Ed.: V.A. Magnitskiy, Doctor of Technical Sciences; Ed. of Publishing House: V.A. Kalinin; Tech. Ed.: Yu. V. Rylina.

PURPOSE: This book is intended for engineers and geophysicists concerned with problems of deformations.

COVERAGE: This collection consists of eight articles on the mechanics of deformations in solid plastic media as applied to the solution of geophysical and engineering problems. No personalities are mentioned. References appear at the end of each article.

TABLE OF CONTENTS:

Card 1/5

Some Problems (Cont.)

loading, the usual Maxwell's equation is not adequate. Taking into account the additional components of deformation, a new equation embodying the relationship between shear deformation and the velocity of full shear deformation is analyzed.

Gurevich, G.I. Initial Considerations in the Approach to Tectonic Modeling 75

The author deals with considerations in the application of the principle of similitude to the modeling of tectonic and hydrodynamic processes in the solution of geodynamic problems. The following names are mentioned: B.L. Shneyerson, Ye. N. Lyustikh, A.A. Ilyushin, M.V. Gzovskiy.

Khaykovich, I.M. Propagation of Vibrations in a Medium With Relaxation of Stresses 145

The theory of propagation of seismic waves in an ideally elastic medium is not adequate for purposes of interpretation. The present article establishes the quantitative corrections for a half-space subjected to axially symmetric loading. Maxwell's three-dimensional equation is used in finding a solution for corrections. The following names are mentioned: G.I.

SOV/2250

Some Problems (Cont.)

Keylis-Borok, V.I., and V.I. Ul'yanova. Problem of Creep in Hollow Cylinders Under Normal Pressure 211

The author considers the process of residual deformation in a hollow cylinder and takes into account the time changes of stresses and deformations. This problem is of interest in theoretical studies of seismic behavior and also in studies of the relationship between the creep and interior pressure in pipes. The following names are mentioned: A.F. Golovin, L.I. Kachanov, A.A. Abramov, L.G. Shershen', I.K. Snitko.

AVAILABLE: Library of Congress

IS/ec
10-15-59

Card 5/5

S/124/60/000/008/010/011
A005/A001

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 8, p. 120, # 10587

AUTHOR: Sherman, D. I.

TITLE: On the Problem of the Stress State of a Ponderable Semi-Infinite Plane With Two Circular Deep-Drawn Apertures

PERIODICAL: Tr. In-ta fiz. Zemli. AN SSSR, 1959, No. 2, (169), pp. 187-210

TEXT: The author investigates the stresses in a plane triply-connected region having the shape of a semi-infinite plane with two circular apertures and affected by the gravity; the straight line connecting the centers of the apertures is perpendicular to the gravity direction. Assuming that the radii of the apertures are small in comparison with the depth of their position, the given problem can be reduced, with a sufficient degree of accuracy, to the problem of stresses in an infinite plane weakened by two circular apertures, at the boundaries of which the following boundary conditions are fulfilled:

$$X_x \cos(n, x) + X_y \cos(n, y) = k_1 \cos(n, x)$$

$$X_y \cos(n, x) + Y_y \cos(n, y) = k_2 \cos(n, y), \qquad (*)$$

S/124/60/000/008/010/011
A005/A001

On the Problem of the Stress State of a Ponderable Semi-Infinite Plane With Two Circular Deep-Drawn Apertures

where k_1, k_2 are certain positive constants. The author solved this problem earlier[1] (Prikl. matem. i mekhan., 1951, Vol. 15, No. 3, No. 6). In the article reviewed, a new simpler solution is given. Using the special formulation of the boundary conditions (*), the author reduces the problem by a particular transformation to the elementary auxiliary problem of the two-dimensional elasticity theory for a plane with one circular aperture and to the determination of a certain infinite sequence of constants, for which an infinite system of linear algebraic equations is obtained. The numerical solution of the system is presented for the case $R_1 = 2\,R_2 = 0.5\,c$, where R_1, R_2 are the radii of the apertures, c is the distance between their centers. The infinite system is shortened at first to 17 and then to 7 equations; both of finite systems obtained in this way are solved by iterations. The author does not present a detailed substantiation and states that the infinite system mentioned is quasi-regular for arbitrary values of R_1, R_2, c. The case of equal apertures is especially considered.

S. G. Mikhlin

Translator's note: This is the full translation of the original Russian abstract.

SHERMAN, D.I. (Moskva)

Lateral bending of a plate supported aling its edges consisting of several closed curves. Prikl. mat. i mekh. 23 no.1:109-123 Ja-F '59. (MIRA 12:2)

(Elastic plates and shells)

SHERMAN, D.I. (Moskva)

Torsion of an elliptic bar longitudinally weakened by an elliptic cavity. Inzh. sbor. 25:3-19 '59. (MIRA 13:2)

(Elastic rods and wires) (Torsion)

KEYLIS-BOROK, Vladimir Isaakovich; SHERMAN, D.I., otv.red.; YANOVSKAYA, T.B., red.izd-va; POLYAKOVA, T.V., tekhn.red.

[Interference surface waves] Interferentsionnye poverkhnostnye volny. Moskva, Izd-vo Akad.nauk SSSR, 1960. 194 p. (MIRA 13:7)

(Wave motion, Theory of)

Sherman, D. I.

PHASE I BOOK EXPLOITATION SOV/4000

SOV/12-M-27

Akademiya nauk SSSR. Institut mekhaniki

Inzhenernyy sbornik, t. 27 (Engineering Collection, Vol. 27) Moscow, Izd-vo AN SSSR, 1960. 210 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk.

Resp. Ed.: A. A. Il'yushin; Ed.: V. M. Akhundov; Ed. of Publishing House: V.M. Akhundov; Tech. Ed.: A.P. Gusova.

PURPOSE: This book is intended for engineers, applied physicists, and applied mathematicians.

COVERAGE: The book consists of 24 articles on such problems as wing theory, supersonic flow, theory of shells, stability, plasticity and elasticity, the bending of thin plates and shells, and various aspects of applied mathematics. No personalities are mentioned. References accompany most of the articles.

AVAILABLE: Library of Congress

(18)

36978
S/044/62/000/003/018/092
C111/C222

24.4200
12.8000

AUTHOR: Sherman, D. I.

TITLE: On the stresses in a medium with weight which is weakened by an elliptical and a circular hole

PERIODICAL: Referativnyy zhurnal, Matematika, no. 3, 1962, 39, abstract 3B168. ("Inzhenernyy sb.," 1960, 27, 124-156; 28, 151-170)

TEXT: The author examines the stress distribution in a half-plane with two holes sufficiently far away from the boundary; one hole is elliptical and the other circular. The centers of the holes lie on a straight line parallel to the boundary of the half-plane. The complex potentials are determined by a method of the author, which is frequently used to solve elasticity problems for multiply connected domains (cf., e. g., Rzh. Mat., 1960, 11566). The solution is illustrated by a concrete example, in which the calculation scheme is given in great detail. The connection between this problem and that of shocks in mining is considered.

[Abstracter's note: Complete translation.]

Card 1/1

27799
S/508/60/028/000/012/022
D251/D305

24.4200 (1103, 1327) 1191

AUTHOR: Sherman, D.I. (Moscow)

TITLE: On the tension in a heavy medium weakened by elliptical and circular holes. (Part II)

PERIODICAL: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk. Inzhenernyy sbornik, v. 28, 1960, 151 - 170

TEXT: This article is a continuation of the author's previous work with the same title in Inzhenernyy sbornik, v. 27. The limiting conditions are obtained in the form

$$\varphi^*(\tau) + \frac{\left\{\sigma_1 + A\left(\tau + \frac{1}{\tau}\right)\right\}}{A\left(1 - \frac{\tau^2}{\rho^4}\right)} \overline{\varphi^{*\prime}(\tau)} + \overline{\psi^*(\tau)} = f^*(\tau) \quad (5.2)$$

where the independent term has the form

Card 1/9

On the tension in a heavy ...

$$f^*(\tau) = f_0^*(\tau) + A(2h_1 + 2h_2\rho^{-2})\tau + A(2h_1 + 2h_2\rho^2)\frac{1}{\tau} + C_1. \quad (5.3)$$

It follows easily that

$$\varphi(z) = A(2h_1 + 2h_2\rho^2)\frac{1}{\zeta} + \sum_{k=0}^{\infty}\{\alpha_k^* R_k(\zeta) + \varepsilon_k\beta_k^* W_k(\zeta)\}, \quad (5.4)$$

$$\left\{a_1 + A\left(\frac{\rho^2}{\zeta} + \frac{\zeta}{\rho^2}\right)\right\}\varphi'(z) + \psi(z) =$$

$$= A(2h_1\rho^2 + 2h_2)\frac{1}{\zeta} + \sum_{k=0}^{\infty}\{\alpha_k^*\Omega_k(\zeta) + \varepsilon_k\beta_k^* G_k(\zeta)\}. \quad (5.3)$$

These formulae are true outside the contour L_1 and, in particular on L_2, where

$$\varphi(t) = \sum_{n=0}^{\infty}\varphi_n^*\left(\frac{t-a_2}{R}\right)^n \quad (5.7)$$

Card 2/9

On the tension in a heavy ...

with coefficients of the series

$$\varphi_n^* = A(2h_1 + 2h_2\rho^2)\theta_n + \sum_{k=0}^{\infty}\{\alpha_k^* r_{k,n}^* + \varepsilon_k \beta_k^* \omega_{k,n}^*\}. \tag{5.8}$$

Also, outside L_1

$$\overline{z}\varphi'(z) + \psi(z) = R\left\{\frac{\overline{z}-a_2}{R} - \frac{A}{R}\left[\frac{a_1-a_2}{A} + \left(\frac{\rho^2}{\zeta} + \frac{\zeta}{\rho^2}\right)\right]\right\}\varphi'(z) + \tag{5.9}$$

$$+ \sum_{k=0}^{\infty}\{\alpha_k^* \Omega_k(\zeta) + \varepsilon_k \beta_k^* G_k(\zeta)\} + A(2h_1\rho^2 + 2h_2)\frac{1}{\zeta}.$$

and hence on L_2

$$-\{\overline{t}\varphi'(t) + \psi(t)\} = -\varphi_1^*\frac{R}{t-a_2} + \sum_{n=0}^{\infty}\psi_n^*\left(\frac{t-a_2}{R}\right)^n, \tag{5.10}$$

Card 3/9

On the tension in a heavy ...

On L_2 (1.7) is obtained in the form

$$\omega(t) = \sum_{n=0}^{\infty} \left\{ \varphi_n^* \left(\frac{t-a_2}{R} \right)^n + \psi_n^* \left(\frac{R}{t-a_2} \right)^n \right\} + \quad (6.1)$$
$$+ \beta_0 \frac{t-a_2}{R} + \alpha_{-1} + h_2 R \frac{R}{t-a_2},$$

By means of (1.12) α_k and β_k are expressed by an infinite system of equations, also given. In order to rationalize the calculation further, a transformation is carried out into the form of terms occuring in the formula of Kolosov of the components of stress

$$X_x + Y_y = 4\mathrm{Re}\varphi_1'(z), \quad (6.10)$$

$$Y_y - X_x + 2iX_y = 2[\bar{z}\varphi_1''(z) + \psi_1'(z)].$$

The system

Card 4/9

On the tension in a heavy ...

$$\alpha_k + \sum_{m=0}^{\infty} \left\{ \alpha_m^* p_{m,k+1}^* + \varepsilon_m \beta_m^* q_{m,k+1}^* \right\} = -A(2h_1 c_{k+1} + 2h_2 d_{k+1}) \qquad (6.5)$$

$$(k = 0, 1, 2, \ldots),$$

$$\beta_k - \sum_{m=0}^{\infty} \left\{ \alpha_m^* r_{m,k+1}^* + \varepsilon_m \beta_m^* w_{m,k+1}^* \right\} = A(2h_1 + 2h_2 \rho^2)\theta_{k+1}$$

$$(k = 1, 2, \ldots).$$

is then considered. This system is said to be quasi irregular always for any relative dimensions of the space. On the basis of Cauchy's formula for the function $\zeta^m(\zeta - \lambda_2)^{-m}$ regular inside a closed curve γ, and making use of (3.5) one obtains

$$h_{m,n} = \frac{1}{2\pi i} \int_{\gamma} \frac{\tau^m}{(\tau - \lambda_2)^m} \frac{d\tau}{(\tau - \lambda_1)^{m-n+1}} \quad (n = 1, 2, \ldots m) \qquad (7.2)$$

Card 5/9

On the tension in a heavy ...

$$|h_{m,n}| \leqslant \frac{\rho^{m+1}}{(|\lambda_2|-\rho)^m(\rho-|\lambda_1|)^{m-n+1}} \quad (n=1, 2, \ldots, m). \tag{7.3}$$

near $\zeta = \lambda_1$. From the general form of the expansion within $\zeta = \lambda_2$ of a function regular outside γ, and making use of (3.5), one obtains

$$l_{m,n} = \frac{1}{2\pi i}\int_{\Gamma}\frac{\tau^m}{(\tau-\lambda_1)^m}\cdot\frac{d\tau}{(\tau-\lambda_2)^{m-n+1}} \quad (n=1, 2, \ldots m) \tag{7.5}$$

$$l_{m,n} \leqslant \frac{\rho^{m+1}}{(\rho-|\lambda_1|)^m(|\lambda_2|-\rho)^{m-n+1}} \quad (n=1, 2, \ldots, m). \tag{7.6}$$

The richt-hand-sides of (7.3) and (7.6) give the relationship between $h^*_{m,n}$ and $l^*_{m,n}$. The functions

Card 6/9

On the tension in a heavy ...

$$h_m(\zeta) = \left(\frac{R}{A}\right)^m \sum_{n=1}^{m} h_{m,n} \frac{1}{(\zeta - \lambda_1)^n}, \qquad (7.7)$$

$$l_m(\zeta) = \left(\frac{R}{A}\right)^m \sum_{n=1}^{m} l_{m,n} \left(\frac{\zeta}{\rho^2 - \lambda_2 \zeta}\right)^n.$$

are important in the further working. The coefficients of the expansion of $(\lambda_1 - \zeta)^{-1}$ within $z = a_2$ are positive and the expansion has the form

$$\frac{1}{\lambda_1 - \zeta} = \frac{1}{|\lambda_1|} \frac{A}{R} \sum_{k=0}^{\infty} |\theta_{k+1}| \left(\frac{z - a_2}{R}\right)^k, \qquad (7.8)$$

The dominated expansion on L_2 of $(\lambda_1 - \zeta)^{-n}$ for some integer $n > 0$ is of the form,

Card 7/9

On the tension in a heavy ...

$$c_0^n \sum_{k=0}^{\infty} (-1)^k C_{-n}^k \theta^k \left(\frac{z-a_2}{R}\right)^k , \qquad (7.9)$$

$$c_0 = \frac{A}{R}\frac{1}{|\lambda_1|} a_0 0.$$

The Taylor series

$$b_0 \frac{\rho}{\frac{2\rho}{\varepsilon} - 1 - \rho^2} x^m \sum_{k=0}^{\infty} \Delta^k \left(\frac{z-a_2}{R}\right)^k , \quad \Delta = \max\{\sigma, \theta\}. \qquad (7.12)$$

is hence constructed. The expansion of (7.12) is the dominating series of the expansion of the first function of (7.7). The second function of (7.7) (also regular outside γ) gives a nearly-linear expansion $(\lambda_2\sigma_0 - \rho^2 = \lambda_2^2 - \rho^2 > 0)$

$$\frac{\zeta}{\rho^2 - \lambda_2\zeta} = -\frac{1}{\lambda_2} - \frac{\rho^2}{\lambda_2} \frac{1}{(\lambda_2\sigma_0 - \rho^2) + \lambda_2 \sum_{k=1}^{\infty} \sigma_k \left(\frac{z-a_2}{R}\right)^k} .$$

Card 8/9

On the tension in a heavy ...

Hence, by various simplifications, equations of the form

$$\frac{1}{\zeta+1}=-\frac{1}{\frac{a_1-a_2}{A}-2}\,\frac{1+\frac{1}{\zeta}}{1-\frac{R}{a_1-a_2-2A}\,\frac{z-a_1}{R}},$$

$$\frac{1}{\zeta-1}=-\frac{1}{\frac{a_1-a_2}{A}+2}\,\frac{1-\frac{1}{\zeta}}{1-\frac{R}{a_1-a_2+2A}\,\frac{z-a_2}{R}}, \qquad (7.21)$$

are obtained. The article ends with a review of the theory of the method. There are 2 Soviet-bloc references.

SUBMITTED: May 12, 1959

Card 9/9

LAVRENT'YEV, M.A., otv.red.; MIKHAYLOV, G.K., red.; BITSADZE, A.V., red.; VEKUA, I.N., red.; DZHANELIDZE, G.Yu., red.; LUR'YE, A.I., red.; MANDZHAVIDZE, G.F., red.; MIKHAYLOV, G.K., red.; SEDOV, L.I., red.; SOBOLEV, S.L., red.; SOKOLOVSKIY, V.V., red.; KHRISTIANOVICH, S.A., red.; SHERMAN, D.I., red.; RYVKIN, A.Z., red.izd-va; VOLKOVA, V.V., tekhn.red.

[Problems in the mechanics of solids] Problemy mekhaniki sploshnoi sredy; k semidesiatiletiiu akademika N.I.Muskhelishvili. Moskva, 1961. 577 p. (MIRA 14:3)

1. Akademiya nauk SSSR.
(Mechanics, Analytic) (Elastic solids)

SHERMAN, D.I. (Moskva)

Ponderable medium weakened by periodical circular holes. Part 1. (MIRA 14:6)
Inzh.sbor. 31:24-75 '61.
(Elastic plates and shells)

Sheremet'yev, D. I.

PHASE I BOOK EXPLOITATION SOV/6201

Vsesoyuznyy s"yezd po teoreticheskoy i prikladnoy mekhanike. 1st, Moscow, 1960.

Trudy Vsesoyuznogo s"yezda po teoreticheskoy i prikladnoy mekhanike, 27 yanvarya -- 3 fevralya 1960 g. Obzornyye doklady (Transactions of the All-Union Congress on Theoretical and Applied Mechanics, 27 January to 3 February 1960. Summary Reports). Moscow, Izd-vo AN SSSR, 1962. 467 p. 3000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Natsional'nyy komitet SSSR po teoreticheskoy i prikladnoy mekhanike.

Editorial Board: L. I. Sedov, Chairman; V. V. Sokolovskiy, Deputy Chairman; G. S. Shapiro, Scientific Secretary; G. Yu. Dzhanelidze, S. V. Kalinin, L. G. Loytsyanskiy, A. I. Lur'ye, G. K. Mikhaylov, G. I. Petrov, and V. V. Rumyantsev; Resp. Ed.: L. I. Sedov; Ed. of Publishing House: A. G. Chakhirev; Tech. Ed.: R. A. Zamarayeva.

Card 1/ 6

(25)

Transactions of the All-Union Congress (Cont.) SOV/6201

PURPOSE: This book is intended for scientific and engineering personnel who are interested in recent work in theoretical and applied mechanics.

COVERAGE: The articles included in these transactions are arranged by general subject matter under the following heads: general and applied mechanics (5 papers), fluid mechanics (10 papers), and the mechanics of rigid bodies (8 papers). Besides the organizational personnel of the congress, no personalities are mentioned. Six of the papers in the present collection have no references; the remaining 17 contain approximately 1400 references in Russian, Ukrainian, English, German, Czechoslovak, Rumanian, French, Italian, and Dutch.

TABLE OF CONTENTS:

SECTION I. GENERAL AND APPLIED MECHANICS

Card 2/6

AVAILABLE: Library of Congress

SUBJECT: Physics

IS/dmp/mas
2-13-62

Card 6/6

SHERMAN, D.I.

Reducing certain problems in the theory of steady-state vibrations to Fredholm's integral equation. Izv. AN Arm. SSR. Ser. fiz.-mat. nauk 16 no.4:41-63 '63.
(MIRA 16:8)

1. Institut mekhaniki AN SSSR.

ARAMANOVICH, I.G.; SHERMAN, D.I. (Moscow)

"On certain special problems in elasticity".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

L 32971-66 EWP(k)/EWT(d)/EWT(m)/T-2/EWP(w) IJP(c) EM
ACC NR: AT6016915 (N) SOURCE CODE: UR/0000/65/000/000/0352/0399

AUTHOR: Sherman, D. I.

ORG: Institute of Mechanics, AN SSSR (Institut mekhaniki AN SSSR)

TITLE: A solution of the Dirichlet problem for a circular ring and some applications in potential theory and elasticity theory

SOURCE: International Symposium on Applications of the Theory of Functions in Continuum Mechanics. Tiflis, 1963. Prilozheniya teorii funktsiy v mekhanike sploshnoy sredy. t. 1: Mekhanika tverdogo tela (Applications of the theory of functions in continuum mechanics. v. 1: Mechanics of solids); trudy simpoziuma. Moscow, Izd-vo Nauka, 1965, 352-399

TOPIC TAGS: Dirichlet problem, boundary value problem, elasticity theory, approximate solution

ABSTRACT: The Dirichlet problem is solved for a ring of concentric circles L_1 and L_2. The desired function is regular in the ring and is defined by the boundary conditions:

$$\varphi(t) + \overline{\varphi(t)} = f_j(t) + 2C_j$$
$$L_j \quad (j = 1, 2), \quad C_1 = 0,$$

where $f_j(t)$ are Holder constants and C_2 is some unknown constant.

Card 1/3

The solution is given in the form

$$\varphi(z)=\sum_{n=0}^{\infty}\left[G(\lambda^n z)+\Omega\left(\frac{z}{\lambda^n}\right)\right]+\frac{1}{4\pi i}\int_{L_1}\frac{f_2(t)}{t}dt.$$

which has the advantage over other solutions (in particular those in power series) that solutions may be determined to any desired degree of accuracy even when the circles L_1 and L_2 are very close to one another. The extension to the case of elliptical rings is sketched. An example for a circular half-ring under twisting stress is given to illustrate the convergence of the solution. The solution is applied to the study of the stress fields of a circular shaft subjected to twisting moments and consisting of two identically armored cylinders which are half-circular in cross section and have the same radii. The extension to other types of cross sections is sketched. The Dirichlet problem and the Dirichlet-Neymann mixed problem are studied for a semi-circle to find the function $\phi_1(z)$ regular in the semi-circular region S. Finally, the case of plane deformation of a semi-circle with the arc free of external forces and the components of displacement given on the diameter is studied. It is shown that the fundamental mixed problem of the theory of elasticity for a semi-circle reduces to the singular integral-differential equation

L 32971-66
ACC NR: AT6016915

$$(\varkappa + A)\varphi_1(t_0) + \overline{\delta(t_0)} = \frac{1}{\pi i}\int_{\gamma_0}[-\overline{\delta(t)} + (A-\varkappa)\varphi_1(t)]\frac{dt}{t-t_0} +$$

$$+ \frac{1}{\pi i}\int_{\gamma_0}[-A\overline{\delta(t)} + (1-A\varkappa)\varphi_1(t)]\frac{dt}{t-\frac{R^2}{t_0}} + F(t_0),$$

or

$$\overline{\delta(t_0)} + \frac{1}{\pi i}\int_{\gamma_0}[\overline{\delta(t)} + 2\varkappa\varphi_1(t)]\frac{dt}{t-t_0} -$$

$$-\frac{1}{\pi i}\int_{\gamma_0}[\varkappa\overline{\delta(t)} + (\varkappa^2+1)\varphi_1(t)]\frac{dt}{t-\frac{R^2}{t_0}} = \Lambda(t_0),$$

Orig. art. has: 7 figures, 2 tables, 275 formulas.

SUB CODE: 12,20/ SUBM DATE: 13Aug65/ ORIG REF: 015/ OTH REF: 004

Card 3/3

SHERMAN, E.M. (L'vov)

Effect of the ligation of one carotid artery on the bioelectric activity of the brain in rabbits. Pat. fiziol. i eksp. terap. 9 no.3:66-67 My-Je '65. (MIRA 18:9)

L 31850-66

ACC NR: AP6021317 (N) SOURCE CODE: UR/0390/65/028/005/0550/0550

29

B

AUTHOR: Sherman, D. M.

ORG: none

TITLE: Effect of dithilin and diplatsin on the outcome of traumatic shock

SOURCE: Farmakologiya i toksikologiya, v. 28, no. 5, 1965, 550

TOPIC TAGS: injury, rabbit, drug effect, blood pressure, biologic respiration, reflex activity, bioelectric phenomenon

ABSTRACT: Experiments were conducted on 92 rabbits which were struck 300-400 blows on the hip with an iron bar. During the experiment the change in arterial pressure, pressor sinocartid reflexes, respiration, temperature in the right intestines and muscles, bioelectric activity of the brain and heart, reaction of the animal to pain and temperature irritations, etc., were studied. The basic indicators were the survival and length of life of the experimental animals.

In 15 control experiments trauma causes a reaction with 4 phases: the agitation phase, parabiotic, transitional phase, torpid shock phase, and collapse phase. After this, terminal state and death

UDC: 617.001.36-092.9-085.785.3+615.785.3

occured. In 13 control experiments the trauma reaction was limited to only the agitation phase, resulting in collapse and death of the animals.

In the experimental series trauma was applied after a single venous administration of dithilin or diplatsin in a dose of 1 mg/kg. Artificial respiration was applied. Of 10 rabbits given dithilin, 5 survived; of 10 rabbits given diplatsin, 4 survived.

Administration of dithilin or diplatsin 15-30 minutes after trauma in the torpid shock phase also increase the survivability of the animals. The protective action of dithilin lasted 30 minutes, of diplatsin, for 3 hours. Artificial respiration, without the myorelaxants, did not affect the course of traumatic shock and survivability.

The data indicate these drugs alter the dynamics of the course of traumatic shock. [JPRS]

SUB CODE: 06 / SUBM DATE: 09Jul64

SHERMAN, D. M.

Thermoregulation disorders in traumatic shock. Eksper. khir. i anest. no.2:91-93 '62. (MIRA 15:6)

1. Iz eksperimental'noy laboratorii L'vovskogo okruzhnogo voyennogo gospitalya.

(SHOCK) (BODY TEMPERATURE—REGULATION)

SHERMAN, D.M. (L'vov)

Effect of heating on the results of treating experimental shock with N.G.Belen'kii's serum. Trudy Kiev. nauch.-issl. inst. perel. krovi i neotlozh. khir. 3:146-152 '61. (MIRA 17:10)

SHMIDAN, O. S. i BUDANOV, A. I.

25515

Nivelirnaya Svyaz' Pulya Kronshtadtskogo Fitshtoka S Moterikom. Sbornik Nauch. - Tekhn. i Proizvor Statey Po Geodezii, Kartografii, Topografii, Aeros"yemke i Gravimetrii, Vyp. 23, 1949, s. 61 - 68

SO: LETOPIS' No. 34

SHERMAN, D.S., inzhener; SHAMAROVA, T.A., redaktor; KUZ'MIN, G.M., tekhnicheskiy redaktor.

[Aid for workers in linear measurements]Posobie dlia rabochikh na lineinykh izmereniiakh. Izd. 3 Moskva, Izd-vo geodezicheskoi li'-ry,1955. [Microfilm] (MLRA 8:5)

(Base measuring)

SUNDAKOV, Yakov Arnol'dovich; SHERMAN, D.S., redaktor; KHROMCHENKO, F.I., redaktor izdatel'stva; KUZ'MIN, G.M., tekhnicheskiy redaktor

[Geodetic work for the construction of multistory buildings] Geodezicheskie raboty pri stroitel'stve mnogoetazhnykh zdanii. Moskva, Izd-vo geodezicheskoi lit-ry, 1956. 222 p. (MLRA 9:8)
(Building) (Geodesy)

SHERMAN, Daniil Savel'yevich; LARIN, B.A., kand. tekhn. nauk, red.; ZUBAKOV, A.G., red. izd-va; PREYS, E M., tekhn. red.

[Manual for processing base-line measurements in first-order, second-order, and third-order triangulation] Rukovodstvo po kameral'noi obrabotke bazisov 1 2 i 3 klassov. 3. izd., perer. i dop. Moskva, Izd-vo geodez. lit-ry 1961. 179 p. (MIRA 14:10)
(Surveying—Tables, etc.)

SHERMAN, D.S., red.; KOMAR'KOVA, L.M., red.izd-va; ROMANOVA, V.V., tekhn. red.

[Safety rules for topographic and geodesic work. In effect from October 1, 1962]Pravila po tekhnike bezopasnosti na topografo-geodezicheskikh rabotakh. Vvoditsia v deistvie s 1 oktiabria 1962. g. Moskva, Izd-vo geodez.lit-ry, 1962. 73 p. (MIRA 16:2)

1. Russia (1923- U.S.S.R.)Glavnoye upravleniye geodezii i kartografii.
(Topography--Safety measures) (Geodesy--Safety measures)

KRIVOY, TS.P.; TREYSTER, Yu.Ya.; SHERMAN, E.M.

Automatic control of the blast distribution to blast furnace tuyeres. Metallurg 7 no.2:6-8 F '62. (MIRA 15:3)

1. TSentral'naya laboratoriya avtomatiki.
(Blast furnaces) (Automatic control)