GERSHUNI, G. V.

"The Mechanisms of Activities of the Auditory Organ and Some Other Receptors in the Light of Electrophysiological Investigations" (p. 1) by Gershuni, G. V.

SO: Advances in Modern Biology, (Uspekhi Sovremennoi Biologie), VOL. XIII, No. 1, 1940

GERSCHUNI, G.V.

BC

PROCESSES AND PROPERTIES INDEX

Function of proprioceptors of skeletal muscle of frog when acted on with certain chemical agents. G. V. Gershuni and S. P. Narikashvili (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, 36, 112—126).—Drugs can be classified as acting on the motor nerve endings without any action on the proprioceptors, like curare, nicotine, and muscarine; or acting on the sensory peripheral apparatus and motor nerve endings, like cocaine and atropine; or causing changes in the muscular tissues with simultaneous loss of the sensory and motor function of the muscular fibres, like histamine and distilled water.

E. C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GERSCHUNI, G.V.

BC

A-4

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Influence of motor [illegible] on activity of [illegible] of skeletal muscle of [illegible] [illegible] Mesdiraschvili and G. V. Gershuni (Compt. rend. Acad. Sci. U.R.S.S., 1942, 36, 243—244).—Motor denervation of [illegible] muscle (10—20 days after the anterior [illegible]) [illegible] accompanied by a considerable increase in the [illegible] discharges, the val. of the extending frequency [illegible]. This may be due to a direct change in the [illegible] of the mechanical forces [illegible] fibres, or [illegible] the muscle. F. S.
[illegible] various groups of [illegible]

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

GERSCHUNI, G.V.

BC

Influence of [illegible] and posterior roots on activity of [illegible] G. V. Gerschuni and S. V. Narikashvili [illegible] Sci. U.R.S.S. [illegible], 27, 10—16).—Using [illegible] motor impulses. digits from 14 frogs, and a technique similar to that of Matthews (Physiol. Abs., 1931, 16, 480), it was shown that stimulation of the relevant anterior or posterior spinal roots caused a decrease in frequency and regularity of proprioceptive discharges in response to stretch of the muscle. Owing to [illegible] spread of stimulating current, differentiation between anterior and posterior root effects was not possible.

A. D. M. G.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

"On the Sensory and Subsensory Reactions Evoked by External Stimuli Acting upon the Human Sense Organs", Bull. Acad. Sci. USSR (Biol. Ser.) 2, pp 210-228, 1945.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

[illegible]

"About the Modification of Auditory Sensitivity in Action of Sound During Hypnotic Sleep," Fiz. Zhur., 32, No.5, pp 557-566, 1946

Translation 297, Lulich

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

Dr. of Biological Sciences, Institute of Physiology, im. I.P. Pavlov.

Member of USSR Academy of Sciences

Concerning: "The Study of Subsensorial Unfelt Reactions Accompanying the Functioning of the Organs of Senses"

Soviet Source: N: Radyanska Ukraina, Kiev, 13 June 1947

Abstracted In USAF, "Treasure Island", on file in Library of Congress, Air Information Division, Report No. 13433.

GERSHUNI, G. V. FA 53T57

USSR/Medicine - Ears
Medicine - Hearing

Aug 1947

"Subsensory Reflexes in Ear Irritations," G. V. Gershuni, I. I. Korotkin, Lab Physiol Sensory Organs, Physiol Inst imeni I. P. Pavlov, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVII, No 4

Describes experiments conducted to determine whether it is possible to have conditional-reflex reactions when conditional signal lies lower than sensory threshold and irritation is not perceived by subject. States that results could not be confirmed. Submitted by Academician L. A. Orbeli, 13 Feb 1947.

[redacted] 53T57

GERSHUNI, G.V.

GERSHUNI, G.V.

Changes in the auditory function during the action of the sound. Probl.fiziol.akust. 1:5-20 '49 (MIRA 10:11)

1. Fiziologicheskiy institut im. akad. I.P.Pavlova AN SSSR. (HEARING)

ALEKSEYENKO, N.U.; BLINKOV, S.M.; GERSHUNI, G.V.

Disorders of perception of sound direction as a symptom of cerebral focal injuries. Prob.fiziol.akust., Moskva 1:93-104 '49. (CIML 19:2)

1. Physiological Institute imeni Academician I.P.Pavlov of the Academy of Sciences USSR and the Institute of the Brain of the Ministry of Public Health.

[illegible], [illegible] ([illegible])

See: [illegible]

Gershuni, G. V. and [illegible], A. V.- "[illegible] manifestations of the activity of various divisions of the central nervous system of the cat when [illegible] asleep and awake," Trudy [illegible] in-ta im. Pavlova, Vol. III, [illegible], p. [illegible]-31 -- Bibliog: p. 31

SO: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. [illegible], 1949).

GHRSHUNI, G.V.

Study of sensations and conditioned reflexes in man under the influence of sound stimuli. Trudy fiziol. inst. 4:19-24 '49. (MIRA 9:5)

(CONDITIONED RESPONSE)
(SENSES AND SENSATION)

"Physiological Principles of Objective Audiometry", Probl. Fiziol. Akust. Moskva 1, pp 3-7, 1950.

GERSHUNI, G.V.

Physiological principles of objective audiometry. Probl. fiziol. akust. 2:3-7 '50. (MIRA 10:11)

1. Fiziologicheskiy institut im. akad. I.P.Pavlova AN SSSR. (AUDIOMETRY)

GERSHUNI, G.V.

Quantitative investigation of the range of action of imperceptible sound stimulations. Probl.fiziol.akust., Moskva Vol.2:29-36 1950.
(CIML 20:5)

1. Physiological Institute imeni Academician I.P.Pavlov of the Academy of Sciences USSR.

GERSHUN, G. V. PA 193T98

USSR/Physics - Sound and Light, Intensities of Oct 51

"Lowest Limits of Sound and Light Intensities That Effect the Organs of Hearing and Sight," G. V. Gershun

"Zhur Tekh Fiz" Vol XXI, No 10, pp 1202-1204

This article is dedicated to the 70th birthday of Nikolay Nikolayevich Andreyev, Russian physicist. Gershun assumes that conditional reactions surpass sensitivity of organic senses. He presents curves of exptl data (cf. A. A. Knyazeva, "Trudy Fiziol" Inst imeni Pavlov, Ak Nauk, No 4, 1949). Submitted 31 Jan 51.

193T98

Gershuni, G. V.

GERSHUNI, G.V.; KOZHEVNIKOV, V.A.; MATYATOVA, Ye.S.

Studies on certain manifestations of the function of the auditory analyzer in man by means of conditioned cutaneo-galvanic reflexes. Vest. oto-rin. 16 no.4:14-20 Jl-Ag '54. (MLRA 7:8)

1. Iz laboratorii slukhovogo analizatora (zav. prof. G.V.Gershuni) Instituta fiziologii imeni I.P.Pavlova Akademii nauk SSSR i kliniki bolezney ukha, gorla i nosa (zav. chlen-korrespondent Akademii meditsinskikh nauk SSSR V.F.Undrits) I Leningradskogo meditsinskogo insituta.

(REFLEX, CONDITIONED,
*cutaneo-galvanic, auditory analysor funct. test)
(HEARING TEST,
*cutaneo-galvanic conditioned reflex technic)

GERSHUNI, G.V.

Using different reactions as a basis for studying the activity of human sound analysor. Probl.fiziol.akust. 3:45-52 '55. (MLRA 9:5)

1. Laboratoriya fiziologii slukhovogo analizatora Instituta fiziologii imeni I.P.Pavlova AN SSSR, Leningrad.
(HEARING) (REFLEXES)

EXCERPTA MEDICA Sec.2 Vol.9/8 Physiology,etc. Aug56

3653. GERSHUNI G.V. *Characters of conditioned galvanic skin reflexes and reactions of alpha-rhythm extinction in response to sub- and supra-liminal auditory stimulation in man (Russian text) Ž. VYSČ. NERV. DEJATEL. 1955, 5/5 (665-676) Graphs 5 Tables 4

As long as the intensity of the auditory stimulus is less than 6 decibels, the latency of the galvanic skin reflex is relatively great (average 3.1 sec.), falling to 1.7 sec. when the threshold value is exceeded. The reactions show a very marked change when the intensity is raised to 70 db., at which point disturbances of the alpha rhythm are frequently observed. The inhibition of this rhythm is of shorter duration with subliminal than with supraliminal stimulation. It is concluded that a switch-over occurs in the CNS when conditioned reflex activity is studied by alteration of the intensity of the conditional stimulus. Von Skramlik - Berlin

"About New Methods of Measurement of Hearing in Man".
Abstracted for inclusion in the Second International Congress on Acoustics, Cambridge, Mass,. 17-24, Jun 1956

Pavlov Institute of Physiology of the Academy of Science of the USSR, Leningrad.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

USSR/Acoustics - Physiological Acoustics. Speech and Singing, J-8

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35634

Author: Gershunin, G. V.

Institution: None

Title: On Certain New Methods of Measuring Hearing of Humans and the Results Obtained with Them

Original Periodical: Akust. zh., 1956, 2, No 2, 137-141

Abstract: Explanation of new methods for measuring hearing, based on the use of conditioned reactions to sound by humans. Data are given to show that the absolute hearing thresholds and differential limits for the frequency and intensity of pure tones can be measured in humans with the aid of these reactions with the same reliability, as when using the verbal response; in some cases one observes conditioned reflexes, which appear to be subthreshold ones within limits of one to 6 db relative to the verbal response.

Card 1/2

USSR/Acoustics - Physiological Acoustics. Speech and Singing,

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35634

Abstract: Based on the facts obtained, attention is called to the signifi-cance of the central mechanisms, that sharpen and coarsen the de-gree of discrimination of frequency and intensity of tonal signals.

Card 2/2

1783. GERSUNI G. V. Lab. of the Physiol. of Acoustical Analyser Pavlov Inst. of Physiol., USSR Acad. of Sciences. *General results of investigating the activity of the sound analyser in man by means of various reactions (Russian text) Z. VYSČ. NERV. DEJATEL. 1957, 7/1 (13-24) Graphs 5

The article describes the results of studying the quantitative indices of the function of the acoustical analyser in man - the absolute and differential thresholds - on the basis of various reactions. For this aim, in addition to the conventional verbally conditioned reactions, use was made of conditioned eye-lid movements, skin-galvanic, and electro-cortical reactions. All the reactions involved in the study of quantitative indices of the acoustical analyser activity were classified into three groups: (1) verbally conditioned reactions, (2) reactions elaborated with an unconditioned reinforcement and (3) reactions developing 'on the spot', i.e. those which do not require either unconditioned reinforcement in the experiment or verbal instructions. It has been found that: (1) Absolute auditory thresholds and differential threshold for the frequency and intensity of pure tones can be measured in man with the help of these reactions as reliably as by means of verbal responses. (2) In some cases conditioned reflexes have appeared which are subthreshold within 1 to 6 decibels in relation to the verbal response. (3) Changes in absolute and differential sensitivity reaching 25-30 decibels can be discovered, depending on the conditions under which the reactions occur. (4) Preliminary excitation of certain parts of the motor system is one of the important conditions determining the changes in the analyser sensitivity. The article discusses the possible mechanisms determining the variability of the analyser parameters and their conformity with the nature of the activity in question. The author points out the weakness of those schemes of analyser activity which ignore the significance of two-way connections in the integral organism.

AVAKYAN, R.V.; GERSHUNI, G.V.; RATENBERG, M.A.

Studies of the auditory analysor in signs of hysteric deafness [with summary in English]. Zhur.vys.nerv.deiat. 7 no.3:325-334 My-Je '57. (MIRA 10:10)

1. Laboratoriya fiziologii slukhovogo analizatora Instituta fiziologii im. I.P.Pavlova AN SSSR i Leningradskiy nauchno-issledovatel'skiy institut po boleznyam ukha, gorla, nosa i rechi.
(HEARING TESTS,
in hysteric deafness, conditioned reflex method (Rus))
(REFLEX, CONDITIONED,
in hearing tests in hysteric deafness (Rus))

EXCERPTA MEDICA Sec.11 Vol.10/7 Oto-Rhino-Laryngo Jul57
GERSUNI G V.

1409. GERSUNI G.V. Pavlov Inst. of Physiol., Acad. of Scis, U.S.S.R., Leningrad.
*Concerning new methods of the measurement of hearing in man J. ACOUST. SOC. AMER. 1957, 29/1 (129-131) Graphs 5

It is known that the main quantitative characteristics of hearing in man can be obtained by so-called psychophysical methods. In these methods the responses to sound stimuli are based upon the use of verbal instructions. This paper gives a description of methods of measurements of hearing based upon the use of other different responses to sound stimuli. A set of different conditioned responses was used (galvanic-skin reflexes, eyelid reflexes, electro-cortical and oculomotor reactions). The data obtained by these methods show the following: (1) absolute auditory thresholds and difference limens for frequency and intensity of pure tones can be measured with the same accuracy by these reactions as by verbal responses; (2) in certain cases conditioned reflexes subliminal to the verbal response in the range of 1 to 6 db. may be detected; (3) changes of absolute sensitivity, attaining 25 to 30 db. and dependent on the conditions under which the reactions take place, can be detected. The present data of hearing measurements obtained by means of different responses are considered as highly characteristic of the process of sound discrimination in man and animals.

USSR / Human and Animal Physiology. Nervous System, Higher Nervous Activity, Behavior. T

Abs Jour : Ref Zhur - Biol., No 15, 1958, No. 70558

Author : Gershuni, G. V.
Inst : Not given
Title : Discrimination by the Human Auditory Analyzer of Complex Stimuli with Increasing Amounts of Information

Orig Pub : Fiziol. Zh. SSSR, 1957, Vol 43, No 11, 1086-1097

Abstract : In addition to its physical complexity, each stimulus is characterized by the complexity of that aggregate of which it is an element. An assessment of this statistical complexity of the stimulus is possible with the use of the methods of the theory of information (I). For any analyzer, various systems of stimuli may be created which may be evaluated according to various signs; the amount of I in the stimulus, the character of the code (the method

Card 1/2

GERSHUNI, G.V.

Relationship between the sensitivity of the analysor and the nature of reactions produced in man. Probl.fiziol.opt. 12:79-81 '58 (MIRA 11:6)

1. Laboratoriay fiziologii slukhovogo analizatora Instituta fiziologii im. I.P. Pavlova AN SSSR.
(OPTICS, PHYSIOLOGICAL)

GERSHUNI, G.V.; KNYAZEVA, A.A.

Auditory adaptation under conditions of "distracted attention."
Probl.fiziol.akust. 4:5-15 '59. (MIRA 13:5)

1. Laboratoriya fiziologii slukhovogo analizatora Instituta fiziologii im. I.P. Pavlova AN SSSR i Kafedra bolezney ukha, gorla i nosa 1-go Leningradskogo meditsinskogo instituta im. I.P. Pavlova, Leningrad.
(HEARING)

GERSHUNI, G.V.

Current data from studying the activity of the biological sound analyzer and our objectives. Trudy Inst.fiziol. 8:18-23 '59. (MIRA 13:5)

1. Laboratoriya fiziologii slukhovogo analizatora (zaveduyushchiy - G.V. Gershuni Instituta fiziologii im. I.P. Pavlova AN SSSR. (HEARING)

GERSHUNI, G.V.; KLAAS, Yu.A.: LUKOMSKAYA, N.Ya.; LINYUCHEV, M.N.;
SAGAL, A.A.

Method of evaluating human discrimination of sound stimuli with increasing amounts of information and its use in studying the effect of certain pharmacological substances [with summary in English]. Biofizika 4 no.2:158-165 '59. (MIRA 12:4)

1. Institut fiziology imeni I.P. Pavlova AN SSSR, Leningrad 1-y Leningradskiy meditsinskiy institut imeni I.P. Pavlova.

(PHARMACOLOGY,
discrimination of sound stimuli with increased amount of information in investigation of eff. of pharmacol. prep. (Rus))
(PERCEPTION,
same)
(SOUNDS, eff.
same)

GERSHUNI, G.V. (Leningrad)

International Colloqium on Electroencephalography of the Higher Nervous Activity. Fiziol.zhur. 45 no.2:208-215 F '59.

(MIRA 12:3)

(ELECTROENCEPHALOGRAPHY--CONGRESSES)

GERSHUNI, G.V.

Central regulation of discharges from the peripheral neuron of the auditory system. Fiziol.zhur.SSSR 45 no.7:772-777 Jl '59. (MIRA 13:4)

1. From the laboratory of physiology of the auditory analyzer, I.P. Pavlov Institute of Physiology, Leningrad.
(ACOUSTIC NERVE physiology)
(CENTRAL NERVOUS SYSTEM physiology)

GERSHUNI, G.V.

Physiology of analyzers. Fiziol.zhur. 45 no.11:1403-1404 N '59.
(MIRA 13:5)

(PHYSIOLOGY)

ALEKSEYENKO, N.Yu.; KLAAS, Yu.A.; SHAFRANOVSKIY, K.I., Prinimal uchastiye CHERMAN, T.P. LUPPOV, S.P., otv.red.; GERSHUNI, G.V., prof., red.; GOL'DANSKAYA, M.I., red.izd-va; KRUGLIKOVA, N.A., tekhn.red.

[Physiological acoustics; bibliographical index of Soviet literature, 1917-1950] Fiziologicheskaia akustika; bibliograficheskii ukazatel' sovetskoi literatury, 1917-1950. Moskva, Izd-vo Akad.nauk SSSR, 1960. 136 p. (MIRA 14:1)

1. Akademiya nauk SSSR. Biblioteka. 2. Institut vysshey nervnoy deyatel'nosti AN SSSR (for Alekseyenko). 3. Institut fiziologii im. I.P.Pavlova AN SSSR (for Klaas). 4. Biblioteka AN SSSR (for Shafranovskiy, Cherman).
(BIBLIOGRAPHY--HEARING)

GERSHUNI, G.V., prof.

Hearing. Zdorov'e 6 no.1:9-11 Ja '60. (MIRA 13:4)
(HEARING)

82727

S/046/60/006/003/003/012
B006/B063

24.1500

AUTHOR: Gershuni, G. V.

TITLE: Regulation of a Neural Pulse Stream in the Auditory System

PERIODICAL: Akusticheskiy zhurnal, 1960, Vol. 6, No. 3, pp. 299-306

TEXT: On the basis of electric-physiological examinations of reflexes of various parts of the auditory system (cochlea, geniculate body, cerebral cortex) of living beings the author studies the problem of regulating the current of primary impulses in the organism, which permit the "informative" perception of sound signals. Fig. 1 illustrates the electric reactions of various parts of the auditory system to a sound signal of a duration of 10 msec. The electric oscillations have amplitudes of 50 μv. The dependence of these amplitudes on the sound intensity is shown in Fig. 2. The first nerve stimuli in the cochlea attain amplitudes of nearly 100 μv (at 80 decibels) and are largely dependent on the sound intensity (Curve 1). The amplitudes of the first positive wave are not higher than 10 v. At intensities of more than 40 decibels they are practically no longer dependent on the sound intensity (Curve 2). The first positive wave in the auditory

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Regulation of a Neural Pulse Stream in the Auditory System

S/046/60/006/003/003/012
B006/B063

area of the cortex attains amplitudes of up to 70 μv, and the dependence of the amplitudes on the sound intensity decreases rapidly (Curve 3). Next, the author discusses special electric reaction diagrams which were taken under different conditions, and studies the effects of disturbances (e.g., anesthesia, partial destruction of the auditory area of the cortex) The results discussed here were, for the major part, published by Ya. A. Al'tman. They illustrate the importance of the various ways of impulse regulation in the organism. 1) The current of impulses resulting from an acoustic stimulation in a nerve is limited. The secondary current caused by this current are also limited. 2) The current of impulses resulting from the action of a special system of (reverse) connections radiating from the center is limited. 3) The current of impulses in the higher ranges of the auditory system changes under the action of sections of the central nervous system outside the auditory system. The author discusses two mechanisms of the regulation of information transmitted by currents of nervous impulses which may occur in the auditory system under the action of sound. The first mechanism consists in a change of the participating elements, and the second one in a change of the level of the characteristic noise in the system. Mention is made of Nikolay Nikolayevich Andreyev and

Card 2/3

82727

Regulation of a Neural Pulse Stream in the Auditory System

S/046/60/006/003/003/012
B006/B063

A. M. Maruseva. There are 5 figures and 24 references: 13 Soviet and 3 US.

ASSOCIATION: Institut fiziologii im. I. P. Pavlova Leningrad (Institute of Physiology imeni I. P. Pavlov, Leningrad)

SUBMITTED: May 18, 1960

LH

Card 3/3

GERSHUNI, G.V.

Evaluation of the functional significance of electrical responses of the auditory system. Responses to short sounds (clicks) and the determination of the initial moment of the stimulus action. Fiziol. zhur. 48 no.3:241-250 Mr '62. (MIRA 15:4)

1. From the Laboratory of Auditory Analyser Physiology, I.P.Pavlov Institute of Physiology, Leningrad.
(HEARING) (ELECTROPHYSIOLOGY)

KUZIN, A.M., glav. red.; GEL'FAND, I.M., red.; LIVANOV, M.N., red.; GERSHUNI, G.V., doktor med. nauk, red.; KHURGIN, Ya.I., doktor fiz.-matem. nauk, red.; KOCHEREZHKIN, V.G., kand. biol. nauk, red.; GURFINKEL', V.S., red. izd-va; POLENOVA, T.P., tekhn.red.

[Biological aspects of cybernetics] Biologicheskie aspekty kibernetiki; sbornik rabot. Moskva, Izd-vo Akad. nauk SSSR, 1962. 237 p. (MIRA 16:1)

1. Akademiya nauk SSSR. Nauchnyy sovet po kompleksnoy probleme "kibernetika." 2. Chlen-korrespondent Akademii nauk SSSR (for Kuzin, Gel'fand, Livanov).

(CYBERNETICS)

GERSHUNI, G.V.

Evoked potentials and mechanisms of discrimination of an external signal. Zhur. vys. nerv. deiat. 13 no.5:882-890 S-O'63 (MIRA 16:11)

1. Laboratory of Acoustic Analyser Physiology, Pavlov Institute of Physiology, U.S.S.R. Academy of Sciences, Leningrad.

GERSHUNI, G.V.; [illegible]

Dependence of the primary response of the auditory region of the cortex in cats in a waking state on temporal parameters of the signal. Zhur. vys. nerv. deiat. 14 no.3:[illegible]-497 My-Je '64. (MIRA 17:11)

1. Laboratoriya fiziologii sluchovogo analizatora Instituta fiziologii im. I.P. Pavlova [illegible]

BIBIKOV, Ye.S., kand. tekhn. nauk (Chelyabinsk); GERSHUNI, G.V., prof.

Is our ear a radio loudspeaker? Priroda 53 no.9:124-125 '64.
(MIRA 17:10)

1. Institut fiziologii im. I.P. Pavlova (for Gershuni).

GERSHUNI, G.V.

Organization of afferent flow and [illegible] of [illegible] signals of various duration. Zhur. vys. nerv. deiat. [illegible] (MIRA 18:5)
263-273 Mr-Ap '65.

1. Institut fiziologii imeni I.P. Pavlova AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

GERSHUNI, G. Z.

1 Oct 52

USSR/Physics - Heat Transfer

"Free Thermal Convection in Space Between Vertical Coaxial Cylinders," G. Z. Gershuni, Molotov State Univ imeni Gor'kiy

DAN, Vol 86, No 4, pp 697-8

Investigates thermal convection in a liquid between coaxial cylinders at different temperatures. Finds that heat transfer from hot to cool cylinder depends on molecular thermal conductivity of liquid. It holds true as ling as Gr. Pr 13 (Prandl-Grasshof number). Ovee this limit solution is unstable and turbulence occurs. Presented by Acad M. A. Leontovich 3 Jul 52.

252T96

GERSHTEIN, G. L. [illegible]

"Sound Absorption in a Ferromagnetic Near the Curie Point," Uch. Zap. [illegible], un-ta, No 1, pp 69-71, 1953

Anomalously high sound absorption in a ferromagnetic near the Curie point, due to energy dissipation of the sound wave, is analyzed. A formula of linear absorption is derived. (RZhFiz, No 6, 1955)

Sum. No. 681, 7 Oct 55

2797. NEKOTORYS SOPROSY USTOYCHIROSTI STATSIONARNYKH KONVEKTIVNYKH DEIZHENIY. MOLOTOV, 1954, 9C 2L CM. (M-VO VYSSH. OBRAZOVANIYA SSSR. MOLOTOVSKIY GOS. UN-T IM. A. M. GOR'KOGO) 100 EKZ. B. TS. - (54-56626)

SO: KNIZHANAYA LETOPIS, VOL. 2, 1955

"A Certain Case of Solution of Convection Problem With Account of Ratio of Viscosity Coefficient to Temperature"
Uch. Zap Molotovsk. un-ta, 8, No 3, 1954, 87-90

Equations of convection are solved taking into account of the viscosity in the case of an infinite vertical slit with plane parallel walls heated to different temperatures. Exact stationary solutions are found in two cases in which the ratio of viscosity to temperature is linear and may be expressed by Bachinskiy's formula. The temperature distribution in this case is linear and the heat transfer from hot to cold wall is determined by the molecular heat conductivity of the liquid. (RZhFiz, No 9, 1955)

SO:: Sum-No 737, 12 Jan 56

GERSHUNI, G. Z.

"Certain Problems of the Stability of Stationary Convective Movements." Cand Phys-Math Sci, Molotov State U, Min Higher Education USSR, Molotov, 1954. (KL No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

USSR/Physics - Convective movement stability FD-3051

Card 1/2 Pub. 153 - 20/23

Author : Gershuni, G. Z.

Title : Problem of the stability of planar convective movement of a liquid

Periodical : Zhur. tekh. fiz., 25, February 1955, 351-357

Abstract : Earlier the author investigated (ibid., 23, 1838, 1953) the stability of stationary convective movement of a liquid between vertical parallel planes heated to different temperatures or between planes arbitrarily oriented relative to the gravitational field, the investigation showing that for various angles of inclination the crisis of stationary movement occurs for different causes; further, this problem is of interest for its own self since it relates to the practical important problem of heat transfer through liquid or gas layers. In the present work the author considers the convective movement of a liquid in the portion of a planar slot remote from the ends which is formed by two planes between which is maintained a constant temperature difference T. He drives

Card 2/2 FD-3051

Abstract : the related equations and solves. He clarifies that the so called threshold of convection is a special case of the occurrence of turbulence, as noted by V. S. Sorokin (Prikl. mat. i mekh., 18, 197, 1954). He thanks V. S. Sorokin for discussions. Seven references: e.g. V. S. Sorokin, Prikl. mat. i mekh., 17, 39, 1953.

Institution : -

Submitted : June 25, 1954

SOV/139-58-4-6/30

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Two Types of Unstable Convective Flow Between Parallel Vertical Planes (O dvukh tipakh neustoychivosti konvektivnogo dvizheniya mezhdu parallel'nymi vertikal'nymi ploskostyami)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 43-47 (USSR)

ABSTRACT: The stability of stationary convective flow between parallel vertical planes held at different temperatures has already been investigated by the first author, using Galerkin's method (Ref.1). In the present paper the authors have used a more complicated form for the approximating functions (see Eqs.5), and have so found a more accurate approximate solution. This has allowed a more accurate calculation of the earlier results and has in addition uncovered a second type of instability, not given in the earlier work at all, a type with null phase velocity which the authors call a "standing disturbance" as opposed to a "travelling disturbance". Taking the planes to be $x = \pm 1$, the dimensionless equations for the stationary convective flow are given by Eq.(1). The

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Two Types of Unstable Convective Flow Between Parallel Vertical Planes

stream and temperature functions φ and Θ of plane harmonic disturbances are given by Eqs.(2) and (3) with boundary conditions as in Eq.(4). G and P are the Grasshof and Prandtl numbers, k and ω the wave number and complex frequency of the disturbance. These equations were derived by the first author (Ref 1). The question of stability has thus been reduced to that of finding the eigen-values of equations (2) to (4). The authors find an approximate solution to this problem by assuming forms for φ and Θ of the type given in Eq.(5). They then make plausible guesses at φ_1, φ_2, Θ_1, Θ_2, see Eqs.(6) and (8). All boundary conditions are now satisfied by the approximate solution. This solution differs from the cruder approximation the first author used previously (Ref 1) in that the stream function φ is now the sum of two functions, with two variable coefficients, and that the additional boundary condition on Θ, Eq.(7), is taken into account. Using Galerkin's method, the authors obtain Eq.(12) for real eigen values of ω, and Eq.(11) for the corresponding relation between G and k. Eliminating ω between

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Two Types of Unstable Convective Flow Between Parallel Vertical Planes

Eq.(11) and Eq.(12), a curve is obtained in the (G,k) plane which the authors call a 'neutral curve' - i.e. one corresponding to real values of ω. From the position of the minimum on this curve the critical values of the Grasshof number G_m and the wave number k_m can be found. $\omega = 0$ gives a solution of Eq.(12), and the corresponding curve of G_m against $\log P$ is shown in Fig.1. In the range shown k_m was practically constant, increasing only from 1.6 to 1.7. This is the instability that was not revealed in the earlier work (Ref 1). Excluding $\omega = 0$, for $P > 1.8$ the authors obtain the second type of instability - the "travelling" type. For this type $\log G_m$ is plotted against $\log P$ in Fig.2 (full line). Eq.(14) is asymptotically true, and a good approximation for $P > 50$. For this type k_m increases from 0 to 1.6 at $P > 50$. For this type of disturbance there is a good agreement with the author's earlier work (Ref 1). Thus eq.(14) was also obtained, though with 224 instead of 214 in the numerator, and the asymptote was reached at $P = 0.96$.

Card3/4 The main results can be summarised thus:

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Two Types of Unstable Convective Flow Between Parallel Vertical Planes

For convective flow between two parallel planes held at different temperatures, instabilities appear if there is a large temperature difference between the planes. "Standing" disturbances correspond to $P < 1.8$, both types are possible for $P > 1.8$, though for $P > 2.2$ the "travelling" disturbances are the more dangerous as they correspond to a smaller Grasshof number.
There are 2 figures and 1 Soviet reference.

ASSOCIATIONS: Permskiy gosuniversitet (Perm' State University) and Permskiy pedagogicheskiy institut (Perm' Pedagogic Institute)

SUBMITTED: January 8, 1958

Card 4/4

SOV/126-6-2-22/34

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Forced Vibrations in an Elasto-Plastic System (Vynuzhdennyye kolebaniya v uprugo-plasticheskoy sisteme)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 339-346 (USSR)

ABSTRACT: Forced vibrations in an elasto-plastic system beyond the elastic limit are considered. Friction and hysteresis are taken into account. The resonance properties of such a system are discussed and compared with the experimental data given in Refs. 1 and 2. The equation of motion of a point under the action of an elasto-plastic force F(x) and an external force G sin $(\omega t + \varphi)$ is of the following form

$$m\ddot{x} + \lambda\dot{x} + F(x) = G \sin(\omega t + \varphi) \qquad (2)$$

where λ is the coefficient of friction and F(x) is given by:

$$\left.\begin{aligned} F_I = k_1 x, \quad F_{II} = F_m + k_2(x - x_m), \\ F_{III} = k_1(x - \Delta), \quad F_{IV} = -F_m + k_2(x + x_m - \Delta). \end{aligned}\right\} \qquad (3)$$

where the various constants have the meaning indicated in Fig.1. The above equation is then re-written in the dimensionless form

$$\ddot{x} + \beta\dot{x} + f(\lambda) = g \sin (pt + \varphi) \quad (4)$$

where

$$p = \omega/\omega_o, \; g = G/F_m, \; \beta = \lambda/m\omega_o, \; f + F/F_m$$

$$\left.\begin{aligned} &f_I = x, \quad f_{II} = 1 + \alpha (x - 1), \\ &f_{III} = x - \delta, \; f_{IV} = -1 + \alpha (x + 1 - \delta), \end{aligned}\right\} \quad (5)$$

$$\delta = \frac{\Delta}{x_m} \quad \text{and} \quad \alpha = \frac{k_2}{k_1} \; .$$

The problem consists of finding periodic solutions of the above equation which have a period $2\pi/p$, i.e. equal to the period of the forcer. The appropriate system of boundary conditions is given by Eq.(6). The equations are solved by an approximation method suggested by B. G. Galerkin.

In the case $\beta = 0$ the resonance curves are as shown in Figs. 2 and 3 ($\alpha = k_2/k_1$; cf. Fig.1). The form of the curves indicates the presence of considerable absorption due to hysteresis. The assymmetry of the curves becomes more pronounced as α decreases. The low frequency side of the resonance curve is steeper than the high frequency side. When the coefficient of friction is not zero the resonance frequency beyond the elastic limit increases as friction increases. In general, the resonance frequency decreases at larger amplitudes of vibration and the relation between the amplitude of vibration and the amplitude of the forcing function is non-linear. The problem was suggested by Professor M. Kornfel'd. There are 7 figures and 4 references, 3 of which are Soviet, 1 English.

Forced Vibrations in an Elasto-Plastic System SOV/126-6-2-22/34

ASSOCIATIONS: Permskiy gosudarstvennyy universitet
(Perm' State University) and
Permskiy pedagogicheskiy institut
(Perm' Pedagogical Institute)

SUBMITTED: June 7, 1956

Card 4/4 1. Vibration--Theory 2. Mathematics--Applications

AUTHORS: ~~Gershuni, G. Z.~~, Zhukhovitskiy, Ye. M. SOV/ 56-34 -3-20/55

TITLE: The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field (Statsionarnoye konvektivnoye dvizheniye elektroprovodyashchey zhidkosti mezhdu parallel'nymi ploskostyami v magnitnom pole)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 670-674 (USSR)

ABSTRACT: The two planes referrred to in the title may be heated to various temperatures. First, the equations of the motion of the medium (these are the equations of convection in the case investigated here) and the Maxwell equations for the field in the medium are written down. In the equation for the curl of the magnetic field, the displacement current is neglected and in the equation of heat conduction - the tough dissipation and Joule dissipation. The electric field strength and the current density are eliminated first from Maxwell's equation. The above-mentioned equations are subsequently converted into dimensionless variables. 4 dimensionless parameters occur in these equations. The authors investigate here the steady

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The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

convection in the space between vertical parallel surfaces in the case of the presence of an exterior magnetic field which is vertical to the surfaces. If the linear dimensions of the surfaces are sufficiently great compared with the distance between them, then an accurate solution of the above-mentioned dimensionless equations can be determined which describes the steady solution in the part distanced from the ends of the gap formed by the surfaces. This motion has the following pecularities: 1) The velocity $\vec{v}$ is always parallel to the z-axis. 2) The temperature T depends only on x. 3) The field-vector $\vec{H}$ is situated everywhere in the surface (xz), viz. it holds $H_y = 0$. 4) All values do not depend on y (plane problem) and except pressure, neither on z. In this case the z-axis is parallel to the surfaces and the x-axis is vertical to them. The authors determine here the distribution of temperature, velocity and field strength on the cross section. First, T = -x is found. Also the terms for the velocity distribution and the magnetic field strength are given explicitely; all these formulae together represent the solution of the problem discussed here. A diagram demonstrates the velocity-distributions for the Gartman numbers M = 0,5,10.

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The Stationary Convective Motion of an Electrically Conducting Liquid Between Parallel Surfaces in a Magnetic Field

The velocitydistribution $v = Gx(x^2 - 1)/6$ is obtained with lacking field. The motion decreases rapidly with increasing field strength. Moreover, a peculiar boundary layer occurs in the flow: A thin layer with an important gradient of velocity is formed in the vicinity of the walls. Also the distribution of the induced magnetic field on the cross section is demonstrated by a diagram. Concluding, a formula for the vertical convective thermic flow is given. The solution found here describes the motion in a vertical gap in the presence of a transversal external field. It may, however, be readily generalized for cases with inclined gap and with an external field oriented at random. There are 2 figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University), Permskiy pedagogicheskiy institut (Perm Pedagogical Institute)

SUBMITTED: September 19, 1957

Card 3/3

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOV/56-34-3-21/55

TITLE: On the Stability of Steady Convective Motion of an Electrically Conducting Liquid Between Parallel Vertical Planes in a Magnetic Field (Ob ustoychivosti statsionrnogo konv ktivnogo dvizheniya elektroprovodyashchey zhidkosti mezhdu parallel'nymi vertikal'nymi ploskostyami v magnitnom pole)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. ", Nr 3, pp. 675-683 (USSR)

ABSTRACT: First the authors refer to earlier works dealing with the same subject among them one published by themselves (Ref.1). The generalization to the case of random position of the planes is more difficult than in the case of the steady problem and it can be carried out **in the same way as G.Z. Gershuni in his study** (Ref.3). First the equations for the perturbations are put down, the authors here investigating two-dimensional perturbations. Also a current function and a vector potential are introduced. The sign of the imaginary

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APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

part of the frequency ω determines the behaviour of small perturbations. The authors then mention the differential equations for the amplitudes of the perturbations of velocity and temperature must disappear in the parallel boundary planes bounding the liquid; the corresponding boundary conditions are put down. The perturbations of the magnetic field need, in general, not disappear; as boundary conditions for the field serve the usual conditions on the separating surfaces of the media. Furthermore two possible orientations of the constant external field are investigated: 1.-The constant homogenous external field is situated at right angles to the parallel planes and thus also to the vector of the velocity of the steady motion of the liquid. 2.-The external field has the same direction as the velocity. With longitudinal and also with transverse fields the amplitude of the vector potential of the perturbation of the field can be eliminated from the equations. The problem then reduces to the finding of the amplitudes of the current function and of temperature from the given equations of the problem and the boundary conditions pertaining to it.

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This problem will have a solution only for certain values of the complex number ω. In the second chapter of this work the problem formed is solved by approximation according to the method by Galerkin, the course of computation being followed step by step. The results obtained are discussed separately for the case of a longitudinal and a transverse field. In the transverse case the critical wave number k_m decreases monotonously with increasing M i.e. with the magnetic field becoming stronger the wave length of the steady perturbations increases. Besides, the investigated steady motion is unstable also with regard to nonsteady perturbations when a transverse field is present. Such a instability appears at sufficiently great field strengths. A diagram shows the dependence of the critical wave number on the field strength. In the case of a longitudinal field the stability can be compensated only by steady perturbations with $\omega = 0$. A longitudinal field increases the stability of motion

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much less than a transverse field. In a longitudinal field the critical wave number decreases monotonously with increasing field strength. The qualitative results obtained can be made more precise by their approximation method used. There are 2 figures, 1 table and 9 references, 4 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (State University Perm), Permskiy gosudarstvennyy pedagogicheskiy institut (Perm State Pedagogic Institute)

SUBMITTED: September 19, 1957

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PHASE I BOOK EXPLOITATION SOV/3762

Konferentsiya po magnitnoy gidrodinamike. Riga, 1958.

Voprosy magnitnoy gidrodinamiki i dinamiki plazmy; trudy Konferentsii. (Problems & Magnetohydrodynamics and Plasma Dynamics; Transactions of a Conference) Riga, Izd-vo AN Latviyskoy SSR, 1959. 343 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut fiziki.

Editorial Board: D.A. Frank-Kamenetskiy, Doctor of Physics and Mathematics, Professor; A.I. Vol'dek, Doctor of Technical Sciences, Professor; I.M. Kirko, Doctor of Physics and Mathematics; V.Ya. Veldre, Candidate of Physics and Mathematics; V.G. Vitol, Candidate of Physics and Mathematics; Yu.M. Kruzin'; and V.Ya. Kravchenko.

Ed.: A. Teytel'baum; Tech. Ed.: A. Klyavinya.

PURPOSE: This book is intended for physicists working in the field of magnetohydrodynamics and plasma dynamics.

COVERAGE: This volume contains the transactions of a conference held in Riga, June 1958, on problems in applied and theoretical magnetohydrodynamics. The objects of the conference were the investigation of the basic trends in theoretical and applied magnetohydrodynamics, establishing contact between the people doing research in different branches of magnetohydrodynamics, and promoting the participation of theoretical physicists in problems in applied magnetohydrodynamics. More than 160 persons from different parts of the Soviet Union took part in the conference, and 55 papers were read. Similar conferences are to be held regularly in the future; the next such conference is scheduled to be held in Riga in June 1960. In this present collection of the transactions of the conference, most of the papers and comments on papers are presented by the authors themselves in an abridged form. The book is divided into two parts: the first part deals with problems in theoretical magnetohydrodynamics and plasma dynamics, and consists of 35 articles on such aspects of the problem as the application of magnetohydrodynamics in astrophysics (D.A. Frank-Kamenetskiy), magnetohydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman), acceleration of plasma in a magnetic field (G.V. Gordeyev and A.I. Ostanov), stability of shock waves and magnetohydrodynamics (A.I. Akhiyezer). The second part, consisting of 33 articles, deals with problems of experimental magnetohydrodynamics, including the application of physical simulation for investigation of electromagnetic processes in liquid metals (I.M. Kirko) and the development of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the Academy of Sciences, Latvian SSR. Several articles are devoted to induction pumps, electromagnetic crucibles, electromagnetic stirrers for molten metals, and their application in the metallurgical industry including schematic diagrams of their power-supply systems. References are given at the end of most of the articles.

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AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M. SOV/20-124-2-15/71

TITLE: A Closed Convective Boundary Layer (Zamknutyy konvektivnyy pogranichnyy sloy)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 2, pp 296-300 (USSR)

ABSTRACT: The present paper solves the problem of the closed convective boundary layer in a horizontal circular cylinder. The surface of the cylinder with a radius R is kept at the temperature $T_0 = \Theta \sin x$, where x denotes the coordinate along the circle and Θ a time-constant amplitude. The temperature assumed to be homogeneous in the core is considered to be the temperature of reference. The core is assumed to rotate as a solid at the rate $v_\varphi = \omega r$, where the angular velocity ω is required. The boundary layer equations (in disregard of the curvature of the layer and with introduction of dimensionless variables) are:

$$v_x \frac{\partial v_x}{\partial x} + v_y \frac{\partial v_x}{\partial y} = \frac{\partial^2 v_x}{\partial y^2} + G \sin x\, T$$

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$$v_x \frac{\partial T}{\partial x} = v_y \frac{\partial T}{\partial y} = \frac{1}{Pr} \frac{\partial^2 T}{\partial y^2} ; \quad \frac{\partial v_x}{\partial x} + \frac{\partial v_y}{\partial y} = 0 .$$

Here $G = g \beta \Theta R^3/\nu^2$ denotes the Grasskhof number and $Pr = \nu/\chi$ the Prandtl number. The velocity layer and the temperature layer are assumed to have the same thickness $\delta(\delta \ll 1)$. The temperature and the velocity on the surface of the cylinder and on the boundary layer against the core are assumed to satisfy the usual boundary conditions, besides which there is a number of additional conditions. Besides, temperature and velocity must, as function of x, satisfy the condition of cyclisity. The approximated solution of the above equations is set up in the form

$v_x = \bar{\omega}(P_1 + P_2 \cos 2x + \beta P_3 \sin 2x)$, $T = Q_1 \sin x + \alpha Q_2 \cos x$.

The functions written down above have the necessary periodicity with respect to x. The coefficients P and Q can be selected as polynomials of y in such a manner that they satisfy the above conditions. The polynomials are also explicitly written down.

The authors do not give the entire calculations but only the final formulas: $\omega = 0.629(\nu/R^2)(G/Pr)^{1/2}$; $\delta = 4.34\,R(G\,Pr)^{-1/4}$; $\alpha = -2.69$; $\beta = -(4.03 + 1.55/Pr)$. By means of the formulas derived it is possible to calculate the density of the heat flow on any point of the surface. Finally, a formula is given for the total heat current passing through the cross section. The condition for the existence of the investigated convective motion is $G\,Pr \gg 350$. At low values of the Rayleigh (Reley)- parameter $G\,Pr$ there is a weak convection without the formation of a boundary layer. There are 1 figure and 4 references, 1 of which is Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Perm' State University imeni A. M. Gor'kiy)
Permskiy pedagogicheskiy institut (Perm' Pedagogical Institute)

PRESENTED: September 20, 1958, by M. A. Leontovich, Academician

SUBMITTED: September 19, 1958

Card 3/3

GERSHUNI, G. Z., ZHUKHOVITSKIY, E. M. (Perm)

"On the Motion of an Electrically Conducting Fluid Surrounding a Rotating Sphere in the Presence of a Magnetic Field."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

88010

S/170/60/003/012/007/015
B019/B056

11.9200

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 12, pp. 63-67

TEXT: It is assumed that in the rectangular gap investigated in the present paper, the temperatures of its vertical walls are constant and amount to $-\theta$ and $+\theta$. In the horizontal cross sections the temperature changes from $-\theta$ to $+\theta$. First, the flow function is derived, the boundary layer being assumed to be considerably thinner than the thickness d and the height h of the gap. Next, the motion in the boundary layer is investigated. A system of equations for the velocity and the temperature of a liquid in the gap is given and approximate solutions are obtained. As a condition for the applicability of the approximate solutions obtained here, $GrPr \gg 50\ell^{3/2}$, where Gr is the Grasshoff number, Pr the Prandtl

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Heat Transfer Through a Vertical Gap With Rectangular Cross Section in the Case of Strong Convection

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number, and $\ell = h/d \gg 1$. Finally, a formula for the heat transfer through the gap is obtained. System of equations for velocity and temperature of the liquid:

$$v_x \partial v_x/\partial x + v_y \partial v_x/\partial_y = UdU/dx + \partial^2 v_x/\partial y^2 - Gr\gamma(x)T \qquad (5)$$

$$v_x \partial T/\partial x + v_y \partial T/\partial y = (1/Pr)\partial^2 T/\partial y^2 \qquad (6)$$

$$\partial v_x/\partial x + \partial v_y/\partial y = 0 \qquad (7)$$

The approximate solutions are:

$$v_x = p_0(z) + p_1(z)U(x) + p_2(z)\cos\frac{2\pi x}{l+1} \qquad (8)$$

$$T = q_1(z)T_0(x) + q_2(z)\cos\pi x/(l+1) \qquad (9)$$

$\gamma(x)$ is a function, which for the upper and the lower wall of the gap is 0, for the lateral walls -1 or +1. $z = y/\delta$, where δ is the thickness of the boundary layer, the coefficients p_i and q_i must be taken as polynomials corresponding to the boundary conditions. For the heat transfer through

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the gap the relation

$$Q = -\kappa\int_a^b (\partial T/\partial y)_0 dx = 0.730\kappa(GrPr)^{1/4} l^{9/8}$$

was obtained. There are 1 figure and 4 references: 3 Soviet.

ASSOCIATION: Gosudarstvennyy universitet, Gosudarstvennyy pedagogicheskiy institut, g. Perm' (State University, State Pedagogical Institute, Perm')

SUBMITTED: May 27, 1960

Card 3/3

S/057/60/030/008/007/019
B019/B060

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: The Flow of a Conductive Liquid Around a Sphere in a Strong Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 8, pp. 925 - 926

TEXT: The authors consider the flow around a sphere of a conductive liquid with a low Reynolds number in a magnetic field. The field direction is assumed to lie in the direction of flow. They proceed from the steady-state equations (2) and (3) in nondimensional quantities, and obtain solutions (4) which, for weak magnetic fields, correspond to the results obtained by Chester (Ref. 1). The calculation of the coefficients is dealt with, and it is finally stated that with large field strengths resisting power grows proportionally with the field. There are 4 references: 3 Soviet and 1 American.

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The Flow of a Conductive Liquid Around a Sphere in a Strong Magnetic Field S/057/60/030/008/007/019 B019/B060

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University). Permskiy pedagogicheskiy institut (Perm' Pedagogical Institute)

SUBMITTED: February 22, 1960

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S/057/60/030/009/011/021
B019/B054

26.1410

AUTHORS: Gershuni, G. Z. and Zhukhovitskiy, Ye. M.

TITLE: Rotation of a Sphere in a Viscous Conducting Liquid in a Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1067-1073

TEXT: The authors study the motion of a viscous incompressible conducting liquid around a steadily rotating sphere in the presence of a magnetic field in the direction of the rotational axis. They assume the case of slow rotation in which the inertial forces can be neglected as compared with the viscous forces, i.e., they assume a low Reynolds number. The magnetic Reynolds number is also assumed to be low. The authors obtain expressions for the distribution of the velocity and the induced field, as well as formulas for the braking moment. In the case of weak fields, the braking moment increases proportionally to the square field strength. In the case of high field strengths, the dependence is linear. The problem arising with slow rotation of the sphere in a conducting liquid in a

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Rotation of a Sphere in a Viscous Conducting Liquid in a Magnetic Field

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B019/B054

longitudinal magnetic field was solved in successive approximation by Yu. K. Krumin' (Ref. 1). He found a solution of this problem for weak fields in which the velocity distribution differs only slightly from that without a field. In the present paper, the authors obtain a general solution which also holds for strong fields. In this connection, the authors set up, in the first part, a linearized equation of motion of a viscous incompressible conducting liquid in dimensionless parameters. They obtain solutions for the velocity of the medium and the field strengths with the aid of Legendre polynomials and Bessel functions after a projection of the said equation of motion on the Z-axis which coincides with the rotational axis and the magnetic field direction. These general solutions are discussed for weak and strong fields. There are 3 Soviet references. √B

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University), Permskiy gosudarstvennyy pedagogicheskiy institut (Perm' State Pedagogical Institute)

SUBMITTED: March 25, 1960

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83185

S/056/60/039/002/022/044
B006/B056

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AUTHOR: Gershuni, G. Z.

TITLE: A Mechanism of Ultrasonic Absorption in Paramagnetic Metals Placed in a Magnetic Field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 2(8), pp. 362-363

TEXT: In a medium that is located in an external magnetic field and whose susceptibility is temperature-dependent, temperature- as well as magnetization oscillations occur at every point of the medium during the passage of longitudinal sound waves. If the medium is conductive, currents are, besides, induced, which entail additional sound absorption. The author estimates the absorption of a plane wave in an isotropic medium, which is due to this effect. If $\vec{H} \parallel \vec{k}$ ($\vec{k}$ - sound wave vector), no current is induced. If $\vec{H} \perp \vec{k}$, the greatest effect is produced. In this case, a transverse current wave occurs, which propagates at sonic velocity, and which is polarized perpendicular to $\vec{H}$ and $\vec{k}$. Its amplitude is given by equation (1). The dissipation and the absorption coefficient are calculated from

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this relation. It is found that, if $\lambda/\delta \gg 1$ (δ - skin depth), i.e., if frequency is low, the absorption coefficient grows proportional to the square of the frequency. At high frequencies ($\lambda/\delta \ll 1$, practically at $\omega \sim 10^8 \text{sec}^{-1}$), a limit γ_m is attained, which is given by formula (2). Field- and frequency dependence of the absorption coefficient are the same as in a conducting medium moving in a sound wave within a magnetic field (Ref. 2). The ratio between the absorption coefficient given by (2) and the coefficient of absorption due to Foucault currents equals $(aT/\mu)^2(\partial\mu/\partial T)^2$ (μ - magnetic permeability). This ratio is nearly always small; only paramagnetic rare earths have a comparatively large $\partial\mu/\partial T$ near ferro- and antiferromagnetic transition points, and the effect due to Foucault currents may become considerable as, e.g., in dysprosium at 180°K, where $\partial\mu/\partial T \approx 0.01$ deg^{-1}. The parameter a is not experimentally known for rare earths, the data for "tabulated" metals (some of them are given) are of the order of unity. With $a \sim 1$, $(aT/\mu)^2(\partial\mu/\partial T)^2 \approx 3$. With $\sigma \sim 10^{16}$ sec^{-1} $v \approx 3 \cdot 10^5$ cm/sec, $\rho = 8.6$ g/cm^3

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A Mechanism of Ultrasonic Absorption in Paramagnetic Metals Placed in a Magnetic Field

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and $H \sim 10^4$ oe, $\gamma_m \sim 10^{-3}$ cm^{-1}. Relaxation effects were not taken into account in this estimate. S. A. Al'tshuler is mentioned. There are 4 references: 1 Soviet and 3 US.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: February 19, 1960

X

Card 3/3

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Conductive fluid flowing around a sphere in a strong magnetic field. Zhur.tekh.fiz. 30 no.8:925-926 Ag '60. (MIRA 13:8)

1. Permskiy gosudarstvennyy universitet i Permskiy pedagogicheskiy institut.
(Fluid dynamics) (Magnetic fields)

GERSHUNI, G.Z.; ZHUKHOVITSKIY, Ye.M.

Heat transfer through a vertical slit with a rectangular cross section in the case of strong convection. Inzh.-fiz. zhur. no.12:63-67 D '60. (MIRA 14:3)

1. Gosudarstvennyy universitet i Gosudarstvennyy pedagogicheskiy institut.

(Heat—Convection)

37...

24671+ S/056/62/042/004/033/037
B125/B102

AUTHORS: Gershuni, G. Z., Zhukhovitskiy, Ye. M.

TITLE: Convective instability spectrum of a conducting medium in a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 1122-1125

TEXT: The conditions for oscillatory convective instability of a conducting medium in a magnetic field are determined. A vertical plane layer of a conducting medium is heated from below in a magnetic field. The equilibrium is disturbed so that the velocity $\vec{v}$ and the perturbation of the field $\vec{H}$ are vertical. The temperature perturbation is $T = T(x,t)$, where x is the coordinate taken from the center of the layer in a transverse direction. The pressure gradient is zero, and all quantities depend on the time t as $e^{\lambda t}$. Then, the equations derived from the ordinary equations of magnetohydrodynamics -

$$\lambda v = v'' + RT + M^2 H',$$
$$\lambda PT = v + T'', \quad \lambda P_m H = v' + H'' \qquad (1),$$

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APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

Convective instability spectrum ... S/056/62/042/004/033/037
B125/B102

(R = Rayleigh number, M = Hartmann number, P = Prandtl number, $P_m = 4\pi\sigma\nu/c^2$), have the solution $v = v_0 \sin\pi x$, $T = T_0 \sin\pi x$, $H = H_0 \cos\pi x$ (2), if v = 0, T = 0 holds for the ideally conducting boundaries $x = \pm 1$ of the layer. The equations for the eigenvalues λ of the perturbations (2) give the equations $R_1 = \pi^4 + \pi^2 M^2$ (7),

$$R_2 = \pi^4 \frac{(P + P_m)(1 + P_m)}{P_m^2} + \pi^2 \frac{1 + P_m}{1 + P} \frac{P^2}{P_m^2} M^2, \qquad (8), \text{ and}$$

$$b^2 = \pi^4 \frac{P}{P_m}\left(\frac{M^2}{\pi^4} \frac{P_m - P}{1 + P} - 1\right). \qquad (9)$$

for the branches of the stability curves for monotonic and oscillatory perturbations. (7) and (8) are straight lines in the plane (R, M^2). As V. S. Sorokin pointed out that oscillatory instability occurs with certain properties of the medium ($4\pi\sigma\chi/c^2 > 1$) and sufficiently strong fields ($M > \bar{M}$). The critical field strength $\bar{M}^2 = \pi^2(1 + P)(P_m - P)$ follows from the condition $R_1 = R_2$. This condition is evidently fulfilled for cavities of any shape. The necessary condition for the existence of an oscillatory

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instability reads

$$P_m/P > \int |T|^2 dV \int |\mathrm{rot}\, \mathbf{H}|^2 dV \Big/ \int |\mathbf{H}|^2 dV \int |\nabla T|^2 dV \quad (14),$$

the right-hand side being of the order of 1. There is 1 figure. The English-language reference reads as follows: S. Chandrasekhar. Phil. Mag., 43, 501, 1952.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm State University) Permskiy gosudarstvennyy pedagogicheskiy institut (Perm State Pedagogical Institute)

SUBMITTED: November 22, 1961

S/040/63/027/002/008/019
D251/D308

AUTHORS: Gershuni, G. Z. and Zhukovitskiy, Ye. M. (Perm')

TITLE: On the convective instability of a two-component mixture in a gravitational field

PERIODICAL: Prikladnaya matematika i mekhanika, v. 27, no. 2, 1963, 301-308

TEXT: The authors investigate the problem stated, which so far has been largely ignored by theoretical and practical research workers. The problem of the stability of the convection of a two-dimensional vertical layer of the mixture heated from below is solved exactly on the basis of the convective equations of I. G. Shaposhnikov (PMM, v. 17, no. 5, 1953). The possibility of a state of equilibrium is demonstrated, and it is shown that, for equilibrium, the density gradient will be constant and vertical. In contra-distinction from the case of a pure medium, investigated by V. S. Sorokin (PMM, v. 17, no. 1, 1953) there are two possible types of disturbance of the equilibrium position which may arise -

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On the convective ...

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D251/D308

i.e. monotonic and oscillatory disturbances. Equations are deduced, in terms of the ordinary and diffusional Rayleigh numbers, for the 'neutral' line and the 'neutral' oscillation respectively, (i.e. the line or oscillation which separates those disturbances which are damped from those which increase monotonically in the second case). It has so far been assumed that the equilibrium gradients of temperature and concentration are independent. In conclusion, the authors investigate the stability of equilibrium when these gradients are connected by some law. It is shown that for normal thermodiffusion only unstable relatively monotonic disturbances are possible, while for anomalous thermodiffusion oscillatory instability is possible, and also monotonic instability with heating from above. There are 3 figures.

SUBMITTED: November 28, 1962

Card 2/2

ACCESSION NR: AP4015965 S/0040/63/027/005/0779/0783

AUTHORS: Gershuni, G. Z. (Perm'); Zhukhovitskiy, Ye. M. (Perm')

TITLE: Parametric excitation of convective instability

SOURCE: Prikl. matem. i mekhan., v. 27, no. 5, 1963, 779-783

TOPIC TAGS: parametric excitation, convective instability, temperature gradient, nonstationary equilibrium, auto oscillation, parametric resonance, heat equation, skin effect

ABSTRACT: Convective stability of a fluid in a gravity field is generally studied under the assumption that the equilibrium temperature gradient does not depend on time. Nonstationary equilibrium of fluid is also possible, where the equilibrium temperature changes with time by a law determined by nonstationary heating conditions. Apparently, stability of such nonstationary equilibrium has not yet been studied. The authors are interested particularly in the case where the equilibrium temperature gradient changes periodically with time. The fluid is represented as an auto-oscillating system with periodically changing parameter. Under such conditions, interesting phenomena of the parametric resonance type are to be expected. The authors investigate stability of equilibrium of a plane horizontal fluid layer

ACCESSION NR: AP4015965

with periodically changing temperature gradient. Their solution shows clearly the characteristic peculiarities of the problem. Orig. art. has: 5 figures and 26 formulas.

ASSOCIATION: none

SUBMITTED: 27May63 DATE ACQ: 21Nov63 ENCL: 00

SUB CODE: AI NO REF SOV: 003 OTHER: 003

Card 2/2

[illegible], [illegible]; [illegible], Ya.M.; [illegible], [illegible]

Electronic structure of the [illegible] molecule. Zhur. strukt. khim. [illegible] no.4:[illegible] Ag '64. (MIRA [illegible])

1. Permskiy gosudarstvennyy universitet i Permskiy gosudarstvennyy pedagogicheskiy institut.

ENCL: 00

OTHER: 002

Card 2/2

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

GERSHUNI, G.Z. (Perm'); ZHUKHOVITSKIY, Ye.M. (Perm')

Parametric instability of the revolution of a fluid as a rigid body. Prikl. mat. i mekh. 28 no.5:829-834 S-O '64. (MIRA 17:11) [illegible] Pc-1

S/0040/61/029/001/0008/0098

[illegible] Perm; Zhukhovitskiy, Ye. M. (Perm)

[illegible] parallel flows for small

[illegible] V. 29, no. 1, 1961, [illegible]

[illegible], Reynolds number, aerodynamics,

[illegible] dimensional parallel steady-state [illegible] theory of hydrodynamic [illegible] [illegible] and invest[illegible] [illegible] mean increments into series [illegible] Reynolds number R. These series expansions permit [illegible] of the spectrum of perturbations in [illegible] velocity profile. In a fluid

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000514920011-8"

L 41660-65
ACCESSION NR: AP5006257

...vibrations are damped monotonically (i.e. all the decrements ... of the spectrum turns out to be ... and not ... In view ... profile ... Figures, 46 formulas.

SUB CODE: MA, ME

NO REF SOV: 007 OTHER: 006

Card 2/2

ACCESSION NR: AP4013424 S/0057/64/034/002/0336/0339

AUTHOR: Gershuni, G.Z.; Zhukhovitskiy, Ye.M.

TITLE: Rotation of a sphere in a viscous conductive liquid in a magnetic field at large Reynolds numbers

SOURCE: Zhurnal tekhn.fiz.,v.34, no.2, 1964, 336-339

TOPIC TAGS: magnetohydrodynamics, turbulent magnetohydrodynamics, turbulence, boundary layer, magnetohydrodynamic boundary layer

ABSTRACT: The rotation of a non-conducting sphere in a viscous conducting liquid in the presence of a uniform magnetic field parallel to the axis of rotation is discussed. The hydrodynamic Reynolds number is assumed to be large, so that a boundary layer is formed; the magnetic Reynolds number is assumed to be small, so that the induced field is small compared with the applied field. The velocity of the liquid in the boundary layer of uniform thickness d is assumed to be given by

$$v_\varphi = \omega R(1-x)^2 \sin\theta; \quad v_\theta = a\omega R x(1-x)^2 \sin 2\theta$$

where r, θ, φ are the usual spherical coordinates, R is the radius of the sphere, a is a constant to be determined with d, and

Cord 1/2