ISAKOV, I.S., prof., admiral flota v otstavke, otv.red.; SHULEYKIN, V.V., akademik, inzh.-kapitan 1 ranga, zamestitel' otv.red. po II tomu; DEMIN, L.A., dotsent, kand.geograf.nauk, inzh.-kapitan 1 ranga, glavnyy red.; ABAN'KIN, P.S., admiral, red.; VIZE, V.Yu., red.; GERASIMOV, I.P., red.; GLINKOV, Ye.G., inzh.-kontr-admiral, red.; DROZDOV, O.A., prof., doktor geograf.nauk, red.; ZOZULYA, F.V., vitse-admiral, red.; PAVLOVSKIY, Ye.N., akademik, general-leytenant meditsinskoy sluzhby, red.; POGOSYAN, Kh.P., prof., doktor geograf.nauk, red.; RUDOVITS, L.F., doktor geograf.nauk, red.; SKORODUMOV, L.A., kontr-admiral, red.; SHIRSHOV, P.P., akademik, red. [deceased]; BASHILOV, G.Ya., inzh.-kapitan 2 ranga, uchenyy sekretar'; SEREGIN, M.P., kapitan 1 ranga, red.kart; RYABCHIKOV, S.T., podpolkovnik, red.kart; YEGOR'YEVA, A.V., kand.geograf.nauk, red.kart; AVER'YANOVA, P.S., kand.geograf.nauk, red.kart; BUGORKOVA, O.S., red.kart; GAPONOVA, A.A., red.kart; DMITRIYEVA, T.V., red.kart; DOTSENKO, Ye.I., red.kart; KONYUKOVA, L.G., red.kart; KOMOLOVA, Ye.N., red.kart; LUKANOVA, L.S., red.kart; SMIRNOVA, V.G., kand.geograf.nauk, red.kart; CHECHULINA, Ye.P., red.kart; SHKOL'NIKOV, A.M., red.kart; GRIN'KO, A.M., tekhn.red.; IVANOVA, M.A., tekhn.red.; MOROZOVA, A.F., tekhn.red.

[Marine atlas] Morskoi atlas. Otv.red.I.S.Isakov. Glav.red. L.A. Demin. Izd. Morskogo general'nogo shtaba. Vol.2 [Physical geography] Fiziko-geograficheskii. Zamestitel' otv.red. po II tomu V.V. Shuleikin. 1953. 76 maps. (MIRA 12:1)

1. Russia (1923- U.S.S.R.) Voyenno-morskoye ministerstvo. 2. Chlen-korrespondent Akademii nauk SSSR (for Vize, Gerasimov).
(Ocean--Maps) (Harbors--Maps)

SHULEIKIN, V. V.

RT-1331 [Destruction of waves on a shoal] Pages 75-76 of : V otdelenii fiziko-matematicheskikh nauk.
Vestnik Akademii Nauk SSSR, 23(12): 75-77, 1953.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001550130001-5"

DMITRIYEV, A.A.; SHULEYKIN, V.V., akademik.

Passage of long waves through an obstacle with partial reflection and given reflection coefficient. Dokl.AN SSSR 90 no.4:509-512 Je '53. (MLRA 6:5)

1. Akademiya Nauk SSSR (for Shuleykin). (Waves)

SHULEYKIN, V.V.

DMITRIYEV, A.A.; BONCHKOVSKAYA, T.V.; SHULEYKIN, V.V., akademik.

Concerning wave turbulence. Dokl. AN SSSR 91 no.1:31-33 Jl '53. (MLRA 6:6)

1. Akademiya nauk SSSR (for Shuleykin). (Turbulence)

LINEYKIN, P.S., SHULEYKIN, V.V., akademik.

Distribution of salinity in shallow sea water. Dokl. AN SSSR 91 no.1:71-73 Jl '53. (MLRA 6:6)

1. Akademiya nauk SSSR (for Shuleykin). 2. Gosudarstvenny okeanograficheskiy institut. (Sea water)

BIBIKOV, D.N.; SHULEYKIN, V.V., akademik.

On the problem of ice conditions in non-completely freezing water currents. Dokl.AN SSSR 91 no.4:799-801 Ag '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Shuleykin).
(Ice on rivers, lakes, etc.)

SHULEYKIN, V. V. 11 Aug 53

USSR/Geophysics - Wind Energy

"How the Energy of a Wind is Transfered to a Wave," Acad V. V. Shuleykin, Marine Hydrophys Inst. Acad Sci USSR

DAN SSSR, Vol 91, No 5, pp 1079-1082

Derives the formula for the energy $W_V$ transfered by a wind to a wave per unit surface of the sea in unit time; namely $W_V = \frac{n}{2}\cdot\frac{h}{T}\,\delta_a(V-c)^2$, where h is wave height, n a coefficient depending on steepness $h/\lambda$ of waves ($\lambda$ wave length), T the period of the waves, $\delta_a$ the density of air, V the velocity of the waves, c a constant. Also obtains an expression for the coefficient, eta, of utilization by man of wave energy (e.g. finds eta $\sim$ 9 to 54%). Presented 19 Apr 53.

266T75

KITKIN, P.A.; SHULEYKIN, V.V., akademik.

Effect of wind on the water mass in small inland basins. Dokl.AN SSSR 91 no.6:1325-1328 Ag '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Shuleykin). 2. Morskoy gidrofizicheskiy institut Akademii nauk SSSR. (Hydrodynamics) (Winds)

KOLESNIKOV, A.G.; SHULEYKIN, V.V., akademik.

Variations of water temperature in reservoirs in wintertime. Dokl.AN SSSR 92 no.1:37-40 S '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Shuleykin). 2. Morskiy gidrofizicheskiy institut Akademii nauk SSSR (for Kolesnikov). (Water) (Reservoirs)

~~Acad~~ V. V. Shuleykin

USSR/Geophysics - Waves 1 Sep 53

"A Hydrodynamic Picture of the Transfer of Energy From Wind to Wave," Acad V. V. Shuleykin, Marine Hydrophysics Inst Acad Sci USSR

DAN SSSR, Vol 92, No 1, pp 41-44

Explained in a previous work (DAN, Vol 91, No 5, 1953) how the energy of wind is transferred to a wave. Attempts here to obtain directly from the hydrodynamic eq the approx hypothetical relations which are confirmed in the previous work. Reveals some new, important facts. Presented 4 Jul 53.

274T60

[redacted]

KITKIN, P.A.; SHULEYKIN, V.V., akademik.

On the dynamics of sea and ocean currents. Dokl.AN SSSR 92 no.2:293-296 S '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Shuleykin). 2. Morskoy gidrofizicheskiy institut Akademii nauk SSSR (for Kitkin). (Ocean currents)

VOIT, S.S.; SHULEYKIN, V.V., akademik.

Transition of spherical sound waves from a moving medium into another medium moving at a different speed and having other characteristics. Dokl.AN SSSR 92 no.3:491-493 S '53. (MLRA 6:9)

1. Akademiya nauk SSSR (for Shuleykin). 2. Morskoy gidrofizicheskiy institut Akademii nauk SSSR (for Voit). (Fluid mechanics) (Sound waves)

SOKOLOV, A.A.; TERNOV, I.M.; SHULEYKIN, V.V., akademik.

Motion of fast electrons in the magnetic field. Dokl.AN SSSR 92 no.3:537-540 S '53. (MLRA 6:9)

1. Akademiya nauk SSSR (for Shuleykin). 2. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (for Sokolov and Ternov).
(Electrons) (Electromagnetism)

IVANENKO, D.; BRODSKIY, A.; SHULEYKIN, V.V., akademik.

Interaction of gravitation and the vacuum of particles. Dokl.AN SSSR 92 no.4:731-734 O '53. (MLRA 6:9)

1. Akademiya nauk SSSR (for Shuleykin). 2. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (for Ivanenko and Brodskiy). (Gravitation) (Mesons)

NOZDREV, V.; SHULEYKIN, V.V., akademik.

Investigation of the critical conditions of liquid - vapor systems by ultrasonic method. Dokl.AN SSSR 92 no.6:1145-1148 O '53. (MLRA 6:10)

1. Akademiya nauk SSSR (for Shuleykin). 2. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (for Nozdrev). (Critical point)

MAKSIMOV, I.V.; SHULEYKIN, V.V., akademik.

Secular changes of the 11-year cycle of solar activity. Dokl.AN SSSR 92 no.6:1149-1152 O '53. (MLRA 6:10)

1. Akademiya nauk SSSR (for Shuleykin). 2. Institut okeanologii Akademii nauk SSSR (for Maksimov). (Sun spots)

LAIKHTMAN, D.L.; YUDIN, M.I.; SHULEYKIN, V.V., akademik.

Transformation of the lowest layer of the air under the influence of the underlying surface. Dokl.AN SSSR 93 no.2:249-252 N '53. (MLRA 6:10)

1. Akademiya nauk SSSR (for Shuleykin). (Atmosphere)

SHULEYKIN, V.V.

4

551.556:532.593:551.465

5K-181

Shuleikin, V. V., Profil' i osnovnye parametry vetrovoi volny. [Profile and the basic parameters of wind waves.] Akademiia Nauk SSSR, Doklady, Moscow, 93(2):265-268, Nov. 11, 1953. 3 figs, 11 refs. DLC—The photographing and filming of waves made in an artificial storm basin permitted the author, not only to study in detail the wave's profile, but even to disclose definite regularities of its transformation. In this theoretical paper are derived the common equations of the curve set to which belong, not only the profiles of the investigated waves, but also of trochoids (as a particular case) which are peculiar to the profile of surge waves. *Subject Headings:* 1. Ocean wave theory 2. Ocean wave laboratory experiments.—*A.M.P.*

1

480

SHULEYKIN, V.V., akademik.

Wave destruction in shallow waters. Dokl.AN SSSR 93 no.3:463-466 N '53.
(MLRA 6:11)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR. (Tidal waves)

SHULEYKIN, V. V.

USSR/Geophysics - Shore wave action

Card 1/1

Author : Shuleykin, V. V.

Title : The breakup of waves under the action of shoals

Periodical : Izv. AN SSSR, Ser. geofiz. 1, 65-76, Jan/Feb 1954

Abstract : Investigate the distortion of the profile of waves which are propagated on shoals. Expresses a hypothesis concerning the dependence of the phase velocity upon the phase of the oscillations executed by the surface of the wave. This hypothesis proceeds from the equation of continuity as written in application to the case of the joint measurables: the depth of the sea and the amplitude of the waves. The hypothesis is suggested also by the data of the old investigations that take into consideration the appearance and development of the second overtone; its results agree well with immediate observations and experiences.

Institution : Marine Hydrophysics Institute, Academy of Sciences, USSR

Submitted : October 8, 1953

SHULEYKIN. V.V.

USSR/Geophysics - Book review

FD 389

Card 1/1

Author : Shuleykin, V. V., Academician

Title : Morskoy atlas, tom II - Fizikogeograficheskiy [Marine Atlas, Volume II - Physicogeographic], edited by Prof. Admiral I. S. Isakov and L. A. Demin, Docent, Cand. Geog. Sci., 1953

Periodical : Izv. AN SSSR, Ser. geofiz. 3, 299-301, May/Jun 1954

Abstract : Favorable review. The Atlas contains 4 divisions: A. Most important maritime voyage and expeditions (Russian and Soviet). B. Oceanography. C. Climate. D. Terrestrial magnetism, cartography, astronomy. Contains 75 plates.

Institution :

Submitted :

SHULEYKIN. V. V.

FD 398

USSR/Geophysics - Book review

Card 1/1

Author : Snezhinskiy, V. A., Engineer-Captain (1st rank), and Yegorov, N. I., Engineer-Captain (1st rank)

Title : Book review: V. V. Shuleykin, Fizika morya [Physics of the Sea], 3rd edition, supplemented, Acad Sci USSR Publishing House, 1953, 990 pp, 3,000 copies, 50 rubles

Periodical : Izv. AN SSSR, Ser. geofiz. 4. 378-380, Jul/Aug 1954

Abstract : Favorable review of 3rd edition. First edition appeared 20 years ago.

Institution : -

Submitted : -

SHULEYKIN, V. V.

USSR/Geophysics - Wind wave FD-759

Card 1/1 : Pub 44-7/11

Author : Shuleykin, V. V.

Title : Dynamics of wind waves and of dead surges

Periodical : Izv. AN SSSR, Ser. geofiz., No. 5, 451-481, Sep-Oct 1954

Abstract : Describes a new experimental method for investingating wind waves and dead surges in so-called storm basin - a circular basin of very large diameter in which are created wind waves of 10 meter wavelength and 1 meter height under the action of air currents up to 19 m/sec. The birth, growth, and damping of the waves are recorded photographically on a paper strip. Seven references, all USSR, including "Formation of sea waves by wind," P. L. Kapitsa, DAN SSSR, 64, No 4, 1949.

Institution : Marine Hydrophysics Institute, Acad. Sci. USSR

Submitted : June 11, 1954

Translation — No. 393, 22 Apr. 55

SHULEYKIN, V.V.

USSR/Scientists - Oceanographer

Card 1/1

Author : Shuleikin, V. V., Academician

Title : Stepan Osipovich Makarov, commemorating the 15th anniversary of his death.

Periodical : Nauka i Zhizn' 21/4, 37-38, April 1954

Abstract : Admiral Makarov was born January 8, 1849 and was famous as a naval leader and scientist. In the latter field he conducted experiments in hydrologics. Among other things he discovered that currents flow in both directions in the Bosporus - a surface current from the Black Sea and a depth current into the Black Sea. Photographs.

Institution : ....

Submitted : ....

SHULEYKIN, V.V.

**USSR.**

6.4-306

Obsuzhdenie vtorogo toma Morskogo Atlasa. [Evaluation of volume two of the Marine Atlas.] *Vsesoiusnoe Geograficheskoe Obshchestvo, Izvestiia*, 86(2):206-207, March/April 1954. 551.582.3(26) DLC—This is an account of a special meeting held by the Geographical Society of the U.S.S.R. to evaluate the second volume (physical geography) of the Marine Atlas edited by I. S. ISAKOV, V. V. SHULEIKIN and L. A. DEMIN. Vol. 2 contains 76 sheets, with 138 principal maps, 228 supplementary maps, 239 graphs and 24 pages of text. Its content by subject includes: The most important marine voyages and expeditions; Oceanography and Climate of the World Ocean. (For review of vol. 1, see 3.9-206, Sept. 1952, MAB.) *Subject Headings:* 1. Marine atlases 2. Oceanographic expeditions 3. Oceanography.—*I.L.D.*

SHULEYKIN, V.V., akademik.

Internal mechanism of wave formation caused by wind power. Dokl. AN SSSR 94 no.4:677-680 F '54. (MLRA 7:2)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR. (Wind power) (Waves)

SHULEYKIN, V.V.

2

532.593 : 551.465

4012. GROWTH OF LENGTH OF WAVES UNDER THE ACTION OF WIND. V.V.Shuleikin.

Dokl. Akad. Nauk SSSR, Vol. 94, No. 6, 1049-52 (1954). In Russian.

A relationship is derived for the time dependence of wavelength and height of sea-waves. An approximate solution of this equation is found. Experiments carried out in a pond show that this expression described well the growth of wavelength with time. Z.Krasucki

SHULEYKIN, V.V., akademik.

Origin of steady stagnant surges. Dokl.AN SSSR 95 no.3:509-512 Mr '54. (MLRA 7:3)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Wind power) (Waves)

SHULEYKIN, V.V., akademik.

Physical causes of wave crest tapering. Dokl.AN SSSR 95 no.5:987-990 Ap '54. (MLRA 7:4)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR. (Waves)

SHULEYKIN, V. V.

USSR/Geophysics - Kinematics

Card 1/1

Author : Shuleykin, V. V., Academician

Title : Kinematics of waves of maximum steepness

Periodical : Dokl. AN SSSR 95, 6, 1185 - 1188, 21 Apr 1954

Abstract : Analysis of conditions for formation of crests on waves of maximum steepness. Diagrams.

Institution : Marin Hydro-Phys. Inst. of the Acad. of Scs. of the USSR

Submitted : 12 Feb 1954

SHULEYKIN, V.V.

USSR

6.7-237 551.556:532.59

Shuleikin, V. V. Povedenie zybi pri vstrechnom vetre. [The behavior of swell during head wind.] *Akademiia Nauk SSSR, Doklady*, 97(4):655-657, Aug. 1, 1954. fig., 3 refs., 10 eqs. DLC—The author examines the law of diminution of the height of waves and how the lengths of waves behave under such circumstances. This mathematical treatment is based upon earlier work of the author on the internal mechanism of wind energy supply to waves, the law of increase in length of waves as a result of wind action and on the origin of stable swells. *Subject Headings:* 1. Wind waves 2. Ocean swell 3. Ocean wave generation. —*I.L.D.*

62

Shuleykin, V. V.

USSR/Geophysics - Hydrophysics

Card 1/1 Pub. 22 - 15/48

Authors : Shuleykin, V. V., Academician

Title : Development of waves from a windward shore to a leeward coast line over deep sea

Periodical : Dok. AN SSSR 98/3, 381-384, Sep 21, 1954

Abstract : Data regarding the actual physical meaning of the so-called wave momentum and the physical meaning of the scales, which are determined by the magnitude of wind velocity relative to the crests of the waves, are outlined. It was established that the wind actually affects not the geometrical profile of the sea-waves but the material particles moving along the orbits of the waves. The necessity of investigating the stream of energy transmitted by the material particles, in the direction of the moving waves, is explained. Eight USSR references (1947-1954). Graphs.

Institution : Academy of Sciences USSR, Sea Hydrophysics Institute

Submitted : July 10, 1954

Shuleykin, V. V.

USSR/Geophysics - Dynamic oceanography

Card 1/1 Pub. 22 - 16/47

Authors : Shuleykin, V. V., Academician

Title : The outflow of a swell from a stormy zone of a deep sea

Periodical : Dok. AN SSSR 99/1, 57 - 60, Nov 1, 1954

Abstract : The sea conditions with a calm zone adjacent to a stormy one are considered. The behavior of a sea swell under such conditions is analyzed and its dynamic states are given a mathematical interpretation from which a diagram is developed showing a relationship between the length and the height of a dead swell. Four USSR references (1947-1954). Graph.

Institution : Naval Hydrophysical Institute of the Acad. of Scs. of the USSR

Submitted : ...

SHULEYKIN, V. V.

SHULEYKIN, V.V., akademik.

Development of wind-produced waves on a shallow sea. Dokl.AN SSSR 104 no.2:215-218 S '55. (MLRA 9:2)

1.Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Waves)

SHULEYKIN, V.V., akademik.

Equations for wind-produced wave fields on shallow waters. Dokl. AN SSSR 104 no.3:397-400 S '55. (MLRA 9:2)

1.Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Waves)

VOYT, S.S.; SHULEYKIN, V.V., akademik, redaktor; KLYAUS, Ye.M., redaktor; POLESITSKAYA, S.M., tekhnicheskiy redaktor

[What are tides] Chto takoe prilivy. Moskva, Izd-vo Akademii nauk SSSR, 1956. 101 p. (MLRA 9:2)

(Tides)

SHULEYKIN, V.V.; ALEKSEYEV, D.M., redaktor izdatel'stva; SHEVCHENKO, G.N., tekhnicheskiy redaktor.

[The theory of ocean waves] Teoriia morskikh voln. Moskva, Izd-vo Akademii nauk SSSR, 1956. 141 p. (Akademiia nauk SSSR. Morskoi gidrofizicheskii institut. Trudy, vol.9) (MLRA 9:11)
(Ocean) (Waves)

LAZAREV, P.P.; SHULEYKIN, V.V., akademik, redaktor; DERYAGIN, B.V., redaktor; FRANK, G.M., redaktor; VOLAROVICH, M.P., professor, redaktor; YEFIMOV, professor, redaktor; MASLOV, professor, redaktor; KUZIN, A.M., professor, redaktor; KUZNETSOVA, Ye.B., redaktor; SHEVCHENKO, G.N., tekhnicheskiy redaktor.

[Collection in memory of Academician P.P.Lazarev] Sbornik posviashchennyi pamiati akademika P.P.Lazareva. Moskva, Izd-vo Akademii nauk SSSR, 1956. 374 p. (MIRA 9:6)

1. Akademiya nauk SSSR. 2.Chlen-korrespondent AN SSSR (for Deryagin). 3.Chlen-korrespondent AMN (for Frank).
(Physics) (Physiology) (Geophysics)

SOV/124-57-5-5585

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 5, p 68 (USSR)

AUTHOR: Shuleykin, V. V.

TITLE: Theory of Ocean Waves (Teoriya morskikh voln)

PERIODICAL: Tr. Mor. gidrofiz. in-ta AN SSSR. 1956, Vol 9, 143 pp, ill.

ABSTRACT: A compendium containing the results obtained by the author mainly in the wave basin of the Oceanic Hydrophysics Institute, Academy of Sciences, USSR. The work contains the following chapters: Derivation of the Classical Relationships for a Deep Sea. Derivation of the Classical Relationships for a Shallow Sea. Group Velocity of Waves. Wave Energy. Transfer of Wave Energy. A More Exact Definition of the Kinematics of Ocean Waves. The Profile and Basic Parameters of Ocean Waves. Physical Causes of the Sharpening of Ocean-wave Crests. The Kinematics of the Limiting Steepness of Waves. The Breaking of Waves Under the Action of Shallows. Generation of Wind Waves on a Calm Surface. Some Hypotheses on Wave-energy Growth. Test-installation Setup in a Wave Basin. Wave-energy Balance and the Increase in the Height of the Waves. Theory of the Maintenance of the Waves by the Wind Energy. Theory of the

Card 1/2

SOV/124-57-5-5585

Theory of Ocean Waves

Growth of the Wave Length Under the Action of the Wind. The Causes of a Steady Swell. Wave Behavior During a Change in Wind Direction. Reference Determination of the Action of the Basin Walls. Reference Determination of the Eddy Viscosity. Wave Development From the Upwind Shore to the Downwind Shore of a Deep Sea. The Spreading of Swell Away From a Storm Area in a Deep Sea. Development of Sea Waves in a Shallow Sea. Analysis of Measurements of Extremely-large Wind-generated Waves. Role of the Tangential Force of the Wind in the Augmentation of the Wave Energy. Wave Refraction on a Continental Shelf. Bibliography: 30 references.

Reviewer's name not given.

Card 2/2

SHULEYKIN, V.V.

551.521.3

9085. SODIUM LINE IN THE ABSORPTION SPECTRUM OF AIR ABOVE THE SEA LEVEL V.V.Shuleikin and P.F.Shakurov [illegible] 1956 In Russian

Special technique was used to photograph the continuous spectrum of light which travelled ca. 10 km at an altitude of [illegible] above sea level. Owing to the large width of the slit, [illegible] was found that the [illegible] of [illegible] mine the number of excited sodium atoms in sea air. From the absorption curve this number was determined to be 40-65 $cm^3$.

F. Lachman

SHULEYKIN, V.V.

551.510.535

7082. INFLUENCE OF A VARIABLE STREAM OF SOLAR POSITIVE PARTICLES ON THE WIND IN THE IONOSPHERE. V.V.Shulelkin and L.A.Korneva. Dokl. Akad. Nauk SSSR, Vol. 107, No. 1, 59-62 (1956). In Russian.

A theoretical derivation of the wind produced by charged particles from the sun due to the earth's magnetic field. A periodic variation in current density is assumed, with the period of the solar rotation. J.M.Hough

SHULEYKIN, V.V., akademik.

Tangential force of the wind as a factor in the energy increment of waves. Dokl.AN SSSR. 109 no4:761-763 Ag 1956. (MIRA 9:10)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Waves) (Winds)

SHULEYKIN, V.V., akademik.

Analysis of measurements of the highest wind-induced waves in the ocean. Dokl.AN SSSR 110 no.1:53-56 S-O '56. (MLRA 9:11)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Waves)

SHULEYKIN, V.V., akademik.

Refined law of wind wave growth in length. Dokl.AN SSSR 111 no.2:348-351 N '56. (MIRA 10:1)

1. Morskoy gidrofizicheskiy institut Akademii nauk SSSR.
(Wav-

LAZAREV, P.P., akademik; VAVILOV, S.I. [deceased], akademik, red.; ORBELI, L.A., akademik, red.; SHULEYKIN, V.V., akademik, red.; DERYAGIN, B.V., red.; KRAVKOV, S.V. [deceased], red.; VOLAROVICH, M.P., doktor fiz.-matem.nauk, red.; KOVNER, S.S., prof., red.; FRANK, G.M., d-r biolog.nauk, red.; YEFIMOV, V.V., d-r biologich. nauk, red.; MASLOV, N.M., nauchnyy sotrudnik, red.; GESSEN, L.V., red.izd-va; ZELENKOVA, Ye.V., tekhn.red.

[Works] Sochineniia. Moskva, Izd-vo Akad.nauk SSSR. Vol.1. 1957. 895 p. (MIRA 11:1)

1. Chlen-korrespondent AN SSSR (for Deryagin, Kravkov). (Physics)

SHULEYKIN, V. V.

Narastanie Dliny Bol'shikh Vetrovykh Voln i Roli Vnutrennego Turbulentnogo Treniia. V. V. Shuleikin. *AN SSSR Dokl.*, Mar. 21, 1957, pp. 560-563. In Russian. Study of the growth of high wind waves and the role of turbulent internal friction.

Shuleykin, V. V.

51-6-23/25

AUTHOR: Gal'perin, Yu. I.

TITLE: Remarks on the Paper of V. V. Shuleykin and P. F. Shakurov "The Sodium Line in the Absorption Spectrum of Air Above the Sea". (Po povodu stat'i V. V. Shuleykina i P. F. Shakurova "Liniya natriya v spektre pogloshcheniya vozdukha nad morem".)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol. III, Nr. 6, p.672. (USSR)

ABSTRACT: A letter. The present author criticizes the above paper of V. V. Shuleykin and P. F. Shakurov (Ref.1). Shuleykin and Shakurov photographed an emission spectrum of an incandescent lamp after passage through 10 km of air about 50 m above the sea surface. The beam from the lamp was not parallel and was not focused on the spectrograph slit. The D-doublet of Na was not resolved and it is hardly noticeable in Fig.1 of Ref.1. Shuleykin and Shakurov's paper does not give the essential experimental details such as the type of the spectrograph used, its resolving power, dispersion, parameters of the camera, etc. Their calculation of line intensity and derivation of the

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51-6-23/25

Remarks on the Paper of V. V. Shuleykin and P. F. Shakurov "The Sodium Line in the Absorption Spectrum of Air Above the Sea".

atomic absorption coefficient are both erroneous. The present author points out also that the purported estimate of the number of excited Na atoms can only apply to non-excited atoms in their ground state. There is 1 Russian reference.

ASSOCIATION: Institute of Atmospheric Physics, Academy of Sciences of the USSR. (Institut fiziki atmosfery, AN SSSR.)

SUBMITTED: July 22, 1957.

AVAILABLE: Library of Congress.

Card 2/2

SHULEYKIN, V.V.

49-11-7/12

AUTHOR: Shuleykin, V. V.

TITLE: Physics of the Sea in the Soviet Union During the Last Forty Years. (Sovetskaya fizika morya za sorok let)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.11, pp. 1366-1383 (USSR)

ABSTRACT: Investigations in the field of physics of the sea are at present being carried out by the Hydro-physics Institute of the Sea Ac.Sc. USSR (Morskoy Gidrofizicheskiy Institut Akademii Nauk SSSR) and also by the State Oceanographic Institute of the Chief Directorate of the Hydro-meteorological Services (Gosudarstvennyy Okeanograficheskiy Institut Glavnogo Upravleniya Gidrometsluzhby), Institute of Oceanology of the Ac.Sc. USSR (Institut Okeanologii AN SSSR) and others. The author, who is a well known authority on this subject, reviews Soviet work in this field both pre-war and post-war and a considerable part of the information contained in the paper is based on earlier published work of the author himself. Particular attention is paid to the experimental work carried out in an artificial storm basin at the Hydro-physics Institute of the Sea Ac.Sc., by the method of A. A. Ivanov (Ref.22); thousands of waves were photographed and then analysed. Some of the obtained

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Physics of the Sea in the Soviet Union During the Last Forty Years.

results are described and these led to changes in the views relating to the kinematics of the wind currents, the profile of which may differ considerably from that of a trochoide. The author also deals in some detail with hydro-optical investigations carried out in the Soviet Union. It is mentioned that of theoretical and practical interest are also investigations by R. N. Ivanov relating to molecular films of surface active substances which are able to suppress waves; the wave energy is absorbed by friction between the sea-water and these films which can be considered as a sort of "two-dimensional gas" which expands during the passage of the bottom of the wave and becomes compressed during the passage of the top of the wave. The results of Ivanov (Ref.35) have fully confirmed the theory of scattering of these films and also the theory of the wind caused drift.
There are 13 figures and 35 Slavic references.

AVAILABLE: Library of Congress.

Card 2/2

SHULEYKIN, V.V.

Problems in present-day theory of sea waves. Geog.sbor. no.12:68-82 '57. (MIRA 11:1)

(Waves)

AUTHOR SHULEYKIN V.V. PA - 3143

TITLE Growth in Length of High Wind Waves And the Role of Turbulent Internal Friction.
(Narastaniye dliny bol'shikh vetrovykh voln i roli vnutrennego turbulentnogo treniya -Russian)

PERIODCIAL Doklady Akademii Nauk, 1957, Vol 113, Nr 3, pp 560-563 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT The problems dealt with in D., 1956, Vol 111, Nr 2, are formulated with greater exactness in order to explain the effect of second order which is due to internal friction. For this purpose energy dispersion is investigated separately from the dissipation of the moved mass at the expense of the turbulent exchange in water. An equation is obtained which differs from that of the aforementioned paper of 1956 only by an additional term with the coefficient of the turbulent exchange $\nu$ (kinematic viscosity). From this equation it can be seen that the increase of the radius R of the devolving arc (and therefore also the wavelength $\lambda$) is connected not only with the velocity of the increase ( and thus also with the velocity of the increase of the wave height h), but also with a new term that depends on internal turbulent friction. It is shown that R and $\lambda$ grow according to a parabolic low. Under the influence of the effect dealt with here both increased by only 2°/o of the value that corresponds to the maximum wave height within one hour. Investigations confirm the fact that the quantity r/R may be considered to be constant, that $\nu$, which characterizes the en-

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AUTHOR SHULEYKIN V.V., Member of the Academy PA - 3020

TITLE Some Data Concerning the Kinematics of Sea Waves. (Yeshche o kinematike morshikh voln -Russian )

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 5, pp 1043 - 1045 (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT The present work shows that the ellipse with the semi-axes a and b (which in previous works were considered only as auxiliary curves), have a very distinct physical significance. The equations inthe parametrical form $x = R\theta + a \sin\theta$, $y = b \cos\theta$ are more correct kinematic equations than the equations of the trochoids (which serve as first approximation). First the momentary value of the velocity w of the wave current is expressed by means of a previously derived formula. In the same manner the nometary value of drive velocity and of the current are expressed. Further, the momentary value of the horizontal component of the velocity $v \cos\theta$ of the velocity of a surface particel is considered. The equations for w, u and $v \cos\theta$ are written down, and by adding the left sides of these three equations the momentary value of the total velocity of the horizontal motion of the surface particles is obtained. By adding all right sides an expression, which is suited for the physical interpretation of the phenomena, is obtained: $w + u + v\cos\theta = (w \frac{r^2}{R} + \bar{u}) + (wr + w \frac{r^2}{R} + \bar{u} \frac{r}{R}) \cos\theta$

This total velocity of the horizontal motion is divided into two parts: the first consists of a constant current, which, in turn, consists of a

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Some Data Concerning the Kinematics of Sea Waves. PA - 3020

"wave velocity" and of a "drive velocity". The more interesting is the second or oscillating part of the current: $U_x = \pi(r + \frac{r^a}{R} + \frac{\bar{u}\, r}{\pi R}) \cos\theta$

The brackets contain nothing but the expression for the semiaxis a of the aforrementioned "auxiliary ellipse". In a system of coordinates moving with the velocity $\pi \frac{r^a}{R} + \bar{u}$ in the direction of the waves the ellipse with the semiaxes a and b represents the path taken by a particle of water. In the general case the complicated motion of a particle on the surface can be divided into two components in the aforementioned system of coordinates which is moved at the same time. In conclusion several of such cases are graphically explained.
(with 2 illustrations)

ASSOCIATION Marine Hydrophysical Institute of the Academy of Science of the U.S.S.R.
PRESENTED BY
SUBMITTED 24.12.1956
AVAILABLE Library of Congress
Card 2/2

Shuleykin V. V.

20-5-18/54

AUTHOR: Shuleykin, V. V., Academician

TITLE: The Profile of the Wind Waves and their Recording by Means of Bottom Wave Recorders (Profil' vetrovykh voln i yego zapis' na pridonnykh volnografakh).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 5, pp. 915-918 (USSR)

ABSTRACT: On the occasion of the downflow of the surface of the sea to the bottom not only the total amplitudes of pressure oscillations, but even the "overtones" of various orders present in a real profile of highly tapered wind waves are "filtered". The present paper discusses the quantitative investigation of this "filtration", the at present existing kinematic conceptions on the wind waves being assumed. The author obtains the following results: 1.) Comparison of the values obtained by means of two different methods of the $(a_2/a_1)$ ($a_n$ here denotes the coefficients of the harmonic analyses of sea waves) again confirms for all values of a certain argument $\varkappa$ the accuracy of the basic assumption of the here assumed kinematics of the

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SOV-49-58-6-3/12

AUTHORS: Shuleykin, V. V., Gushchin, V. F., Peskov, P. I.

TITLE: Oscillations in the Heat Balance of the Atlantic Ocean (Kolebaniya teplovogo balansa Atlanticheskogo Okeana)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 6, pp 729-740 (USSR)

ABSTRACT: Descriptions of normal investigational methods into heat balance problems are found in Ref.1. The present article considers oscillations in components of the heat balance and their sums in the Atlantic (from day to day) in various regions of interest. It will be shown that these oscillations exceed the corresponding ones averaged over a month. This blurs the general pattern but enables local oscillations (obtained by the ship Sedov) to be considered - the times examined lie between October and December and the latitudes from 50°-16°27'N. Fig.1 gives the values of some of the elements which change from day to day. Curve 1 shows the change in latitude of a place at true midday in October, November and December 1957. Curve 2 gives the change in solar height at culmination. Curve 3 gives the change in temperature of the water surface and Curve 4 the change in temperature of the air. The first points on all these diagrams (11, 12 and 13 Oct) correspond to the N. Sea. Position coordinates at true noon were cal-

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culated by A. Kh. Gil'mutdinov. Actinometric and meteorological observations were made by V. F. Gushchin, V. A. Krasnov, P. I. Peskov, I. G. Serebrennikov, V. P. Smirnov, V. G. Fedorov and D. I. Filippov.

1. Heat intake from direct and diffuse solar radiation.
As in the hydrographical ship "Taymyr" (Ref.2), apparatus was used which permitted continuous registration of direct and diffuse radiation falling per $cm^2$ of horizontal surface (Ref.3). The radiation receiver (a piranometer, mounted in gimbals on the mizzen mast - out of the shade) was connected to a self-recording galvanometer. Every twenty seconds a mark was made on a tape which unrolled at 2 cm/hour (driven by a synchronous electric motor). Examples of these traces (reduced in scale) are given in Fig.2. This instrument was calibrated several times during the voyage by a system due to Yu. D. Yanishevskiy. The scale is not entirely linear, being smaller for small deviations than for large. Had the solar height remained fairly constant, this could have been

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allowed for by graduating and measuring the traces with a planimeter. However, the ship worked at various latitudes and a different method was therefore necessary. A trapezium was constructed: the ordinate axis was read from the scale divisions of the galvanometer. Straight lines were then drawn parallel to the abscissa. A millimetre ruler was used to measure the total length of all segments cut off. The time-scale was known from the construction of the instrument and the ordinate of each elementary segment was known by calibration. Thus the result could be obtained. Curve 1 (Fig.6) shows the change in diurnal heat sum per $cm^2$ of the Atlantic surface (at different stages on the voyage). As can be seen, on clear days the heat sum changes (depending on latitude) from 287 to 506 $cal/day/cm^2$, although, in the same region, the variation extends from 56 to 506 cal when cloudy days are included. One of the authors (Ref.1) has introduced a coefficient of solar energy utilisation to characterise the influence of clouds. This can be found by calculating the greatest possible heat sum which can reach 1 $cm^2$ of a horizontal surface by direct solar radiation in a perfectly clear sky (at a given latitude and day of the year). Such quantities were found for latitudes $60^o$-$90^o$N

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Oscillations in the Heat Balance of the Atlantic Ocean.

(Refs.1, 2) and $50^{\circ}$-$0^{\circ}$ (Ref.3). Fig.3 gives part of a diagram by N. I. Yegorov for the three months - October, November and December. From this we can obtain $q_o$ (the quantity described). If the corresponding, actually measured magnitude is $q$, $\eta$ (= $q/q_o$) is called the utilization coefficient. The curve marked 0 in Fig.6 gives values for $q_o$. N. I. Yegorov has compared the change in $\eta$ with the change in cloudiness for the Indian Ocean and the Red Sea (Fig.3, Ref.3). Fig.4 gives a similar comparison for the parts of the Atlantic investigated (small circles - points obtained in October; black dots - points obtained in November, and squares - points obtained in December) The dotted line gives N. I. Yegorov's results for comparison. As he showed in Ref.3, a scatter of points is unavoidable since the amount of cloud, unlike the radiation, is not recorded continuously. A small correction is needed to allow for the fact that $q_o$

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is defined for direct radiation whilst q includes also diffuse radiation (thus the experimental curve has some points with $\eta > 1$). A comparison of Yegorov's material with that in the present article indicates that the relation between $\eta$ and degree of cloud is universal to a sufficiently close approximation.

2. Amount of heat penetrating into the water. Previously, only the amount of heat reaching the surface has been considered. To consider the amount entering the water it is necessary to calculate the extent of reflection. One of the authors has already considered the reflection coefficient of the sea's surface (Ref.1). Sverdrup (Ref.4) has made similar investigations for both direct and diffuse reflection at varying solar heights. On the basis of these calculations, the authors have constructed a diagram of change in reflected energy depending on the hour angle of the Sun. Fig.5.(a)and (b), gives two such diagrams - one corresponding to the Northern course of the 'Sedov' and the other to the Southern. The scales of the two diagrams are different, and, in both cases, the curve for the reflected rays is ten times larger than the curve for the daily variation of direct and diffuse radiation. The reflection coefficient reaches high values

at small angles - thus it has dropped from 0.4 at $5^{\circ}$ to 0.12 at $20^{\circ}$. After $50^{\circ}$, it remains almost constant at 0.03. As a result, the total reflected energy per day changed little as the 'Sedov' changed from its northerly to its southerly route. By graphical integration the empirical formula for the amount of reflected heat:

$$\Delta q = 33\,\eta\zeta \text{ m cal/day cm}^2 \qquad (1)$$

was obtained, where $\eta$ is the utilisation coefficient and $\zeta$ is an empirical coefficient, changing by 20% between the northerly and southerly routes, but approximately equal to one. Fig.6, curve 1, gives $\Delta q$ thus calculated for each day and, thence, curve 2 which shows the amount of heat penetrating the water.

3. Heat loss by evaporation. This was the most important heat loss factor in the regions surveyed. One of the authors (Ref.1), in experiments in the Indian Ocean, found that the amount of water evaporating/unit time/unit surface area depended on the humidity deficiency and the wind speed. It

was emphasised that in determining the former, the compressibility of water vapour at the given temperature must be found and also the humidity gradient between the surface of the sea and the measuring point. Sverdrup (Ref.4), basing his work on the theory of turbulent diffusion, confirmed a linear relationship first put forward by V. V. Shuleykin. This has been shown to give good results in many cases (Refs.2, 3, 5). Using this relationship, the results obtained in the Atlantic can be expressed by:

$$q_s = 5.85\ (e_w - e_6)V_6 \text{ m.cal/day/cm}^2 \qquad (2)$$

where $e_w$ is the water vapour compressibility at the given surface temperature; $e_6$ is the compressibility at a height of 6 m above the surface (both expressed in millibars); and $V_6$ is the wind velocity in m/sec at this height. Curve 3, Fig.6, gives the results obtained with this formula. As can be seen, on some days the amount of heat lost by evaporation exceeded that gained from solar radiation. The heat lost varied from 530-100 cal/cm$^2$. The loss by evaporation remained approximately constant at all latitudes investigated and depended, basically, upon the wind velocity.

4. Loss in effective radiation. The next factor in importance is the effective heat loss into interplanetary space. Owing to instrumental defects, this had to be calculated from existing formulae. The one chosen was due to Ångström (Ref.6):

$$q_{i_o} = \sigma T^4 (0.255 + 0.322 \times 10^{-0.069e}) \qquad (3)$$

Using this, Sverdrup constructed a graph (temperature of water on the abscissa, relative humidity as ordinate) (Ref.4). He then drew curves of different effective radiations (0.160 - 0.195 m.cal/min/cm$^2$) suitable for interpolation. These were for a clear sky. The authors employed these graphs to calculate the quantity of heat lost per cm$^2$ of the Atlantic each day. The results are shown in Curve 4, Fig.3. Presence of clouds was allowed for by the formula:

$$q_i = q_{i_o}(1 - C_H n_H - C_M n_M - C_L n_L) \qquad (4)$$

$n_H$, $n_M$ : $n_L$ correspond to the amount of cloud in upper, middle and lower layers (in tenths). The values of $C_H$ : $C_M$ and $C_L$ are given by the authors as suggested by N. I. Yegorov (Ref.5). The heat loss in effective radiation is given in Curve 5, Fig.6 - it varies between 250 cal and 82 cal/day/cm$^2$. As is expected, negative maxima on this curve correspond to positive maxima on Curve 1.

3. Loss in convective exchange between ocean and atmosphere. This plays the major part in polar seas, but in middle latitudes, as in the Atlantic, it is relatively small. Much research in this field has been carried out and the most suitable formula to use seems to be that of V. S. Samoylenko (Ref.7):

$$q_c = 3(\vartheta_w - \vartheta_6)V_6 \text{ m.cal/day/cm}^2 \quad (5)$$

This has been confirmed by the theoretical researches of P. P. Kuz'min (Ref.8) and A. G. Kolesnikov (Ref.9). Here $V_6$ is the wind velocity at height 6 m; $\vartheta_w$ is the temperature of the water surface and $\vartheta_6$ is the air temperature at 6 m. The convective exchange heat loss is given in Fig.6

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(Curve 6) - it varies little from zero. Usually, though not always, the air temperature was lower than the water temperature and the greatest heat loss by this mechanism came about when the temperature difference was greatest and the wind velocity highest. Even so the largest value reached was 65 cal/day/cm$^2$.

6. Overall heat balance. To obtain the overall heat balance it is only necessary to add algebraically the Curves 2, 3, 5 and 6 in Fig.6. This gives Fig.7. It can be seen that the balance during the voyage was predominantly negative - positive values appearing on only 18 days (on 5 of which it did not reach +10 cal/day/cm$^2$). The negative maxima are much bigger than the positive (largest positive = +117 cal/day/cm$^2$; largest negative = 566 cal/day/cm$^2$). The daily oscillations are much greater than the variations from latitude to latitude and from month to month. It is proposed that Fig.7 can be used to give the temperature distribution of water at different depths and at different times of the

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year (using the formula due to A. G. Kolesnikov (Ref.10) and the results of S. V. Dobroklonskiy (Ref.11) and S. G. Boguslavskiy (Ref.12)). The authors divide their results into three headings: the first, from 14 - 29 October, with an average latitude 37°N; the second, from 30 October to 18 November, with an average latitude 21°N; and the last, from 19 November to 8 December, with an average latitude 34°N. The corresponding average heat losses are 116, 53 and 216 cal/day/cm². It is interesting to compare these with heat content observations made at the same time on the Gettysburg bank ($\varphi$ = 36°32'N, $\lambda$ = 11°30'W ). Fig.8 gives the vertical temperature distribution of the water averaged over the day - Curve 1 for October 22-23, Curve 2 for December 4-5. The second curve gives a depth 20 m deeper than the first, owing to position, but this is unimportant since Curve 1 can be extrapolated. Fig.8 indicates that, for the period October 24-December 4, the average heat loss was 156 cal/cm²/day. The mean heat loss for November was also calculated by taking the arithmetic mean of the experimental results obtained in

AUTHOR: Shuleykin, V.V. SOV/49-58-9-14/14

TITLE: G. U. Sverdrup (Commemorative Note) (Garal'd Ul'rik Sverdrup. K godovshchine so dnya smerti)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 9, pp 1151 - 1152 (USSR)

ABSTRACT: Commemorative note on the occasion of the first anniversary of the death of this Norwegian scientist.

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AUTHOR: Shuleykin, V.V., Academician (Moscow) SOV-26-58-10-12/51

TITLE: Some of the Research Work of the Oceanographic Ship "Sedov" (Nekotoryye issledovaniya na okeanograficheskom sudne "Sedov")

PERIODICAL: Priroda, 1958, Nr 10, pp 59-67 (USSR)

ABSTRACT: Some of the research work carried out on board the "Sedov" during 1957 in the Atlantic Ocean is described. The survey was carried out at the height of the storm season in the last three months of the year between Africa and South America, extending from Cape Verde Islands into the Sargasso Sea. The height and behavior of the waves at different parts of the sea were studied in relation to the intensity of storms which had occurred. Geomagnetic studies and research into the extent of magnetic deviation were made in the latitude of 16° N where the deviation is particularly great. The contributions of L.A. Korneva and A.T. Mironov to geomagnetic speculations and research are mentioned. The electric currents in the ocean were charted at various depths using special electrodes and it was found that their intensity decreased with a decrease in depth, achieving a minimum in the surface layers of the ocean. This agreed with the findings recorded by Yu.G. Ryzhkov and G.A. Gubin in the Indian

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Some of the Research Work of the Oceanographic Ship "Sedov"

Ocean in 1956 on board the "Ob'". From this the author concludes that half the additional magnetic field in the Atlantic is caused by electric currents in the ocean and the other half by currents in the upper layers of the ionosphere. The "Sedov" also studied the thermal balance of the ocean from day to day, recording by automatic devices the influx of the solar energy and the amount of heat lost by vaporization. The heat losses were found to exceed the heat received from the sun during the pre-winter season, and the thermal balance varied generally between wide limits. The wind shifts around capes and peninsulas were also studied. On the principle that there is a connection between the length of a fish's body and the maximum speed it can attain, it was calculated that a shark has a top speed of 7.7 m/sec, whereas its pilot-fish have a top speed of only 2.7 m/sec. In movement the pilot-fish keep very close to the shark. It was found that a shark will produce a friction layer of water around its body as it moves. If the pilot-fish keep within this layer they will be "towed" by the shark. If inadvertently they tend to stray outside it, strong dynamic

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Some of the Research Work of the Oceanographic Ship "Sedov"

forces will tend to draw them back again. Thus, pilot-fish can accompany the shark at speeds well above their top limit. There are 4 photos, 2 maps, 4 graphs, and 1 diagram.

1. Oceanography--Atlantic Ocean

Card 3/3

AUTHOR: Shuleykin, V. V., Academician 20-3-15/59

TITLE: The Development of Sea Waves from Their Initiation to the Phase of Maximum Steepness (Razvitiye morskikh voln ot zarozhdeniya do naibol'shey krutizny)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 3, pp. 472-475 (USSR)

ABSTRACT: This work attempts the description of the principle of the development of waves in the short initial phase, whereon at present it is impossible to set up a serious theory. This is prohibited yet at present by the very difficult analysis of the small waves. The author studied the kinematics of the big waves in the presence of a drift-current, which has taken in already a sufficiently thick water stratum. First a generalized term for the momentum of the acting forces is written down. The process of calculation is persecuted step by step. The change of the steepness of the developing wind--waves which is found by this way is here illustrated in a diagram. The observations in the storm-basin of the Navy Hydrophysical Institute (Morskoy gidrofizicheskiy institut) allowed the discovery of an easily stateable partly

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destruction of the wave tops in the second phase of the wave formation. The effective dependence of the steepness of the waves on their length must be expressed by a curve with flattened breaks. As a comparison in a diagram the effective change of steepness of wind-waves with advancing time is copied on the base of photorecording of waves in a storm basin. The general character of the curve found in this way agrees well with the theoretical curve. There are 2 figures and 7 references, 6 of which are Slavic.

SUBMITTED: September 2, 1957

AVAILABLE: Library of Congress

AUTHOR: Shuleykin, V. V., Member of the Academy 20-119-2-17/60

TITLE: Telluric Currents in the Ocean and Magnetic Declination (Telluricheskiye toki v okeane i magnitnoye skloneniye)

PERIODICAL: Doklady Akademii Nauk SSR, 1958, Vol 119, Nr 2, pp 257 - 260 (USSR)

ABSTRACT: In 1956 Yu. G. Ryzhkov and F. A. Gubin (aboard the Diesel-electric ship Ob') discovered a strong increase of the density of telluric currents in the depth of the Indian ocean. Of special interest is the measuring of the density of telluric currents at various depths in the Atlantic between Africa and South America where the distance between the two continents is smallest. The authors could also carry out these measurements in this region and also north of it in the course of the oceanographic-geophysical expedition of the ship "Sedov" in the last quarter of 1957. The electrodes and the measuring method are shortly described. A completely reliable registration of the potential differences between the electrodes was possible at a latitude of 17°05' north and a longitude of 31°57' west on November 10, 1957. The gradient was

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about 30 millivolt/km in the surface layer and was directed along the meridian from north to south. Also at a depth of 250m the potential gradient has the direction from north to south and may be about 80 millivolt/km. At such a value of the potential gradient the densitiv of current at a depth of 250m must amount to $3.57 \cdot 10^{-4}$ A/m$^2$. When the electrodes are simultaneously lifted the potential differences between them decreases according to a simple linear law. When the straight is continued to the bottom of the ocean the values of the gradient for greater depths can be extrapolated and the magnitude of the whole amperage flowing in the investigated region of the Atlantic along the meridian can be estimated. According to this only about 10 Ampere flow through a "gate" of 1 m width and 5000 m height. According to the calculations by L. A. Korneva an amperage of 15 amperes would be necessary for the explanation of the actually existing earth-magnetic field. The lacking part of the magnetic field strength is obviously to be referred to the currents in the

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Telluric Currents in the Ocean and Magnetic Declination

ionosphere. A registration of the telluric currents in the depth about just as reliable was made aboard the "Sedov" on November 24, 1957. The strong increase of the density of telluric currents in the depth was also proved by the measurements aboard the "Sedov" and aboard the third expedition ship (Mikhail Lomonosov). This increase according to the depth has to be explained in detail by a theory to be constructed. At present it can only be maintained that the telluric currents in the ocean depend on the corpuscular emission of the sun. At the end the author reports shortly on the formation of the eddy current in the ocean. The author expresses his gratitude to P. S. Mitrofanov and V. N. Dolgopolov for their help in the experiments aboard the expedition ship "Sedov". There is 1 figure and 6 Soviet references.

SUBMITTED: January 15, 1958

AUTHORS: Shuleykin, V. V., Member, Academy of Sciences 2o-119-5-24/59

TITLE: How the Pilot Fish Manages to Move With the Same Speed as the Shark (Kak ryba-lotsman dvizhetsya so skorost'yu akuly)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 5, pp. 929 - 932 (USSR)

ABSTRACT: The short body of the pilot fish ( Naucrates ductor) in fact is only little suited for its high speed of motion. The length of a fish body actually is related to the maximum speed of a fish, as the author showed in a previous work (Reference 1). During the stay of the expeditionary vessel "Sedov" at one of the oceanographic stations in the Atlantic a shark of a length of 185 cm and a pilot fish of a length of 21 cm were caught. According to the theoretical curve mentioned in the above quoted previous work the maximum speed of the shark had to be 77o cm/sec and that of the pilot fish 275 cm/sec. According to L. A. Kovalevskaya (Reference 2) the continuous speed (on long distances) probably is about the same percentage of the maximum speed with all fishes. Therefore the pilot fish accompanying the shark can not swim in a normal way. A photograph made aboard the "Sedov" gives the explanation for this apparent paradoxical

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How the Pilot Fish Manages to Move With the Same Speed as the Shark 20-119-5-24/59

phenomenon: the pilot fish always move very closely to the body of the sharks, also when these swim only slowly. The pilot fish keep within the friction layer directly at the surface of the body of the shark in the case of high speed; this friction layer reaches in the case of any moving body its maximum value near the tail. The author then gives an approximate calculation for the thickness of the boundary layer. When the pilot fish leaves the friction zone by chance it is immediately taken back into the friction zone by the enormous ponderomotoric force of attraction (which occurs in the motion of two fishes with parallel course in a potential flow). Based on these considerations also the accompanying of ships by pilot fish over thousands of miles becomes clear. According to an information by A. N. Svetovidov received when this work was revised, the pilot fish deposits its spawn on the skin of the shark or at the bottom part of the ships. Such functions are possible only in the friction boundary zone. There are 3 figures and 3 references, 3 of which are Soviet.

SUBMITTED: January 7, 1958

Card 2/2

AUTHOR: Shuleykin, V. V., Member, Academy of Sciences, USSR 20-119-6-23/56

TITLE: The Characteristic Parameters of the Wind Wave Field in the Ocean (Kharakteristicheskiye parametry polya vetrovykh voln v okeane)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 119, Nr 6, pp. 1138 - 1141 (USSR)

ABSTRACT: The results of the new measurements of the waves in the ocean were compared with the results of the experiments in the storm basin of the AS USSR and allow the characterization of the field of the storm waves long after the initial states of their development. The possibility of the determination of the field main parameters resulted. The transmission of the wind energy to the waves is characterized by the aerodynamic coefficient $\gamma$ ,which depends on the steepness of the waves: $\gamma = \kappa r/R$. r denoting the radius of the trajectory of the surface particles on the wave and R the socalled rocking radius. On the other side the dimensionless coefficient $\kappa$ is present in the term for the limiting value $r_\infty$ for the storm wave in the ocean on the occasion of a given wind velocity V. The coefficient $\kappa$ ,and the coeffi-

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The Characteristic Parameters of the Wind Wave Field in the Ocean 20-119-6-23/56

cient k characterizing the turbulent phenomena in the water during the wave action are substituted in the complete equation for the balance of the wind waves in an arbitrary distance x from the coast at which the wind blows. The author succeeded in ascertaining the numerical values of k on the base of the observation of waves which practically have become steady. Then the author controls his results on the basis of various numerical data. In first approximation one can expect the formation of steady waves of the height h = 7,5 m. The second approximation is ascertained. On this occasion the author restricts on the consideration of the variability of the values of T and $(R/r)^2$. A diagram illustrates in first approximation the law of the increase of the waves at the coast the wind blows at. Even after a long (lasting 2 days) storm the waves did not become steady yet, i.e. their height could still grow by 0,6 m. The maximum height of a wave most probably is 7,8 to 8 m. A better accuracy in the analysis of the wave field and in the determination of the coefficient k at present cannot be obtained. There are 3 figures and 4 references, 4 of which are Soviet.

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Moscow State Univ

3(9) SOV/20-121-6-14/45

AUTHOR: Shuleykin, V. V., Academician

TITLE: The Exact Integral of the Equation of the Field of the Wind Waves in the Ocean and Its Physical Meaning (Tochnyy integral uravneniya polya vetrovykh voln v okeane i yego fizicheskoye znacheniye)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 6, pp 1005-1008 (USSR)

ABSTRACT: Recent investigations carried out by A. N. Tikhonov and A. A. Samarskiy (Ref 5) make it possible to draw the following conclusion: The exact integral of the equation

$\partial \eta / \partial \tau = 1 - \eta - \eta^{1/2} \partial \eta / \partial \xi$ is completely determined by

those exact solutions which previously were deduced by the authors for the following simple conditions:
a) for the distribution of the height of the steady waves with respect to the various distances $\xi$ from the windward shore; b) for the increase of the height $\eta$ of the waves during the time $\tau$ in which the wind acts in a very great

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(theoretically infinite) distance from the windward shore. A discontinuity line $\xi(\tau)$ must exist in a certain plane of the rectangular system of the coordinates. On the one side of this discontinuity line the condition a) and on the other side - the condition b) is satisfied. The motion of this discontinuity on the surface of the ocean begins on the windward shore. The corresponding differential equation was integrated according to the method of Euler (Eyler)-Cauchy (Koshi). A second and more exact method of solution is based on the physical significance of the phenomena. Some properties of these phenomena are discussed in a few lines. On the whole, the discontinuity line $\xi(\tau)$ describes the law of the progressive motion of a certain "front" extending from the windward shore to the open sea. Behind this front there is a swell which becomes steady. Ahead of this front, the height of the waves increases according to $\eta = 1 - e^{-\tau}$. The exact solution of the above-given equation is shown by a figure. The real velocity of the motion of the above-mentioned "front" first increases quickly, and continues to increase slowly. Finally, the equation dx/dt = 0,625 c was

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obtained for the real velocity of the "front". There is $f_{\infty} V = c$ where $f_{\infty}$ denotes the ratio of the phase velocity of the highest waves which are possible for the wind velocity V to this velocity V itself. The author thanks A. N. Tikhonov for his useful advice to use the new theory of quasilinear equations. There are 2 figures and 8 references, 8 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: April 28, 1958

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3(9)

AUTHOR: Shuleykin, V. V., Academician SOV/20-123-6-15/50

TITLE: The Steepness of Developing Waves at Various Wind Velocities (Krutizna razvivayushchikhsya voln pri razlichnykh skorost'yakh vetra)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 1010-1013 (USSR)

ABSTRACT: The author first in short discusses some earlier papers dealing with this subject. Observations carried out on the open sea as well as in an artificial storm basin showed that, in the case of one and the same wave length, the steepness of waves increases with increasing wind velocity. Thus, it may be surmised that the intermediate stage of wave development with wavelengths of from $\lambda_2$ to $\lambda_o$ is of importance only at high wind velocities. $\lambda_2$ denotes a certain short wave length and $\lambda_0$ a certain wave length value. At lower wind velocities the difference $\lambda_o - \lambda_2$ becomes smaller and at a certain given wind velocity it may also become equal to zero. If wind velocities are still smaller, the value $\lambda_o = \lambda_2$ may shift towards shorter wave lengths. The present

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paper intends to examine these assumptions and to find a precise explanation of existing conceptions of the very interesting intermediate stage of the development of waves with lengths of $\lambda_2$ to $\lambda_0$. Experiments were carried out in the storm basin of the Morskoy gidrofizicheskiy institut (Ocean-Hydrographical Institute), and the wave profile was photographed immediately by means of the "Kiyev" photographic camera. Within the field of vision of this camera there were electric clocks and an electric seconds counter, by means of which it was possible to measure the time corresponding to each photograph taken with an accuracy of 0.01 sec. The 33 series of photographs were subdivided into 3 groups corresponding to the wind velocities

$V = 7 \pm 1$ m/sec, $V = 11 \pm 1$ m/sec and $V = 15 \pm 1$ m/sec.

Evaluation of the results obtained by these measurements showed the following: The differences in the steepness of waves having the same wave length increase with a decrease of the corresponding wave length. In the course of the development of waves up to their extreme dimensions (possible on the ocean at one or the other wind velocity) this difference diminishes constantly and vanishes practically in the later stages of the

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development of waves. The laws for the development of wind waves found by the present paper are not only of theoretical but also of great practical interest, for it is easily possible to improve the technique of correcting measuring scales, which was described by V. V. Shuleykin (Ref 5) to perfection. There are 2 figures and 5 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: September 19, 1958

SHULEYKIN, Vasiliy Vladimirovich; YEGOROV, N.I., otv.red.; GROSMAN, R.V., red.; YASNOGORODSKAYA, M.M., red.; BRAYNINA. M.I., tekhn.red.; FLAUM, M.Ya., tekhn.red.

[Concise course of marine physics] Kratkii kurs fiziki moria. Leningrad, Gidrometeor.izd-vo, 1959. 477 p. (MIRA 12:8)
(Oceanography)

SHULEYKIN, Vasiliy Vladimirovich, akademik; FAYNBOYM, I.B., red.; SAVCHENKO, Ye.V., tekhn.red.

[Research on the physics of oceans and seas] Fizicheskie issledovaniia okeanov i morei. Moskva, Izd-vo "Znanie," 1960. 39 p. (Vsesoiuznoe obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii. Ser.9, Fizika i khimiia, no.18).
(Oceanography) (MIRA 13:10)

SHULEYKIN, V.V.

Hydrodynamic resonance in summer monsoon streams. Izv.AN SSSR.Ser.geofiz no.6:828-838 Je '60. (MIRA 13:6)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova. (Monsoons)

SHULEYKIN, V.V.

Calculating possible magnitudes of wind waves in the field of Atlantic hurricanes. Izv.AN SSSR.Ser.geofiz. no.7: 1013-1021 Jl '60. (MIRA 13:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Hurricanes)

SHULEYKIN, V.V.

Using the equation of the wind wave field for forecasting purposes.
Trudy Okean kom. 9:18-44 '60. (MIRA 14:1)
(Waves)

SHULEYKIN, V.V., akademik; KATS, A.L., kand.geograf.nauk; POGOSYAN, Kh.P., prof.; ASTAPENKO, P.D., kand.geograf.nauk

World's weather. Znan.sila 35 no.8:4-6 Ag '60. (MIRA 13:9)

(Meteorology)

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B013/B014

AUTHOR: Shuleykin, V. V., Academician

TITLE: Experimental Verification of the Hypothesis Concerning the Nature of Magnetic Declination

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 5, pp 1015-1017 (USSR)

ABSTRACT: The author describes the experimental verification of his hypothesis concerning magnetic declination in the equatorial and tropical belt of the Atlantic. Of special interest is the region around the point 1° south latitude and 25° west longitude. According to the author's hypothesis, a distorting magnetic field is superimposed on the principal magnetic field of the Earth (with a moment directed along the axis of rotation of the planet). The latter is caused by electric currents in the ocean and also by currents of the ionosphere (which are directed along the continents). A simple and reliably recording photoelectric instrument was built which allows to take distinct pictures of the 127-mm mariner's compass (with a course pointer) and a small timepiece of the type "Moscow". A positive substandard motion-picture film is used for this purpose. For

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an additional check, the compass course was also read from the magnetic main compass of the ship during the experiments. With the help of these separate methods it was found that magnetic declination at a depth of about 2000 m is at least 5° lower compared to the ocean surface. It is assumed that declination is changed there only by the field of natural earth currents in the ocean. The latitude component consists of two quantities, i.e., quantity y which is caused by currents in the ocean, and a certain quantity Y, which is assumed to be caused by currents of the ionosphere. Y is probably constant from the ocean surface to a depth of about 2000 m. Natural earth currents in the ocean thus constitute about one-third of the latitude component of the field strength of the terrestrial magnetic field. It is therefore possible to assume that the remaining two thirds result from the portion of currents in the ionosphere. The latter are related to the distribution of oceans and continents on the Earth. The principal theoretical considerations of the author were confirmed by the experimental results under discussion. The problem to be solved next is the refinement of methods for the recording of magnetic declination in the depth of

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the ocean. It would also be necessary to investigate the part played by currents in the ionosphere in the development of the latitude component of the terrestrial magnetic field. The author thanks the Soviet Navy for their assistance in investigations on board the expedition ship "Sedov". He further thanks B. R. Lazarenko and Ye. S. Borisevich for their assistance in the construction of apparatus, A. V. Lekedemonskiy for his supervision of the melting of a bronze container, and L. F. Vereshchagin and A. A. Semirchan for testing the container at the Institut vysokikh davleniy AN SSSR (Institute of High Pressures of the AS USSR) and for the very careful sealing of flanges. L. A. Kornev is also mentioned in this paper. There are 3 figures and 7 Soviet references.

SUBMITTED: December 3, 1959

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SHULEYKIN, V.V., akademik

More about wind currents in the sea. Dokl. AN SSSR 134 no.6:1343-1346 O '60. (MIRA 13:10)

(Ocean currents)

21494

S/020/61/137/004/018/031
B104/B206

3.9100 (1041,1121)

AUTHOR: Shuleykin, V. V., Academician

TITLE: Some peculiarities of the secular changes of the magnetic field above the ocean

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 4, 1961, 848-851

TEXT: The secular changes of the geomagnetic field can be studied with the aid of records on the magnetic deviations. In Fig. 1, the magnetic deviations in Paris (2), London (1) and Rome (3) are graphically shown on the basis of records dating back to the sixteenth century. Accurate analyses show that to a purely sinusoidal change of the magnetic deviation, a weak second harmonic is superimposed. The constant deviations in these places are: $-6.6^{\circ}$ (London), $-6.0^{\circ}$ (Paris) and $-2.8^{\circ}$ (Rome). On the basis of known data, Fleming (Terrestrial Magnetism and Electricity, 1949, p. 15) constructed for the latitudes $40^{\circ}$N, $0^{\circ}$ and $40^{\circ}$, deviations for different longitudes. In a similar manner, the author constructed the changes of the deviations in the given time interval (Fig. 2). These results are transferred to the map shown in Fig. 3. The shaded part shows the magnetic

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declinations. For the three latitudes, the full lines give the changes of the mean deviations for the different longitudes, the three dotted lines give the changes of the deviation amplitudes. From the further discussion of the results, in which the author also refers to Bullard et al (Phil. Trans. Roy. Soc. London. A, 247, 213 (1954)), he concludes the following: 1) If the electromagnetic field of the Bullard "eddies" interacts with the low-conductive earth's crust and produces a drift of the convection cells, this type of interaction with the better conductive ocean must be considered all the more. 2) The dotted lines in Fig. 3 prove an interaction of the electromagnetic field of the cells with the water. 3) Likewise, the constant deviation above the water is greater than above the continents, which is also taken as proof for the author's hypothesis on the decisive role of the oceans in the formation of the geomagnetic field. 4) The author concludes that the Bullard convection cells produce the basic geomagnetic field, the axis of which coincides with the axis of the rotation of the earth. 5) The interaction of the electromagnetic field of the cells with the highly conductive water of the ocean produces "eddies" of the currents in the ocean around the continents. 6) It is possible that the interaction of the electromagnetic cells with the waters of the individual oceans produces in them constant currents, to which eddy currents are superimposed, which are produced in the ocean during magnetic storm. There are 3 figures and 10 references: 8 Soviet-bloc and 2 non-Soviet-bloc.

SUBMITTED: January 11, 1960

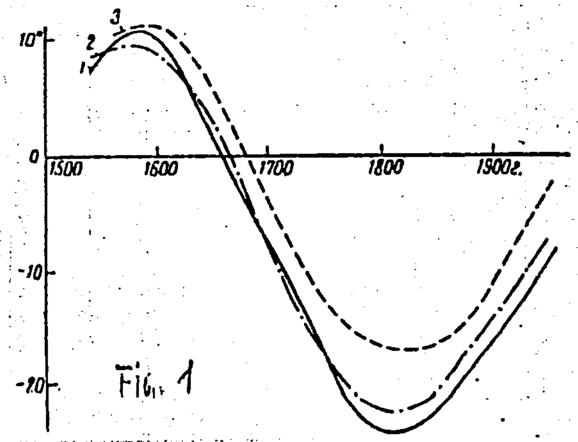


Fig. 1

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