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SOVIET BLOC INTERNATIONAL
GEOPHYSICAL YEAR INFORMATION

MARCH 7 1958

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PLEASE NOTE

This report presents unevaluated information on Soviet Bloc International Geophysical Year activities selected from foreign-language publications as indicated in parentheses. It is published as an aid to United States Government research.

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I. GENERAL

Czechoslovak Efforts in IGY

Czechoslovakia participates in almost all areas of the IGY effort. In the field of meteorology, synoptic observations are being conducted by stations in Prague, Brno, and Kosice, with four regular deadlines in a 24-hour period; with aerological radiosonde measurement of pressure, temperature, and humidity in Prague and Poprad twice daily; and measurement of high-altitude wind four times daily.

Eight stations measure the total solar radiation, including that on a horizontal plane of the sky. Eleven stations measure direct and total solar radiation, as well as in three spectral areas, and will also measure at the same time the duration of solar light. Two stations measure effective radiation, and two stations will also measure the total area of radiation.

One station will measure ozone at the surface level by a chemical method, while chemical analysis of impacts gathered in 20 various stations, supplemented by other physicochemical methods, will also be performed.

Cloud cover and noctilucent clouds will be observed for special purposes.

Efforts in the field of geomagnetism include the Pruhonice Observatory's research on magnetic storms and magnetic pulsations, and work is also performed on world geomagnetic mapping. The branch station at Budkov and the Slovak geophysical observatory in Hurbanovo will also cooperate on the same problems. These two centers will also conduct research in the field of telluric currents.

The field of aurora and nightglow will be studied by 30 stations of the Hydrometeorological Institute, 22 people's observatories, and astronomical circles in schools and factories observing the aurora borealis. The Ondrejov and Prcice stations will also photograph the aurora borealis to determine its altitude. The Institute of History of the Czechoslovak Academy of Sciences will cooperate in the framework of the worldwide study of aurora with the processing of reports on aurora in Czechoslovakia for the last 100 years. Nightglow will be measured photoelectrically in five spectral areas in Ondrejov and Lomnický štít, and A. Mrkos, participant in the Soviet Antarctic expedition, will also conduct simultaneous measurements.

Pruhonice and Panska Ves will conduct ionosphere measurements, which will consist of measuring ionospheric characteristics with an ionosonde (protaceci aparatura) twice hourly, measurement of attenuation of radio waves in the ionosphere, measurement of reflection and polarization of long and medium waves, the determination of ionospheric winds, the determination of the origin of sporadic E layer, and some other ionospheric effects.

While weather permits, all appearances of solar activity will be studied in detail and simultaneously. Both optical and radio observation will be conducted, with optical observation dealing chiefly with chromospheric eruptions, the chromosphere, and prominences. The observations will be performed by special equipment in Ondrejov, where radio measurement of solar emission in the 56 and 130 centimeter wave bands will also take place. Ondrejov and five other stations will also conduct photographic observation of sun spots.

In the field of cosmic radiation, a Prague station and the Lomnický Štit station will measure the variations of hard components of cosmic radiation and variations in neutron radiation.

The alert and communications center for the Czechoslovak IGY effort is in Pruhonice, which is connected with world alert centers and relays their reports to Czechoslovak workers and the Czechoslovak radio system.

In the second group of disciplines of the IGY, five stations measure geographical coordinates. Especially interesting will be the Ondrejov measurements after comparison, since this station conducted measurements in the last polar year. The institute of Astronomy in Prague will handle time service. In the field of seismic observation, seven stations will study seismic activity in Czechoslovak territory and microseismic disturbances also. Gravimetric study will observe swells of the earth's crust in various deep mines in Příbram. The radioactivity of rain will be measured in the field of nuclear radiation. Czechoslovakia also is thinking of participating in the observation of artificial satellites while they are visible. At present, after the launching of the Soviet satellites, visual, photographic, and radio observations are made of the satellites and rocket carriers. Due to understandable conditions, Czechoslovakia will not work at all in the field of oceanography and glaciology. (Vestník Československé Akademie Věd, No 9/10, Nov/Dec 57, pp 417-420)

Some Reports of Observations in Czechoslovakia

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Observation efforts according to the program of the IGY are progressing very satisfactorily in the most varied sectors in Czechoslovakia. For example, during the first 4 months of the IGY, 32 large solar eruptions

were measured by Czechoslovak observatories. The results of the Ondrejov observatory are highly rated in foreign countries, and Dr Ellison of Edinburgh, one of the best specialists in the study of the chromosphere, rates this work as the best organized visual observation of eruptions in Europe.

Great attention is devoted to the observation of Soviet artificial satellites. Up to 30 November, 24 passages of the rocket carrier of the first satellite, 3 passages of the first satellite itself, and 8 passages of the second satellite were observed, while 35 photographs of the rocket carrier of the first satellite, one photograph of the first satellite itself, and one photograph of the second satellite were taken. Especially good conditions existed at the Skalnaté Pleso observatory, at a height of 1,783 meters.

The Institute of Hydrometeorology and the People's Observatory in Prague received 23 reports on seven different aurora, and the report was sent to Edinburgh. The Institute of History of the Czechoslovak Academy of Sciences is processing reports on the observation of aurora during the past 100 years.

The Ondrejov Observatory of the Institute of Astronomy of the Czechoslovak Academy of Sciences observes solar radio noise on the 56 centimeter wave length, and announces the findings in monthly bulletins. Some 142 larger noise flareups have been recorded. Night glow is measured photo-electrically in Ondrejov and Lomnický štít. During the first 3 months of the IGY, these points observed 41 series of night and twilight glow and sent the findings to centers in Moscow and Paris.

Czechoslovakia's meteorological observation for the IGY is also extensive, with 160 scientific and technical workers participating. The findings on weather measurements are regularly sent to the world center in Geneva and to the world data center in Moscow. (Prague, Svobodné Slovo, 15 Dec 57)

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Number of Chinese Workers in the Field of Geophysics

Before the liberation, China had but some 40 persons participating in geophysical research, mostly in the field of meteorology. Since the liberation, the number of participants has been increased. At present, there are more than 10,000 research workers engaged in this type of work.

An initial geomagnetic and seismic observation network has now been established in China, the first set of geomagnetic and seismic maps has been completed, and a report on "the study of atmospheric current of the Tibetan plateau and its effect on the climate in China", by Yeh Tu-cheng and Ku Cheng-ch'ao, has also been completed. (Lhasa, Tibet Jih-pao, 14 Aug 57)

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II. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Soviets Use New Method for Photographing Artificial Satellite

A new method of photographing artificial satellites has enabled Soviet scientists to obtain three photographs of Sputnik II from which the visible ephemeris of the satellite can be determined with an accuracy better than 0.001 degree and the time of passage to within thousandths of a second.

The new method was developed and tried by astrophysicists at the Astrophysics Institute of the Academy of Sciences Kazakh SSR at the end of January, according to a TASS press dispatch of 1 February from Alma-Ata. At the high mountain observatory of the institute, which is situated near Alma-Ata in Zailiyskiy Ala-Tau, astrophysicists attached an oscillating plate to the large meniscus telescope, which interrupts over a specified time interval the trace left by the satellite on a photographic plate. These time intervals are synchronously recorded on a highly accurate oscillograph. (Baku, Bakinskiy Rabochiy, 4 Feb 58)

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Physiological Experiment on Sputnik II

In "Flight Into the Cosmos," Prof Vasiliy Vasil'yevich Parin, Active Member of the Academy of Medical Sciences USSR, reports the following on physiological experiments with Sputnik II: Soviet technology contributed greatly to science when it made it possible to have exact physiological data received on earth from an air-tight container with the dog Layka. Radiotelemetered data on the reactions of the dog during her flight through space in the second artificial earth satellite is now being processed and analyzed. Initial indications are that the experimental animal's reactions were quite satisfactory during the entire period of the physiological experiment and information obtained answered a number of complicated questions in space medicine.

The Sputnik II launching proved that a living organism was capable of surviving the effects of a violent thrust greatly exceeding the gravitational pull of the earth.

Telemetered data received showed that the dog tolerated the effects of the prolonged period of acceleration well during the entire period the rocket motors were working and after the satellite had entered its orbit.

After the rocket entered the orbit and the rocket motors ceased to function Layka found herself in a state of weightlessness. Experience has shown that both animals and humans lose their coordination during brief periods of weightlessness lasting only 10 seconds. Respiration, circulation, and the body temperature are also affected when a state of weightlessness exists. The nervous system becomes adapted to such an unusual condition after repeated practice, however, and coordination gradually improves. Layka underwent a period of conditioning before she was sent up.

The cabin holding Layka was placed inside the rocket not lengthwise, but crosswise. The action of g-forces on the body of the dog was thereby not longitudinal, but perpendicular. This served to prevent any serious disturbances in the circulation of the blood.

It can be assumed that humans would be capable of tolerating a brief acceleration of 10 g or more in a cosmic ship after undergoing a period of conditioning. A special anti-g suit consisting of rubber components containing air and pressing against the blood vessels of the lower half of the body can be used as protection against the effects of acceleration.

Since natural air circulation is impossible under conditions of weightlessness, a system of forced ventilation was created in the hermetic cabin of Sputnik II. Highly active chemical compounds emitted oxygen and removed carbon dioxide and excessive moisture.

Layka was fed from a special container, arranged in a special manner so as to prevent dispersion of liquid food all over the cabin due to weightlessness.

Cosmic rays are particles consisting of various elements which move with almost the speed of light. They possess great penetrating power and can ionize the molecules of a living organism, thereby severely damaging living tissues. The danger lies in the fact that cells of the nervous system, cardiac muscles, and other vital organs may be destroyed.

Sputnik II contained instruments for measuring cosmic rays and solar radiation. Information recorded and transmitted to earth contributed greatly to knowledge about radiation in outer space.

Layka was well protected in her hermetic cabin from ultraviolet rays. Many different methods of protection from solar radiation on earth have been developed. Their effectiveness was tested high above the earth with the flight of the second earth satellite.

Protection against ultraviolet rays need not be cumbersome. Ordinary glass may serve well to protect a living organism from these rays.

(Zdorov'ye, No 1, Jan 58, pp 2-3)

Sovetskiy iskusstvennyy sputnik Zemli (Soviet Artificial Earth Satellite), Moscow, Pravda Publishing House, 1957

Krylov, Yu. and Razumeyev, V., Vtoraya Luna (Second Moon), Molodaya Gvardiya Publishing House of the Central Committee of the Young Communist Youth League, 1957, ("Engineering in the Sixth Five-Year Plan" Series)

Iskusstvennyy sputnik Zemli (Artificial Earth Satellite), (material from a seminar on the US Vanguard project), translation from English, edited by Yu. S. Khlebtsevich, Sovetskoye Radio Publishing House, 1957

Kaznevskiy, V. P., Razvedchiki mezhplanetnogo prostranstva (Explorers of Interplanetary Space), DOSAAF Publishing House, Moscow, 1957

Pobedonostsev, Yu. A., Doctor of Technical Sciences, Iskusstvennyy sputnik Zemli (Artificial Earth Satellite), Moscow, Znaniye Publishing House, 1957

B. V. Lyapunov reviews the aforementioned publications in a recent issue of Nauka i Zhizn' as follows:

The creation of artificial satellites by Soviet scientists was valued by all progressive people as the greatest scientific achievement, opening unprecedented prospects to science and practice. It was natural, therefore, that among a very wide circle of readers, both Soviet and foreign, an unusual growth in interest in popular scientific literature on problems of astronautics should occur. Striving to satisfy this interest, the Pravda publishing house, immediately after the satellite events, published a collection, Sovetskiy isskustvennyy sputnik Zemli. The collection contains articles by leading Soviet scientists discussing in detail the problems connected with creating an artificial satellite, its orbit and observations of its movement, and the scientific significance of the "second moon."

Books and brochures on this theme were published by a number of other publishing houses.

Vtoraya Luna, a popular science pamphlet by Yu. Krylov and V. Razumeyev, presents the scientific and technical fundamentals involved in creating the artificial satellite. The reader is acquainted with the achievements of contemporary rocket engineering, which makes it possible to attain tremendous speeds necessary for escape into outer space: with the problems connected with creating the satellite -- equipping it with scientific apparatus, observations of orbital movement, etc. However, having given relatively much attention to rocket engineering, the authors have discussed in insufficient detail the instruments on satellites and the significance of the investigations being conducted by them.

At the jubilee session of the Supreme Soviet USSR, N. S. Khrushchev said: "Our satellites are revolving around the Earth and are waiting for US and other satellites to appear, together with them, and to establish a 'commonwealth of satellites.'" It is known that the launching of the US satellite was a failure. The collection Iskusstvennyy sputnik Zemli acquaints the reader with the US Vanguard project.

The successful launchings of the satellites has brought the problems of interplanetary flight closer to solution. One can speak of a flight to the Moon of an automatic rocket and of human travel into the cosmos as a prospect of the not-too-distant future. Among the latest publications on this theme is the book by V. P. Kaznevskiy entitled Razvedchiki mezplanetnogo prostranstva. A description of explorers of interplanetary space and a presentation of the physicotchnical fundamentals of reactive motion comprise the main content of this book. The equipment of the contemporary aerological rocket, its guidance, ground equipment, transmission of in-flight information and the results of high-altitude investigations are some of the problems mentioned in the book.

The Znaniye Publishing House has issued a pamphlet by Yu. A. Pobedonostsev entitled Iskusstvennyy sputnik Zemli which contains a detailed review of contemporary foreign ballistic rockets, presents data on the first Soviet artificial satellite, and reviews certain satellite projects, including manned satellite projects. The projects of W. Braun and D. Romik are of special interest. In the supplement to the pamphlet, the trained reader will find ~~theoretical considerations used in calculating~~ satellite and examples of these calculations. (Nauka i Zhizn', No 1, Jan 58, p 76)

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Soviet Documentary Film on Satellites

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In a new Soviet-produced documentary film, both Soviet artificial earth satellites are shown before launching. The film also shows the instruments installed in the second satellite, the hermetically sealed cabin for Layka, and the dog before flight into space. The film shows the launching of a Soviet meteorological rocket carrying a dog, and also clips from a camera in the moving rocket. (Prague, Mlada Fronta, 21 Dec 57)

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Yugoslav Public Discussion On Earth Satellites

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On 13 December 1957, in the auditorium of the Trade Union Center (Dom sindikata) in Belgrade, the Astronautical Society of the Aviation Association of Yugoslavia (Astronautičko društvo Vazduhoplovnog saveza Jugoslavije) organized a public discussion on the subject of artificial earth satellites. Participating in the discussion before an overflow audience were the following prominent scientific and public workers: Academician Dr Pavle Vujevic, president of the National Commission for the International Geophysical Year (pretsednik Nacionalne komisije za medjunarodnu geofizicku godinu); Engr Kosta Sivcev, president of the Astronautical Society of the Aviation Association of Yugoslavia; Ante Obuljen, consultant of the Hydrometeorological Bureau (Savetnik hidrometeoroloskog zavoda); Dr Tatomir Andjelic, a university professor; Dr Marko Janjic, director of the Aviation Medicine Institute (upravnik Vazduhoplovno-medicinskog instituta); Engr Vladimir Avjaz, editor (urednik) of the periodical Vasion (Universe); Milorad Protic, director of the Astronomical Observatory (upravnik Astronomske opservatorije); and Engr Vladislav Matovic, secretary of the Astronautical Society of the Aviation Association of Yugoslavia. Mirosljub Jevtovic, editor for Radio Belgrade, was moderator of the discussion. (Belgrade, Aero svet, Vol 7, No 150, 29 Dec 57, p 2)

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Satellite Tracking at Potsdam

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The rocket carrier of Sputnik I was photographed with a small but powerful astrocamera for the first time by the Potsdam Astrophysical Observatory on 26 October 1957 at 1,000, writes Dr Guentzel-Lingner. The cameras used at Potsdam have special devices for synchronizing the time indication with the position indication of the satellite on the photograph. A fast shutter device is synchronized with a chronograph which records the time of the shutter closing on a paper strip. A comparison of the paper strip and film gives information on the passage of the satellite past certain fixed stars or other celestial reference points. The results of the observation are relayed to Moscow by phone within the hour. (Berlin, Die Wirtschaft, No 51/52, 19 Dec 57, p 3)

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Poles Suggest Capture of Planetoid for Use as Satellite

A brief, unsigned news item entitled "The Planetoid -- an Earth Satellite" reports that a recent Warsaw meeting of the Polish Society of Rocket Engineering and Astronautics gave special attention to a report by Engr V. Geisler and M. Pankov, who suggested the idea of using small celestial bodies, planetoids, as artificial earth satellites [space stations:] rather than to launch special artificial structures from the earth.

The authors suggest the use of the planetoid Hermes, discovered in 1937, for this purpose. According to their calculations, the periodic approach of Hermes to the Earth (less than 500,000 kilometers away) gives man the possibility of "moving on to it" rather easily. Because of the small mass of this miniature celestial body, which is only one kilometer in diameter, it would be possible to change its orbit and convert it into a space station. (Nauka i Zhizn', No 1, Jan 50, p 70)

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Italian, French Communist Newspapers Reprint von Braun Rocket Sketch;
Give Soviets Credit

The lengths to which the Communist and fellow-traveling newspapers will go to manufacture propaganda on Soviet space achievements is vividly highlighted by recent violations of a US copyright by the Rome daily L'Unita, organ of the Italian Communist Party; the Paris daily, L'Humanite, organ of the French Communist Party; and the Rome daily, Avanti! organ of the fellow-traveling Italian Socialist (Nenni) Party. The rights violated in all three cases belong to The Viking Press of New York City under a 1952 copyright by the Crowell-Collier Publishing Company.

L'Unita, on page 9 of its 7 November 1957 issue, published an article on present and future Soviet space achievements and adjoining the article printed a picture of a rocket with the caption: "Moscow -- A vertical section of a 3-stage rocket with which it is believed the Soviets will attempt the first unmanned flight toward the Moon." The picture is an identical reproduction of an illustration on page 24 of Across the Space Frontier, a compilation of articles and illustrations on the coming space age by a number of authors including Wernher von Braun, published by The Viking Press in 1952. The illustration was drawn by Rolf Klep from a sketch by von Braun and portrays the latter's conception of a future US three-stage rocket ready for launching from Johnston Island in the Pacific.

On 3 January 1958, L'Humanite printed on its front page an obviously touched-up version of the same von Braun illustration with notations in the Cyrillic alphabet on it and with the following caption: "A sketch illustrating a Soviet work published in 1955, Trip Through the Universe [title translated from the French]. It gives an idea of what a rocket carrying a human crew in the nose could be."

Avanti!, on page 3 of its 1 January 1958, issue carried the same touched-up version of the von Braun sketch, but with an even more blatant caption: "The three-stage rocket which transported the great Sputnik to its orbit. This design appeared in a Soviet periodical."

None of these three newspapers gave any attribution of the picture to von Braun or The Viking Press, and, as can be observed from the caption, L'Unita and L'Humanite inferred and Avanti! stated outright that the picture originated in the USSR.

III. UPPER ATMOSPHERE

New Book on Effects of Solar Activity

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Ocherki Fiziko-Geograficheskikh Proyavleniy Solnechnoy Deyatel'nosti (Essays on Physicogeographic Manifestations of Solar Activity), by M. S. Eygenon, published by the Publishing House of L'vov University, 1957, 230 pp, is a book devoted to heliogeophysics, i. e., the study of the terrestrial manifestations of solar activity. The first part of the book presents basic data on the Sun and its activity, on the physical essentiality of action of the Sun on the atmosphere of our planet. The second part is devoted to the cyclic and rhythmic nature of solar activity and the geophysical consequences of this cyclic nature. The third and major part examines various physicogeographic manifestations of solar activity, particularly the fluctuations in climate, the changes in the level of the Caspian Sea, fluctuations of the iciness of polar seas, and the nature of the major anomaly of general circulation of the Earth's atmosphere in 1954-1956. Solar activity is analyzed as a possible geological factor and in its manifestation in the biosphere. (Priroda, No 12, Dec 57, p 123)

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Famed Chinese Astronomer Returns to China

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After spending 32 years in France doing research work, Dr Ch'eng Mao-lan, the internationally famed astronomer, returned to China recently. To honor his return, a welcome dinner party was given to him by Wu Yu-hsun (Woo Yui-hsun), vice-president of the Chinese Academy of Sciences on 2 August 1957. Ch'eng holds a master's degree in mathematics and a doctorate in astronomy. In 1945, he received an award from the French Academy of Sciences, and in 1956, he was made a Chevalier in the Legion of Honor for his scientific work in France. He specializes in the study of spectrophotometry of fixed stars and the study of night glow and auroral spectra. He has published some 68 scientific papers. He will continue to do research work in the field of astronomy. (Kuei-yang, Kweichow Jih-pao, 4 Aug 57)

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IV. METEOROLOGY

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Azerbaijdzhan Radio Weather Stations Automatically Transmit Data

Three radiometeorological stations, automatically transmitting weather data, are operating in the Azerbaijdzhan SSR under the Administration of the Hydrometeorological Service (UGMS). These stations are located on the north-eastern shore of the Caspian Sea. They consist of a small radio transmitter and meteorological instruments (barometer, thermometer, and wind

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velocity and direction indicators) fastened to a 20-25 meter mast. Batteries, power control systems, automatic time switches, and other equipment, are installed in a small underground room. Data is transmitted punctually every 6 hours. Range is estimated at 400 kilometers.

The signals transmitted are received at Fort Shevchenko and rebroadcast to the UGMS Weather Bureau, where weather forecasts for the Caspian Sea and neighboring areas are compiled.

The stations are designed to operate for one year without servicing. Expeditions from UGMS are dispatched once a year by plane, automobile, and sometimes by camel, for servicing, repairs, etc.

This year, automatic radiometeorological stations will be established at higher altitudes in the mountains of Azerbayzhdan and Dagestan. In addition to readings of atmospheric pressure, air temperature, wind velocity and direction, they will also record precipitation and other meteorological data. (Baku, Bakinskiy Rabochiy, 6 Feb 58)

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IGY Work at Kustanay Aerological Station

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L. Legushina and V. Musatova, Komsomol aerologists, work at the Kustanay Aerological Station preparing sounding balloons for upper atmosphere research.

Under the IGY program, Kustanay Station engages in standard meteorological observations, reporting four times a day, radio sounding of the atmosphere, and balloon observations. (Alma-Ata, Kazakhstanskaya Pravda, 10 Dec 57)

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V. OCEANOGRAPHY

New Pamphlet on Destructive Sea Waves

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Tsunami (Tsunami), by A. Ye. Svyatlovskiy, published by the Publishing House of the Academy of Sciences USSR, 1957, 68 pages with illustrations, is a pamphlet concerning waves originating in the seas and oceans, usually as a result of underwater earthquakes and more rarely as a result of eruptions of underwater or island volcanos." In this pamphlet, Svyatlovskiy acquaints the reader with the peculiarities of these destructive sea waves. Having given reasons for their origination, geological nature, physical properties, methods of studying, and the possibility of forecasting them, the author makes certain recommendations for protecting the population of Pacific Ocean coastal areas of the Soviet Union and also ships in coastal ports. A force scale recommended for characterizing the force of sea quakes which may be accompanied by the formation of tsunami is given. (Priroda, No 1, Jan 58, p 126)

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VI. SEISMOLOGY

Lhasa Observatory Obtains Valuable Data

A news item reveals that the Lhasa Observatory, sponsored by the Geophysics Institute of the Chinese Academy of Sciences, has obtained some valuable and precise geomagnetic and seismic data during the first month of its operation. The observatory was formally inaugurated on 1 July 1957. It was originally established for participation in the IGY program. All data gathered through the Lhasa observatory will be compiled and sent to the central station in Peiping for further study. (Lhasa, Tibet Jih-pao, 14 Aug 57)

China Has 20 Seismological Stations

Since the liberation, China has so far established a total of some 20 seismological stations to do seismological work. Many scientific reports have been made by these stations. (Lhasa, Tibet Jih-pao, 14 Aug 57)

Ch'eng-tu Establishes a Seismic Station

A new seismological station was recently established in a suburb southwest of Ch'eng-tu. The station was equipped with the first set of the latest model of seismic equipment imported from the Soviet Union. The equipment used in this station is capable of registering shocks and motions of earthquake in the vicinity of Ch'eng-tu, as well as in any area throughout the world. (Ch'eng-tu Jih-pao, 26 Aug 57)

Study of Figure of the Earth Without Use of Normal Comparison Planet

In investigating the figure of the Earth by gravimetric methods use is made generally of a normal comparison planet, and as such, a level spheroid is mostly used. Adopting the method of Sludskiy and making no use of a normal Earth, S. V. Gromov, in his report "Determination of the Figure of the Earth Without Using the Concept of a Normal Comparison Planet," develops formulas which make it possible to compute the components of the inclination of the vertical in points of the physical surface of the Earth, as well as the altitudes of a certain quasi-geoid relative to a nonlevel ellipsoid. (Vestnik Leningradskogo Universiteta, No 19, Seriya Matematiki, Mekhaniki i Astronomii, No 4, 1957, pp 145-152)

Preparations for Absolute Gravity Measurement at Potsdam

For the new determination of absolute gravity, the Geodetic Institute at Potsdam has designed an apparatus with two pendulums which swing on a common carrier and do not have to be removed from the evacuated case for the taking of measurements, according to R. Schroeter in "Preparations for the Measurement of Absolute Gravity at Potsdam" All dynamic influences of the stand and foundation are supposed to be excluded by the counteroscillations of the reversion pendulums. The expected influences of the elastic interaction between knife edges and bearings during the pendulous oscillation are to be eliminated by the use of three pendulums of different lengths (25, 50, and 75 cm).

The article contains two cross sectional drawings of the new pendulum instrument. (Feingeräsetechnik, No 1, Jan 58, pp 21-22)

Potsdam Geodetic Institute and the IGY

A report by Prof K. Reicheneder on the Potsdam Geodetic Institute includes the following information:

Today there are more scientists and associates employed at the institute than there were before 1945.

The work of the institute is divided among four departments: (1) the Department of Mathematical Geodesy, which considers problems of the geoid, deviations of the plumb line, and other mathematical problems of geodesy, including the establishment of datum levels and bench marks and the improvement of computing machines and methods; (2) the Department

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of Physical Geodesy, which is concerned with gravimetric studies for scientific purposes, especially the new determination of the absolute force of gravity in Potsdam, and with improvement and development of methods and instruments for the study of the gravitational field of the earth; (3) the Department of Practical Geodesy, which carries out development work on new physical methods for distance and range measurements, the calibration, testing, and further development of geodetic instruments, and with studies on the measurement of base lines, angles, and altitudes; and (4) the Department of Astronomical Geodesy, which carries out fundamental longitude determinations and works on the improvement of astronomical-geodetic observations. It is also responsible for time service and the improvement of quartz clocks.

The institute is developing sea gravimeters, which are of especial importance at present.

In the development of other geodetic instruments, the departments of physical and practical geodesy work closely together. The emphasis at present is on longitude measurements, an area where foreign countries have obtained a considerable lead in recent years.

The Potsdam Geodetic Institute is participating in the IGY, primarily in the program on longitudes and latitudes and secondarily on earth tides. The government has already appropriated the funds for an astrolaboratory. Joint work is already going on between the Tokyo Observatory and Potsdam in regard to the transit time of electromagnetic waves. (Wissenschaftliche Annalen, Vol 6, No 12, Dec 57, pp 853-864)

VIII. ARCTIC AND ANTARCTIC

Fossil Remains and Other Antarctic Discoveries Reported

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At the end of the fifth month of its voyage, the expeditionary ship Ob' was at the southern edge of the Pacific Ocean en route to the little-studied part of Antarctica -- the Oates Coast. The immense section of Antarctica from Knox Coast in the west to the shores of King George V Land was carefully explored by members of the Soviet Union's third Marine Antarctic Expedition.

Nosing its way through the off-shore pack ice, the Ob' made continuous fathometer measurements over hundreds of miles. Many of the measurements were made in places where nautical charts showed no soundings.

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dition's cartographers to map over 1,000 miles of the Antarctic Coast. Work conducted in Wilkes Land showed that the shore line depicted on the maps was actually located many miles to the south. In the region called "Discovery Land," there is a bank or shallow located about 100 meters off shore to which glacial tongues, interconnected by land floes, extend. Careful surveys in the reputed location of "Discovery Land" showed no such land existed. It was also found that the Ninnis and Mertz glacial tongues actually extended into the sea 10 miles less than shown on the expedition's charts.

On 1 February, an AN-2, piloted by M. N. Kuminskiy, with Hero of the Soviet Union M. M. Kirillov as navigator, made a flight over the region of the South Magnetic Pole. Participants of the flight described the region of the pole as a bright green ice sheet swept completely clear of snow and reflecting the rays of the sun.

Another of the expedition's airplanes piloted by Hero of the Soviet Union K. F. Mikhaleiko, chief of the air detachment, with V. N. Ivanov as navigator, landed a group of the expedition's scientists on Cape Horn Bluff. Because of the surrounding glacier, Cape Horn Bluff appears to be an island rising to a height of 425 meters above sea level. The mineralogical composition of the sandstone found here proved to be very interesting. Together with the usual grains of feldspar, they contained up to 30 percent granite, as well as a considerable amount of cassiterite. Of greatest interest was the discovery in the sandstone of the carbonized remains of wood and the impressions of the leaves of plants which grew in the Antarctic 200-250 million years ago. Also found were fossils, reminiscent of the bones of animals which apparently lived here hundreds of millions of years ago.

At a meeting of the scientific council of the Marine Antarctic Expedition, a report by Prof P. A. Shumskiy, Doctor of Geographical Sciences, concerning the basic results of the glaciological investigations carried out by Soviet scientists in the Antarctic was heard. If these findings are confirmed by those of the other expeditions, then it is possible to consider that the average thickness of the ice cover in the Antarctic does not exceed 1,500 meters, as was previously thought, and the total amount of ice consists of about 30 million cubic kilometers instead of 19 million.

A few days ago, the expedition received an invitation to participate in an Antarctic symposium -- an international scientific conference organized by the New Zealand IGY Committee. After completing investigations in the vicinity of King George V Land, the Ob' will proceed to Wellington, New Zealand, where the symposium will be held toward the middle of February.

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This information on the activities of the USSR Marine Arctic Expedition was radioed to Soviet newspapers by A. Dunayev, Leningradskaya Pravda's special correspondent, and V. Tkachev, first mate of the Ob'. (Leningrad, Leningradskaya Pravda, 6 Feb 58; Moscow, Izvestiya, 8 Feb 58)

Impressions of Arctic Form Basis for New Book

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Dva Leta v Arktike (Two Years in the Arctic), by N. N. Sushkina, published by the Publishing House of the Academy of Sciences USSR, 1957, 174 pages with illustrations, is based on the personal impressions of the author, who spent 2 years in Novaya Zemlya and Franz-Josef Land. Information is given on the geological past of these places, on the character of icing and the work of ice-breakers, on the climate, animal world, and vegetation. The author interestingly discusses the exploration of these places, the contemporary life of the population, its laws and customs, as well as the conduct of commerce in Novaya Zemlya.

The text is accompanied by interesting illustrations and maps. (Priroda, No 1, Jan 58, p 126)

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