32140
S/534/61/000/021/004/005
D055/D114

Geomagnetic phenomena ...

hours. They resembled a magnetic storm in that they occurred in three stages: in the initial phase the field grows, in the main phase it diminishes and then come the after-effects. But the scale and duration of all three phases was less than in magnetic storms. During the same time at the Sverdlovsk, Pavlovsk and Tbilisi magnetic observatories the field remained quiet. The author regards these results as an indication that the variations in the magnetic field were caused by the explosion of the Tunguska meteorite. It may be assumed that the passage through the ionosphere of a shock-wave caused by the explosion, gave rise to the increase in tension of the geomagnetic field. The time delay in these changes after the moment of explosion was equal to the time taken by the shock-wave to pass from the point of explosion to the lower boundary of the ionosphere. If the speed of the shock-wave is taken as $3.3 \cdot 10^4$ cm/sec, and the height of the lower boundary as 80 km, the time delay is $2.4 \cdot 10^2$ sec, which approximates to the figure determined from magnetograms - $1.4 \cdot 10^2$ sec. The author expresses thanks to Professor Yu.D. Kalinin, to V.I. Afanas'yeva and V.M. Mishin, Candidates of Physical and Mathematical Sciences, to G.V. Kuklin, a junior scientific associate of the East Siberian branch of the SOAN SSSR, to L.A. Shepkin,

Card 2/5

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619030011-0"

32140
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D055/D114

Geomagnetic phenomena ...

associate of the Kafedra radiofiziki Irkutskogo gosuniversiteta (Chair of Radiophysics of the Irkutsk State University), to A.V. Bukhnikivshvili, Director of the Institut geofiziki (Institute of Geophysics) of the AN Gruzinskaya SSR, to M.A. Belousova, scientific associate of the Institut zemnogo magnetizma Akademii nauk SSSR (Institute of Terrestrial Magnetism of the Academy of Sciences USSR), and to T.N. Panov, scientific associate of the Sverdlovsk Magnetic Observatory. There are 2 figures, 1 set of figures and 8 references, of which 4 are Soviet and 4 non-Soviet. The 4 English-language references are: T. Gold, Gas Dynamics of Cosmic Clouds. Edit. by H.C. van de Hulst, T.M. Burgers, Amsterdam, 1955; S.F. Singer, Trans. Amer. Geophys. Union, 38, 2, 1957; H.E. Petschek, Rev. Mod. Phys., 30, 1958, 966; H. Uyeda, H. Maeda, A. Kimpara, T. Obayashi, S. Ishikava, a. Y. Kawabata, J. Geomagn. and Geoelectr., 11, 42, 1959. [Abstracters note: Essentially verbatim translation].

Card 3/5

32140
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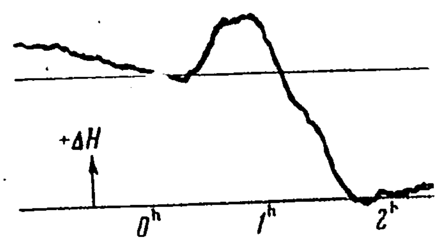
D055/D114

Geomagnetic phenomena ...

Fig. 1 Changes in the H component of the Earth's magnetic field observed at the Irkutsk Magnetic Observatory after the explosion of the Tunguska meteorite (GMT; marking correction for one hour 4.2 min).



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32140
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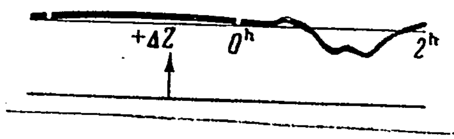
D055/D114

Geomagnetic phenomena ...

Fig. 2 Changes in the Z component of the Earth's magnetic field observed at the Irkutsk Magnetic Observatory after the explosion of the Tunguska meteorite (GMT; no correction).



Card 5/5

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619030011-0"

IVANOV, K.G.

Morphological patterns of sudden onsets of magnetic storms. Geomag. i aer. 1 no.2:232-235 Mr-Ap '61. (MIRA 14:7)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Sibirskogo otdeleniya AN SSSR.
(Magnetic storms)

IVANOV, K.G.

Cause of subsequent changes in the magnetic field during the geomagnetic effect of the Tunguska meteorite. Geomag. i aer. 1 no.4:616-618 Jl-Ag '61. (MIRA 14:12)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Sibirskogo otdeleniya AN SSSR.
(Magnetism, Terrestrial)
(Podkamennaya Tunguska Valley--Meteorites)

42165

S/203/62/002/001/017/019
I023/I223

3.5??0
10.140

AUTHOR: Ivanov, K.G.

TITLE: Geomagnetic effects of explosions in the lower atmosphere

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 153-160

TEXT: Results on the geomagnetic effects in the lower atmosphere (beneath 80km), published during 1959-60, are presented. It is assumed that the initial variation of the geomagnetic field caused by the explosion near the Christmas island (April 28, 1958) is induced by the passage of a shock wave through the ionosphere. The shock wave is produced by the explosion. The shock waves of the explosions near the Johnston island (August 1, 1958, August 12, 1958) increased the geomagnetic field by passing through the F-region of the ionosphere. The time lag of the variation behind the explosion near the Christmas island is equal to the time it takes the shock wave to reach the E-layer from the explosion place ($\sim 10^6$cm above ground). The propagation velocity of the shock wave

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APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619030011-0"

S/203/62/002/001/017/019
I023/I223

Geomagnetic effects...

is assumed to be ~ $3.3 \times 10^4 \frac{cm}{sec}$. The time it took for the shock wave to travel from the explosions near the Johnston island to the height of 200 to 300 km was estimated by using formulas of points explosion in a non-homogeneous atmosphere. The calculated times are 1-2 min. for the explosion of August 1, 1958, and 2-9 min. for the explosion of August 12, 1958. The measured delays are 2 and ~5 min. correspondingly. There are 3 tables and 1 figure.

ASSOCIATION: Institut zemnogo magnetizma, ionsfery, i rasprostraneniya radiovolu SO Akademii nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere and Radiowave Propagation S), Academy of Sciences, USSR)

SUBMITTED: December 5, 1961

Card 2/2

42141

S/203/62/002/002/017/017
I046/I246

3,9120 (4603,7705,4809)

AUTHOR: Ivanov, K.G.

TITLE: The effect of the electric currents induced in the earth on the form and size of midnight sudden magnetic storm commencements (SSC)

PERIODICAL: Geomagnetizm i aerologiya, v.2, no. 2, 1962, 367-368

TEXT: The magnetic field of the electric currents induced by SSC in the earth intensifies the near-midnight SSC by ~30%, and the relaxation of these currents is thus responsible for the ~30% drop in the SSC amplitude within 6 to 10 minutes after the magnetogram maximum. The most important English-language reference reads: S. Chapman, V.C.A. Ferraro, Terr. Magn. and Atmos. Electr., 36, 77, 1931.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln SO AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Propagation of Radiowaves of the SO AS USSR)

SUBMITTED: December 5, 1961

Card 1/1

IVANOV, K.G.

Diurnal variation of the frequency of sudden commencements in geomagnetism. Geomag. i aer. 2 no.3:573-574 My-Je '62. (MIRA 15:11)

(Magnetic storms)

ACCESSION NR: AT4035839 S/2534/64/000/024/0141/0151

AUTHOR: Ivanov, K. G.

TITLE: Geomagnetic effect due to the Tunguska meteorite

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, no. 24, 1964. Trudy*, Desyatoy Meteoritnoy konferentsii v Leningrade 29 maya - 1 iyunya 1962 g., 141-151

TOPIC TAGS: meteorite, meteorite explosion, geomagnetic field, shock wave, magnetohydrodynamics, ionosphere, E-layer, Tunguska meteorite

ABSTRACT: The variation in the geomagnetic intensity due to the impact of the Tunguska meteorite, which fell in the Tungus region of Siberia on 30 June 1908, is considered. The interaction of the shock wave generated by the explosion with the geomagnetic field caused the H-component of the latter to vary 2.3 min later. The magnitude, form, and duration of such variations are similar in nature to the geomagnetic effects caused by nuclear explosions. Using the method of

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ACCESSION NR: AT4035839

successive approximations it was found that the explosion occurred at 0016.9 GMT on 30 June 1908, at about 6—9 km above ground. The explosion liberated approximately 10^{23} ergs of energy and created, in the E-layer of the ionosphere, a region with a locally increased conductivity. The life of such a region and its effect on the geomagnetic field are considered important. The author thanks Yu. D. Kalinin and V. I. Afanas'yev for their help. Orig. art. has: 6 figures and 5 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 28May64 ENCL: 00

SUB CODE: AS NO REF SOV: 026 OTHER: 009

Card 2/2

42013
S/203/62/002/005/009/010
I046/I246

AUTHOR: Ivanov, K.G.

TITLE: The effect of the local conductivity enhancement in the ionospheric E-layer on the S_q-variation of the geomagnetic field

PERIODICAL: Geomagnetizm i aeronomiya, v.2, no.5, 1962, 943-948

TEXT: The effect of the local conductivity enhancement in the E-layer (produced by nuclear explosions in the lower atmosphere or penetration of meteorites) on S_q-currents and on the geomagnetic S_q-variation is calculated from Maxwell's equations for steady current by methods developed in Ref.9 (T.Nagata, T.Rikitake, J.Yokoyama. Rept.Ionosphere Res.Japan, 1955, 9, 121-135). Numerical solution is given for the additional currents produced by a circular region 1000 km in radius with a 100% conductivity enhancement at the center, a parabolic decrease to the initial conductivity level at the boundary, and an undisturbed S_q-current density of $\sim 1.5 \cdot 10^{-4}$ CGSM per 1 cm of meridional length. The S_q-variation of the X-

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component gains in intensity at points situated below the enhanced-conductivity region and grows weaker at all other points. The S_q-variation of the Z-component is enhanced by the southern current vortex, and weakened by the northern vortex. The additional-current intensity flowing through the region should constitute ~7000 A, i.e., ~30% of the undisturbed S_q-current intensity. The resulting X-component at the point below the center of the region is -3.5 γ. When the conductivity increases at the center by 300%, the variation of the X-component of the magnetic field produced by the additional current that flows along the meridian passing under the center of the region and of the Y-component along the parallel passing through the focus of the southern current vortex is 10.5 and 6 γ respectively. There are 2 figures.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprosstraneniya voln SO AN SSSR (Institute of the Terrestrial Magnetism, the Ionosphere and Propagation of Radiowaves SB AS USSR)

SUBMITTED: March 23, 1962

IVANOV, K.G.

Height of the explosion of the Tunguska meteorite. Astron.zhur. 40 no.2:329-331 Mr-Ap '63. (MIRA 16:3)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

(Podkamennaya Tunguska Valley--Meteorites)

IVANOV, K.G.

Geomagnetic effect of the Tunguska fall. Meteoritika no.24:141-151 '64. (MIRA 17:5)

ACCESSION NR: AP4031639 S/0203/64/004/002/0342/0346

AUTHOR: Ivanov, K. G.

TITLE: Movement of shock waves in outer space near the earth

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 342-346

TOPIC TAGS: shock wave, outer space, corpuscular stream, magnetic storm, geomagnetic field

ABSTRACT: This study stems from the growing accumulation of data, experimental and theoretical, showing that shock waves arise during movements of corpuscular streams in outer space, and from a desire to relate these data to the theory concerning advance of shock waves into the earth's magnetic field. The author has computed the movement of a 1-dimensional plane shock wave by means of infinitely small discrete increments as it encounters an inhomogeneous magnetic field parallel to the shock front. He has found that the field strength decreases in proportion to the cube of the distance from the source in a direction perpendicular to the wave front. The results of these computations were used to determine the properties of

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ACCESSION NR: AP4031639

shock waves as they give rise to sudden onsets of magnetic storms. It was found that the amplitude of the shock wave in the magnetic field of the earth decreases from its initial value at a distance of about 15 radii to a value of Z = 2 at a distance of about 7-9 radii, depending on the initial amplitude. The velocity of the shock wave also declines and at a distance of about 7-9 radii becomes similar to the velocity of the small magnetic disturbances. The generation of shock waves practically ceases here. The magnetic field strength at the front of the shock wave depends on the value of the initial amplitude, and its greatest value, 60-160 gamma, is observed at distances of 7-9 radii from the center of the earth. "In conclusion, the author considers it his duty to thank Yu. D. Kalinin for his interest in the work and for his suggestions." Orig. art. has: 3 figures and 19 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln SO AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere, and Propagation of Radio Waves SO AN SSSR)

SUBMITTED: 09Sep63 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: ES NO REF SOV: 003 OTHER: 008

Card 2/2

IVANOV, K.G.

Interpretation of observations of the sudden onset of magnetic storms in outer space. Geomag. i aer. 5 no.3:471-476 My-Je '65. (MIRA 18:5)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

L 14191-66 EWT(1)/EWA(d) GW

ACC NR: AP6002763 SOURCE CODE: UR/0203/65/005/006/1119/1120

AUTHOR: Ivanov, K. G.

38
B

ORG: Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation AN SSSR (Institut zemnogo magnetizma, ionosfery i rasprotraneniya radiovoln)

TITLE: Time of explosion of the Tungus meteorite and delay of the geomagnetic effect

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 6, 1965, 1119-1120

TOPIC TAGS: geomagnetism, ionosphere, meteorite

ABSTRACT: Two formulas are given for calculating the time of explosion of the Tungus meteorite:

$$t = t_Q - \frac{S}{v_Q} - \Delta, \quad (1)$$

$$t = t_R - \frac{S}{v_R} - \Delta, \quad (2)$$

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UDC: 523.5

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L 14191-66

ACC NR: AP6002763

where t_Q and t_R are the times of arrival for the Love and Rayleigh waves respectively; v_Q and v_R are the velocities of these waves; s is the distance from the epicenter to Irkutsk; Δ is the correction for an explosion in the air which is equal to the path of the shock wave from the point of explosion to the surface of the earth at the epicenter of the explosion (0.1-0.3 minutes). The most reliable data give a value of (0 h. 15.2 m.±0.2 m.) UT. The time for delay of the beginning of the geomagnetic effect from the Tungus meteorite with respect to the moment of explosion is calculated at (4.8 m.±0.2 m.). It is assumed that the time of delay is equal to the time for the shock wave to pass from the point of explosion to the ionosphere. A wave propagating with a velocity of 330 m/sec covers a distance of ~95 km in 4.8 minutes, which is extremely close to the altitudes of the conductive layer of the ionosphere. Orig. art. has: 1 figure, 2 formulas.

SUB CODE: 08/ SUBM DATE: 07Jan65/ ORIG REF: 008/ OTH REF: 003

ACC NR: AP6011691 SOURCE CODE: UR/0203/66/006/002/0190/0196

AUTHOR: Ivanov, K. G.

ORG: Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR)

TITLE: Solar plasma streams observed by Mariner II as free rotating jets

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 2, 1966, 190-196

TOPIC TAGS: corpuscular stream, interplanetary matter, central meridian, calcium flocculus, magnetic storm, asymmetry coefficient

ABSTRACT: Corpuscular streams of solar plasma emitted by active centers are turbulent because of their interaction with interplanetary matter. Measurements which the cosmic rocket Mariner II obtained during the period from 2 September to 16 October 1962 showed cyclic changes in plasma velocity. The velocity increased gradually, attained its maximum, and then gradually decreased. These measurements were obtained when Mariner II passed streams in interplanetary space. Each stream measured by Mariner II coincided with the passage of an active solar

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UDC: 523.877.629.192.2

[illegible] through the central meridian. These active centers were rich in
calcium flocculi, which are sources of magnetic storms. A supplementary
analysis showed that each passage through a stream of plasma coincided
with the position of calcium flocculi in the central [illegible]
width of the plasma [illegible] determined from data of Mariner II.
It was found to be from 0.3 to 1.0 AU at the distance of Mariner II.
Analysis of plasma velocity graphs shows that the structure of the
plasma stream is asymmetric with respect to its axis. The density of
the stream varies, causing the location of its axis to change. In four
of nine cases the plasma streams caused magnetic storms with sudden commencement and in four other cases, storms with gradual commencement.
The remaining case showed weak perturbances. Storms with sudden commencement have maximum field intensity during the first part of the
stream, and the coefficient of asymmetry is also great. Magnetic storms
occur when the earth is located in the first part of the stream and when
the source of the stream is a group of bipolar sunspots. The author
thanks Yu. D. Kalinin. Orig. art. has: 1 table, 3 figures and 12 formulas.
[EC]

Card 2/2

ACC NR: AP6032685 SOURCE CODE: UR/0203/66/006/005/0822/0826

AUTHOR: Ivanov, K. G.; Shevnin, A. D.

ORG: Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR (Institut zemnogo magnetizma, ionosfery, i rasprostraneniya radiovoln AN SSSR)

TITLE: Geomagnetic phenomena observed during the passage of the earth through the tail of Halley's comet in 1910

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 5, 1966, 822-826

TOPIC TAGS: comet tail, comet head, ~~lower conjunction~~, geomagnetic disturbance, solar wind, plasma shock wave, ~~Mach-angle magnetic sound wave~~, ~~particle concentration~~, ~~Halley comet~~ comet, earth magnetism, ionized plasma

ABSTRACT: On 18—19 May 1910, the earth passed through the tail of Halley's Comet. At that time the comet was in the lower conjunction with the sun, and its distance from the earth was approximately 24 million km. The tail's length exceeded that distance. The orbital velocity of the comet was 45 km/sec, and the orbital velocity of the earth counter to the comet's head was 30 km/sec at an angle of 30°. The computed velocity of the tail at the earth's orbit was 80 km/sec. In one hr the earth travelled 300,000 km in the comet's tail. Magnetic disturbances were observed at the moment of passage. Magnetograms of

 UDC: 550.385:523.6

ACC NR: AP6032685

the time of passage of seven geomagentic observatories at various geographical latitudes and longitudes were repeatedly studied. Irregular oscillations of the magnetic field were recorded by all observatories. The amplitude and duration of variations differ at individual observatories. The distribution of disturbances concerned with the passage of the comet through the solar disk is asymmetric. The comet had a type-I main tail and a type-II secondary tail. The main tail consisted of highly conductive plasma, which was streamlined by the solar wind as a solid body. The interaction between the solar wind and the comet substance created a shock wave whose frontal surface enclosed the comet with its tail. Turbulent motions within this surface were transferred into the magnetohydrodynamic trace. The asymptotic position of the shock front at large distances from the streamlined body is determined by the Mach angle, which depends upon the velocity of the magnetic sound waves within the solar wind. The Mach angle was determined to be between 9°41' and 13°. The tail plasma of the comet consisted of ions of carbon dioxide and electrons. The concentration of particles in the tail decreased in proportion to the square of the distance from the head. At the distance of the earth the plasma density was able to produce only slight magnetic disturbances. The authors thank V. N. Bobrov, M. Burgod, Z. A. V'yukhina, N. A. Katsiashvili, and K. L. Svendson for submitting magnetograms and L. S. Banukhin, B. A. Vorontsov-Vel'yeminov,

Card 2/3

ACC NR: AP6032685

S. K. Vsekhsvyatskiy, and Yu. O. Kalinin for their interest and discussions of the problem. Orig. art. has: 1 table, 2 figures and 4 formulas.

SUB CODE: 03,08,20/ SUBM DATE: 15May65/ ORIG REF: 008/ OTH REF: 013

Card 3/3

L 23045-66 EWT(1)/ETC(f)/EPF(n)-2/EWG(m)/FCC/EWA(h) IJP(c) AT/GW

ACC NR: AP6011691 SOURCE CODE: UR/0203/66/006/002/0190/0196

AUTHOR: Ivanov, K. G.

ORG: Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radio Waves, AN SSSR (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR)

TITLE: Solar plasma streams observed by Mariner II as free rotating jets

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 2, 1966, 190-196

TOPIC TAGS: corpuscular stream, interplanetary matter, central meridian, calcium flocculus, magnetic storm, asymmetry coefficient

ABSTRACT: Corpuscular streams of solar plasma emitted by active centers are turbulent because of their interaction with interplanetary matter. Measurements which the cosmic rocket Mariner II obtained during the period from 2 September to 16 October 1962 showed cyclic changes in plasma velocity. The velocity increased gradually, attained its maximum, and then gradually decreased. These measurements were obtained when Mariner II passed streams in interplanetary space. Each stream measured by Mariner II coincided with the passage of an active solar

Card 1/2 UDC: 523.877.629.192.2

L 23043-66

ACC NR: AP6011691

center through the central meridian. These active centers were rich in calcium flocculi, which are sources of magnetic storms. A supplementary analysis showed that each passage through a stream of plasma coincided with the position of calcium flocculi in the central meridian. The width of the plasma streams may be determined from data of Mariner II. It was found to be from 0.3 to 1.0 AU at the distance of Mariner II. Analysis of plasma velocity graphs shows that the structure of the plasma stream is asymmetric with respect to its axis. The density of the stream varies, causing the location of its axis to change. In four of nine cases the plasma streams caused magnetic storms with sudden commencement and in four other cases, storms with gradual commencement. The remaining case showed weak perturbances. Storms with sudden commencement have maximum field intensity during the first part of the stream, and the coefficient of asymmetry is also great. Magnetic storms occur when the earth is located in the first part of the stream and when the source of the stream is a group of bipolar sunspots. The author thanks Yu. D. Kalinin. Orig. art. has: 1 table, 3 figures and 12 formulas. [EG]

SUB CODE: 04/ SUBM DATE: 22Feb65/ ORIG REF: 011/ OTH REF: 011

ATD PRESS: 4234

Card 2/2

IVANOV, Krasarm Ivanovich; KRYUCHKOV, Vladimir Aleksandrovich; POGODIN, L.Ye., red.

[Realized dreams; on the 20th anniversary of the liberation of Hungary] Voploshchennye mechty; k 20-letiiu osvobozhdeniia Vengrii. Moskva, Znanie, 1965. 38 p. (Novoe v zhizni, nauke, tekhnike. VII Seriia: Mezhdunarodnaia, no.6) (MIRA 18:4)

IVANOV, K.I., inzh.; LEYBOSHIN, R.A., inzh.; SHIFRIN, D.Ya., inzh.

Passenger ship for the Caspian Sea. Sudostroenie 26 no.9:1-5 S'60. (MIRA 13:10)

(Inland water transportation--Passenger traffic)
(Caspian Sea--Ships)

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