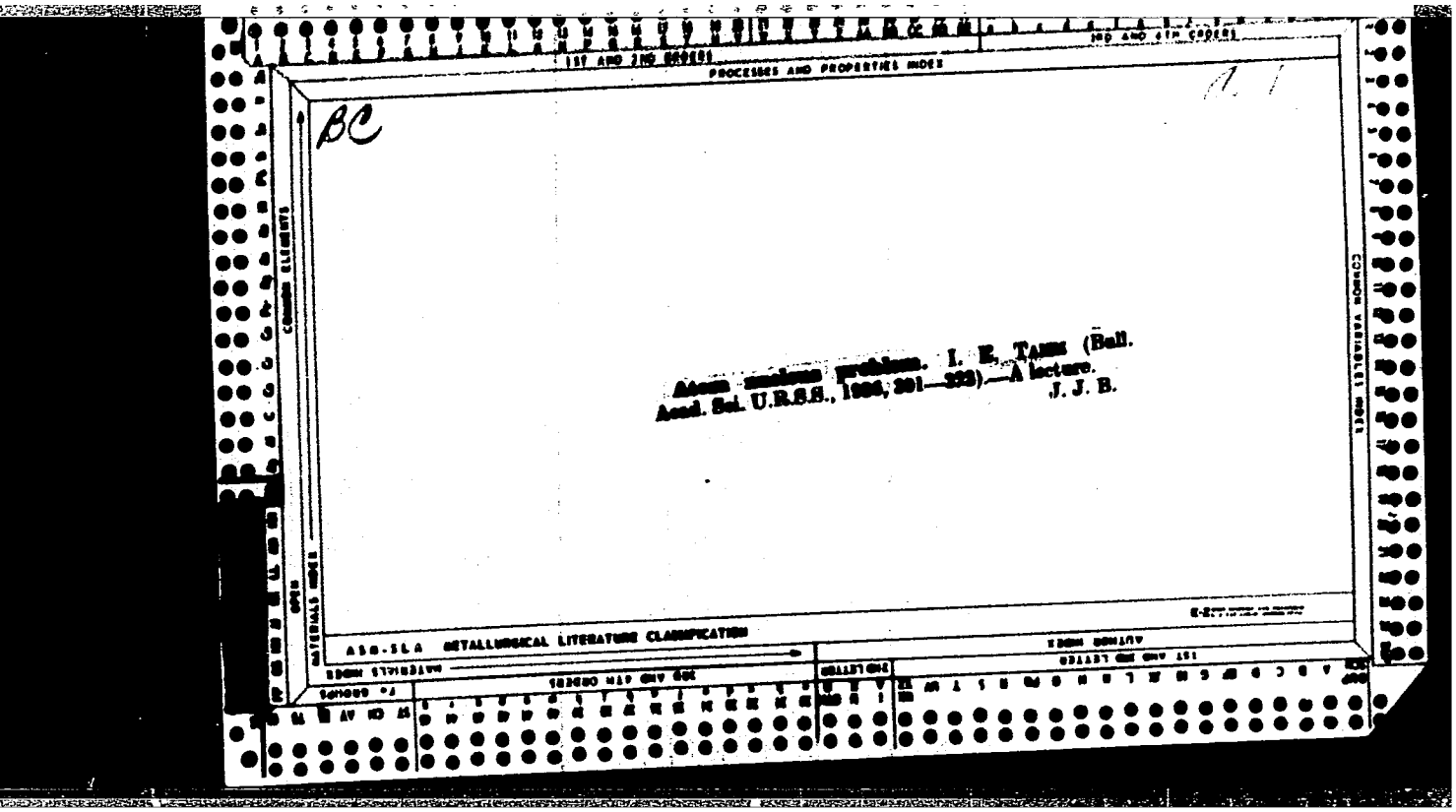
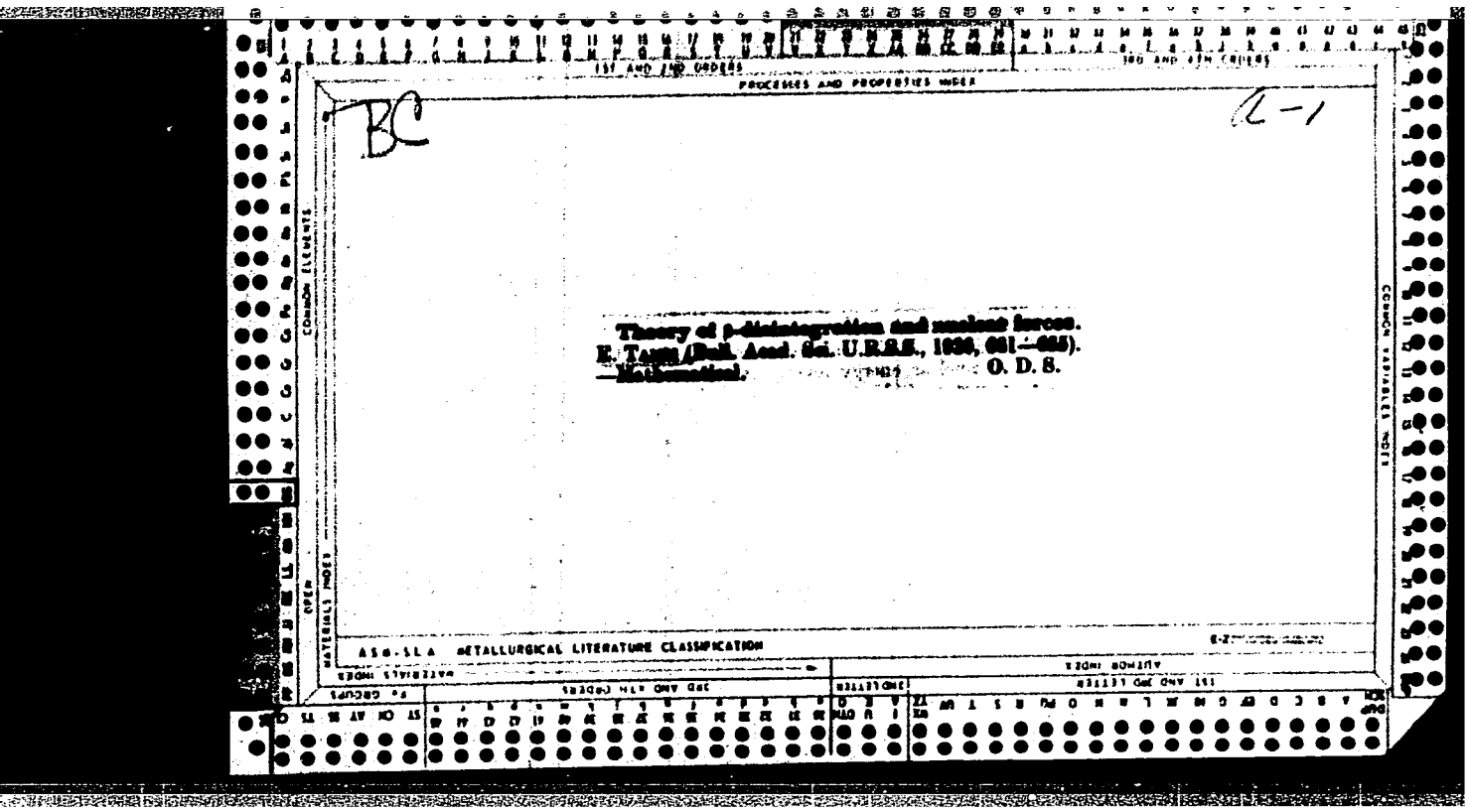
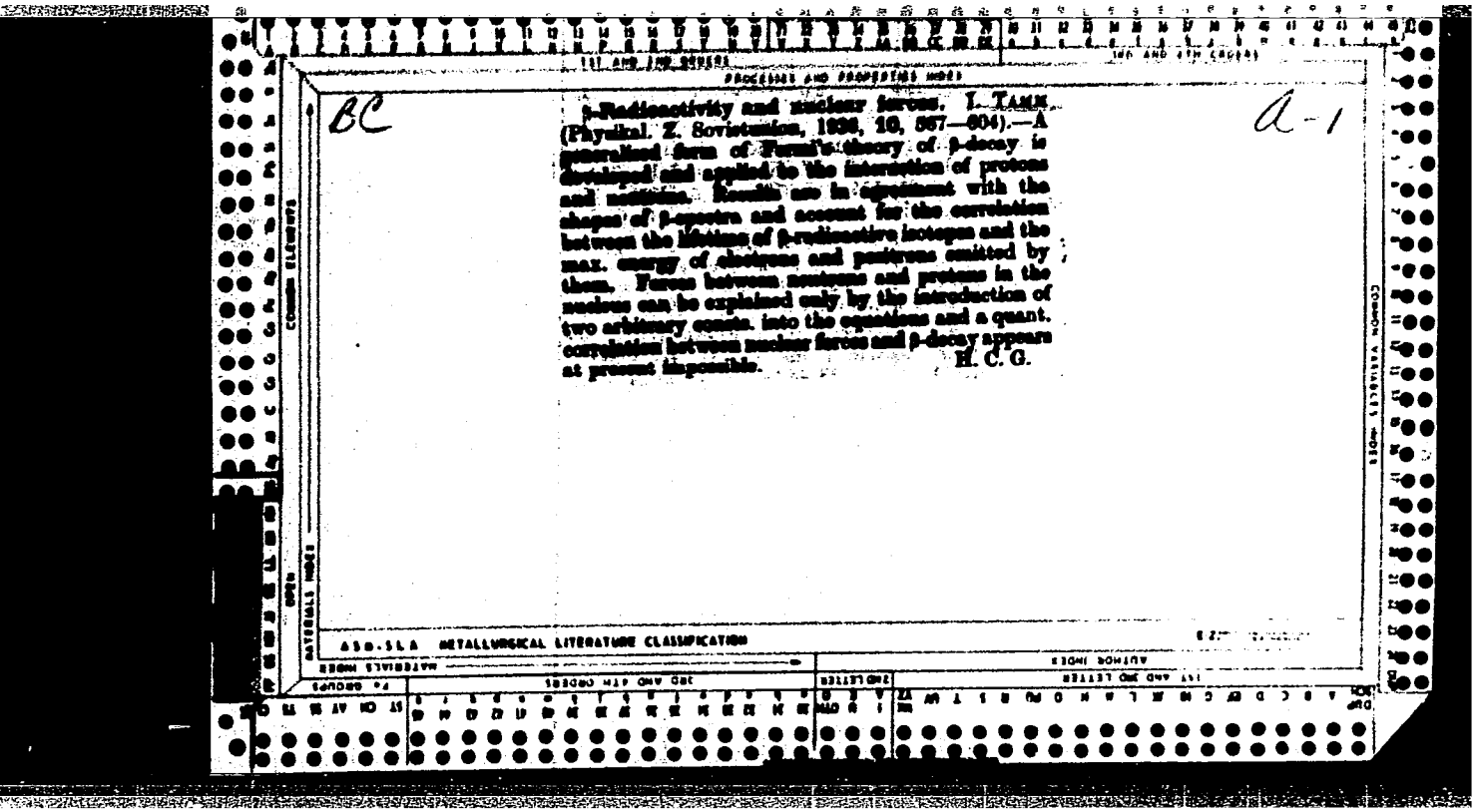


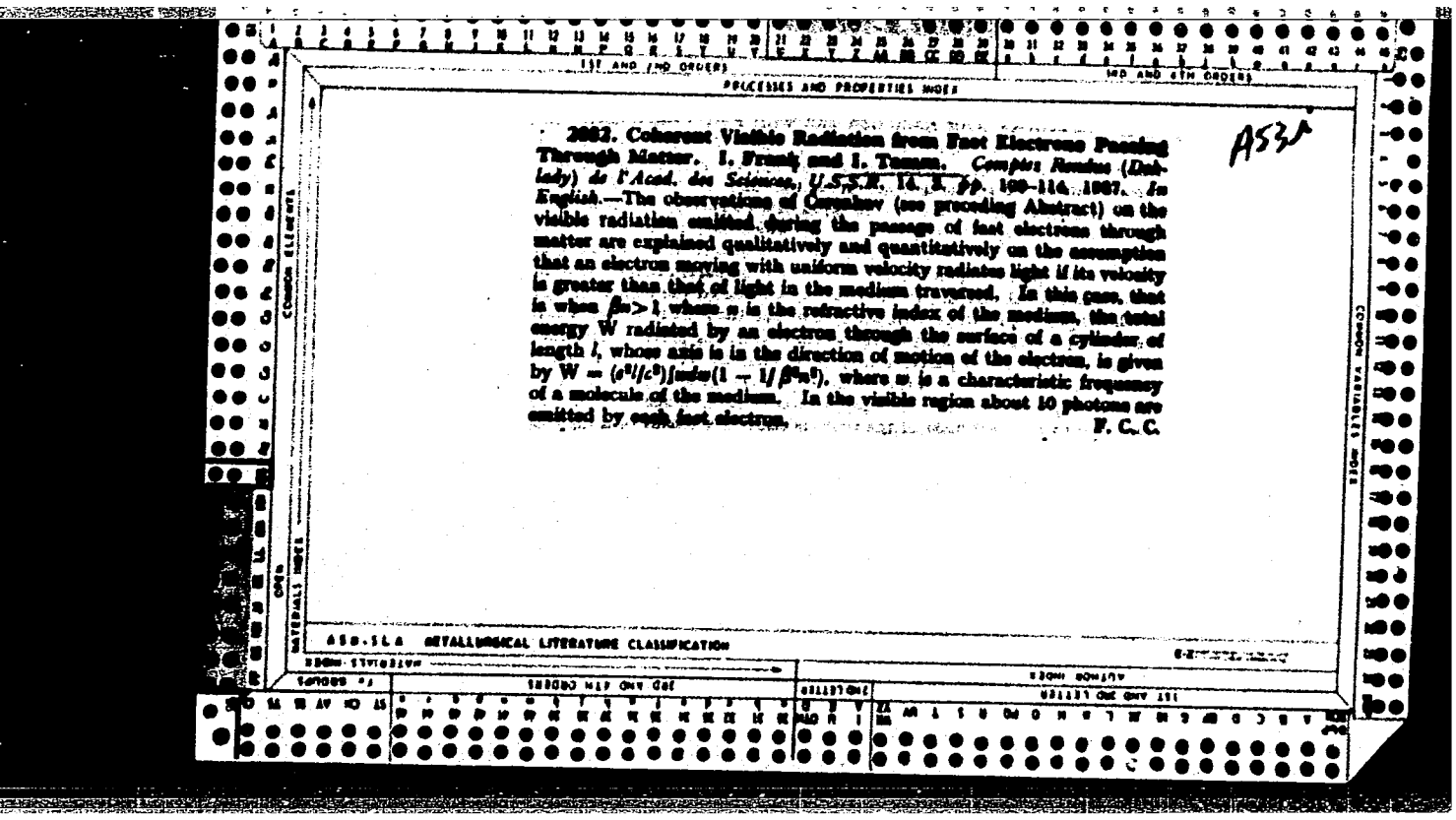




BC

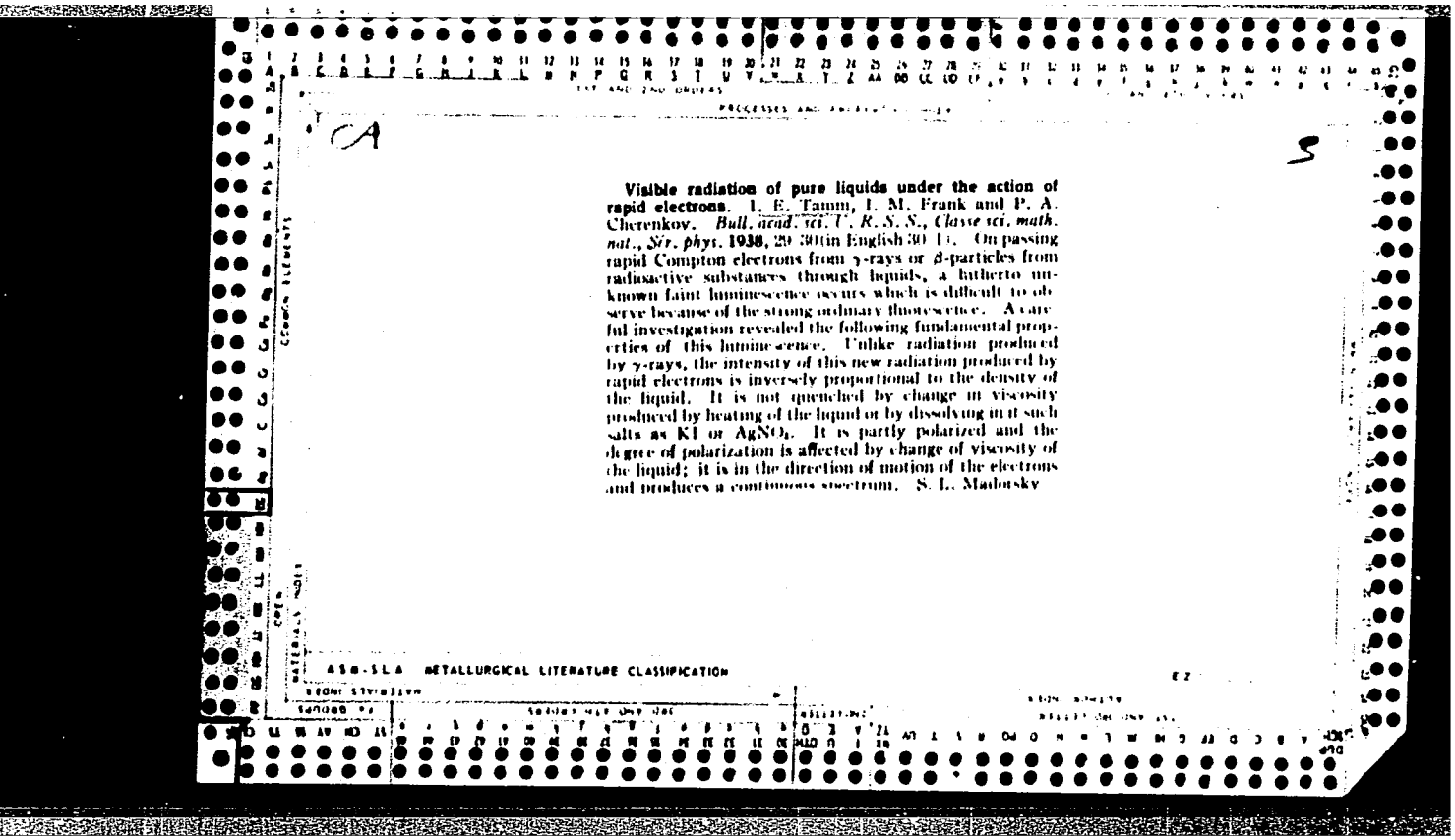
β-Radioactivity and nuclear forces. I. Tamm. (Physikal. Z. Sowjetunion, 1936, 10, 567—604).—A generalised form of Fermi's theory of β-decay is developed and applied to the interaction of protons and neutrons. Results are in agreement with the shapes of β-spectra and account for the correlation between the lifetime of β-radioactive isotopes and the max. energy of electrons and positrons emitted by them. Forces between neutrons and protons in the nucleus can be explained only by the introduction of two arbitrary consts. into the equations and a quant. correlation between nuclear forces and β-decay appears at present impossible. H. C. G.

A



2882. Coherent Visible Radiation from Fast Electrons Passing Through Matter. I. Frank and I. Tamm. *Compte Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 14, 3, pp. 109–114, 1937. *In English.*—The observations of Cerenkov (see preceding Abstract) on the visible radiation emitted during the passage of fast electrons through matter are explained qualitatively and quantitatively on the assumption that an electron moving with uniform velocity radiates light if its velocity is greater than that of light in the medium traversed. In this case, that is when $\beta n > 1$, where n is the refractive index of the medium, the total energy W radiated by an electron through the surface of a cylinder of length l, whose axis is in the direction of motion of the electron, is given by $W = (e^2/c^2)l\omega\nu(1 - 1/\beta^2 n^2)$, where ω is a characteristic frequency of a molecule of the medium. In the visible region about 10 photons are emitted by each fast electron. F. C. C.

A53

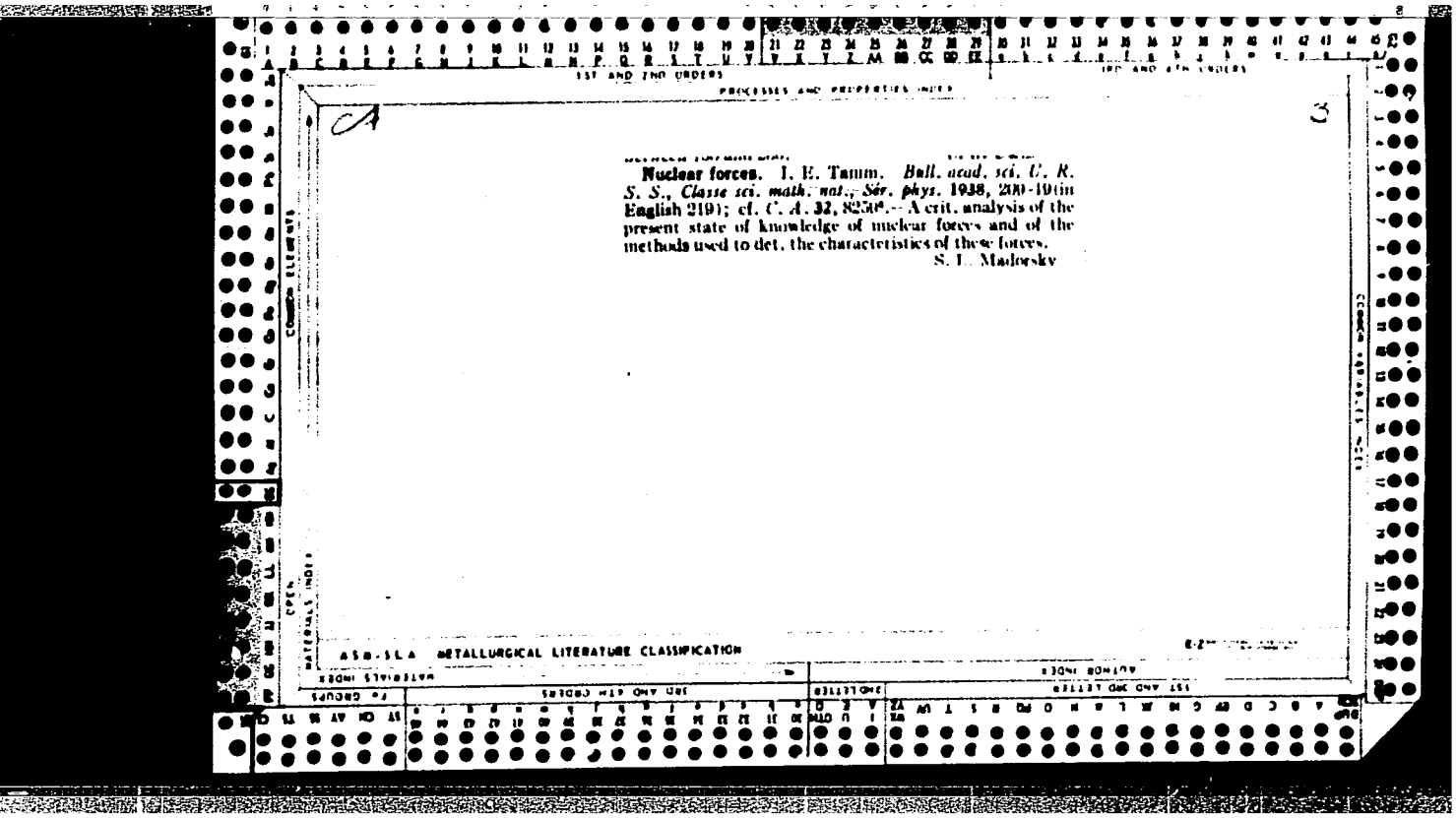


CA

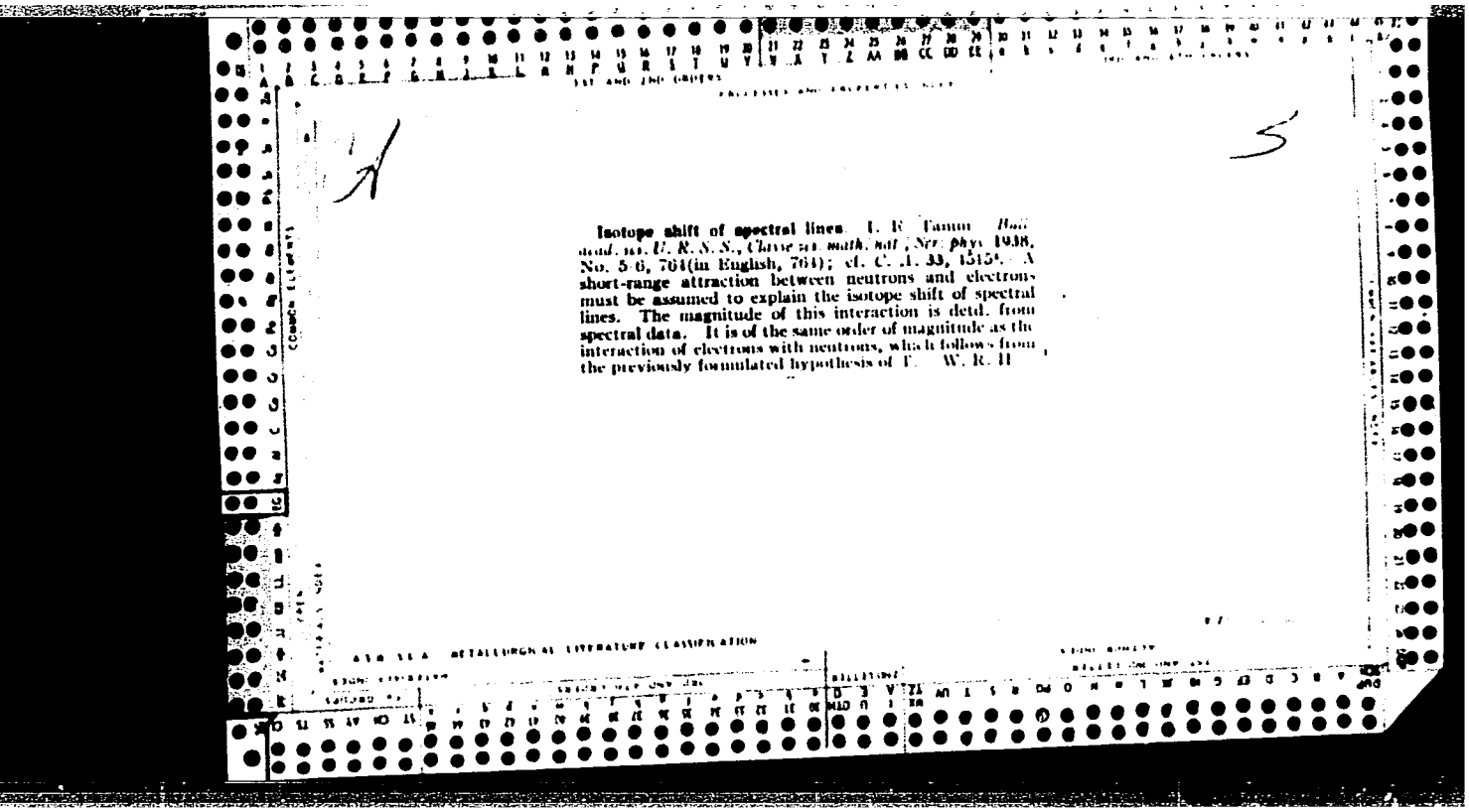
5

Visible radiation of pure liquids under the action of rapid electrons. I. E. Tamm, I. M. Frank and P. A. Cherenkov. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. phys.* **1938**, 29 30(in English 30 1). On passing rapid Compton electrons from γ-rays or β-particles from radioactive substances through liquids, a hitherto unknown faint luminescence occurs which is difficult to observe because of the strong ordinary fluorescence. A careful investigation revealed the following fundamental properties of this luminescence. Unlike radiation produced by γ-rays, the intensity of this new radiation produced by rapid electrons is inversely proportional to the density of the liquid. It is not quenched by change in viscosity produced by heating of the liquid or by dissolving in it such salts as KI or $AgNO_3$. It is partly polarized and the degree of polarization is affected by change of viscosity of the liquid; it is in the direction of motion of the electrons and produces a continuous spectrum. S. L. Madorsky

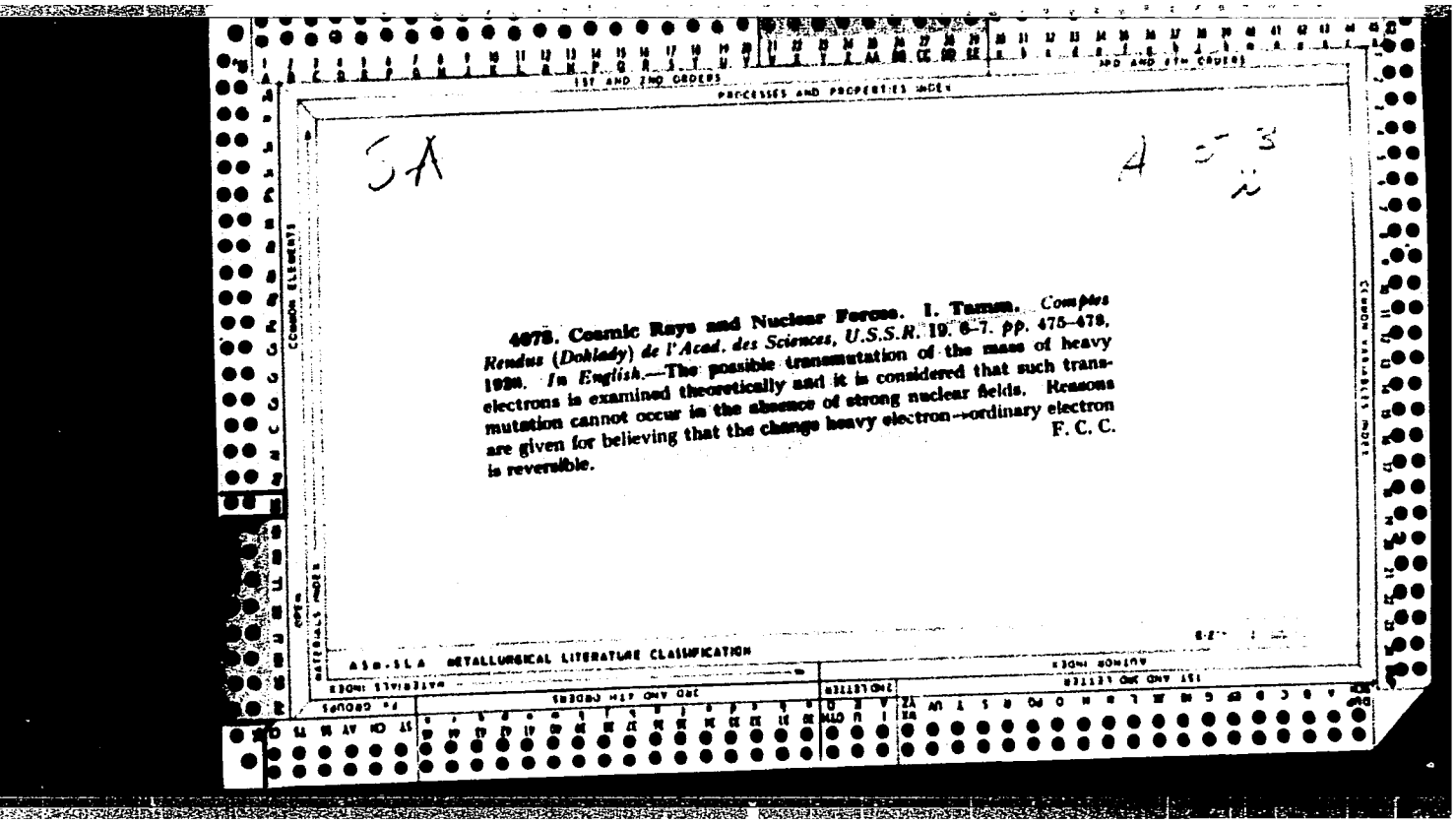
A58-5LA METALLURGICAL LITERATURE CLASSIFICATION



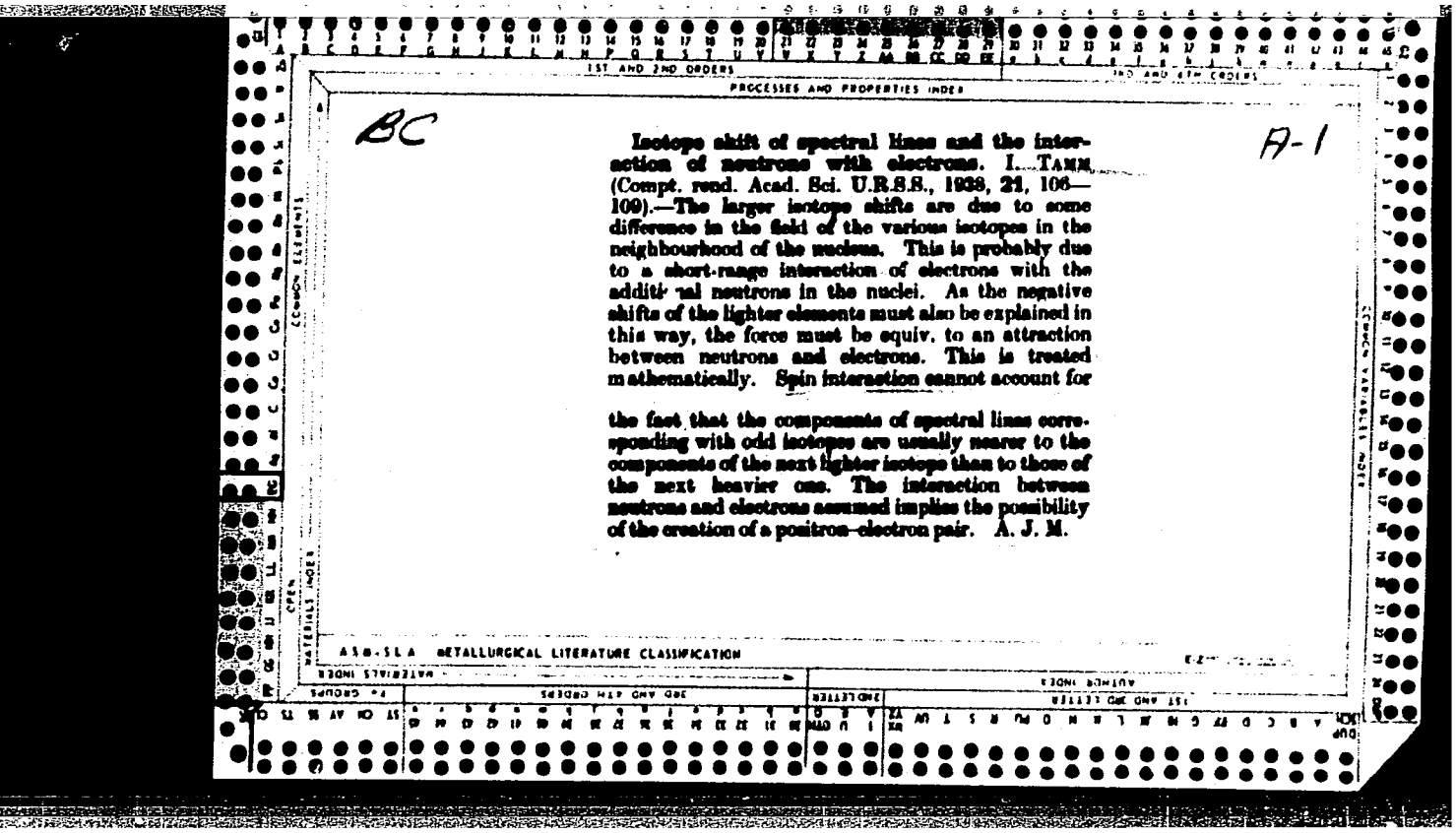
Nuclear forces. I. E. Tamm. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. phys.* **1938**, 209-19(in English 219); cf. *C. A.* **32**, 8250⁸.—A crit. analysis of the present state of knowledge of nuclear forces and of the methods used to det. the characteristics of these forces.
S. L. Madorsky



Isotope shift of spectral lines. I. E. Tamm. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. phys.* 1938, No. 5-6, 764 (in English, 764); cf. C. A. 33, 1515⁹. A short-range attraction between neutrons and electrons must be assumed to explain the isotope shift of spectral lines. The magnitude of this interaction is detd. from spectral data. It is of the same order of magnitude as the interaction of electrons with neutrons, which follows from the previously formulated hypothesis of I. W. R. H.



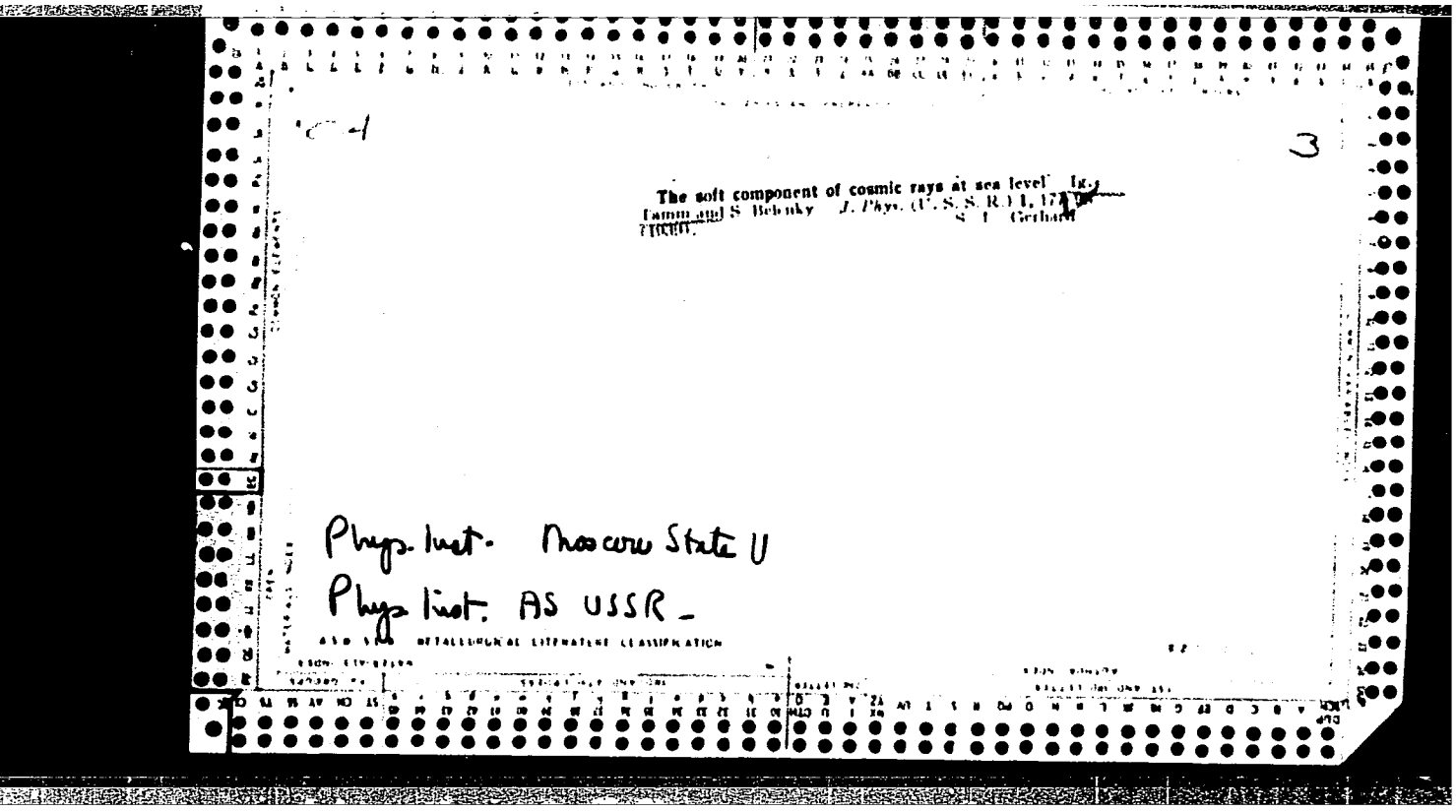
4078. **Cosmic Rays and Nuclear Forces.** I. Tamm. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 19. 6–7. pp. 475–478, 1938. *In English.*—The possible transmutation of the mass of heavy electrons is examined theoretically and it is considered that such transmutation cannot occur in the absence of strong nuclear fields. Reasons are given for believing that the change heavy electron→ordinary electron is reversible. F. C. C.



BC

A-1

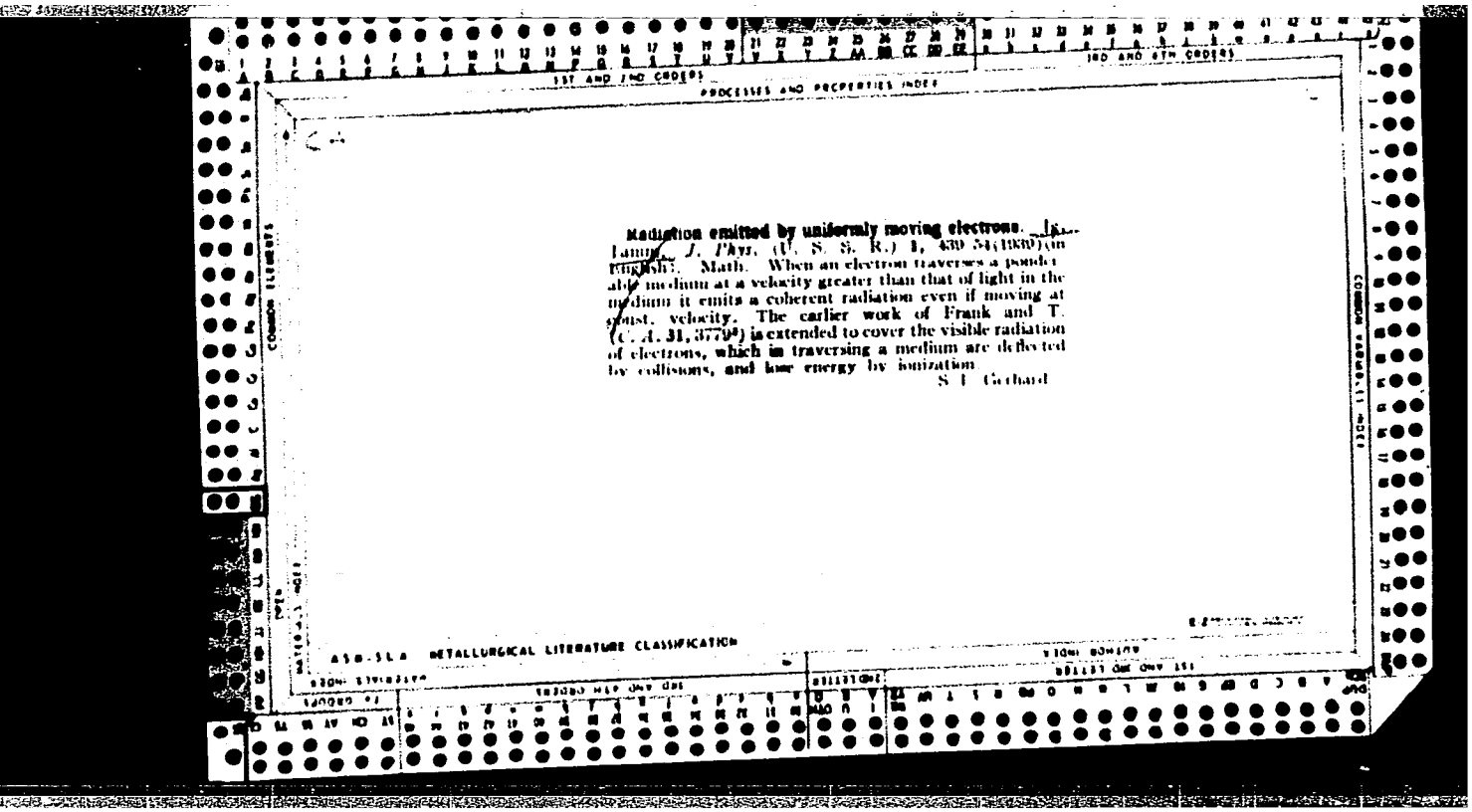
Isotope shift of spectral lines and the interaction of neutrons with electrons. I. TAMM. (Compt. rend. Acad. Sci. U.R.S.S., 1938, 21, 106—109).—The larger isotope shifts are due to some difference in the field of the various isotopes in the neighbourhood of the nucleus. This is probably due to a short-range interaction of electrons with the additional neutrons in the nuclei. As the negative shifts of the lighter elements must also be explained in this way, the force must be equiv. to an attraction between neutrons and electrons. This is treated mathematically. Spin interaction cannot account for the fact that the components of spectral lines corresponding with odd isotopes are usually nearer to the components of the next lighter isotope than to those of the next heavier one. The interaction between neutrons and electrons assumed implies the possibility of the creation of a positron–electron pair. A. J. M.



The soft component of cosmic rays at sea level [illegible]
[illegible] S Belenky J. Phys. (U.S.S.R.) 1, 17[illegible]
[illegible] S I Gerhard

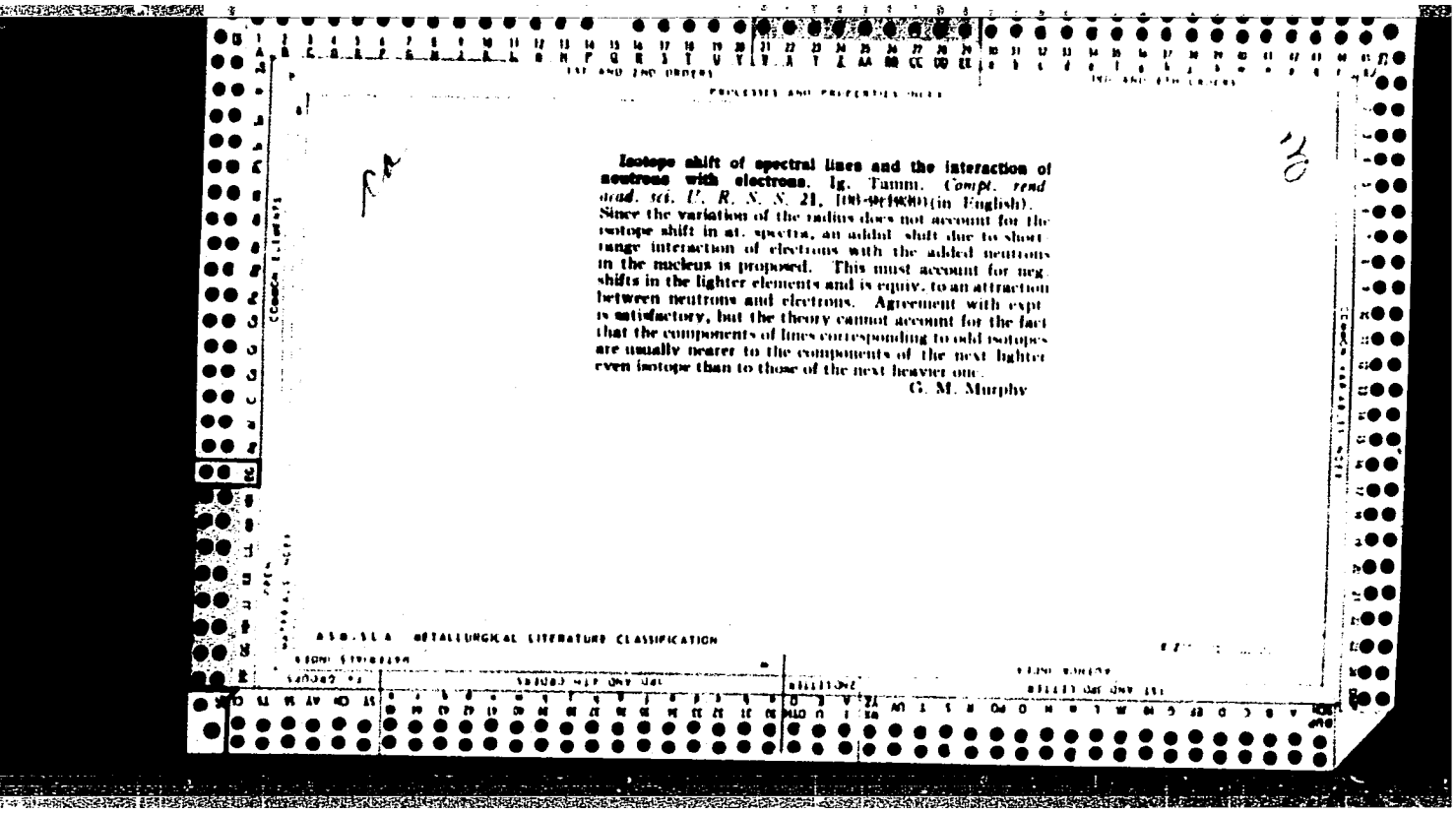
Phys. Inst. Moscow State U

Phys Inst. AS USSR



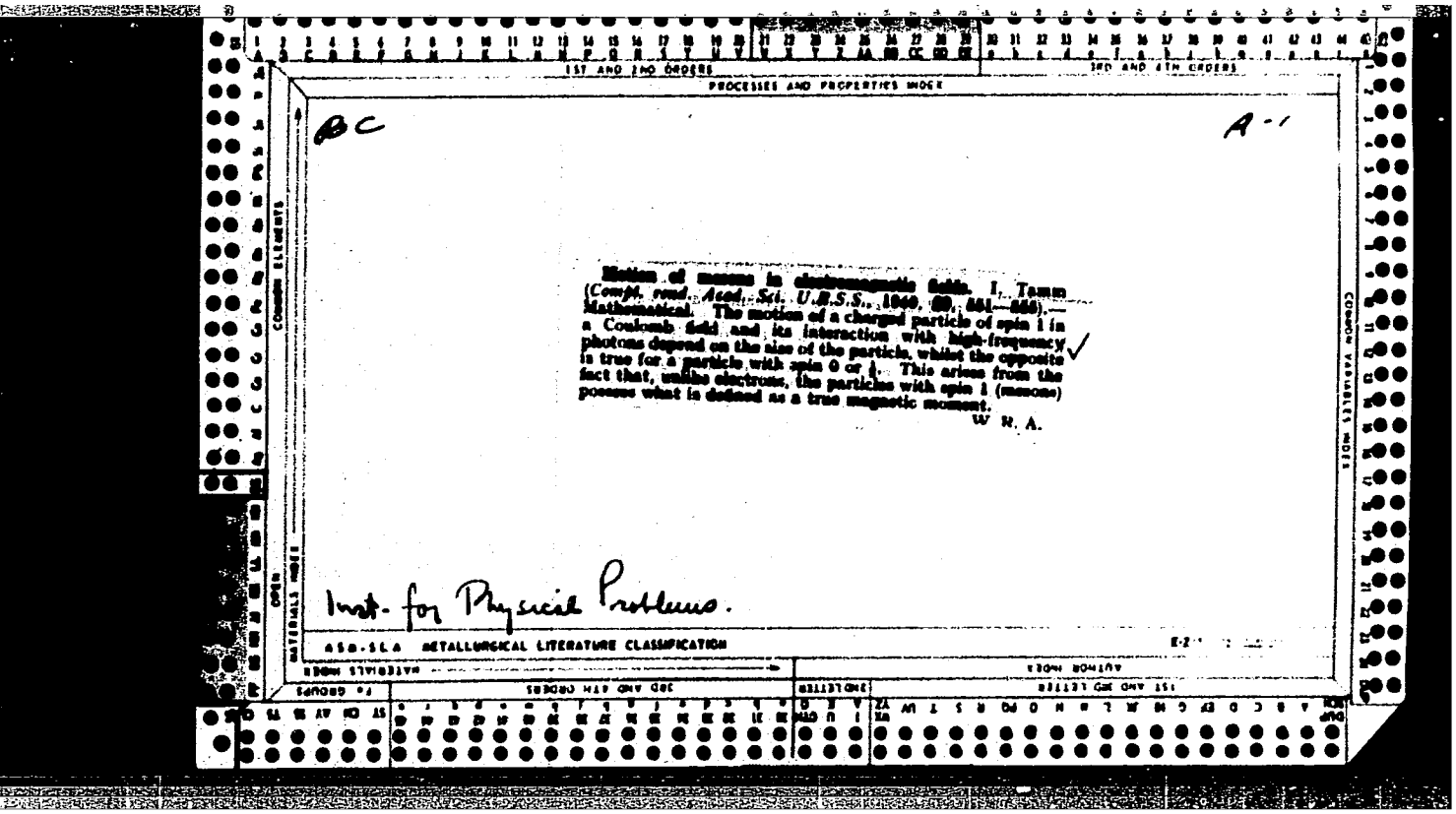
Radiation emitted by uniformly moving electrons. Ia... Tamm, *J. Phys.* (U. S. S. R.) **1**, 439-54(1939)(in English). Math. When an electron traverses a ponderable medium at a velocity greater than that of light in the medium it emits a coherent radiation even if moving at const. velocity. The earlier work of Frank and T. (*C. A.* **31**, 3779[9]) is extended to cover the visible radiation of electrons, which in traversing a medium are deflected by collisions, and lose energy by ionization.

S. I. Gerhard



Isotope shift of spectral lines and the interaction of neutrons with electrons. Ig. Tamm. *Compt. rend acad. sci. U. R. S. S.* 21, [illegible](in English). Since the variation of the radius does not account for the isotope shift in at. spectra, an addnl. shift due to short-range interaction of electrons with the added neutrons in the nucleus is proposed. This must account for neg. shifts in the lighter elements and is equiv. to an attraction between neutrons and electrons. Agreement with expt. is satisfactory, but the theory cannot account for the fact that the components of lines corresponding to odd isotopes are usually nearer to the components of the next lighter even isotope than to those of the next heavier one.

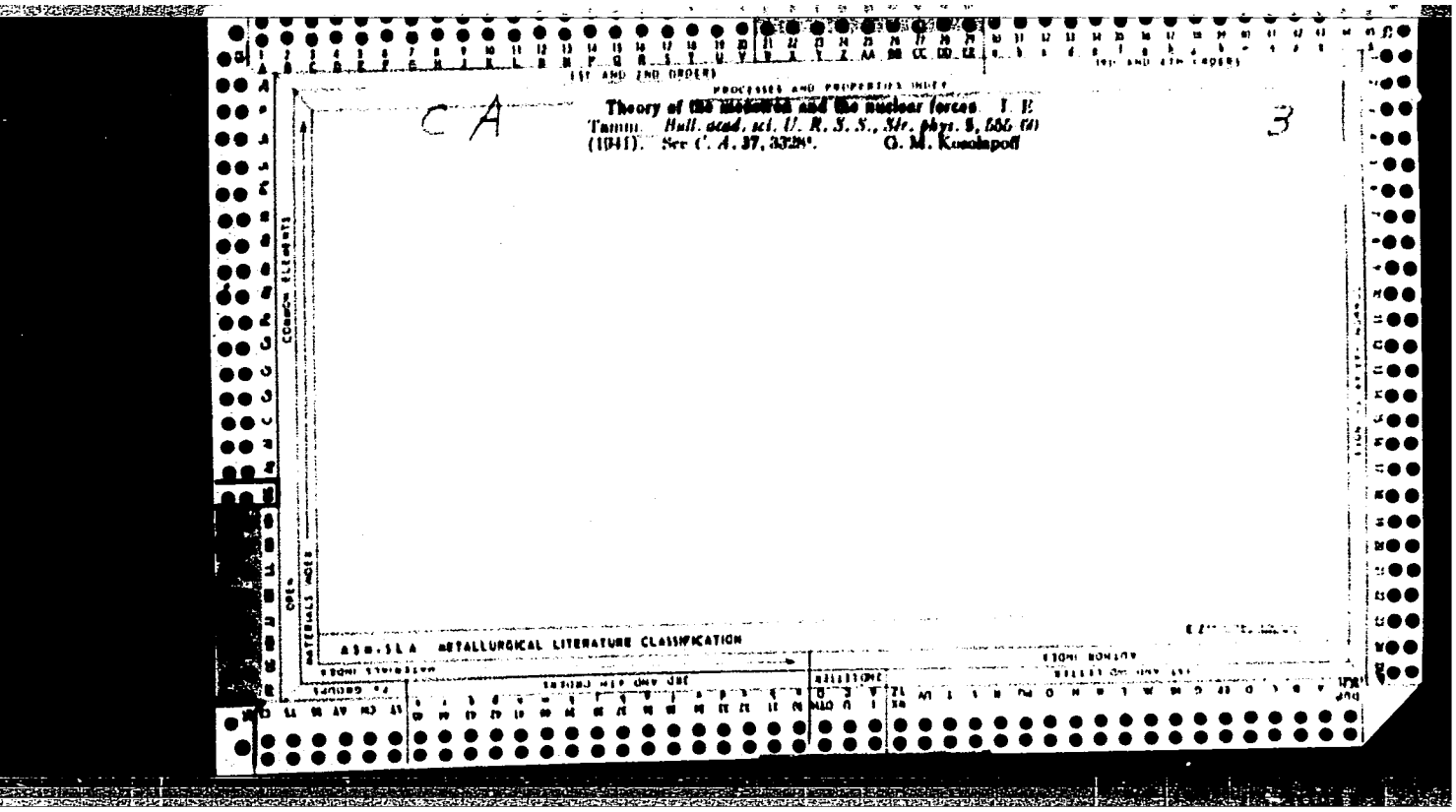
G. M. Murphy



TAMM, I. Ye.

"The Nature of Nuclear Forces (L. D. Landau, co-author).

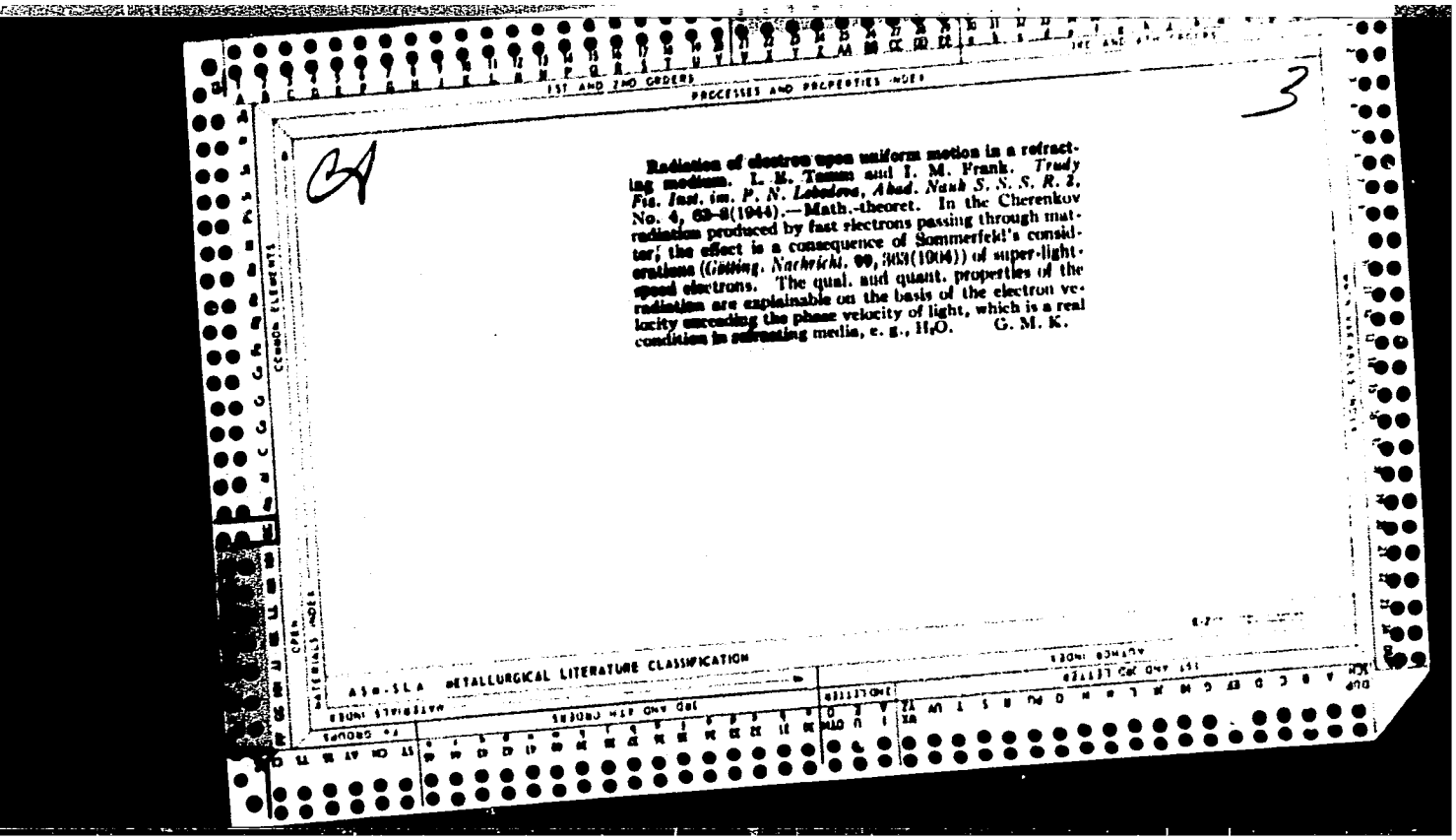
DAN 1940. Vol 29. p.555.



TAMM, I. Ye

"Theory of Electromagnetic Processes in a Striated Core (V. L. Ginzburg- co-author).

Izr. Akad. Nauk. Sev. Fizich. 1943. Vol 7. p 30.



Radiation of electron upon uniform motion in a refracting medium. I. E. Tamm and I. M. Frank. *Trudy Fiz. Inst. im. P. N. Lebedeva, Akad. Nauk S. S. S. R.* 2, No. 4, 63–8(1944).—Math.-theoret. In the Cherenkov radiation produced by fast electrons passing through matter, the effect is a consequence of Sommerfeld's considerations (*Götting. Nachrichi.* 99, 363(1904)) of super-light-speed electrons. The qual. and quant. properties of the radiation are explainable on the basis of the electron velocity exceeding the phase velocity of light, which is a real condition in refracting media, e. g., H_2O. G. M. K.

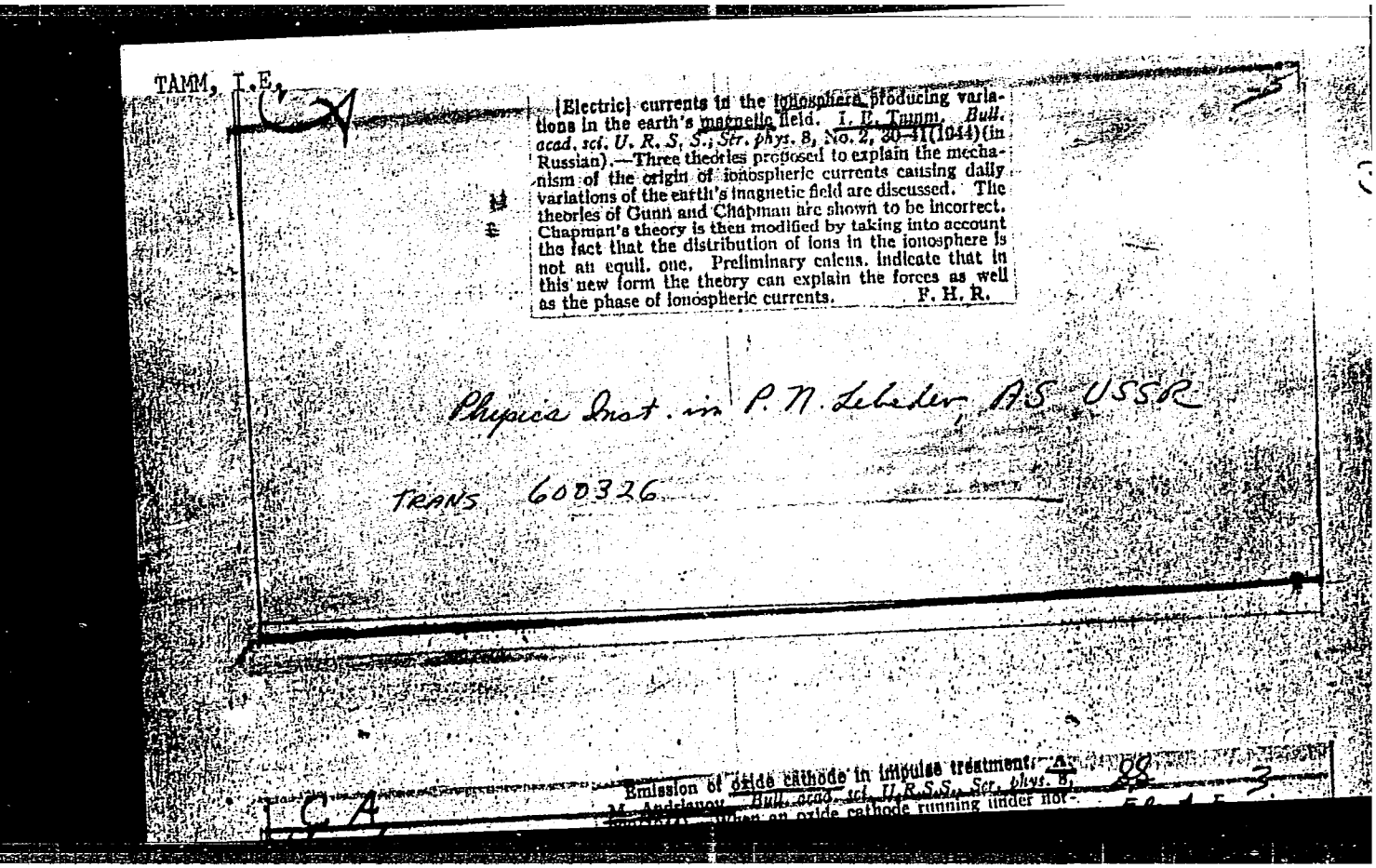
Propagation of Waves

W. E.

2523. On Currents in the Ionosphere which Cause the Variations of the Terrestial Magnetic Field.—I. Tamm. (*Journ. of Phys.* [of USSR], No. 6, Vol. 8, 1944, p. 383. in English, summary only; in full in Nos. 1-4. *Bull. de l'Ac. des Sci. de l'URSS, Série Physique*, 1944.)

"Three theories which have been proposed to explain the mechanism of appearance of ionosphere currents which cause the daily variations of the terrestrial magnetic field are discussed. The fallibility of two of the theories (Gann's and Chapman's) which was first mentioned by Cowling is proved in the general form. However, up to the present the Chapman theory of gravitational drift did not take into account the fact that the distribution of the ions in the ionosphere is an equilibrium one. By taking into account this circumstance a modification of the Chapman theory is suggested. Preliminary calculations indicate that this theory may yield the magnitude as well as the phase of the ionosphere currents."

1945



TAMM, I.E.

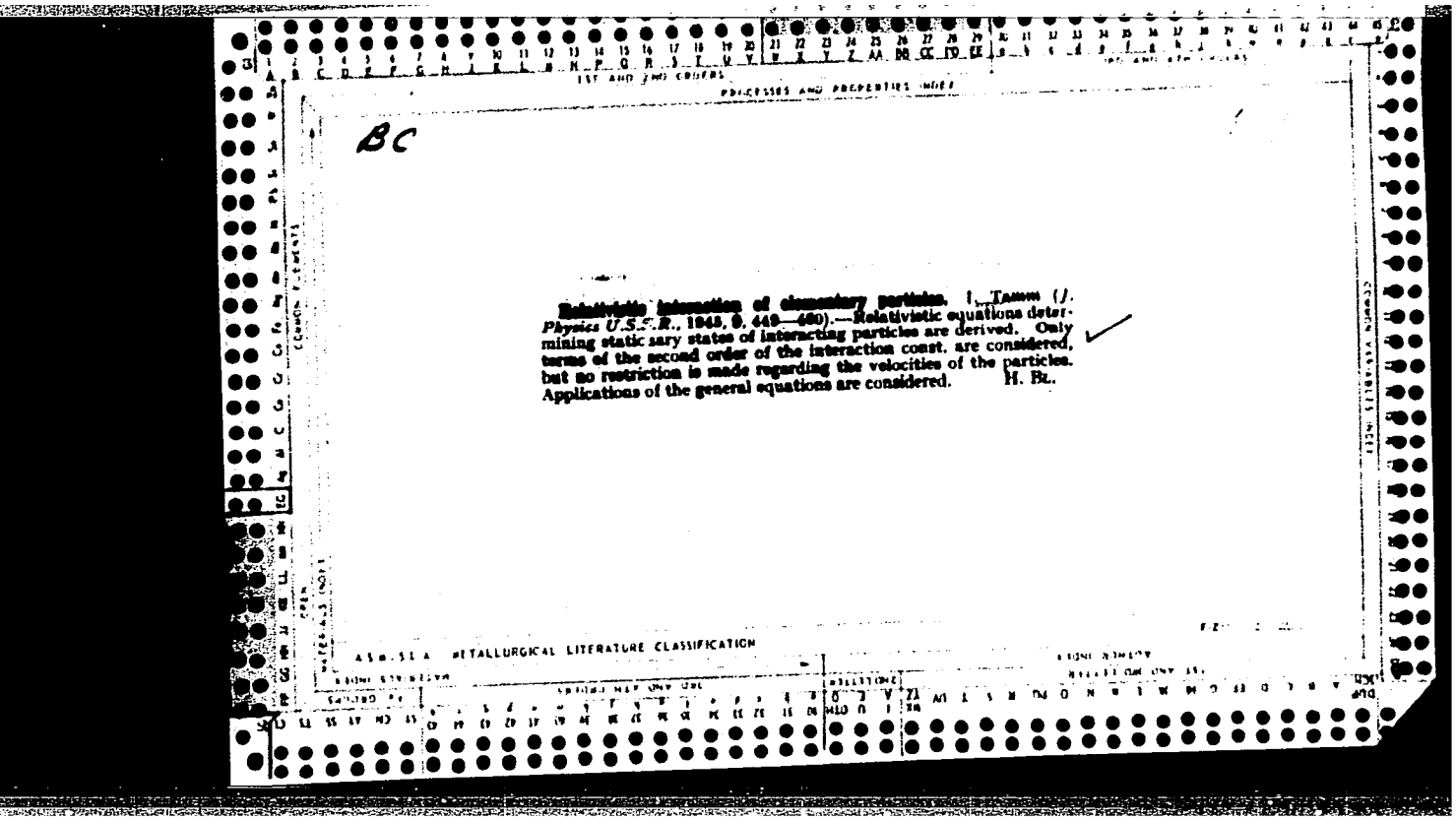
[Electric] currents in the ionosphere producing variations in the earth's magnetic field. I. E. Tamm. *Bull. acad. sci. U. R. S. S., Sér. phys.* 8, No. 2, 30-41(1944)(in Russian).—Three theories proposed to explain the mechanism of the origin of ionospheric currents causing daily variations of the earth's magnetic field are discussed. The theories of Gunn and Chapman are shown to be incorrect. Chapman's theory is then modified by taking into account the fact that the distribution of ions in the ionosphere is not an equil. one. Preliminary calcns. indicate that in this new form the theory can explain the forces as well as the phase of ionospheric currents. F. H. R.

Physics Inst. im P. N. Lebedev, AS USSR

TRANS 600326

CA

Emission of oxide cathode in impulse treatment. M. Andrianov. *Bull. acad. sci. U.R.S.S., Sér. phys.* 8, [illegible] when an oxide cathode running under hot-



BC

Relativistic interaction of elementary particles. I. Tamm (*J. Physics U.S.S.R.*, 1945, 9, 449—480).—Relativistic equations determining static sary states of interacting particles are derived. Only terms of the second order of the interaction const. are considered, but no restriction is made regarding the velocities of the particles. Applications of the general equations are considered. H. Bt.

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

TAMPERE, Kh. T.

"Stilevye tipy melodiki estonskikh run."

report submitted for 7th Intl Cong, Anthropological & Ethnological Sciences, Moscow, 3-10 Aug 64.

TAMM, I. Ye. (Cor. Mbr)

"Currents in the Ionosphere Which are Caused by the Variations in the Earth's Magnetic Field," a report submitted at the General Assemblies of OFMI in 1944.

IAN-Ser Fiz, Vol 9, No 3, 1945

TAMM, I. E.

"Basic Theory of Electricity", published by State Publishers of Technical Literature, Moscow, 1946.

TAMM, I. Ye.

"On the Forced Oscillation of an Endless Plate in Contact with Water. (L. M. Brekhovskikh, co-author).

ZhTF 1946. Vol 16. p 879.

TAMM, I. Ye.

"Energy Spectrum of a Cascade Electron
(S. Z. Belen'kiy, co-author)

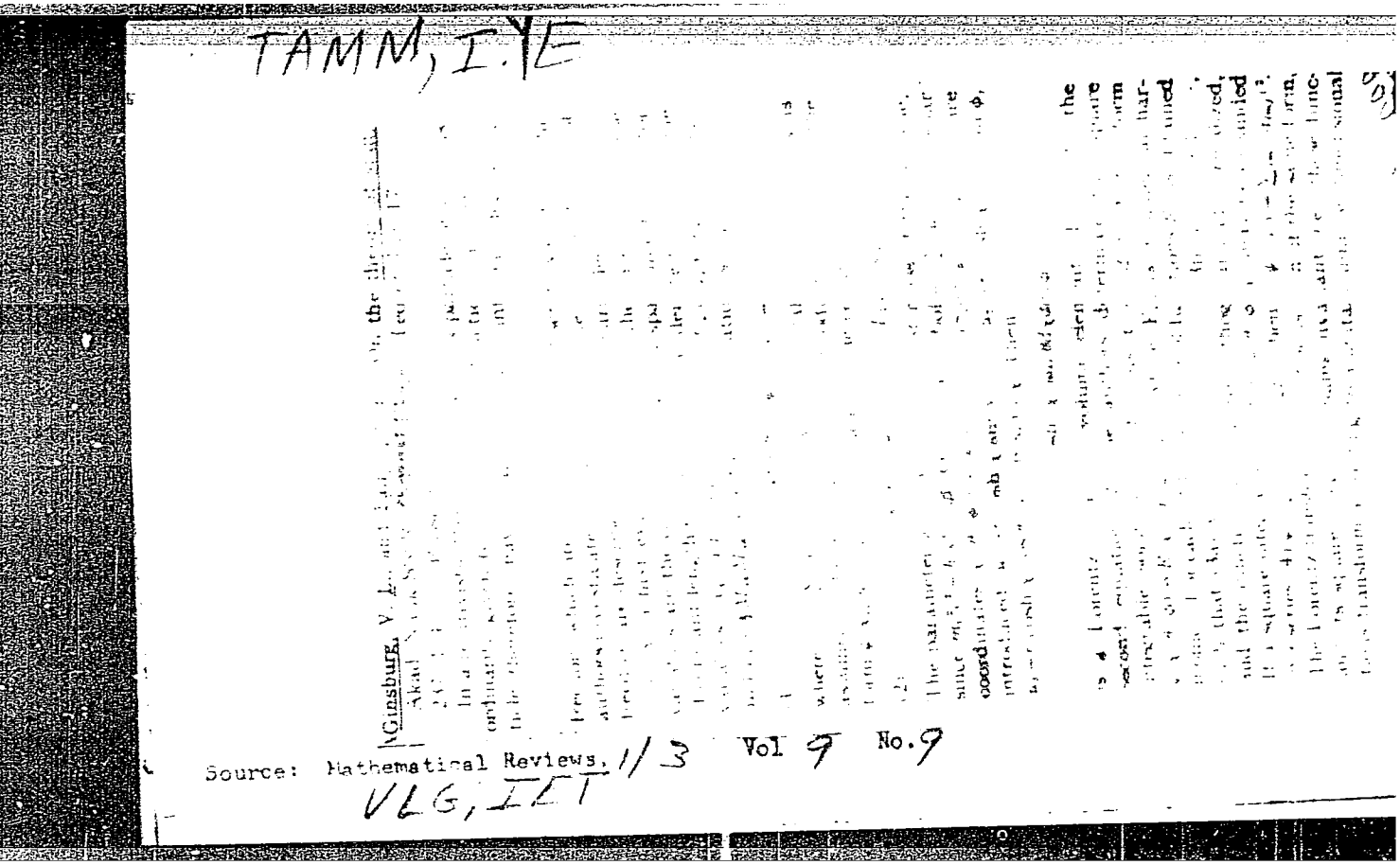
Phys. Rev. 1946. Vol 70. p. 660.

TAMM, I. Ye.

Meson- A Series of Articles Under the Editorship of I. Ye. Tamm, State Publishing House of Technical-Theoretical Literature, Moscow-Leningrad, 1947

Book-CS-G-EG-1205

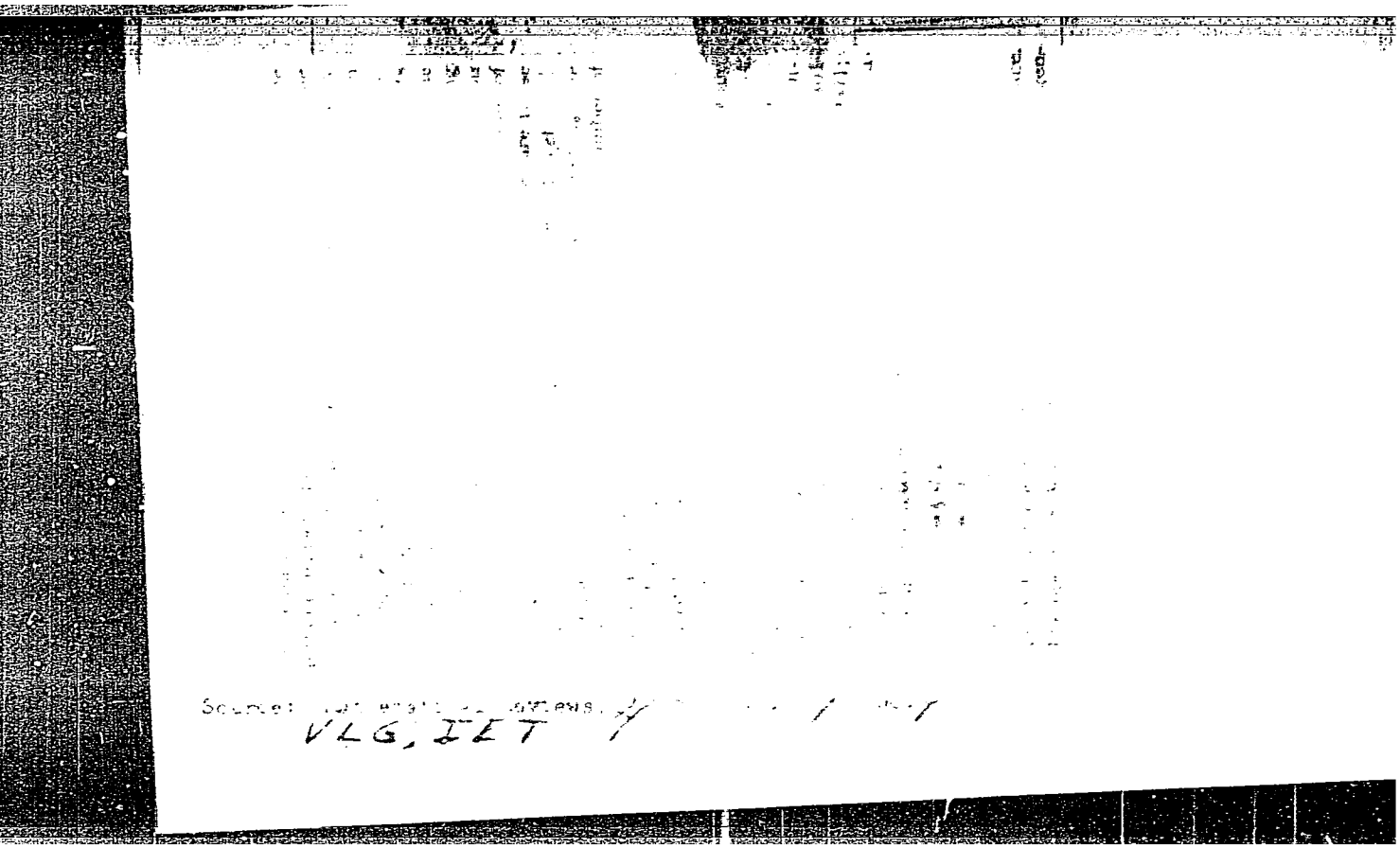
TAMM, I.Y.



Ginsburg, V. L.

Source: Mathematical Reviews, 11/3 Vol 9 No. 9

VLG, IET



VLG, IET

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001754820001-3"

... of the Lorentz group ...
... particular realization ... been ...
... terms of vector or spinor ...
... al number, r is inte... integr...
... The equation (3b) ...
... reducible representations ...
... Two different sets of ...
... ations. For the case dis...
... There exist also repres...
... cannot ... expressed ...
... retained ... term
... α^2 ... positive ... al
... half integral according ... half
integral. Hence only a finite ... and
consequently only a finite n... values ...

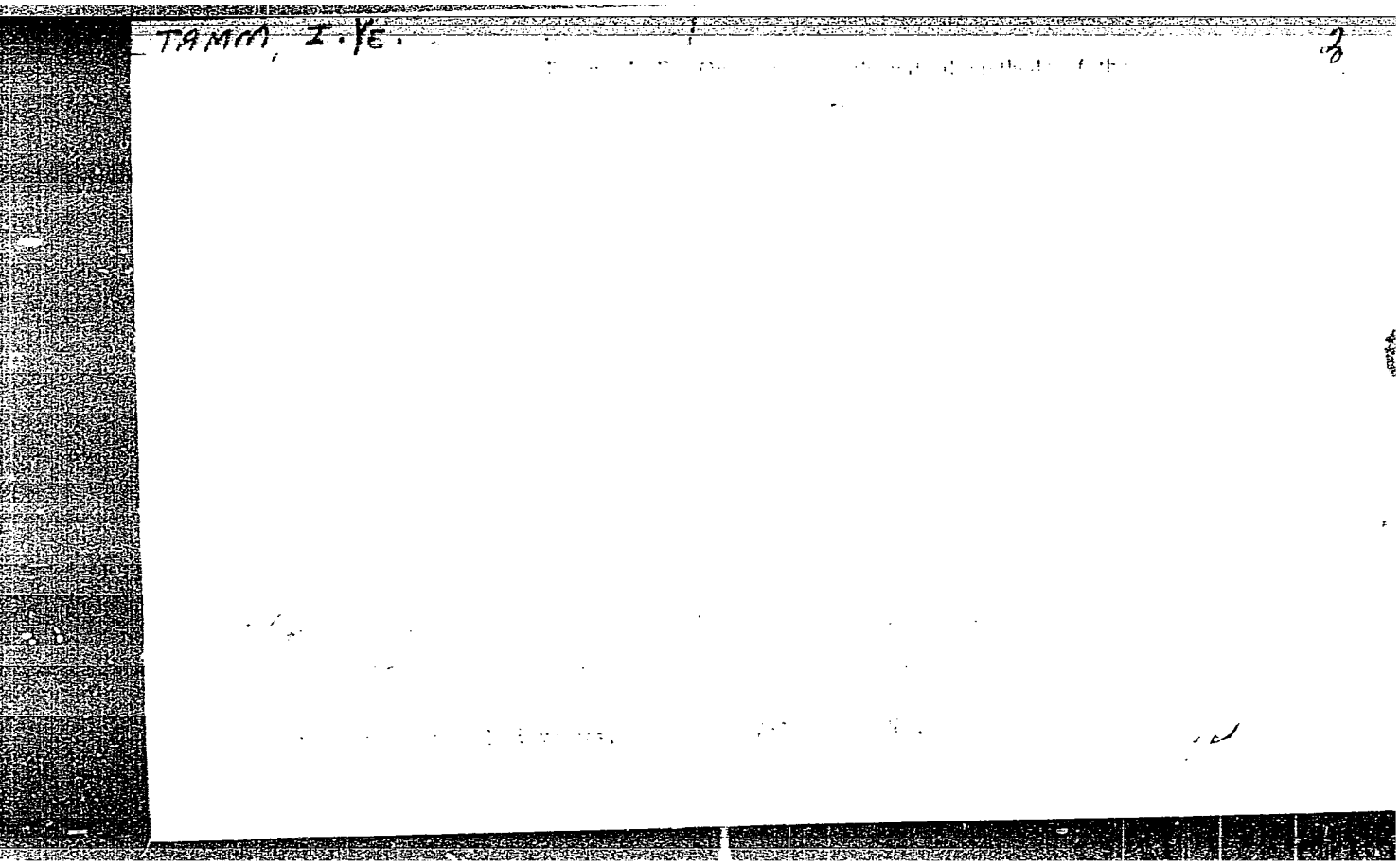
After briefly discussing po... of the equations
(1) and (5) the authors men... the
theory proposed. As shown by ... Pauli ...
Soc. London Ser. A 173, ... 1939) ...
... the interaction with the ... magnetic ...
... described by simply repla...
... the ...
... potential) if the spin of the ... greater ...
... additional wave functions m...
... absence of the electro...
... arises here, and the ...
... the interaction w...
... factory way.

Cosmic Radiation

A: C
G 1

1253. Problems of the Meson and the Contemporary Status of Knowledge Regarding Cosmic Rays, by I. E. Tamm, *Uspekhi Fizicheskikh Nauk* 31, No. 2, April 1947. 17 p. (In Russian).

These are intermediate particles which are heavier than electrons but not as heavy as protons; they are also known as mesotrons. Gives a general description of mesotrons. Also gives a basic introduction to cosmic rays and the degree to which they have been studied and understood. This article is meant to be an introduction to a book entitled "The Meson," published by the State Technical Press, and was written by the members of the Theoretical Department of Fian.



TAMM, Igor' Evgen'evich, 1895-

The fundamental theory of electricity. Izd. 4. Moskva, Gos. izd-vo tekhn.-tecret. lit-ry, 1949. 627 p. (50-15876)

QC518.T3 1949 MH

TAMM, I. E.

37192. Elementarnye chastitsy. V sb: Nauka i Zhizn'. M., 1949, s. 409-18

SO: Letopis' Zhurnal_nykh Statey, Vol 7, 1949

TAMM, I. YE. PA 30/49T84

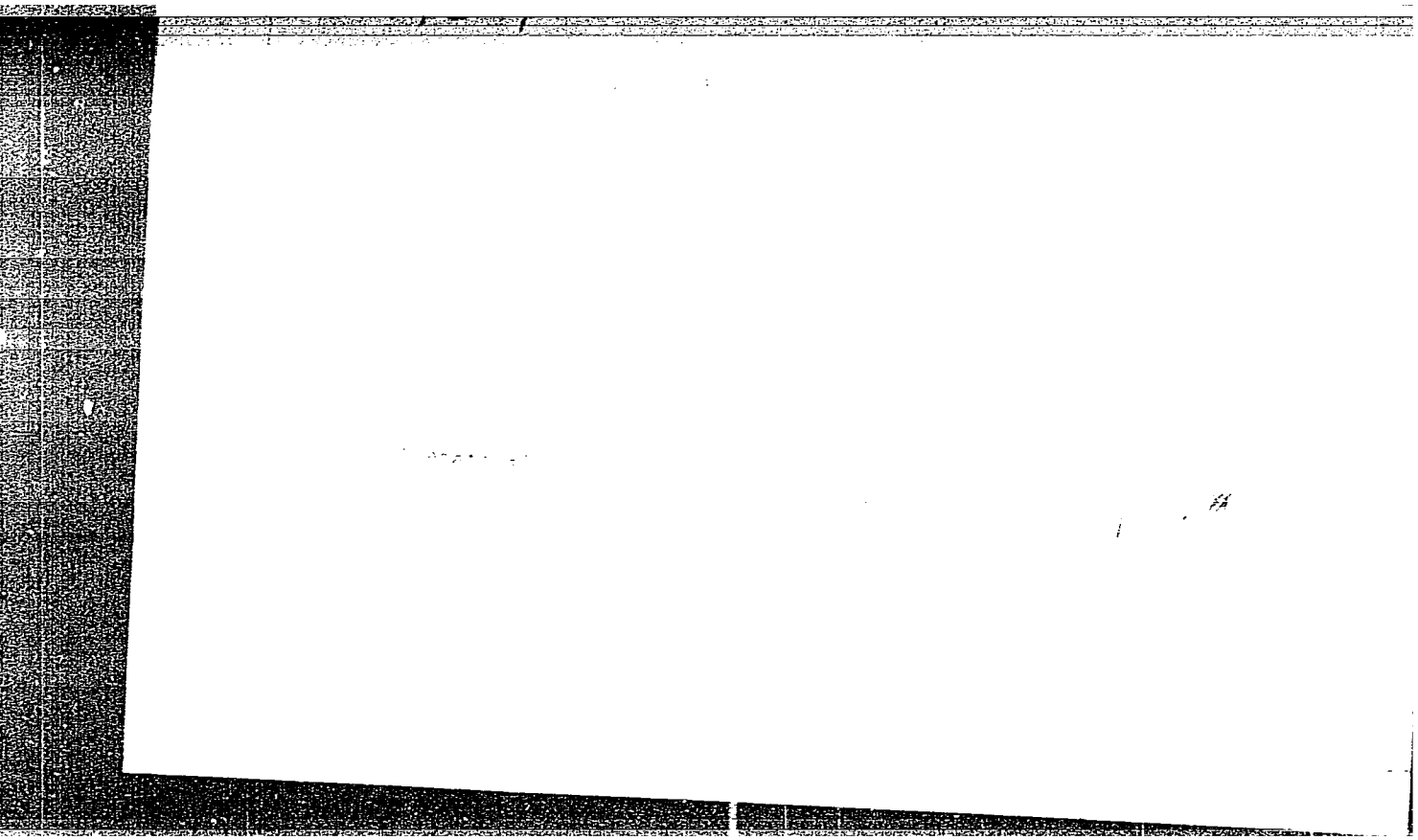
USSR/Nuclear Physics - Dispersion Jan 49
Nuclear Physics - Elementary Particles

"Several Mathematical Methods Concerning the Theory of Particle Dispersion," I. Ye. Tamm, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 3½ pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 1

Points out drawbacks in method of finding the proper functions of continuous spectrum explained in previous paper (see 63T80). Proposes new and modified variation method free of these drawbacks. Submitted 28 Jul 48.

[redacted] 30/49T84



USSR.

530.145

9941. On a relativistic theory of the interaction of nucleons. I. E. TAMM, V. P. SILIN AND V. YA. FAINBERG. *Zh. eksper. teor. Fiz.*, **24**, *No.* 1, 3–13 (1953) *In Russian.*

It is shown that a relativistic treatment of two nucleons interacting through a pseudoscalar meson field with pseudovector coupling does not alter a previous conclusion [I. Tamm, *Journal of Physics, USSR*, 9, 449 (1945)] about the instability of the system because of the pole at $r = 0$. The potential obtained from second-order perturbation theory is considered. In another section, the work of Levy [Abstr. 80 (1952)] concerning pseudoscalar mesons with pseudoscalar coupling is considered. It is shown that his conclusions of no binding and infinite energy for the two-nucleon system, are incorrect.

G. E. BROWN

TAMM, I.Ye.; LESHKOVTSEV, V.A., redaktor; GAVRILOV, S.S., tekhnicheskiy redaktor

[Basic theory of electricity] Osnovy teorii elektrichestva. Izd. 5-e. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1954. 620 p. (Electricity)
(MLRA 7:11)

TAMM, I. E.

USSR

1243. Semi-phenomenological theory of the interaction of π-mesons with nucleons. I. The scattering of π mesons by nuclei. L. E. TAMM, V. A. [illegible] AND V. Ya. FAINBERG. Zh. eksper. teor. Fiz. 26, No. 6, 649-67 (1954) In Russian.

The basis of the approach [cf Abstr 7:(1954)] is the assumption of a nucleon of mass M which [illegible] exist in an excited isobaric state with [illegible] and mass M [illegible]

The nucleon [illegible] coupling constant g [illegible] constant g' and a constant γ [illegible] the probabilities of absorptive or radiative [illegible] between the 2 states of the nucleon. The [illegible] (the pion) are treated relativistically, whereas [illegible] down appreciably the accuracy in the [illegible] of the basic equations are [illegible] practically important even at [illegible]

The matrix elements for the [illegible] of order γ^2 of the effect [illegible] are represented phenomenologically [illegible] state. Formulae for the scattering [illegible] are derived. A comparison [illegible] and [illegible]

Physics Inst. im. Lebedev, AS USSR

MANDEL'SHTAM, L.I.; LEONTOVICH, M.A., akademik; ANDRONOV, A.A., akademik [deceased]; LANDSBERG, G.S., akademik; TAMM, I.Ye., akademik; GUROV, K.P., redaktor; SOKOLOVA, T.F., tekhnicheskiy redaktor

[Complete works] Polnoe sobranie trudov. Pod red. M.A.Leontovicha. [Moskva] Izd-vo Akad. nauk SSSR. Vol.4. 1955. 511 p. (MLRA 8:6)
(Vibration)

TAMM, I. E.

The method of truncated field equations and its application to the scattering of mesons by nucleons. V. P. Silin I. E. Tamm, and V. Ya. Fainberg (P. N. Lebedev Phys Inst., Acad. Sci. U.S.S.R., Moscow). *Zhur. Eksptl. i Teoret. Fiz.* 29, 6–19(1955).—General problems are discussed, like the presentation of impulses, "minus particles" and boundary conditions, which are encountered in applying this new system of truncated equations. The method can be applied to the scattering of mesons by nucleons with a much better approximation than has been done heretofore.

Werner Jacobson

(2)

Translation D 419421 - p.107

FRENKEL', Ya.I.; SEMENOV, N.N., akademik, redaktor; SOKOVOV, A.A., doktor fiziko-matematicheskikh nauk, redaktor; BOGOLYUBOV, N.N., akademik, redaktor; TAMM, I.Ye., akademik, otvetstvennyy redaktor; ANSEL'M, A.I., doktor fiziko-matematicheskikh nauk, redaktor; BLOKHINTSEV, D.I., doktor fiziko-matematicheskikh nauk, redaktor; KONTOROVA, T.A., kandidat fiziko-matematicheskikh nauk, redaktor; GOLANT, V.Ye., redaktor izdatel'stva; SMIRNOVA, A.V., tekhnicheskiy redaktor

[Selected works] Sobranie izbrannykh trudov. Moskva, Izd-vo Akademii nauk SSSR. Vol.1. [Electrodynamics; general theory of electricity] Elektrodinamika; obshchaia teoriia elektrichestva. 1956. 370 p. (MLRA 9:11)

1. Chlen korrespondent AN SSSR (for Frenkel')
(Electrodynamics)

TAMM, I. Ye.

3

Method of truncated field equations and its application to the scattering of mesons by nucleons. V. P. Silin, I. E. Tamm, and V. Ya. Fainberg. *Soviet Phys., JETP 2*, 3-13(1956)(Engl. translation).—See *C.A.* 49, 15512i.

B. M. B.

Tamm I. Ye.

USSR/Theoretical Physics - General Problems

B-1

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33702

Author : Tamm, I. Ye.

Institution : None

Title : Albert Einstein and Modern Physics

Original Periodical : Uspekhi Fiz. Nauk, 1956, 59, No 1, 5-10

Abstract : Opening address at the meeting of the Einstein session of the Division of Physicomathematical Sciences on 30 November 1955.

Card 1/1

TAMM, I-Ye.

JOLIOT-CURIE, Frederic; SKOBEL'TSYN, D.V., akademik, otvetstvennyy redaktor; TAMM, I.Ye., redaktor; DZHELEPOV, B.S., redaktor; FRANK, I.M., redaktor; KROSHEV, L.V., redaktor; SMIRNOVA, G.N., redaktor; BARIT, I.Ya, redaktor izdatel'stva; RYNDZYUNSKAYA, S.M., redakter izdatel'stva; ZELINKOVA, Ye.V., tekhnicheskiy redaktor; NAZARYAN, L.V., tekhnicheskiy redaktor

[Selected works. Work written in collaboration with Irene Joiot-Curie] Izbrannye trudy. Frederik i Iren Zholio-Kiuri. Sovmestnye trudy. Moskva, Izd-vo Akademii nauk SSSR, 1957. 561 p. (MLRA 10:2)
(Radioactivity)

TE. 12mm

Distr: LE3d

3848

ON THE STRUCTURE OF NUCLEONS. I. E. Tamm (Academy of Sciences, USSR) Soviet Phys. JETP 5, 154-5 (1957) Aug.

Comparison of the results of measurements of the scattering of fast electrons with energy up to 550 Mev by protons with measurements of the interaction of electrons with neutrons has led to conclusions that these data as a whole are in contradiction either with the charge independence of the interaction of mesons with nucleons, or with the foundations of quantum electrodynamics. This note presents arguments against the legitimacy of these conclusions. - L. F. W.

4

1-PHYS

1

1

TAMM, I.Ye., akademik.

Role of the leading natural science will shift from physics to biology in the relatively near future. Tekh. mol. 25 no.9:13 S '57. (MLRA 10:9)
(Biology)

AUTHOR TAMM, I.E. PA - 2087

TITLE On the Structure of Nucleons (O strukture nuklonov).

PERIODICAL Zhurnal Eksperimental'noi i Teoret. Fiziki, 1957, Vol 32, Nr 1 pp 178-180 (U.S.S.R.)

Received 3/1957 Reviewed 4/1957

ABSTRACT By comparing the results of the measurements of the scattering of fast electrons by protons with those of the interaction of electrons with neutrons, some physicists have formed the opinion that the total of these data is incompatible with the charge independence of the interaction between pions and nucleons and also with the basis of quantum-electrodynamics. The present work furnishes proofs against the correctness of such conclusions.

The most direct argument in favor of the conclusions mentioned is raised by D.ENNI, M.LEVI, and D.RAVENHALL: In the case of superposition of charge densities in the proton and in the neutron, their meson charges cancel each other and the charge density of the so-called "nucleon heart" is obtained, i.e. the charge density which is only due to the distribution of the nucleons and the nucleon pairs $\varrho_c = \varrho_p(r) + \varrho_n(r)$. In consideration of other experimental arguments ENNI et al. drew the conclusion that the mean quadratic radius of the charge of the heart piece is practically equal to r_p. $r_c \sim r_p \sim 0{,}77 \cdot 10^{-13}$ cm $\sim 3{,}7$ h/Mc. However, it is just this result that is paradoxical. For, if only a smaller energy than μc^2 is studied, the recoil on the occasion of the radiation of a meson through a "hollow" nucleon can be neglected. These and other conclusions are contra-

Card 1/2

PA - 2087

On the Structure of Nucleons.

dictory to the statements made by ENNI et al. According to TAMM the theory mentioned here (though only indirectly) is based on the condition of weak interaction between mesons and nucleons. Because, however, this interaction is actually strong, each meson must be dissociated in a nucleon - anti-nucleon pair during a considerable length of time. Therefore, the distribution of these pairs (which, according to the definition, belong to the parts of a nucleon heart) must be approximately equal to the distribution $r \sim h/\mu c$ of the mesons.

It is highly probable that the anti-nucleons produced on the periphery of the physical nucleon and the nucleon in the center of the physical nucleon will annihilate each other reciprocally, after which they will newly created, etc. Therefore, the charges of all nucleons and anti-nucleons (i.e. the charge of the heart piece) are distributed more or less symmetrically over the whole volume of the meson cloud. These ideas are entirely in keeping with the fact that no experiments whatever point in the direction of any concentration of the proton charge near the center of protons. A further contradiction in connection with the structure of the nucleon is pointed out. A precise theory of nucleons must also take the properties of the cloud of the virtual K-mesons (which surround the nucleons) into account.

Card 2/2

Phys. Tech Inst. im P. N. Lebedev

AUTHOR TAMM, I.Ye. PA - 3253

TITLE Notes on the Article by JANOSSY L.(YANOSHY) "Further Deliberations on the Physical Interpretation of the LORENTZ Transformation.
(O stat'ye L.Yanoshy "Dal'neyshiye soobrazheniya o fizicheskoy interpretatsii preobrazovaniy Lorentsa" - Russian)

PERIODICAL Uspekhi Fiz. Nauk, 1957, Vol 62, Nr 1, pp 183-185, (U.S.S.R.)
Received 7/1957 Reviewed 8/1957

ABSTRACT The main ideas of the paper by YANOSHY (U 62, 149,1957) are sharply criticized. It is pointed out that the life of μ-mesons does not depend on the manner in which a certain velocity is imparted to them (by slowing down in the atmosphere or in a particle accelerator on the occasion of their creation), and that therefore the difference in life is not due to acceleration. Also the fact of the rotation of the arms of the Michelson interferometer (according to Yanoshi of essential importance as accelerated motion) is only an experimental trick which, in principle, could be avoided. Einstein's theory makes it possible to made definite statements also if the processes which take place are not quantitatively known or recognizable and in this respect it is analogous to the energy conservation law. The fact that the theory of relativity is based upon conditions which cannot be "proved" is common also to all other physical theories. By new discoveries this theory, which has

Card 1/2

PA - 3253

Notes on the Article by JANOSSY L.(YANOSHY) "Further Deliberations on the Physical Interpretation of the LORENTZ Transformation.

been so often and so well approved, will not be proved wrong, but merely the limits of its applicability will be made clear such as has already been the case with the theory of relativity itself with respect to Newton's mechanics.

ASSOCIATION
PRESENTED BY
SUBMITTED
AVAILABLE Library of Congress.
Card 2/2

Tamm, I. Ye.

53-2-2/3

AUTHOR: Tamm, I.Ye.

TITLE: In Memoriam G.S. Landsberg (Pamyati G.S. Landsberga)

PERIODICAL: Uspekhi Fiz. Nauk, 1957, Vol. 63, Nr 2, pp. 287 - 288 (USSR)

ABSTRACT: The author recalls above all the discovery of the combination scattering of light by Landsberg and Mandel'shtam. According to Tamm this is probably the greatest physical discovery of Soviet Physics during its existence. Landsberg, however, was very active in other branches of physics: Physical optics (he discovered the selective scattering of light, and was the first to separate the true molecular scattering of light in solids) and molecular physics. The great army of the spectrosocpy scientists working in research institutes and plant laboratories considered Landsberg to be their teacher, inspirator and leader. He was the initiator and a pioneer of the far reaching penetration of spectroscopic methods into Soviet industry. He put aside an investigation he had once begun only when it had lead to well founded and reliable conclusions. Above all his preference for basic thought must be emphasized.

Card 1/3

. TAMM, I. Ye.

21(7) PHASE I BOOK EXPLOITATION SOV/1241

Akademiya nauk SSSR. Institut atomnoy energii

Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy, t.I. (Plasma Physics and the Problem of Controlled Thermonuclear Reactions, v. 1) [Moscow] Izd-vo AN SSSR, 1958. 300 p. 3,000 copies printed.

Resp. Ed.: Leontovich, M.A., Academician.

PURPOSE: This collection contains previously unpublished work of members of the Institut atomnoy energii (Institute of Atomic Energy) of the Academy of Sciences of the USSR. It is intended for scientists interested in this field.

COVERAGE: This book is the first of four volumes of a collection of articles on theoretical and experimental investigations of problems of controlled thermonuclear reactions and associated questions of plasma physics. The research reported on was conducted during 1951-1958 at the Institute of Atomic Energy. Only papers not previously

Card 1/6

published are included in the collection. The articles are arranged in basically chronological order.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress (QC794.A38)

IS/ksv
3-6-59

TAMM, I. Ye., and SMORODINSKIY, Ya. I. (editors)

"The Works of Ya. I. Frenkel' on Atomic Nuclei."

in Collection of Selected Works of Ya. I. Frenkel', Vol. 2, Scientific Articles. Moscow, Izd-vo AN SSSR, 1958, 600pp.

TAMM, I. Ye.

1L C

CHICOM/31-58-20-7/15

24 (0)

AUTHOR: Tamu,. I. Ye.

TITLE: Unified Field Theory of Elementary Particles

PERIODICAL: K'o Hsüeh T'ung Pao (KEXUE TONGBAO), 1958, Nr 20, pp 627-629

ABSTRACT: This is the author's speech which he gave at Acdemia Sinica of Red China in April, 1958. It was recorded by Ho Tsu-hsiu (何祖麻). The author discusses the general ideas of Heisenberg's unified field theory of elementary particles.

Card 1/1

TAMM, I. Ye.

FRENKEL', Yakov Il'ich, [deceased 1945]; SEMENOV, N.N., akad. otv. red.; SOKOLOV, A.A. doktor fiz.-mat. nauk, red.; BOGOLYUBOV, N.N., akad., red.; TAMM, I.Ye., akad., red.; ANSEL'M, A.I., doktor fiz.-mat. nauk, red.; BLOKHINTSEV, D.I., doktor fiz.-mat. nauk, red.; KONTOROVA, T.A., kand. fiz.-mat. nauk, red. izd-va.; SMIRNOVA, A.V., tekhn. red.

[Selected works] Sobranie izbrannykh trudov. Moskva, Izd-vo Akad. nauk SSSR. Vol. 2. [Scientific articles] Nauchnye stat'i. 1958. 600 p. (MIRA 11:11)

1. Chlen-korrespondent AN SSSR (for Frenkel').
(Physics)

TAMM, I. Ye.

"Radiation of Particles with Speeds Greater than that of Light."
The Times Science Review, Quarterly, No. 30, Winter 1958.

(Substance of evening lecture given during the 2nd UN Conf. on Peaceful Uses of Atomic Energy. The Nobel Prize for Physics has since been awarded to Academician Tamm, P. A. Cherenkov and Il M. Frank for their part in the researches here described.)

AUTHORS: Kobzarev, I. Yu., Tamm, I. Ye. 56-34-4-17/60

TITLE: The Decay Processes of the Strange Particles in the Theory by Feynman and Gell-Mann (Raspady strannykh chastits v teorii Faynmana i Gell-Manna)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 899 - 901 (USSR)

ABSTRACT: This work gives an explanation of the equal probability of the K_{e3} - and $K_{\mu 3}$- decays in the case of absent K_{e2}-decay and of the high asymmetry in the decays of the polarized hyperons on the assumption of the universal A-V-interaction by Gell-Mann and Feynman. One of the most interesting features in the lepton decays of the K-mesons is the absence of the decay $K^+ \longrightarrow e^+ + \nu$ in the case of the presence of the decay $K^+ \longrightarrow \mu^+ + \nu$ on which occasion the decays $K^+ \longrightarrow \mu^+ + \nu + \pi^o$, $K^+ \longrightarrow e^+ + \nu + \pi^o$ have approximately the same decay probabilities. These features very easily can be explained by the following assumption: All these decays take place because of the universal four-fermion interaction which was suggested by Gell-Mann and Feynman (Ref 1) and

Card 1/3

The Decay Processes of the Strange Particles in the Theory by Feynman and Gell-Mann

by Sudarshan and Marshak (Ref 2). If such an interaction is present the decays $K^+ \rightarrow \mu^+ + \nu$, $K^+ \rightarrow e^+ + \nu$ must be caused by the transformation of a K-meson into a pair baryon-antibaryon with subsequent transformation into $e\nu$, $\mu\nu$. A graph is given for such a process. The corresponding probability is proportional to $1 + (v_{\mu,e}/c)\cos\vartheta$, where ϑ means the angle between the direction of the momenta of the myon and of the neutrino. The probabilities of the decays $K \rightarrow e + \nu$, $K \rightarrow \mu + \nu$ show a ratio of $0{,}25 \cdot 10^{-4}$. The situation changes completely if a pion is emitted from the baryon-loop. Then the authors derive the following relationships for the probabilities:

$$(K \rightarrow e + \nu) / (K \rightarrow \mu + \nu) \approx (m_e/m_\mu)^2 \sim 0{,}25 \cdot 10^{-4} \quad \frac{K \rightarrow e + \nu + \pi}{K \rightarrow \mu + \nu + \pi}$$

$$\frac{\pi \rightarrow e + \nu}{\pi \rightarrow \mu + \nu} \sim 1{,}3 \cdot 10^{-4}$$

$$\varsigma\gamma = \frac{\pi \rightarrow e + \nu + \gamma}{\pi \rightarrow \mu + \nu} \sim e^2 \quad \frac{K \rightarrow e + \nu + \pi}{K \rightarrow \mu + \nu} \sim 10^{-3}$$

Card 2/3

The Decay Processes of the Strange Particles in the Theory by Feynman and Gell-Mann 56-34-4-17/60

According to the examined scheme the ratio of the probabilities of the decays $\Lambda \rightarrow p + \pi$, $\Lambda \rightarrow n + \pi^0$ is determined mainly by the relative probability of the production of a charged and of a neutral pion by a baryon. This ratio is equal to about 2, which approaches the experimental value of this ratio. There are 3 figures and 8 references, 0 of which are Soviet.

ASSOCIATION: Fizicheskiy institut im.P.N.Lebedeva Akademii nauk SSSR (Institute of Physics im. P.N. Lebedev, AS USSR)

SUBMITTED: January 16, 1958

1. Mesons--Decay

Card 3/3

AUTHORS: Vonsovskiy, S. V., Leontovich, M. A., Tamm, I. Ye. SOV/53-65-4-12/13

TITLE: Semen Petrovich Shubin (On the Occasion of the Fiftieth Anniversary of His Birth and of the Twentieth Anniversary of His Death)(Semen Petrovich Shubin(K pyatidesyatiletiyu so dnya rozhdeniya i dvadtsatiletiyu so dnya smerti))

PERIODICAL: Uspekhi fizicheskikh nauk, 1958, Vol 65, Nr 4, pp. 733 - 737 (USSR)

ABSTRACT: As introduction a short curriculum vitae of the scientist, who was born on July 31, 1908 in Liepaja(Latvia), is given. Subsequently his work is discussed in detail. a)Publications on the classical theory of oscillation:"Some Problems in the Perturbation Theory of Linear Oscillation Systems" was the title of his first publication (Ref 1); a theoretical investigation of the oscillations of thin diaphragms fastened at a finite number of points followed one year later. b) Publications on the theory of solids: "On the Theory of the Photoeffect in Metals", "On the Transmission Band in Silver", "Concerning the Theory of Liquid Metals", "On the Possible Anomalies of Resistance at Low Temperatures",

Semen Petrovich Shubin (On the Occasion of the Fiftieth Anniversary of His Birth and of the Twentieth Anniversary of His Death) SOV/53-65-4-12/13

"On the Theory of Exchange Interaction", "Problems of the Quasiclassical Treatment of Ferromagnetism" and others. c) Publications on physical statistics: A summary of statistical formulae is mentioned. d)Publications on quantum electrodynamics and theory of the quantized fields: "Classical Analog to the Dirac Theory of Emission", "On the New Dirac Theory of the Electromagnetic Field" and others. Finally a list of scientific papers published by Shubin is given (18 papers, written partly in German, English, and French). There are 1 figure and 26 references, 21 of which are Soviet.

Card 2/2

Tamm, I. Ye.

21(0),24(0) PHASE I BOOK EXPLOITATION SOV/32

Akademiya nauk SSSR. Fizicheskiy institut

Issledovaniya po eksperimental'noy i teoreticheskoy fizike; [sbornik] (Studies on Experimental and Theoretical Physics; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 304 p. Errata slip inserted. 2,300 copies printed.

Ed.: I. L. Fabelinskiy, Doctor of Physical and Mathematical Sciences; Eds. of Publishing House: A. L. Chernyak and V. G. Berkgaut, Tech. Ed.: Yu. V. Rylina; Commission for Publishing the Collection in Memory of Grigoriya Samuilovich Landsberg: I. Ye. Tamm (Chairman), Academician; M. A. Leontovich, Academician; P. A. Bazhulin, Doctor of Physical and Mathematical Sciences; S. L. Mandel'shtam, Doctor of Physical and Mathematical Sciences; I. L. Fabelinskiy, Doctor of Physical and Mathematical Sciences; F. S. Landsberg-Baryshanskaya, Candidate of Physical and Mathematical Sciences; and G. P. Motulevich (Secretary), Candidate of Physical and Mathematical Sciences.

PURPOSE: This book is intended for physicists and researchers engaged in the study of electromagnetic radiations and their role in investigating the structure and composition of materials.

COVERAGE: The collection contains 30 articles which review investigations in spectroscopy, sonics, molecular optics, semiconductor physics, nuclear physics, and other branches of physics. The introductory chapter gives a biographical profile of G. S. Landsberg, Professor and Head of the Department of Optics of the Division of Physical Technology at Moscow University, and reviews his work in Rayleigh scattering, combat gases, spectral analysis of metals, etc. No personalities are mentioned. References accompany each article.

SOV/29-59-1-3/26

21(0)
AUTHORS: Nesmeyanov, A. N., Academician, Tamm, I. Ye., Academician, Nobel Prize Winner

TITLE: Academicians on the Future of Thermonuclear Energy (Akademiki o budushchem termoyadernoy energii)

PERIODICAL: Tekhnika molodezhi, 1959, Nr 1, pp 4 - 4 (USSR)

ABSTRACT: Academician A. N. Nesmeyanov: Soviet scientists advance successfully on the way towards domination of the thermonuclear synthesis and the utilization of thermonuclear energy. These are problems the solution of which will provide mankind with a source of energy to an unlimited extent and for all times to come.
Academician I. Ye. Tamm, Nobel Prize winner: Methods rendering possible the domination of thermonuclear energy are already clarified in principle. But for the time being it cannot be estimated how much time, work and invention will be necessary to overcome serious difficulties on the way towards practical utilization of these principles. I have no doubt that in the long run the thermonuclear reaction will be the basis for power economy. The sources of thermonuclear fuels is virtually

Card 1/2

inexhaustible in sea water, for instance, unlike uranium, thorium, and the like. Their wide distribution excludes any struggle among nations for their deposits. The very serious problems actually arising in connection with the harmful effect of radioactive waste in modern reactors will substantially lose their importance with the use of thermonuclear reactors. There are 2 figures.

21(7),.24 (5)
AUTHOR: Tamm, I. Ye

SOV/53-68-3-3/11

TITLE: The General Properties of the Radiation Emitted by Systems Moving With a Velocity Greater Than That of Light, and Some Contributions to Plasma Physics (Obshchiye svoystva izlucheniya, ispuskayemogo sistemami, dvizhushchimisya so sverkhsvetovymi skorostyami, i nekotoryye prilozheniya k fizike plazmy)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 3, pp 387-396 (USSR)

ABSTRACT: This is the reproduction of a lecture delivered on the occasion of the awarding of the Nobel Prize at Stockholm on December 11, 1958. The author discusses the fundamentals of his theory on Cherenkov radiation: A system moving with the constant velocity v through a medium emits a radiation of the frequency ω propagated with the velocity $c'(\omega)$ in the medium surrounding the system. This radiation, however, can be observed only under the angle ϑ (measured with respect to the direction of the motion of the system), for which $\cos\vartheta = \frac{c'(\omega)}{v}$ holds, furthermore: $v > c'(\omega)$. These basic equations are illustrated on the basis of a schematical drawing (Fig 1). In the following the author

Card 1/4

points out the analogy in aerodynamics - the emission of shock waves in the case of Mach waves moving with supersonic velocity. The apparent contradiction to the theory of relativity occurring as a result of the discovery made by Cherenkov and Vavilov and its interpretation by Frank and Tamm is explained by the fact that, though, if c is the velocity of light in the vacuum and c' is that in a medium, the demand made by the theory of relativity $c' < v < c$ remains conserved, it merely says that no material particle is able to exceed the velocity of light in the vacuum, but that $v > c'$ may be possible. Sommerfeld, as was pointed out to the author by A. F. Ioffe, theoretically investigated the motion of an electron with the velocity of light, but only in a vacuum already in 1904. Frank, V. L. Ginzburg and the author theoretically investigated the most important properties of this new radiation; they may be represented in the following fundamental equations: the system moving with the constant velocity $\vec{v}$ emits the energy $\mathcal{E}$ in the direction characterized by the unit vector $\vec{n}$; the law of the conservation of energy is then $\mathcal{E} + \Delta T + \Delta U = 0$, and that of momentum conservation:

$\frac{\varepsilon}{c'}\vec{n} + \Delta\vec{p} = 0$ (T denotes kinetic energy and U the energy of the internal degrees of freedom; $\vec{p}$ is the momentum of the system). If $\Delta\vec{p}$ is small compared to $\vec{p}$, it holds that $\vec{v}\Delta\vec{p} = \Delta T$; from these 3 conditions it follows that $\Delta U = -\varepsilon\left(1 - \frac{v\cos\vartheta}{c'}\right)$, where ϑ denotes the angle between $\vec{v}$ and $\vec{n}$. If $\Delta U = 0$ (which holds e.g. in the case of a point charge), there follows from the latter equation: $\cos\vartheta = c'/v$, the condition initially given. In the following the author discusses these equations and mentions a number of interesting conclusions to be drawn herefrom. As a practical theoretical example the author then deals with plasma physics and discusses the conditions necessary for the occurrence of the Vavilov-Cherenkov effect, the energy losses of the moving charge, the absorption of plasma waves in the plasma (inverse Cherenkov effect), and Landau's formula for the damping coefficient $\gamma \sim \exp\left(-\frac{mu^2}{2\varkappa T}\right)$. Finally, possibilities of heating the plasma are discussed (excitation

of the so-called magneto-acoustic waves in the magnetic plasma by an electric circular current according to Morozov); the production of such waves by a moving current is a special case of the Cherenkov effect; under certain conditions the absorption of the magneto-acoustic waves in the plasma may lead to a very considerable heating of the plasma. A further possibility of using the Cherenkov effect for plasma stabilization (Morozov and Solov'yev) is finally mentioned. There are 1 figure and 15 references, 10 of which are Soviet.

PHASE I BOOK EXPLOITATION SOV/4393

Cherenkov, Pavel Alekseyevich, Professor, Igor' Yevgen'yevich Tamm, Academician, and Il'ya Mikhaylovich Frank, Corresponding Member, Academy of Sciences USSR

Nobelevskiye lektsii (Nobel Prize Papers) Moscow, Fizmatgiz, 1960. 73 p. 7,000 copies printed.

Ed.: T. V. Mikhalkevich; Tech. Ed.: Ye. A. Yermakova.

PURPOSE: This pamphlet is intended for physicists and researchers engaged in the application of the Cherenkov radiation principle in experimental physics.

COVERAGE: The pamphlet contains lectures by Professor P. A. Cherenkov, Academician I. Ye. Tamm, and Corresponding Member of the USSR Academy of Sciences I. M. Frank given in Stockholm on December 11, 1958 when receiving the Nobel Prize in physics. The supplementary article relates the history of the discovery of the Cherenkov radiation and presents biographical data on the three Nobel Prize re-

Card 1/3

cipients. Photographs of the prize winners are included in the booklet. The complete text of the speeches and of the article were previously published in Uspekhi fizicheskikh nauk, v. 67, no. 1, and v. 68, no. 3. The articles are accompanied by bibliographies listing Soviet and other technical literature.

TABLE OF CONTENTS:

Nobel Prize Papers SOV/4393

AVAILABLE: Library of Congress

Card 3/3

JA/rn/ec
10-20-60

TAMM, I. Ye. Chief of Lab, Inst. of Physics AS USSR.

"Dangers of Continued Arms Race."

paper presented at the Pugwash Conference on Disarmament and World Security, Moscow, 27 Nov-6 Dec 60.

83297
S/026/60/000/008/001/005
A166/A029

24.6510

AUTHOR: Tamm, I.Ye., Academician

TITLE: The Problems of Elementary Particles 19

PERIODICAL: Priroda, 1960, No. 8, pp. 8 - 16

TEXT: There is as yet no complete and logical system embodying all known elementary particles into a single elementary particle theory and all attempts to evolve such a system have foundered on the number of infinite values involved. The method of reducing computed infinite values to finite ones by subtracting from them some second infinite value is of dubious worth and is not based on reality. Three types of interaction between particles can be distinguished: strong, electromagnetic and weak, or decay type. Each type of interaction is thought to have its own field and its own field quanta, and every particle has its specific antiparticle. Antiparticles have been detected for almost every known particle with the exception of photons and π^0-mesons which are identical with their antiparticles. Particle and antiparticle can interact to annihilate, in the course of which their mass and energy are converted into radiation. An apparent paradox, noted in 1956, was that in weak interactions the law of mirror symmetry is vio-

Card 1/3

The Problems of Elementary Particles

lated. According to this law, the conventional direction of the momentum vector must change to the exact opposite upon a switch from a right-hand to a left-hand system of coordinates, or vice versa. Since the right-hand and left-hand systems are coequal, there can be no correlation in physical phenomena between, say, the conventional direction of a spinning particle's momentum vector and the direction of its speed vector, which does not depend on the system of coordinates selected. Such a correlation can, however, occur in weak interactions. For instance, in a right-hand system of coordinates the spin of the electrons emitted during radioactive β-decay is directed predominantly against their speed. In a left-hand system of coordinates, however, the spin vector has the opposite direction and is directed with the electron's speed. In other words, the right-hand and left-hand systems are no longer equivalent and coequal; there is an objective difference between them based on the correlation between the beta-electrons' spin and speed. The most successful explanation of this paradox has been furnished by L.D. Landau's hypothesis of combined diversion which explains that although, taken separately, the law of the equivalency of world and anti-world and the law of mirror symmetry are not fulfilled in weak interactions, the laws of all physical phenomena generally are invariants in relation to combined inversion, i.e., the change from world to antiworld with simultaneous mirror reflection. The author feels, howev-

Card 2/3

The Problems of Elementary Particles

er, that Landau's hypothesis has not yet been finally proven and should be approached with caution. On the basis of these laws the author arranges all 30 known particles and anti-particles in a system (Tables 4 and 5), dividing them into fermions and bosons, distinguished by the fact that fermions, unlike bosons, are subject to Pauli's principle whereby two identical fermions cannot exist together in the same state. Barions, or nuclear-charged particles, are listed separately in Table 5. Heisenberg's non-linear field theory is explained and criticized on the grounds that its mathematical basis is inadequately developed and that quantitative deductions from it are unconvincing. Heisenberg hopes to eliminate the infinite from his theory by introducing indefinite metrics and assigning negative values to certain probabilities. The efficacy of this venture has still to be proved. In the author's opinion, the recent theory that on an ultraminute scale space is not continuous but discrete presents promising prospects for further research. As regards the theory of dispersion correlations, the author feels that it is rather phenomenological and entails the constant introduction of new, empirically determined parameters. It cannot solve the basic problem, i.e., the formation of a coherent theory for the physics of elementary particles. There are 5 tables.

Card 3/3

S/029/60/000/008/001/004
B013/B067

AUTHOR: Tamm, I. Ye., Academician

TITLE: Three Fascinating Physical Problems

PERIODICAL: Tekhnika molodezhi, 1960, No. 8, pp. 7-11

TEXT: In this paper, Igor' Yevgen'yevich Tamm (Fig. p. 9), who in 1958 was awarded the Nobel Prize together with the physicists I. M. Frank and P. A. Cherenkov, first deals with the problem of controlled thermonuclear reactions. The solution of this problem promises a definite and radical solution of the problem of energy reserves. The two main ideas upon which all experiments of controlling thermonuclear reactions are based - magnetic isolation and the characteristic features of thermal plasma radiation - were first expressed by Academician A. D. Sakharov in August 1950. Since 1958, scientists of various countries have been briskly exchanging their views on research work done in this field. Such collaboration between scientists on an international basis may contribute to the solution of the problem and to the technical realization of controlled thermonuclear reactions. The second problem dealt with in this paper is the quantum theory of elementary particles. The author discusses two problems which are closely

Card 1/3

connected with each other, and which are the central point of modern theoretical physics. One concerns the variety of elementary particles, the other the rules governing the interaction and reciprocal transformation of elementary particles of superhigh energy. The existing theory, especially the relativistic quantum theory, cannot satisfy scientists in their penetration into microcosmos. A new theory must be established, by which not only the newly discovered phenomena can be explained, but which also includes all rules that had been found earlier and are regarded as universal. The author discusses Heisenberg's treatment of this problem and the concept of elementary length as a new fundamental constant. In dealing with the present problem, the author mentions, among others, M. A. Markov, Corresponding Member of the Akademiya nauk SSSR (Academy of Sciences USSR). The third subject of the present article are some biophysical problems. The author underlines the double importance of physics in the field of biology. Above all, the new physical investigation- and observation methods are concerned. The characteristics of paramagnetic resonance which were discovered by the Soviet scientist L. A. Blyumenfel'd two years ago seem to be especially promising. Paramagnetic resonance was also discovered by a Soviet physicist, Ye. K. Zavoyskiy. Furthermore, the author says that the physical methods of theoretically analyzing atomic and molecular processes and the methods of

Card 2/3

Three Fascinating Physical Problems

S/029/60/000/008/001/004
B013/B067

determining the rules governing these processes are of great importance to biology. He explains his view of this subject by the example of desoxyribonucleic acid and its part played in genetics. There are 3 figures.

Card 3/3

S/030/60/000/010/001/018
B021/B058

AUTHOR: Tamm, I. Ye., Academician

TITLE: Present State of the Problem of Elementary Particles 19

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No. 10, pp. 10-22

TEXT: This paper is a description of the problem of the elementary particles for persons not specialized in the field of nuclear physics, but in other fields of science. The number of elementary particles has risen to 30 so far, no strict criterium existing for them as yet. Each elementary particle is characterized by a certain rest mass, charge and a spin. In a recently published paper, M. A. Markov reported on the complexity of the problem of the elementary particles which is closely connected with the essential difficulties of the contemporary quantum theory. The author states that we are at the eve of a new development stage of physics. The following three types of interaction of elementary particles are known at present: strong, electromagnetic effects and so-called weak and decay effects, respectively (Table 1), which are subordinated to some strict theorems of the conservation of energy, the momentum and moment, as well

Card 1/3

as of the electric and nuclear charge (Table 2). The theorem of combined inversion has not yet been checked experimentally. The approximate theorems of conservation are mentioned in Table 3. P. A. M. Dirac was the first to anticipate the theorem of particles and antiparticles. The antiparticles of nearly all elementary particles are known at present, with the exception of the photon and the neutral pion. The hypothesis by L. D. Landau on combined inversion is also mentioned. The determination of general principles is described as being one of the main problems of the physics of elementary particles. Many experiments were conducted in this direction. The author confined himself to studying the experiment by Werner Heisenberg. The papers by L. I. Mandel'shtam and I. S. Shapiro are mentioned in connection with other trends of searching a new theory. Finally, the author reports on the study of the spectral representations and dispersion relations, the trend in theoretical physics predominant at present. The author assumes that before long it will be possible to coordinate the physics of elementary particles with energies of up to one billion ev. The opinions on the prospects of the dispersion theory differ. In conclusion, the author states that he briefly described

Present State of the Problem of Elementary Particles

S/030/60/000/010/001/018
B021/B058

the fundamental problems of the theory of the elementary particles. At present it is impossible to predict when they will be solved. There are 6 tables and 1 Soviet reference.

Card 3/3

TAMM, I.E.; ABONYI, Ivan [translator]

Physics of high-energy particles. Fiz szemle 10 no.5:148-149 My '60.

85569

H/016/60/000/011/001/003
B009/B057

24.2120 (1502, 1482, 1395)

AUTHOR: Tamm, I. Ye. (Nobel Prize Winner 1958)

TITLE: General Plasma-physical Aspects of the Radiation of Systems Moving at a Velocity Higher Than the Velocity of Light

PERIODICAL: Fizikai Szemle, 1960, Vol. 10, No. 11, pp. 323-328

TEXT: The author's purpose is to outline the mechanism of radiation emitted in movement at a velocity exceeding that of light and to point out its applications in new, interesting chapters of physics. The article is the text of a Nobel lecture delivered in 1958. Start is made from the aerodynamical relation: $v > c'(\omega)$, where v is the constant velocity of the system and $c'(\omega)$ is the propagation rate of waves of ω frequency in the system. The well defined angle at which these waves are emitted in relation to the direction of motion of the system is given by the formula: $\cos \vartheta = c'(\omega)/v$. From optical considerations the author deduces the relation: $\Delta U = - \varepsilon((1-v \cos\vartheta)/v)$ of much more general validity, which may be helpful in aerodynamics dealing with supersonic motion. In the following, the author points out how this general theory may be applied

Card 1/3

85569

General Plasma-physical Aspects of the Radiation of Systems Moving at a Velocity Higher Than the Velocity of Light

H/016/60/000/011/001/003
B009/B057

in plasma physics. The mathematics of the energy loss of electrical particles moving in matter at high velocity has been elaborated by the author and by I. M. Frank. E. Fermi applied this theory to the determination of the total loss of the particle. These losses form two groups: losses caused by close impact and coherent losses. In plasma of very high temperature, the latter prevail. Analyzing the mechanism of absorption of plasma waves, the author arrives at the conclusion that the relation selecting the plasma electrons taking part in the absorption process is identical with the basic relation of radiation : $v \cos \varphi = c'$. In 1946 L. Landau defined theoretically the damping coefficient of the plasma (γ) perfectly in harmony with the author's explanation of the absorption mechanism. V. Ye. Ginzburg and V. V. Zheleznyakov applied this theory to radioactive solar radiation. The author finally treats the problem of heating the plasma in thermonuclear reactions. Two proposals have recently been made in this line: Heating the plasma is possible first by fast charged particles injected from the outside also when the temperature of the plasma is high and its density is low. The author is of the opinion that the bundle of particles heating the plasma may also move on its

Card 2/3

85569

General Plasma-physical Aspects of the Radiation of Systems Moving at a Velocity Higher Than the Velocity of Light

H/016/60/000/011/001/003
B009/B057

outside, parallel to its surface. Another method was suggested in 1958 by Morozov: heating by magnetoacoustic waves generated by electric current in circular motion. This is a special case of Cherenkov radiation.[19] Another possibility of application of Cherenkov radiation in plasma physics is for the stabilization of the current induced in the plasma. The author has no definite opinion on these problems. His purpose is only to point to the manifold possibilities of application of the theory outlined in this paper. There are 15 references: 10 Soviet, 3 US, 1 German, and 1 Hungarian.

Card 3/3

Tamm, I Ye. . .

AUTHORS: Lebedev, N., Smorodinskiy, Ya., Tyapkin, A. B/053/60/070/02/009/016 B006/B007

TITLE: The Physics of Elementary Particles

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol 70, Nr 2, pp 361-374 (USSR)

ABSTRACT: The authors give a report on the International Conference on High Energy Physics held at Kiyev in July 1959.

D. I. Blokhintsev and I. Ye. Tamm. Two of the seven holders of the Nobel Prize represented were Russians: I. Ye. Tamm and P. A. Cherenkov. Apart from the surveying lectures seminars were held, in which the following Russian lecturers spoke: I. Ye. Tamm on "Diagram Technique and Field Theory", D. D. Ivanenko on the "Nonlinear Field- and Gravitation Theory", V. P. Dzhelepov on "Nucleon-Nucleon Collisions", and L. V. Chuvilo on "Bubble Chambers". The plenary sessions began on July 20. In the first session Bernardini (CERN) spoke. His scientific secretaries were A. Baldin and A. Belousov (Moscow). The report on the lecture mentions the data obtained at the Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev AS USSR) on the "Polarizability of Protons in (γp)-Collisions". B. Pontekorvo (Dubna) delivered a lecture, which is discussed here in detail, on "Pion Scattering by Nucleons and Production of Single Pions in Nucleon-Nucleon and Pion-Nucleon Interactions". Next, V. I. Veksler (Dubna) spoke about "Nucleon-Nucleon and Pion-Nucleon Interactions in the 1.5 - 10 Bev Range".

TAMM, I. Ye.[Tamm, I. IE.]

Problems concerning elementary particles. Des. such. fiz. no.6: 81-93 '62. (MIRA 16:1)

(Particles(Nuclear physics))

TAMM, I.Ye.

Electrodynamic interaction of electrons in accelerators. Trudy Fiz.inst. 18:3-31 '62. (MIRA 15:12)
(Electrons) (Particle accelerators)

TAMM, I.Ye., akademik; ABRIKOSOV, A.A., doktor fiz.-matem.nauk;
KHALATNIKOV, I.M., doktor fiz.-matem.nauk

Nobel prize winner for 1962. Vest.AN SSSR 32 no.12:63-67 D '62.
(MIRA 15:12)

(Landau, Lev Davidovich, 1908-)

TAMM, I.Ye.

IAkov Il'ich Frenkel'. Usp.fiz.nauk 76 no.3:397-430 Mr '62. (MIRA 15:4)

(Frenkel', IAkov Il'ich, 1894-1952)

TAMM, I.Ye., akademik

Niels Bohr and present-day physics; in memory of a great scientist. Priroda 51 [i.e. 52] no.5:44-51 '63.
(MIRA 16:6)
(Bohr, Niels Henrick David, 1885-1962)

TAMM, I.Ye.

Niels Bohr, eminent physicist of the 20th century. Usp. fiz. nauk 80 no.2:191-195 Je '63. (MIRA 16:9)
(Bohr, Niels Henrick David, 1885-1962)

AMBARTSUMYAN, V.A., akademik; ASRATYAN, E.A.; BOGOLYUBOV, N.N., akademik; VINOGRADOV, A.P., akademik; GINETSINSKIY, A.G.; KNUNYANTS, I.L., akademik; KOCHETKOV, N.K.; KURSANOV, A.L., akademik; MEL'NIKOV, O.A.; NESMEYANOV, A.N., akademik; NESMEYANOV, An.N., doktor khim. nauk; OBREIMOV, I.V., akademik; POLIVANOV, M.K., kand.fiz.-mat.nauk; REUTOV,O.A.; RYZHKOV, V.L.; SPITSIN, V.I., akademik; TAMM, I.Ye., akademik; FESENKOV, V.G., akademik; FOK, V.A., akademik; SHCHERBAKOV, D.I., akademik; FRANK, I.M.; FRANK, G.M.; KHOKHLOV, A.S., doktor khim. nauk; SHEMYAKIN, M.M., akademik; ENGEL'GARDT, V.A., akademik; SHAPOSHNIKOV, V.N., akademik; BOYARSKIY,V.A.; LIKHTENSHTEYN, Ye.S.; VYAZEMTSEVA, V.N., red.izd-va; KLYAYS, Ye.M., red.izd-va; TARASENKO, V.M., red.izd-va; POLYAKOVA, T.V., tekhn. red.

[As seen by a scientis: From the Earth to galaxies, To the atomic nucleus, From the atom to the molecule, From the molecule to the organism] Glazami uchenogo: Ot Zemli do galaktik, K iadru atoma domolekuly, Ot molekuly do organizma. Moskva, Izd-vo AN SSSR, 1963. 736 p. (MIRA 16:12)

1. Akademiya nauk SSSR. 2. Chlen-korrespondent AN SSSR (for Asratyan, Ginetsinskiy, Kochetkov, Mel'nikov, Reutov, Ryzhkov, Frank,I.M., Frank, G.M.)

(Astronomy) (Nuclear physics) (Chemistry) (Biology)

KUZNETSOV, B.G., prof.; POMERANCHUK, I.Ya., akademk; SMORODINSKIY, Ya.A., prof.; TAMM, I.Ye., akademik; SHAPIRO, I.S., prof.; CHERNOV, A.G.; FAYNBOYM, I.B., red.

[Problems in the theory of elementary particles; fourth talk] Problemy teorii elementarnykh chastits, beseda chetvertaia. V besede uchastvuiut: B.G. Kuznetsov i dr. Moskva, Izd-vo "Znanie," 1964. 24 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika, matematika, astronomiia, no.20)
(MIRA 17:10)

BRAUNSHTEYN, A.Ye., akademik, otv. red.; BAYEV, A.A., zam. otv. red.; NESMEYANOV, A.N., akademik, red.; TAMM, I.Ye., akademik, red.; VENKSTERN, T.V., zam. otv. red.

[Molecular biology; problems and perspectives. On the 70th birthday of Academician V.A.Engel'gardt] Molekuliarnaia biologiia; problemy i perspektivy. K 70-letiiu so dnia rozhdeniia akademika V.A.Engel'gardta. Moskva, Nauka, 1964. 342 p. (MIRA 18:1)

1. Akademiya nauk SSSR. Institut radiatsionnoy i fiziko-khimicheskoy biologii.