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S/040/60/024/005/024/028
C111/C222

On the Application of Complex Variables for a Plane Plastic Deformation

Theorem 1: In order that the function $F(z,\bar{z})$ defined by (1.7) is real it is necessary and sufficient that

$$(1.8) \quad \frac{\partial^2 e^{i\theta}}{\partial \bar{z}^2} = \frac{\partial^2 e^{-i\theta}}{\partial z^2}$$

is satisfied.

Theorem 2: The partial solution $\theta = \theta(z,\bar{z})$ of (1.8) containing no free parameters determines the tension components up to the constant hydrostatic pressure.

Theorem 3: In order that the tension function F is biharmonic in the plastic domain it is necessary and sufficient that θ satisfies the system

$$(1.13) \quad \frac{\partial^2\theta}{\partial x^2} - \frac{\partial^2\theta}{\partial y^2} - 2\frac{\partial\theta}{\partial x}\frac{\partial\theta}{\partial y} = 0, \quad \left(\frac{\partial\theta}{\partial y}\right)^2 - \left(\frac{\partial\theta}{\partial x}\right)^2 - 2\frac{\partial^2\theta}{\partial x\partial y} = 0.$$

The class of solutions of (1.13) is not empty, e.g.
1) θ = const, 2) $\theta = -2$ arc tg (y/x) + const.
Some particular solutions of the equilibrium conditions in the plastic domain are given, e.g.: if $\theta = \theta(y)$ then θ = arc sin(Ay+B); if $\theta = -2\varphi + R(r)$

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C111/C222

On the Application of Complex Variables for a Plane Plastic Deformation

then $\Theta = -2\varphi + \arcsin\left(a - \frac{b}{r^2}\right)$.

To the first case there corresponds the tension distribution in a strip compressed by rough plates. In the second case, for a = b = 0 one has an axialsymmetric tension field, for a = 1, b = 0 the state of stress of a plastic wedge with a uniformly distributed load on the lateral areas, etc.
The author mentions L.A.Galin. There are 3 Soviet references.

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APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.L. (Moskva)

Plane plastic deformation of anisotropic materials. Prikl. mat. i mekh. 25 no.1:169-173 Ja-F '61. (MIRA 14:6)
(Deformations(Mechanics))

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

KUPRADZE, Viktor Dmitriyevich; DOBROVOL'SKIY, V.L., red.; AKSEL'ROD, I.Sh., tekhn. red.

[Method of the potential in the theory of elasticity] Metody potentsiala v teorii uprugosti. Moskva, Fizmatgiz, 1963. 472 p. (MIRA 16:12)

(Potential, Theory of) (Elasticity)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.L. (Moskva)

Solution of certain problems on stress concentration in the theory of elasticity. Inzh.zhur. 3 no.4:732-736 '63. (MIRA 16:12)

1. Institut mekhaniki AN SSSR.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.I. (Moskva)

Solution of a nonlinear problem of charge blowing in a shaft furnace. Inzh.zhur. 5 no.1:174-176 '65.

(MIRA 18:4)

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L 04914-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) AT/JD
ACC NR: AP6028708 SOURCE CODE: UR/0185/66/011/008/0836/0844

AUTHOR: Dobrovol's'kyy, V. M.--Dobrovol'skiy, V. M.

ORG: Kiev State University im. T. H. Shevchenko (Kyyivs'kyy derzhuniversytet)

TITLE: Surface magnetoconcentrational effects. II. Inherently conductive semiconductors

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 8, 1966, 836-844

TOPIC TAGS: germanium semiconductor, space charge density, electromagnetic field, electron density

ABSTRACT: The author develops the theory of magnetoconcentrational effects in an inherently conductive semiconductor and shows that dependence of characteristics of the surface space charge region on electric and magnetic fields acting on the specimen is affected by variation in electron-hole pair concentration at the boundary of this region with no substantial change in charge value itself. The highest values of the effects studied occur in semiconductors, i.e., germanium, having carriers with long life and high mobility. The basic characteristics of the surface space charge region are calculated and the distribution of charge carrier concentration throughout the semiconductor mass and carrier distribution in the surface space charge region are determined. The calculations do not take injection level or mechanism of carrier genera-

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tion at surface space charge boundary into consideration, but this does not affect the validity of the equations presented. An extensive definition is given of conditions under which the effect of Lorentz forces and of recombination on electron-hole distribution in the surface space charge region. The author thanks O. S. Zints for discussing the work. Orig. art. has: 26 formulas, 2 figures, and 2 tables.

SUB CODE: 12, 20/ SUBM DATE: 21Jul66/ ORIG REF: 005/ OTH REF: 003

Card 2/2

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.N., inzh.; LUZAN, N.F., inzh.; SHVETS, I.L., inzh.

Some remarks on marine power plants used on whalers. Sudostroenie 24 no.9:40-42 S '58. (MIRA 11:11)
(Marine engines) (Whalers)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

STEKLOV, V.Yu.; ZOLOTAREV, T.L., prof., red.; BURLAK, I.N., red.; DOBROVOL'SKIY, V.N.

[Electrification is the road to communism] Elektrifikatsiia - put' k kommunizmu. Moskva, Izd-vo "Sovetskaia Rossiia," 1961. 88 p. (Bibliotechka "Nagliadnaia agitatsiia, propaganda i khudozhestvennoe oformlenie," no.6) (MIRA 15:2)
(Electrification)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

SOV-120-58-1-29/43

AUTHOR: Dobrovol'skiy, V. N.

TITLE: An Oscillographic Method for Determining the Parameters of the Characteristics of a Detector (Ostsillograficheskiy metod opredeleniya parametrov kharakteristiki detektora)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 1, pp 123-124 (USSR)

ABSTRACT: The static characteristic of a germanium detector in the forward direction can be described by the expression:

$$I = I_s [\exp \alpha (V - Ir) - 1] \quad (1)$$

where I is the current to the detector, V is the applied potential, r is the base resistance and the other symbols are the parameters of the characteristics. If the current flowing through the detector is of the form $I = I_0 \exp(-kt)$ then the potential across the detector can be obtained from the following expression:

$$I_0 \exp(- kt) = I_s [\exp \alpha (V - Ir) - 1] \quad (2)$$

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An Oscillographic Method for Determining the Parameters of the Characteristics of a Detector.

The values of V as a function of time may be divided into three regions as follows: (I) $Ir \ll V$ and $\alpha V < 1$. In this case we have:

$$V = \frac{I_o}{\alpha I_s} \exp(-kt) \quad . \qquad (3)$$

(II) $Ir \ll V$ and $V > 1$. Here:

$$V = \frac{1}{\alpha} \ln(I_o/I_s) - \frac{k}{\alpha} t \quad . \qquad (4)$$

(III) For large values of the current when Ir cannot be neglected compared with V we have:

$$V = \frac{1}{\alpha} \ln(I_o/I_s) - \frac{k}{\alpha} t + I_o r \exp(-kt) \quad . \qquad (5)$$

The three cases are illustrated in Fig.1. The graph of V as a function of time is a straight line in region II and curves off in regions I and III. The measurement of α and

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An Oscillographic Method for Determining the Parameters of the Characteristics of a Detector.

I_s was carried out by means of the circuit shown in Fig.2. A symmetric rectangular voltage waveform having a frequency of 50 c/s derived from an oscillator is applied through an RC circuit to a detector d whose characteristics are to be determined. Since the resistance R which is in series with the detector is much larger than the forward resistance of the detector, it follows that when the positive part of the oscillator output is fed to the detector the current through the latter is of the form $I = I_o \exp(-t/RC)$. The time constant of the circuit was chosen to be much smaller than the duration of the pulse which ensures full charging up of the capacitance during the pulse and consequently a change in the current through the detector from I_o to zero. A diode

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SOV-120-58-1-29/43

An Oscillographic Method for Determining the Parameters of the Characteristics of a Detector.

connected in parallel with the detector discharges the capacitor C and the output capacitance of the oscillator at the end of the positive of the cycle. The waveform of the voltage across the detector was observed on an oscillograph screen and the value of I_o was so chosen that the region III was absent and hence the values of I_s could be measured, using the formula:

$$I_s = I_o/\exp \alpha V_o \quad . \tag{6}$$

The values of I_s could be determined directly using a scale attached to the screen of the oscillograph. A typical oscillogram is shown in Fig.3. R. N. Bondarenko

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SOV-120-58-1-29/43

An Oscillographic Method for Determining the Parameters of the Characteristics of a Detector.

is thanked for suggesting this problem and interest in the work. There are 3 figures and 2 Soviet references.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiyev State University)

SUBMITTED: June 24, 1957.

1. Detectors--Analysis 2. Germanium--Applications 3. Detectors --Performance 4. Oscillographs--Applications 5. Mathematics

Card 5/5

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.N.

Diffusion and recombination during the measurement of drift mobility. Fiz.tver.tela 1 no.5:719-725 My '59. (MIRA 12:4)

1. Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko. (Semiconductors)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

LASHKAREV, V.Ye. [Lashkar'ov, V.IE]; BONDARENKO, R.N. [Bondarenko, R.M.];
DOBROVOL'SKIY, V.N. [Dobrovol's'kyi, V.M.]; ZUBRIN, G.P. [Zubrin, H.P.];
LITOVCHENKO, V.G. [Lytovchenko, V.H.]; STRIKHA, V.I.

Properties of germanium containing beryllium admixtures. Ukr. fiz.
zhur. 4 no.3:372-375 My-Je '59. (MIRA 13:2)

1.Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko.
(Germanium) (Beryllium)

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DOBROVOL'SKIY, V.N.

24,7700 26590 S/185/60/005/003/005/020
D274/D303

AUTHOR: Dobrovol's'kyy, V.M.

TITLE: Effect of the magnetic field on the flow of minority carriers

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 5, no. 3, 1960, 333-344

TEXT: The problem is considered in the linear approximation with respect to carrier concentration, for a homogeneous specimen under isothermal conditions. Spherical energy zones are assumed. (In the case of ellipsoidal energy zones, the theory yields a qualitative picture). The basic equation of motion of hole concentration is

$$\frac{\partial \nu}{\partial t} = -\frac{\nu}{\tau} - \frac{1}{e}\nabla \cdot j_p \qquad (1)$$

where ν is the concentration, τ - the lifetime of minority holes, j_p - the density of the hole current, e - the electron charge. An

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analogous equation can be set up for electrons. The expression for the density is given:

$$j_p = e\bar{\mu}_p p \mathcal{E} - kT\bar{\mu}_p \nabla\nu + e\bar{L}_p p \mathcal{E} \times H - kT\bar{L}_p \nabla\nu \times H +$$

$$+ e\bar{K}_p pH \times (H \times \mathcal{E}) - kT\bar{K}_p H \times (H \times \nabla\nu). \quad (2)$$

where

$$p = p_o + \nu;$$

$$\mu_i = \frac{2e}{3}\left(\frac{2kT}{\pi m}\right)^{\frac{1}{2}} \int_0^\infty l_i e^{-x} x dx; \quad L_i = \frac{3\pi^{\frac{1}{2}}}{4c} \int_0^\infty \frac{M_i^2 x^{\frac{3}{2}} e^{-x} dx}{x + \gamma_i}; \quad (3)$$

μ denotes mobilities, l - the free path, p_o - the thermal-equilibrium concentration of holes. Analogous expressions hold for electron-current density. An n-type semiconductor is considered. The field H is assumed homogeneous and parallel to the z-axis. Substituting (2) in (1), and neglecting second-order quantities, one obtains

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$$\frac{\partial \nu}{\partial t} = -\frac{\nu}{\tau} - (\bar{\mu}_p \mathcal{E}_o + \bar{L}_p \mathcal{E}_o \times H + \bar{K}_p \times (H \times \mathcal{E}_o), \nabla)\nu +$$

$$+ \frac{kT}{e}(\bar{\mu}_p \Delta - \bar{K}_p H^2 \Delta x,y)\nu, \quad \Delta x,y = \frac{\partial^2}{\partial x^2} + \frac{\partial}{\partial y^2} \qquad (6)$$

where $\mathcal{E}_o$ is the electric field in the specimen before the injection of carriers. For the case $H \perp j^o$ or $H \parallel j^o$ (j^o being the electrical-current density in the specimen), Eq. (6) reduces to

$$\frac{\partial \nu}{\partial t} = -v_x \frac{\partial \nu}{\partial x} - v_y \frac{\partial \nu}{\partial y} + D_x \frac{\partial^2 \nu}{\partial x^2} + D_y \frac{\partial^2 \nu}{\partial y^2} + D_z \frac{\partial^2 \nu}{\partial z^2} - \frac{\nu}{\tau} \qquad (7)$$

where v_x and v_y are the velocities of carrier transfer, and D_x, D_y D_z - diffusion coefficients:

$$D_x = D_y = \frac{kT}{e}(\bar{\mu}_p - \bar{K}_p H^2); \quad D_z = \frac{kT}{e}\bar{\mu}_p, \qquad (10)$$

Eq. (7) describes the flow of carrier concentration which can be

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Effect of the magnetic field... S/185/60/005/003/005/020 D274/D303

characterized by the quantities μ_x, μ_y, D_x, D_y, D_z. In the following, the value of these quantities in particular cases is considered, as well as their physical interpretation. Analytical expressions are obtained for these quantities in the case of weak and strong magnetic fields, and the power-law dependence of a free path on velocity. For the case of the independence of a free-path, graphs are given of these quantities as functions of the magnetic field (which include also intermediate fields). Some of these graphs were taken from O. Madelung (Ref. 10: Z. f. Naturforsch., 8a, 791, 1953). Eq. (6) was obtained by neglecting second-order quantities; this is justified if the n-type semiconductor has a fairly high conductivity. Further, expressions are derived which hold for arbitrary conductivity. The physical interpretation of obtained formulas is discussed. The first term in the formulas for μ_y is due to the effect of the Lorentz force, the second - to the Hall field $\mathcal{E}_{0y}$. If the latter is zero, μ_y decreases. The magnetic field has no effect on carriers which flow in the direction of the field, but it is effective

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if the carriers flow perpendicular to the field. For sufficiently strong magnetic fields, μ_x changes sign, i.e. the minority holes flow in a direction opposite to the direction of the electric current. The sign-change of μ_x leads to the conclusion that for strong magnetic fields the injection of minority carriers causes a reduction in conductivity. This is in agreement with results reached by other authors. Experimental determination of μ_x, μ_y, D_x, D_y, D_z is then made. Eq. (7) is considered for the case of a plate in the xy-plane and perpendicular magnetic field. It is found that μ and D can be experimentally determined. The measurement of μ_y in a small magnetic field in conjunction with Hall measurements, or the determination of μ_y on a specimen whose shape ensures $\mathcal{E}_{0y} = 0$ with simultaneous measurement of μ_x, make it possible to determine the Hall mobility of minority carriers, as well as the ratio of Hall- to drift mobility; a correct measurement of this ratio is very important, and there are in literature no methods for measuring this ratio for minority carriers. The measurement of μ and D on

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Effect of the magnetic field... S/185/60/005/003/005/020
D274/D303

n-type germanium permits determining the concentration ratios and the mobilities of light and heavy minority holes. There are 5 figures and 22 references: 10 Soviet-bloc and 12 non-Soviet-bloc. The 4 most recent references to English-language publications read as follows: E.M. Conwell, Proc. IRE, 46, 1281, 1958; R.W. Willardson, T. Norman, A. Beer, Phys. Rev., 96, 1512, 1954; N. Harrick, Phys. Rev., 98, 1131, 1955; W. van Roosbroeck, J. Appl. Phys., 26, 380, 1955.

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet im. T.G. Shevchenka (Kiyev State University im. T.G. Shevchenko)

SUBMITTED: October 16, 1959

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B108/B209

24,7700 (1035, 1143, 1145)

AUTHOR: Dobrovol'skiy, V. N.

TITLE: Propagation of excess carriers in an anisotropic cubic crystal under the action of a magnetic field

PERIODICAL: Fizika tverdogo tela, v. 3, no. 5, 1961, 1574 - 1580

TEXT: The author describes the propagation of excess carriers in a magnetic field by means of the phenomenological equations of a current through an anisotropic cubic crystal. On the assumption that in the n-type sample concerned, the concentration of excess carriers is low as compared to the electron concentration ($\nu \ll n$), the linear approximation may be used. The phenomenological equation for the hole current $\vec{j}_p$ in the case of a gradient of the carrier concentration (Ref. 20: F. Seitz. Phys. Rev., 79, 372, 1950) has the form

$$\mathbf{j}_p = e\mu_p p[\mathbf{E} + \mu_{pH}\mathbf{E}\times\mathbf{H} + \beta_p \mathbf{E}H^2 + \gamma_p \mathbf{H}(\mathbf{E},\mathbf{H}) + \delta_p T\mathbf{E}] - kT\mu_p[\nabla\nu + \mu_{pH}\nabla\nu\times\mathbf{H} + \beta_p\nabla\nu H^2 + \gamma_p\mathbf{H}(\nabla\nu,\mathbf{H}) + \delta_p T\nabla\nu]. \quad (1)$$

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where μ_p and μ_{pH} are the carrier and the Hall mobility, respectively; β_p, γ_p, δ_p are phenomenological constants, related to the constants $\alpha, \beta, \gamma, \delta$ of Seitz's paper as follows:

$$\mu_{pH} = \frac{\alpha}{\sigma_0};\ \beta_p = \frac{\beta}{\sigma_0};\ \gamma_p = \frac{\gamma}{\sigma_0};\ \delta_p = \frac{\delta}{\sigma_0}, \qquad (2)$$

σ_0 is the conductivity of the samples; T is a tensor with the components

$$t_{xy} = H_1^2 \cos(\widehat{x1})\cos(\widehat{y1}) + H_2^2 \cos(\widehat{x2})\cos(\widehat{y2}) + H_3^2 \cos(\widehat{x3})\cos(\widehat{y3}). \qquad (3)$$

$(\widehat{x1})$, $(\widehat{y1})$, $(\widehat{x2})$, etc. are the angles between the coordinate axes and the crystallographic axes [100], [010], [001]. Taking the magnetic field $\vec{H}$ to be homogeneous and oriented in the direction of the Oz axis, the equation of continuity yields

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$$\frac{\partial \nu}{\partial t} = -\mu_p(\mathbf{E}_0 + \mu_{pH}\mathbf{E}_0 \times \mathbf{H} + \beta_p \mathbf{E}_0 H^2 + \gamma_p \mathbf{H}(\mathbf{E}_0 \times \mathbf{H}) + + \delta_p T\mathbf{E}_0, \nabla)\nu + D\nu - \frac{\nu}{\tau}, \quad (5)$$

$$D = \frac{kT}{e}\mu_p\left(\Delta + \beta_p H^2\Delta + \gamma_p H^2 \frac{\partial^2}{\partial z^2} + \delta_p \sum_{x,y} t_{xy} \frac{\partial^2}{\partial x \partial y}\right),$$

in linear approximation with respect to γ and p; $\vec{E}_0$ denotes the electric field in the sample before the introduction of excess carriers, and τ is their lifetime. The first term in Eq. (5) is related to the carrier drift, and the second to diffusion. For the case of a transverse magnetic field ($\vec{H} \perp \vec{j}^0$; $\vec{j}^0$ - current density in the sample) one obtains

$$\left.\begin{array}{c} E_{0x} = \frac{j_x^0}{\sigma_H}; \quad \sigma_H = \sigma_0(1 + \mu_{nH}^2 H^2 + \beta_n H^2 + \delta_n t_{xx}), \\ E_{0y} = (\mu_{nH} H - \delta_n t_{yx}) E_{0x}, \\ E_{0z} = -\delta_n t_{zx} E_{0x}. \end{array}\right\} \quad (7)$$

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and, with Eq. (5), the following expressions for the carrier propagation:

$$\frac{\partial \nu}{\partial t} = -v_x \frac{\partial \nu}{\partial x} - v_y \frac{\partial \nu}{\partial y} - v_z \frac{\partial \nu}{\partial z} + D\nu - \frac{\nu}{\tau}, \qquad (8)$$

$$\left.\begin{aligned} \mu_x &= \frac{v_x}{E_{0x}} = \mu_p (1 + \mu_{pH}\mu_{nH} H^2 + \beta_p H^2 + \delta_p t_{xx}), \\ \mu_y &= \frac{v_y}{E_{0x}} = \mu_p [(\mu_{nH} - \mu_{pH}) H + (\delta_p - \delta_n) t_{yx}], \\ \mu_z &= \frac{v_z}{E_{0x}} = \mu_p (\delta_p - \delta_n) t_{zx}. \end{aligned}\right\} \qquad (9)$$

For the case $\vec{H} \parallel \vec{j}^0$ one has

$$\frac{\partial \nu}{\partial t} = -\mu_p (\mathbf{E}_0 + \mu_{pH} \mathbf{E}_0 \times \mathbf{H} + \beta_p \mathbf{E}_0 H^2 + \gamma_p \mathbf{H} (\mathbf{E}_0 \times \mathbf{H}) + + \delta_p T\mathbf{E}_0, \nabla)\nu + D\nu - \frac{\nu}{\tau}, \qquad (9a)$$

$$D = \frac{kT}{e} \mu_p \left(\Delta + \beta_p H^2 \Delta + \gamma_p H^2 \frac{\partial^2}{\partial z^2} + \delta_p \sum t_{xy} \frac{\partial^2}{\partial x \partial y} \right).$$

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and

$$E_{0x}=\frac{j_x^0}{\sigma_H};\quad \sigma_H=\sigma_n(1+\beta_n H^2+\gamma_n H^4+\delta_n t_{xx}),\quad E_{0y}=-\delta_n t_{yx}E_{0x},\quad E_{0z}=-\delta_n t_{zx}E_{0x}. \tag{7a}$$

v_x, v_y, v_z are the transfer velocities of concentration in the directions of the respective axes; μ_x, μ_y, μ_z may be considered to be some effective mobilities; the term $D\nu$ describes the carrier diffusion:

$$D\nu=D_x\frac{\partial^2\nu}{\partial x^2}+D_y\frac{\partial^2\nu}{\partial y^2}+D_z\frac{\partial^2\nu}{\partial z^2} \tag{11}$$

The author points out the possibility of experimentally determining the phenomenological parameters of theory. Professor V. I. Lyashenko is thanked for his help and interest in this work. There are 1 figure,

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23128

S/181/61/003/005/033/042
B108/B209

Propagation of excess...

1 table and 21 references: 14 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet imeni T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: December 6, 1960

Card 6/6

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

28082
S/181/61/003/009/014/039
B102/B104

24,7700

AUTHORS: Dobrovol'skiy, V. N., and Lyashenko, V. I.

TITLE: Study of the drift of the excess carriers in the magnetic field

PERIODICAL: Fizika tverdogo tela, v. 3, no. 9, 1961, 2646-2658

TEXT: The propagation of an excess carrier concentration in n-type and p-type germanium located in a transverse magnetic field and traversed by current has been studied theoretically and experimentally. Fig. 1 shows the orientation of the field components on the specimen. Using equations given in UFZh, 5, 333, 1960 for the cases $E_{oy} = E^{o}_{oy}$ and $E_{oy} = 0$ (E^{o}_{oy} - Hall field), the author derives expressions for the carrier mobilities. The carrier drift was experimentally studied by measuring the field dependence of the quantities $\mu'_{px}/\bar{\mu}_p$ and $\mu'_{py}/\bar{\mu}_p$ (relative hole mobilities) and the analog quantities for electrons. For a short time an approximately 100-μ wide light line was projected to the germanium plate in which the carrier drift was studied. The carriers produced by this light line

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propagated and, after a certain time, reached the collector which was located at the distance Δx_o from the light line. This time was measured first at $H = 0$ (t_o) and then at $H \neq 0$ $(t_o \pm \Delta t)$ at constant E_{ox}. t_o and Δt were measured at different numbers of electron-hole pairs. Subsequently, the authors extrapolated for zero. From the thus obtained values t_o^o and Δt^o the authors calculated the relative carrier mobility using the relation $\mu'_{px}/\bar{\mu}_p = t_o^o/(t_o^o + \Delta t^o)$. $\bar{\mu}_p = (\mu_1 p_1 + \mu_2 p_2)/(p_1 + p_2)$ where μ_i and p_i denote the mobilities and the concentrations of the light and heavy holes. To determine $\mu'_{py}/\bar{\mu}_p$ the light pulse was projected to the specimen in a line which is shown in Fig. 1b and the distances $\Delta y_o/2$ and Δx_o were then measured in which the maximum carrier concentrations were observed after the time t_o. After extrapolation for zero pair number the relative mobility was calculated by the relation $\mu'_{py}/\bar{\mu}_p = \Delta y_o^o/2\Delta x_o^o$. Hence, the otherwise equivalent methods differed in that in the first case time was measured at

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constant distance, in the second, the distance was measured at constant time. The practical measurements were made in two n-type and one p-type germanium specimens. The results were in good agreement with the theory. Using these results the authors calculated $r = p_2/p_1$ and $\lambda = \mu_2/\mu_1$, i.e. equation

$$\left.\begin{aligned} \mu^0_{px} &= \frac{K'(\gamma_1) + r\lambda K'(\lambda^2\gamma_1)}{1+r\lambda}\mu_p; \quad \mu^0_{py} = \frac{\sqrt{\pi}}{2}\gamma_1^{1/2}\frac{L'(\gamma_1) + r\lambda^2 L'(\lambda^2\gamma_1)}{1+r\lambda}\mu_p, \\ \gamma_1 &= \frac{9\pi}{16c^2}\mu_1^2 H^2 = \frac{9\pi}{16c^2}\left(\frac{1+r}{1+r\lambda}\right)^2\mu_p^2 H^2. \end{aligned}\right\} \quad (9)$$

was solved graphically. The following values were obtained for the relative Hall mobilities of the light and heavy carriers:
$H = 0$: $\mu_{nHall}/\bar{\mu}_p = 0.94$; $\bar{\mu}_{pHall}/\bar{\mu}_p = 1.94$. $H = 3{,}000$ oe : $\mu_{1Hall}/\mu_1 = 1.03$; $\mu_{2Hall}/\mu_2 = 1.19$; $\bar{\mu}_{pHall}/\bar{\mu}_p = 1.76$. In general, different values were obtained for Hall mobility and drift mobility and if the mean free path of

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the carriers was independent of velocity their ratio was 1.18 for light and 0.94 for heavy holes. Finally, the authors thank Yu. I. Gorkun for discussions. There are 6 figures and 14 references: 8 Soviet and 6 non-Soviet. The three most recent references to English-language publications read as follows: E. Conwell. Proc. IRE, 46, No. 6, 1958, B. Abeles a. S. Meiboom. Phys. Rev., 95, 31, 1954. M. Prince. Phys. Rev., 92, 681, 1953.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: April 5, 1961

Legend to Fig. 1: a) arrangement for measuring μ'_{px} b) for measuring μ'_{py}; С.Ш.-light line; K - collector

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.N.; LYASHENKO, V.I.

Determining the diffusion coefficient of current carriers. Prib. i tekh.eksp. 6 no.4:118-123 Jl-Ag '61. (MIRA 14:9)

1. Kiyevskiy gosudarstvennyy universitet.
(Electric fields--Measurement)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

24.7600 (1035,1043,1164,1051)

S/181/62/004/002/003/051
B102/B138

AUTHOR: Dobrovol'skiy, V. N.

TITLE: Photoelectric Hall effect and photoconductivity in a magnetic field

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 329-335

TEXT: Photoelectric Hall effect and the photoconductivity of a semiconductor in a magnetic field are studied on the basis of the kinetic equation. A new galvanomagnetic effect is discussed that of negative photoconductivity in strong magnetic fields which was first described by the author together with V. I. Lyashenko (FTT, 3, 2646, 1961). This effect was also experimentally observed (DAN SSSR, 136, 329, 1961). An n-type semiconductor plate with $n_0 \gg p_0$ is considered. It is placed in a magnetic, an electric and a light field (Fig. 1). A constant current, I, is assumed to pass through it. The ratios $\tilde{V}_x = \Delta V_x/V_{ox} = \Delta R/R_0$ and $\tilde{V}_y = \Delta V_y/V_{oy}$ are calculated for a piece of the specimen, bounded by

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x=±a and y=± b; R_o is its resistance.

$$\tilde{V}_y = -\tilde{N} - \frac{\mu_{px} - \mu_{py}\,\mathrm{ctg}\,\theta}{\mu_{nx}} \tilde{P}$$
$$\tilde{V}_x = \tilde{V}_y - \frac{\mu_{py}\,\mathrm{ctg}\,\theta}{\mu^0_{nx}} \tilde{P} \quad (2)$$

$$\tilde{N} = \frac{\Delta N}{N_o};\ \tilde{P} = \frac{\Delta P}{N_o};\ N_o = n_o\omega;\ \Delta N = \int_\omega \Delta n d\omega;\ \Delta P = \int_\omega \Delta p d\omega. \quad (3)$$

$$\mu_{px} = \mu^0_{px} + \mu^0_{py}\,\mathrm{tg}\,\theta,\quad \mu_{py} = \mu^0_{py} - \mu^0_{px}\,\mathrm{tg}\,\theta,$$
$$\mu_{nx} = \mu^0_{nx} - \mu^0_{ny}\,\mathrm{tg}\,\theta,$$
$$\mathrm{tg}\,\theta = \frac{E_{0y}}{E_{0x}} = -\frac{\mu^0_{ny}}{\mu^0_{nx}}, \quad (4)$$

are obtained with

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B102/B138

Photoelectric Hall effect and...

$$\mu^0_{px} = \mu_p - K_p H^2; \quad \mu^0_{nx} = \mu_n - K_n H^2,$$
$$\mu^0_{py} = L_p H; \quad \mu^0_{ny} = L_n H;$$
$$L_i = \frac{3\sqrt{\pi}}{4c} \int_0^\infty \frac{M_i^2 e^{-\varepsilon} \varepsilon^{3/2} d\varepsilon}{\varepsilon + \gamma_i}; \qquad K_i = \frac{9\pi}{16c^2} \int_0^\infty \frac{M_i^3 e^{-\varepsilon} \varepsilon d\varepsilon}{\varepsilon + \gamma_i},$$
$$\gamma_i = \frac{9\pi}{16} \frac{M_i^2 H^2}{c^2}; \quad M_i = \frac{4el_i(\varepsilon)}{3(2\pi m_i^* kT)^{1/2}}; \quad \varepsilon = \frac{m_i^* v_i^2}{2}; \quad i = n, 1, 2,$$
$$p = p_0 + \Delta p; \quad n = n_0 + \Delta n.$$

N_0, ΔN and ΔP are the numbers of equilibrium electrons, excess free electrons and holes, respectively, θ is the Hall angle. The L_i and K_i integrals are calculated for $m_i = 0$ and high H ($\mu_i H/c \gg 1$):

X

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$$\left.\begin{aligned}
&L_i H = \frac{\sqrt{\pi}}{2}\mu_i\gamma_i^{1/2}L_i'(\gamma_i); \quad K_i H^2 = \mu_i\left[1 - K'(\gamma_i)\right],\\
&L'(\gamma_i) = \frac{2}{\sqrt{\pi}}\int_0^\infty \frac{e^{-\varepsilon}\varepsilon^{3/2}d\varepsilon}{\varepsilon+\gamma_i} = 1 - 2\gamma_i + 2\sqrt{\pi}\gamma_i^{3/2}e^{\gamma_i}\left[1-\Phi(\gamma_i^{1/2})\right],\\
&K'(\gamma_i) = \int_0^\infty \frac{e^{-\varepsilon}\varepsilon^2 d\varepsilon}{\varepsilon+\gamma_i} = 1 - \gamma_i + \gamma_i^2 e^{\gamma_i}E_i(-\gamma_i),\\
&\Phi(r) = \frac{2}{\sqrt{\pi}}\int_0^r e^{-a^2}da; \quad E_i(-r) = -\int_r^\infty \frac{e^{-x}dx}{x}.
\end{aligned}\right\} \quad (5)$$

Using these relations, the dependence of $\tilde{\tilde{V}}_y = \tilde{V}_y/\tilde{N}$ and of $\tilde{\tilde{V}}_x = \tilde{V}_x/\tilde{N}$ on $\gamma_1 = \frac{9\pi}{16}\frac{\mu_1^2 H^2}{c^2}$ is determined for the case $\Delta N = \Delta P$. The results are shown in Fig. 2 for $\mu_2/\mu_1 = 8$, $p_2/p_1 = 0.02$ and $\mu_n/\mu_p = 2$. For $\bar{\mu}_p = 2000\ cm^2/v\cdot sec$, $\gamma_1 = 1.75\cdot 10^{-10}\ H^2$. It may be seen that negative photoconductivity is to be expected if the H values are high enough. For

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B102/B138

Photoelectric Hall effect and...

n-type Ge the reversal will occur at $H > 45{,}000$ oe at room temperature; below this the critical H-value will also be lower. Similar considerations are made for weak fields $\mu_i H/c \ll 1$. Professor V. I. Lyashenko and A. A. Ostroukhov are thanked for discussions. There are 2 figures and 4 references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: F. v.d. Maeson. Phil. Res. Repts., 15, 107, 1960.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: July 18, 1961

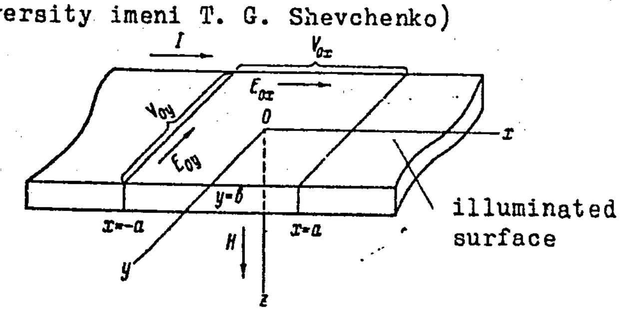

Fig. 1. Illuminated part of specimen.

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44135

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S/181/62/004/010/019/063
B108/B104

AUTHORS: Dobrovol'skiy, V. N., and Gritsenko, Yu. I.

TITLE: Use of the Hall current in investigating the scattering of carriers in semiconductors

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2760 - 2769

TEXT: A method of measuring the Hall current is proposed. In certain cases such a method can be more useful than measurement of the Hall emf as it allows the carrier mobility to be determined from the resistivity of the specimen. The Hall current can be written as the sum of a surface and a volume current. These two components can be determined individually by measuring the total Hall current and the conductivity as depending on the voltage applied to the specimen. From this dependence of the conductivity it is possible to find conditions under which no surface bending of the bands occurs. The surface conductivity is then zero, and the total Hall current equals its volume component. Such conditions can be realized surrounding the specimen with a protective ring. When this ring is also connected to the circuit it will act as the part carrying the surface Hall current, thus eliminating surface effects in the specimen. In this way it

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is possible to examine the processes taking place in the volume alone. Hall current measurements were made with cuprous oxide. It was possible thus to establish a relationship between the carrier mobility and the resistivity of the specimens (Fig. 4), which could not be done from measurements of the Hall emf. There are 4 figures and 1 table.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: May 18, 1962

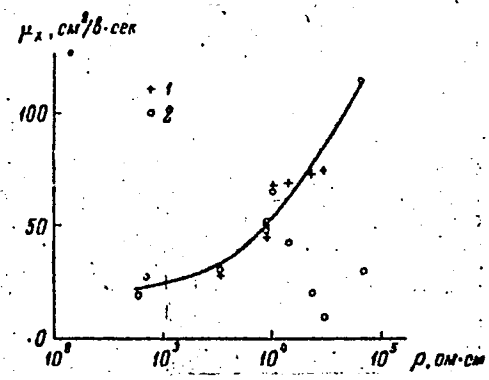

Fig. 4. Hall mobility as a function of resistivity.

Legend: (1) mobility, determined from Hall current; (2) mobility, determined from Hall e.m.f.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

44138

S/181/62/004/010/025/064
B108/B104

24 7700

AUTHOR: Dobrovol'skiy, V. N.

TITLE: Study of the conductivity due to excess carriers in a magnetic field

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2806 - 2812

TEXT: The conductivity due to the injection of excess carriers into p-type germanium was determined in dependence on the intensity of a transverse magnetic field. The changes in voltage drop along the specimen when excess carriers were introduced were measured as ΔV_o without a magnetic field and as ΔV_H in a magnetic field. The relative change in resistivity measured was found to agree very well with the theoretical formula $\tilde{H} = -(1 + \mu_n/\bar{\mu}_p)\Delta V_H \varrho_o/\Delta V_o \varrho_H$, where ϱ is the resistivity, μ_n and $\bar{\mu}_p$ are the electron and hole mobilities (FTT, 4, 329, 1962). At liquid oxygen temperature, the excess carrier conductivity was found to reverse its sign at a field strength of 4500 oe, being negative from that value of H on. There are 4 figures.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

Study of the conductivity due to... S/181/62/004/010/025/064
B108/B104

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

SUBMITTED: May 25, 1962

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

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S/185/62/007/003/012/015
D299/D301

AUTHORS: Karal'nyk, S.M., Hurs'ka, A.P. and Dobrovol's'kyy V.N

TITLE: Study of characteristic absorption of X-rays by germanium-aluminum alloys

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 3, 1962, 327 - 330

TEXT: The position of the K-edge of absorption of Ge in the investigated alloys was studied in comparison with its position in pure Ge. The Al-Ge alloys contained 1, 2, 3, 8, 27 and 98 atom. % Ge, respectively. The displacement of the K-edge of absorption in Al-Ge and in pure Ge at high temperatures (400 - 430°C) was compared with its position at room temperature. The tabulated values are the average results of many repeated experiments. Thereby, the thickness of the absorbing layers varied, as well as the height and width of the diaphragm, the operating conditions of the X-ray tubes, and the number of pulses. The shape of the K-edge was similar to that obtained

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Study of characteristic ... D299/D301

by other investigators. It was found that at high temperatures, the K-edge of absorption of Ge was considerably shifted (about 6 ev.) for low Ge concentrations (2 - 3 atom.%). No such shift was observed at room temperature. The K-edge shift at high temperatures is related to the complete dissolution of Ge in the solid solution. It is noted that the magnitude of the observed shift is greater than that of GeO_2. The K-edge shift in the system Al-Ge is explained by a mechanism proposed in S.M. Karal'nyk et. al (Ref.1: Ukr. fizychn. zh., 6, no. 1, 1961); thereby it is assumed that the redistribution of electrons of the Ge-atoms during its dissolution in Al, takes place at external orbits and the size of the Ge-atoms increases. The present study shows that the results obtained in Ref.1 (Op. cit.) (with Cu-Al and Zn-Al) are not accidental, but apply to various systems. The value of the obtained results would increase even further, if the X-ray investigations were extended to the spectra of the solvent (in the given case -- Al). There are 2 tables and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

Study of characteristic ... S/185/62/007/003/012/015
D299/D301

ASSOCIATION: Kyyivs'kyy derzhuniversytet im. T.H. Shevchenka (Kyyiv State University im. T.H. Shevchenko).

SUBMITTED: June 20, 1961

Card 3/3

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.N.; GRITSENKO, Yu.I.

Using Hall current in studying carrier scattering in semiconductors. Fiz.tver.tela 4 no.10:2760-2769 O '62.
(MIRA 15:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
(Hall effect) (Semiconductors)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.N.

Conductivity due to excess current carriers in a magnetic field. Fiz.tver.tela 4 no.10:2806-2812 O '62. (MIRA 15:12)

1. Kiyevskiy gosudarstvennyy universitet imeni Shevchenko.
(Semiconductors--Electric properties)
(Magnetic fields)

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L 49028-65 EWT(1) IJP(c)

AUTHOR: [illegible]

TITLE: [illegible] the surface scattering of carriers by [illegible] method

SOURCE: Fizika tverdogo tela, v. 7, no. 3, 1965, 811-818

TOPIC TAGS: Hall effect, carrier scattering, surface scattering, surface Hall effect, surface carrier density, surface Hall mobility

ABSTRACT: The paper is devoted to an investigation of surface [illegible] [illegible] of the authors [illegible] [illegible] the surface conduct[illegible] [illegible] rent makes it possible to determine the effective Hall [illegible] surface carrier density, and consequently also the sur[illegible] bending of the energy bands. In addition, the authors measured the surface cu[illegible]ts and determined the

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effective surface Hall mobility at different values of magnetic field for samples of intrinsic germanium with resistivity 45 ohm·cm and relaxation time 500 μsec. The test procedure was similar to that described by Yu. F. Novototskiy-Vlasov (PTE No. 4, 67, 1961). The experimentally measured dependence of the [illegible] Hall mobility on the surface bending of the bands in the germanium [illegible] [illegible] theory, [illegible] work." Orig. art. has: 5 figures and 10 formulas.

ASSOCIATION: [illegible] gosudarstvennyy universitet im. [illegible] State University)

ENCL: 00

OTHER: [illegible]

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.O. [Dobrovol's'kyi, V.O.]

Section of history of mathematics at the 9th International Congress on the History of Science and Technology. Dop. AN URSR no.12:1650 '65. (MIRA 19:1)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.P., podpolkovnik med. sluzhby

Bandage for covering a burn surface. Voen.-med. zhur. no.8:84 Ag '60. (MIRA 14:7)

(BURNS AND SCALDS) (BANDAGES AND BANDAGING)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.P.

Interpreting vertical electric curves obtained in logging permanently frozen ground. Nauch.dokl.vys.shkoly; geol.-geog.nauki no.2:127-133 '59. (MIRA 12:8)

1. Moskovskiy universitet, geologicheskiy fakul'tet, kafedra merzlotovedeniya.
(Frozen ground) (Electric logging)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

S/169/62/000/006/009/093
D228/D304

9.9700

AUTHORS: Ananyan, A. A. and Dobrovol'skiy, V. P.

TITLE: Electroconductance of frozen rocks of a natural structure in the R. Salekhard area

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 6, 1962, 8, abstract 6A39 (V sb. Merzlotn. issled., no. 1, M. MGU, 1961, 216-226)

TEXT: Laboratory determinations were made for the electroconductance of specimens of frozen rocks of a natural structure and moisture. Comparison of the data of measurements, obtained with the application of alternating and direct current, shows that they practically coincide. It is established that the electroconductance of loose frozen rocks is largely determined by the water's phase composition. In the freezing of rocks the electroconductance decreases suddenly. It is noted that rocks of a similar genesis are characterized by approximately identical electroconductivity values. [Abstracter's note: Complete translation.] V/C

Card 1/1

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

S/169/62/000/011/004/077
D228/D307

9,7000

AUTHOR: Dobrovol'skiy, V.P.

TITLE: Electric anisotropy of frozen rocks

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1962, 13, abstract 11A62 (In collection: Merzlotn. issled., no. 2, M., MGU, 1961, 157-164)

TEXT: For frozen rocks electric anisotropy may be caused not only by their structure and texture, but also by their temperature and by the existence of a temperature gradient. The resistivity of frozen rocks depends on their temperature, iciness and composition. The resistance of variably composed layers changes differently when the temperature changes. This involves the unique character of the change with temperature of the anisotropy factor for a rock, formed of lamina of coarsely-dispersed (sands) and finely-dispersed (loams) fractions. The anisotropy factor may increase, decrease, or remain constant in different negative-temperature variation ranges. Maximum values of the anisotropy factor are noted if

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S/169/62/000/011/004/077
D228/D307

Electric anisotropy of frozen rocks

the temperature of frozen rocks is from 0 to -2°. Considerable anisotropy factors are observed in the same way in areas of thermo-karst development. The second cause of anisotropy in a rock is the existence of a temperature gradient in it. The dependence of the rock resistance on the temperature causes anisotropy at the expense of the temperature gradient in a rock that even has a homogeneous composition and moisture content. Studying anisotropy, related to a differing temperature and temperature gradient, and taking into account the patterns of its change must greatly increase the precision of the quantitative interpretation of vertical electric sounding, carried out in environments where frozen rocks occur.
[Abstracter's note: Complete translation]

Card 2/2

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

S/169/61/000/009/006/056
D228/D304

9,9700

AUTHORS: Ananyan, A. A., and Dobrovol'skiy, V. P.

TITLE: The electroconductivity of frozen rocks

PERIODICAL: Referativnyy zhurnal. Geofizika, no. 9, 1961, 9, abstract 9A74 (Geologiya i geofizika, no. 3, 1961, 96-103)

TEXT: Certain patterns are described for the variation of electric resistances of frozen rocks in relation to the phase transformations of water which take place in rocks on the change of the temperature. Data are cited on the influence of the structure of a frozen rock on its electric properties. The results of the experimental investigations of the change of the anisotropy coefficients of frozen layered rocks in relation to the temperature and the qualitative explanation of this phenomenon are given. [Abstracter's note: Complete translation.]

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V. P.

Using the resistance method in electric prospecting for hydraulic engineering construction in permanently frozen ground. Merzl. issl. no.1:190-207 '61. (MIRA 16:1)

(Frozen ground) (Electric prospecting)
(Hydraulic structures)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

ANANYAN, A. A.; DOBROVOL'SKIY, V. P.

Specific electric conductivity of frozen ground of natural structure from the Salekhard region. Merzl. issl. no.1:216-226 '61. (MIRA 16:1)

(Salekhard region—Frozen ground—Electric properties)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.P.

Electric anisotropy of frozen ground. Merzl.issl. no.2:157-164 '61. (MIRA 16:5)

(Salekhard region--Frozen ground--Electric properties)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.P.

Characteristic "freezing" shape of curves in vertical electric sounding. Merzl. issl. no.3:198-203 '63.

Electric prospecting in engineering geology under conditions of the "uniform" distribution of permanently frozen ground in the region of the Ust' Botuobiia water gauge points of the Vilyuy Hydroelectric Power Station. Ibid.:204-214

Characteristics of the structure of the geoelectric division caused by the presence of permanently frozen ground; oelectric sections of frozen ground. Ibid.:215-230

Principles of the regionalization of the area of the distribution of permanently frozen ground for purposes of electric prospecting in hydraulic engineering. Ibid.:231-235

(MIRA 17:6)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOLSKIY V.V.

USSR / General and Special Zoology. Insects.

Abs Jour: Ref Zhur-Biol., No 4, 1958, 16424

Author : Dobrovolskii V.V., Kuperman F.M.
Inst : Not given
Title : On the Control of Swedish Fly Larvae on Corn.
(O bor'be s lichinkami shvedskoi mukhi na kukuruze.)

Orig Pub: Selektsiya i semenovodstvo, 1957, No 1, 56

Abstract: More than 100 types and hybrids of corn were in the sown environs of Moscow at the end of May. A suspension of 2 liters of [hexachlorancyclohexane] HCCH (0.05 g of 12% dust and 2.5 g of ammonium nitrate per 1 litre of water) was introduced into each group of plants June 13. (3-4 plants). Although the experimental young crops were greatly infested with larvae, the

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

USSR / General and Special Zoology. Insects.

Abs Jour: Ref Zhur-Biol., No 4, 1958, 16424

Abstract: plants became better June 22, the leaves restored their normal coloring, the fifth and sixth leaves developed normally, the sixth and seventh leaves opened up one to two days sooner, the plants were stronger than the control plants, while all the larvae in the plants died.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V. V.

"Alluvial Grounds and Their Utilization as Foundations for Structures." Thesis for Degree of Cand. Technical Sci. Sub 23 May 49, Moscow Order of the Labor Red Banner Engineering Construction Inst imeni V. V. Kuybyshev.

Summary 82, 18 Dec 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan-Dec 1949.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V., inzh.

Selecting pressure of scavenging air for two-stroke diesel engines without pressure feed. Energomashinostroenie 6 no.4:21-23 Ap '60. (Diesel engines) (MIRA 13:8)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V., inzh.

Estimate calculation of the basic indices of a supercharged four-stroke diesel engine. Energomashinostroenie 7 no.11:21-24 N '61. (MIRA 14:11)

(Diesel engines)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

Distribution of dispersed chemical elements between the soil forming rocks, soil, and vegetation in the Moscow region. Nauch. dokl. vys. shkoly; biol. nauki no.3:193-198 '63. (MIRA 16:9)

1. Rekomendovana kafedroy obshchey fizicheskoy geografii Moskovskogo gosudarstvennogo pedagogicheskogo instituta im. Lenina.
(Mytishchi District--Trace elements)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V., kand. tekhn. nauk

Method of designing a pulp thickener in the pipeline.
Nauch. soob. IGD 18:182-186 '63. (MIRA 16:11)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V., starshiy nauchnyy sotrudnik, kand.tekhn.nauk

Experimental studies of new methods and equipment for hydraulic filling. Mekh. i avtom. v gor. prom. no.3:33-61 '63. (MIRA 16:10)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V., prof., doktor biolog. nauk

Toward communism without crop losses. Zashch. rast. ot vred. i bol. 6 no.10:6 O '61. (MIRA 16:6)

1. Moskovskiy gosudarstvennyy universitet.
(Plants, Protection of)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

Chemistry and geochemistry of soil. Khim. v shkole 18 no.4: 7-14 Jl-Ag '63. (MIRA 17:1)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

KRYLOV, V.F.; DOBROVOL'SKIY, V.V., kand. tekhn. nauk

Coal mining with filling is a progressive method of working thick steep seams. Ugol' 38 no.12:11-13 '63. (MIRA 17:5)

1. Glavnyy inzh. kombinata Kuzbassugol' (for Krylov).
2. Institut gornodo dela im. A.A. Skochinskogo (for Dobrovol'skiy).

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DEM'YANOV, V.N.; POPOVA, T.N.; KORINA, A.S., kandidat geographicheskikh nauk, dotsent [deceased]; STARODUBROVSKAIA, R.A.; DOBROVOL'SKIY, V.V., dotsent, redaktor.

[General physical geography] Obshchaia fizicheskaia geografiia. Moskva, Izd-vo geodezicheskoi lit-ry. Pt I. 1953. 394 p. (MIRA 7:5)
(Physical geography)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

[illegible] PHOSPHATE INCLUSIONS IN PEAT DEPOSITS. Dobrovol'skii, V.V. [illegible] Chem.

[illegible] vol. 50, 5171i. [illegible] make it useful as fertilizer. C.A.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V. (Voronezh)

Eliminating the damage done by karst. Priroda 44 no.4:117 Ap '55.
(Lipetsk Province--Karst)(Reservoirs) (MIRA 8:4)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

Mineralogy of carbonate nodules in Quaternary loams. V. V. Dobrovol'skii. *Zapiski Vsesoyuz. Mineralog. Obshchestva* 84, 198-205(1955).—The calcareous clays and loams of the great central chernozem (black soil) area of S. Russia contain typically supergene carbonate concretions which do not show any petrographic relation to the character of the underlying rocks or to the chem. compn. of the ground waters. Sedimentary clastic quartz, feldspar, and andalusite are often included in the nodules. In their formation all the elements have participated that are characteristic for the soils; the microscopic structure is that of typically colloform materials, with characteristic desiccation cracks. The mineralogical compn. is rather complex; there are fine-cryst. carbonate concretions which form the chief mass. Many constituents are adsorbed, especially those elements which do not belong to the structure of the carbonates but which are assocd. In their chem. nature the carbonates are chiefly $CaCO_3$ and $MgCO_3$; $FeCO_3$ is usually very subordinate and there is more $CaCO_3$ than $MgCO_3$. Extensive analytical and differential-thermal data are given. An org. origin of the nodules is excluded; the carbonate portion of the nodules and the HCl-sol. portion with its characteristic ratios SiO_2/Al_2O_3 and Al_2O_3/Fe_2O_3 speaks for loess origin. The spectrochem. analysis showed Ti, Zr; Sr, Ba; V, Cr, Mn; traces of Cu, Y, Be, Ga, Ni; and Sn, Pb as accessories, but Co, Zn, and Cd are absent. W. Eitel

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Dobrovol'skiy V.V.

USSR/Cosmochemistry. Geochemistry. Hydrochemistry. D

Abs Jour : Ref Zhur - Khimiya, No. 8, 1957, 26565.

Author : Dobrovol'skiy, V.V.
Inst :
Title : Concretions of Carbonates in Soils and Soil Forming Rocks in Central Black Earth Region.

Orig Pub : Pochvovedeniye, 1956, No. 5, 31 - 42.

Abstract : $CaCO_3$ predominates $MgCO_3$ in the studied concretions and the amount of the insoluble residue increases in the peripheral zones of concretions. Fe produces thin films of hydroxides covering fine grains of carbonates. The chemical composition of concretions corresponds to the composition of the embedding rocks somewhat enriched with Al_2O_3 and Fe_2O_3. Selective occlusion takes place in the process of

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V. V. Cand Geol-Min Sci -- (diss) "Mineralogy and geochemistry of neogenic formations from Quaternary deposits of the Central-Russian forest-steppes." Mos, 1957. 18 pp incl. cover (Min of Geology and Mineral Conservation USSR. All-Union Sci Res Inst of Mineral Raw Material VIMS), 125 copies. List of author's works (14 titles) (KL, 45-57, 97)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

Dobrovol'skiy, V.V.

5-3-22/37

AUTHOR: Dobrovol'skiy, V.V.

TITLE: Mineralogy of Quaternary Sediments Hypergenesis (K mineralogii gipergeneza chetvertichnykh otlozheniy)

PERIODICAL: Byulleten' Moskovskogo Obshchestva Ispytateley Prirody, Otdel Geologicheskiy, 1957, # 3, p 168 (USSR)

ABSTRACT: The hypergene transformation of surface sediments proceeds not only by the change in the outward appearance of a rock but also in destruction of some mineral forms and arising of others. New forms are mostly originated by metasomatosis. The author reviewed various mineralogical forms occurring among the hypergene minerals and noticed that metacolloid structures prevail, which indicates the extensive development of colloid phenomena in the process of hypergene mineralization. Insofar as hypergene transformation of surface sediments is controlled to a considerable degree by general geographical factors, the mineralogical composition of the new forms will have its peculiarities in every natural zone. This circumstance presents a certain interest for paleography.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

USSR/Soil Science - Physical and Chemical Properties of Soil. J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86768

Author : Dobrovol'skiy, V.V.
Inst :
Title : Dispersed Elements in Soil-Forming Rocks of the Central Russian Forest-Steppe

Orig Pub : Pochvovedeniye, 1957, No 6, 56-62

Abstract : A study was made of the content of microelements in a colloidal dispered fraction of the soil-forming rocks of the Central Russian forest-steppe and of neogenes (hard-pans, lime nodules) separated from these rocks. The determination of microelements was made spectrally by a ten-point scale of spectrogram line intensity. Microelements are present in largest quantity in the ferrous, manganese and carbonate neogenes; in sulfate and phosphate neogenes the quantity of microelements is drastically diminished. The complex of minor elements typical of the

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USSR/Soil Science - Physical and Chemical Properties of Soil. J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86768

neogenes determined was established.
Bibliography lists 13 titles. -- N.V. Verigina

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APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

Phosphates from modern peat deposits in central Russian forest steppe areas. Trudy Min. mus. no.8:134-140 '57. (MIRA 11:3)
(Phosphate)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

Studying new gypsum formations from surface deposits in the steppes of European Russia. Trudy Min. muz. no.8:140-145 '57. (MIRA 11:3)
(Gypsum)

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

DOBROVOL'SKIY, V.V.

AUTHOR: Dobrovol'skiy, V.V. 132-12-10/12

TITLE: All-Union Interdepartmental Conference on the Study of the Quaternary Period (Vsesoyuznoye mezhduvedomstvennoye soveshchaniye po izucheniyu chetvertichnogo perioda)

PERIODICAL: Razvedka i okhrana nedr, 1957, 23, # 12, p 58-59 (USSR)

ABSTRACT: Initiated by the Ministry of Geology and Conservation of Natural Resources (Department of Geologo-Geographic Sciences of the Academy of Sciences USSR, Committee for the Study of the Quaternary Period, the Institute of Geology and the Institute of Geography of the Academy of Sciences USSR) a conference on the study of the Quaternary Period was held in Moskva in 1957. 200 lectures were held during the conference which was attended by 500 scientists from the USSR, the Chinese Peoples' Republic, the German Democratic Republic, Czechoslovakia, Hungary, Roumania, Poland, Bulgaria. The main problems among numerous others dealt with during the conference were:

1. Denomination of the Quaternary Period and its lower boundary.
2. Stratigraphic subdivision of the Quaternary Period.

The conference was opened with lectures of V.I. Gromov, B.P. Grichuk, A.I. Moskvitin, E.V. Khantser and others which dealt

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132-12-10/12

All-Union Interdepartmental Conference on the Study of the Quaternary Period

with point 1, whereby the use of the term "anthropogen" was favored by the majority of participants beside the old term "Quaternary Period". The second point was discussed in numerous plenary and sub-committee sessions. I.I. Krasnov (VSEGEI) claimed that the present state of studies enabled the issue of an outline map on deposits of the Quaternary Period of the scale 1:5,000,000. Special charts of the Quaternary layers of the scales 1:500,000 and 1:200,000 and larger were developed during the past years. Coordination of surveying work was recommended as well as complex prospecting for the purpose to discover specific characteristics of different formations. B.A. Fedorovich and others lectured on Quaternary deposits of northern Kazakhstan, which are of great general importance for geomorphologic mapping. E.E. Milanovskiy lectured on volcanic ashes found in layers of the Quaternary Period in southern plains of the USSR, which are important inasmuch they are connected with Pliocene and anthropogen volcanization of the Caucasus. N.A. Belyayevskiy, member of the board of the Ministry of Geology and Conservation of Natural Resources USSR pointed out gross omissions of former work, because basic geologic questions of

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132-12-10/12

All-Union Interdepartmental Conference on the Study of the Quaternary Period

deposits of the Quaternary Period were viewed by the conference from different angles. Great interest was devoted to the study of different angles. The lectures of S.S. Morozov and the Academician I.I. Gerasimov on the subject of geochemistry of Quaternary deposits were of special interest for the national economy. It was decided to hold the next regional conference for Kazakhstan and Central Asia in 1958, for the Ural and western Siberia in 1959, and for eastern Siberia and the Far East in 1960. The next All-Union conference on the study of the Quaternary Period will be held in 1960.

ASSOCIATION: VIMS

AVAILABLE: Library of Congress

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

J-1

USSR/Soil Science - Genesis and Geography of Soils.

Abs Jour : Ref Zhur - Biol., No 9, 38983

Author : Dobrovolskiy, V.V.

Inst : All-Union Geographical Society.

Title : Relics of the Steppe System in the Contemporary Zone of Podzol - Formation.

Orig Pub : Izv. Vses. geogr. o-va, 1957, 89, No 2, 157-159

Abstract : On the basis of a study of soil forming rocks, the author arrives to the conclusion that conditions close to those fo contemporary forest-steppe and steppe existed on the territory of the Ryazan, Tula, Kaluga and Bryansk oblasts in the first half of the Wurms glacial period.

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"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

BAZHENOV, Ivan Ivanovich, inzh.; LEONENKO, Ivan Abramovich, inzh.; KHARCHENKO, Aleksey Kondrat'yevich, kand.tekhn.nauk. Prinimali uchastiye: DOBROVOL'SKIY, V.V., kand.tekhn.nauk; BORODULIN, K.Ya., inzh.; POPOV, A.A., inzh.; KHODAKOV, I.K., red.izd-va; PROZOROVSKAYA, V.L., tekhn. red.

[Coal mines and mining in the Chinese People's Republic] Ugol'naia promyshlennost' Kitaiskoi Narodnoi Respubliki. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu Gosgortekhizdat, 1959. 479 p. (MIRA 13:2)

(China--Coal mines and mining)

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

"APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5

SOV/7-59-2-13/14

3(8)

AUTHOR: Dobrovol'skiy, V. V.

TITLE: Characteristics of the Hypergenesis of Quaternary Sediments in North Kazakhstan (K kharakteristike gipergeneza chetvertichnykh otlozheniy Severnogo Kazakhstana)

PERIODICAL: Geokhimiya, 1959, Nr 2, pp 178-190 (USSR)

ABSTRACT: The region investigated extends between the Ishim and Irtysh rivers south of the latitude of the town of Petropavlovsk. At the region's central and western part are the Severo-Kazakhskaya hills. The colloidal-disperse mass was subjected to a differential thermoanalysis and chemical analysis. The following empirical formula was found: $3.8\ (Si,Ti)O_2 \cdot 1.3\ (Al,Fe)_2O_3 \cdot 0.4(Mg,Ca)O \cdot 0.1\ (K,Na)_2O \cdot 5.4\ H_2O$. Debye diagrams were made by G. A. Sidorenko and the refractive index was determined. The greater part of microelements is to be found in the colloidal-disperse mass (Table 5, Fig 6). The composition of hypergenous new formations is dependent upon the type of landscape. In mountainous wood-steppe regions new formations of carbonate prevail, which often contain iron (Figs 1, 2, 3; analyses in table 1). In the moderately arid steppe gypsum is to be found

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Characteristics of the Hypergenesis of Quaternary Sediments in North Kazakhstan

(Fig 3, analyses in table 3), in the arid steppes the percentage of new formations of chloride - sulfate is higher. New formations of iron (Table 4) and manganese (Fig 5) are rare. The distribution of microelements in new formations was determined spectrographically under the supervision of A. K. Rusanov and by methods devised by him (Table 2). The investigation showed that microelements are regularly distributed among the individual kinds of new formations. There are 6 figures, 7 tables, and 15 references, 13 of which are Soviet.

ASSOCIATION: Vsesoyuznyy institut mineral'nogo syr'ya, Moskva (All-Union Institute of Mineral Raw Materials, Moscow)

SUBMITTED: March 21, 1958

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000410630002-5"

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3 (5), 3 (8), 17 (4) SOV/20-126-2-43/64

AUTHOR: Dobrovol'skiy, V. V.

TITLE: Admixture Elements in Carbonate Concretions From Quaternary Deposits of the Arid Zone (Elementy-primesi v karbonatnykh konkretsiyakh iz chetvertichnykh otlozheniy aridnoy zony)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 2, pp 382-384 (USSR)

ABSTRACT: The redistribution of substance in subaerial conditions differs greatly from the diagenesis processes which under water occur above the sediment (Ref 1). The author carried out comparative mineralogic-petrographic, chemical, and spectroscopic investigations of 68 samples of the concretion mentioned in the title, in order to explain the behavior of small elements under subaerial conditions. These concretions in the USSR originate from the earth hypergenesis and are also distributed over arid zones in many other lands (Refs 2-8). The author deliberately collected these samples of concretions in places far away from any ore-depos[illegible] desert (South Kazakhstan, Soviet Central Asia), steppe (ce[illegible] black-earth territory, European USSR). The analyses [illegible]re made in the laboratories of the Mineralogicheskiy muzey AN SSSR

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Admixture Elements in Carbonate Concretions From Quaternary Deposits of the Arid Zone

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(Mineralogical Museum of the Academy of Sciences, USSR) (analysist N. V. Voronkova), the Voronezh University (by P.V. Yakshova) and the Ministerstvo geologii i okhrany nedr (Ministry for Geology and Protection of Mineral Resources) (by N. S. Valeyev). The results are given in figure 1. By comparing them with the results of the spectral analyses of the quaternary deposits of the area concerned one may see that not every small element common to bearing rocks (Nb, Hf) exists in carbonate concretions (Analogy in Ref 13). As the applied spectral analysis method yields no results as to the absolute content-quantities of the small elements, their relative contents can only be estimated from the quantity of the ratio of the elements. By arithmetic means for elements, which appear constantly or frequently in concretions and in quaternary sediments, it was ascertained that the ratio is constant. There is about 2-3.5 times more Sr accumulated in concretions while, on the other hand, the content of V, Cu, Pb, Ni, Co, and Ba decreases by a factor of 1.2-2.0 that of Ga by a factor of 0.5. Cr remains nearly constant. The interrelations of the characteristic elements are also different in the said

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concretions and sediments (Table 2). Most of the small elements occur in carbonate concretions in smaller quantities than they do in rocks. The results obtained prove a deviation in the small elements during the transformation, under subaerial conditions, of the arid zone. There are 2 tables and 13 references, 10 of which are Soviet.

ASSOCIATION: Vsesoyuznyy institut mineral'nogo syr'ya (All-Union Institute of Mineral Raw Materials)

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(Soils--Analysis)

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(Geomorphology) (Geology)

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