

List of Danish Geodetical and Geophysical Publications 1960

(Compiled by Dansk Geofysisk Forening)

Published in Copenhagen 1960 unless otherwise stated

EINAR ANDERSEN: Gravimetri. — Geofysiken i Danmark. 2. del.

The importance of gravity measurements for the geodesy was demonstrated by Clairauts theorem and Stokes' formula and according to this measurements of the gravity became an important geodetic branch. The earliest measurements were absolute but very soon the relative measurements became dominating. Since 1930 the static instruments are developed and the number of gravity stations is increased enormously.

In Denmark gravity measurements have been carried out from the first beginnings, absolute measurements being carried out by Schumacher. Later "Den Danske Gradmaaling" made relative pendulum measurements at several stations all over the country. When the Royal Danish Geodetic Institute was established the pendulum measurements were continued and in the last 20 years most of the country is covered by a dense net of gravity stations measured by gravimeters. Such measurements have also been made in Greenland and on the Faroe Islands.

EINAR ANDERSEN: Grønland opmåles ved hjælp af Radar. — Ingeniørens Ugeblad nr. 33, 1960.

In 1958 the Royal Danish Geodetic Institute purchased a Tellurometer in preparation for a survey in Greenland. The paper deals with the experiences from this survey and furthermore the principles, according to which the instrument works, are explained.

S. T. ANDERSEN, H. DE VRIES and W. H. ZAGWIJN: Climatic change and radiocarbon dating in the Weichselian glacial of Denmark and The Netherlands, *Geologie en Mijnbouw* 39, No. 2, pp. 38-40 (The Hague).

The results of pollen-analytical studies on the early Pleistocene Weichselian glacial stage in Denmark and the Netherlands show good consistency. As pollen-zone boundaries are not necessarily synchronous over a large area, radiocarbon determinations were made to help define chronostratigraphic units.

The Amersfoort Interstadial was found to be 64000 ± 1100 yr old. Two dates were obtained for the Brørup Interstadial: 59430 ± 1000 yr for pollen zone W 4 and 58740 ± 1000 yr for pollen zone W 3c. Dates from Pleniglacial A of the Netherlands range from 32000 to 50000 yr. Humus from the still uncertain interstadial between Pleniglacial A and B at Breda in the southern Netherlands is 29930 ± 300 yr old, and organic matter remaining after thorough treatment of the sample gave an age of 31750 ± 400 yr. No good radiocarbon dates have yet been obtained for the Pleniglacial B of the Netherlands (28000 to 14000 yr ago). More details on these radiocarbon dates will be published later.

WILLI DANSGAARD: The content of heavy oxygen isotope in the water masses of the Philippine Trench, *Deep-Sea Research* 6, pp. 346-350.

The H_2O^{18} content of a group of 11 water samples from 7558 to 9864 m depth was compared with that of another group of 4 samples from 3830 to 4202 m depth in the Philippine Trench. The difference was 0.1 ± 0.2 ppm which indicates that no significant fractionation has occurred. Thus, the time for a complete exchange of water masses in the trench is very short relative to the time needed for the sedimentation process to reach equilibrium. This latter time is very long, probably on the order of 10^8 yr.

WILLI DANSGAARD, G. NIEF and E. ROTH: Isotopic distribution in a Greenland iceberg, *Nature* 185, No. 4708, p. 232 (London).

The parallelism between deuterium and oxygen-18 content in snow samples from the Greenland icecap is retained in the ice for several hundred years. The samples used were all taken from one piece of ice emitted from the Ingerit glacier in west Greenland. The deuterium content and deviation of the oxygen-18 content are plotted against distance of the sample from an arbitrary zero point; their relationship is linear within measuring accuracy.

The highest oxygen-18 contents are found in layers of clear ice that probably originated from summer melting at the time of formation of the ice; the light isotopic component is more volatile and is lost by evaporation from wet snow.

BØRGE FRISTRUP: Den Internationale Glaciologiske Expedition. »Grønland« 1960, pp. 1–15.

A short summary of the organization and the work carried out on the Greenland Ice Cap by the International Glaciological Expedition 1959–1960 with description of the wintering station.

BØRGE FRISTRUP: Nogle amerikanske undersøgelser på Grønlands indlandsis. »Grønland« 1960, pp. 281–294.

A review of the American glaciological work carried out on the Greenland Ice Cap in connection with the Thule Air Base.

BØRGE FRISTRUP: Studies of Four Glaciers in Greenland. Geogr. Tidsskr. 59. pp. 89–102. Guidebook Denmark pp. 171–184.

Four Greenland glaciers are investigated, their morphology is studied in relation to physiography, climate and change of climate. A relation is found between the rate of retreat and the temperature of the ice. With exception of the Ice Cap most of the Greenland glaciers are temperate glaciers (in South Greenland) og subpolar glaciers (even in North Greenland), the occurrence of superimposed ice is of importance for the ice accumulation.

BØRGE FRISTRUP: The International Glaciological Expedition. Papers distributed Greenland Symp. 6 pp.

Summary of the International Glaciological Expedition and it's work on the Greenland Ice Cap 1959–60.

BØRGE FRISTRUP: Climatological Studies of some High Arctic Stations in North Greenland. Papers distribut. Greenland Symp. 16 pp.

A comparison of the climatology between three North Greenland stations: Jørgen Brønlunds Fjord, Station Nord, and Dundas (Thule) and the two northernmost Canadian stations: Station Alert and Eureka. The very close resemblance between Brønlunds Fjord and Eureka is demonstrated.

BØRGE FRISTRUP: Danish Glaciological Investigations in Greenland. Abstract of paper. I Internat. Symp. on Arctic Geology. Calgary.

Abstract of the paper: Studies of Four Glaciers in Greenland. Geogr. Tidsskr. 59. pp. 89–102.

BØRGE FRISTRUP: Studies of Four Glaciers in Greenland. IUGG. Assembl. Helsinki. Abstract of papers.

Comparative studies of Greenland glaciers especially regarding the possibilities to standardize ablation measurements.

BØRGE FRISTRUP: Studies of Four Glaciers in Greenland. IGC. Stockholm. Abstract of papers.

Abstract of publication: Studies of Four Glaciers in Greenland. Geogr. Tidsskr. 59. pp. 89–102.

BØRGE FRISTRUP and **A. WEIDICK:** Glaciologi. Geofysiken i Danmark 2, pp. 39–53.

A description of the history of glaciology regarding Greenland from the old time up to the latest exploration and investigation of the Ice Cap as well as the glaciers outside.

Geodætisk Institut:

Bulletin of the seismological station København:

No. 77. Jan–Jun 1959. 166 earthquakes and microseismic readings every 6 hours.

Bulletin of the seismological station Nord:

No. 3. Apr–Jun 1958. 216 earthquakes and microseismic readings every 6 hours.

No. 4. Jul–Dec 1958. 321 earthquakes and microseismic readings every 6 hours.

No. 5. Sep 1957–Dec 1958. Additional microseismic readings for IGY days and periods.

Bulletin of the seismological station Scoresbysund:

No. 36. Jul–Dec 1958. 191 earthquakes and microseismic readings every 6 hours.

No. 37. Jul–Dec 1958. Additional microseismic readings for IGY days and periods.

No. 38. Jan–Jun 1959. 178 earthquakes and microseismic readings every 6 hours.

Report on Seismology and Physics of the Interior of the Earth 1957–1960. By EINAR ANDERSEN. Submitted to the Twelfth General Assembly of IUGG held in 1960 in Helsinki, Finland. Compiled by HENRY JENSEN.

Report on Triangulation and Base Measurements 1957–1959. By EINAR ANDERSEN. Submitted to the Twelfth General Assembly of IUGG held in 1960 in Helsinki.

Report on Gravity Measurements 1957–1960. By EINAR ANDERSEN. Submitted to the Twelfth General Assembly of IUGG held in 1960 in Helsinki.

Report on Levelling of High Precision in the Period 1957–1959. By EINAR ANDERSEN. Submitted to the Twelfth General Assembly of IUGG held in 1960 in Helsinki. Compiled by O. SIMONSEN.

Referat af det tredje nordiske geodætiske møde i København 25–30 maj 1959.

Papers presented by EINAR ANDERSEN, BJ. SVEJGAARD, SVEND SAXOV, A. JESSEN, and TORBEN KRARUP.

JØRGEN HJELME: Seismografer. — Fysisk Tidsskrift 58. årg. pp. 10–45.

The first chapter deals with the principles of seismographs, the special features of vertical seismographs, and the electro-dynamical seismographs. All the types of seismographs used in Denmark and Greenland are treated. Some examples of the seismographs recently developed are mentioned.

The problem of the response from seismographs is treated in the second chapter.

The next chapter concerns the recording, and the last chapter gives some examples for applied seismology.

HARALD KROG: Post-glacial submergence of the Great Belt dated by pollen-analysis and radiocarbon, Internat. Geol. Congr. 21st. Copenhagen 1960, Proc. part 4, pp. 127–133.

Carbon-14 measurements date the beginning of submergence of two former freshwater basins in the Great Belt of Denmark as 6600 B.C. Pollen analysis shows that the basins were contemporary. Submergence was due either to eustatic rise or to drainage water from the Ancyus Lake. A present 4.5-m difference in level between the two basins is explained by differences in isostatic uplift.

I. LEHMANN: Structure of the upper mantle as derived from the travel times of seismic P and S waves. — Nature vol. 186. p. 956. (London).

There is found to be a discontinuity surface in the upper mantle at a depth of about 220 km at which the velocities and velocity gradients of P and S waves increase abruptly. Above the discontinuity surface there is a low velocity layer for S.

I. LEHMANN and M. EWING: On short-period surface waves as recorded in Copenhagen. Mémoires de l'Institut Géodésique de Danemark série 3, t. 34. 17 pages + 32 figures, separately bound.

The short-period waves arriving in the first part of the surface wave trains are discussed with reference to records obtained at Copenhagen. Sections of the records of 31 earthquakes are reproduced.

M. V. L. LORCK: The state of the ice in the Arctic seas 1956 — Appendix to the Nautical-Meteorological Annual 1956. — København 1959.

ASGER LUNDBAK: Udforskning af verdensrum og dybhav i det Internationale Geofysiske År 1957-58. — Grønland, pp. 81-89.

A review of deep-sea exploration and space research during IGY and IGC-59.

A. LUNDBAK: Some simple formulas for latitude effects and lifetimes of satellites. — Planetary and Space Science, vol. 2, pp. 212-213. Pergamon Press.

The formulas mentioned are stated, with a special concern to Discoverer V and Discoverer IV.

ASGER LUNDBAK: About Cosmic Dust as Decelerating Factor and a General Law for Satellite Orbits. — XIth International Astronautical Congress, Vol I, Main Sessions, pp. 7-18. Stockholm 1960.

The changes dP/dt of nodal periods P of four satellites are made the objects of investigations during a common period of 15 months, the satellites being Explorer I, Vanguard I, Sputnik III and Explorer IV. Various factors affecting dP/dt are considered, i.e. a latitude effect, a day-night effect, a charged particle effect and especially a cosmic dust effect.

ASGER LUNDBAK: Status i rummet. — Vor Viden, pp. 140-150.

A popular review of satellites, space probes and their results.

J. M. LYSHEDE: Hydrologi. — Geofysiken i Danmark 2, pp. 29-37.

A review of Danish hydrologic investigations from 1849 to 1960 is given. The actual problems are mentioned.

Meteorologisk Institut:

Nautisk-Meteorologisk Årbog/Nautical-Meteorological Annual 1959.

Nautisk-Meteorologisk Årbog/Nautical-Meteorological Annual 1958. — København, 1959.

Magnetic Yearbook 1957. Part 1: Denmark (except Greenland).

Magnetic Yearbook 1958. Part 1: Denmark (except Greenland).

Magnetic Yearbook 1951: Part 2: Greenland, A: Godhavn.

Ugeberetninger om nedbør m. m. årgang 1960.

Månedstillæg om nedbør m. m. årgang 1960.

JOHANNES OLSEN: Vor nabostjerne Solen. — Nat. Verd. 1960, pp. 33-37.

A short popular note about the radiation from the sun and a description of the dominant part the hydrogen ion plays in making the spectrum of the sun continuous even if the sun is exclusively built up of gases.

JOHANNES OLSEN: Solens geofysiske virkninger. — Nat. Verd. 1960, pp. 82-89.

A popular description is given of the disturbances on the sun connected with sunspots and of the effect produced on the earth's atmosphere. Some Danish results showing that the sun may show a constant rotation—period during several years are described.

KNUD PODER: Determinations of Latitude 1956. — Geodætisk Instituts Skrifter 3. Række Bind XXXIII 1960.

Determinations of latitude by the Horrebow-Talcott method in 7 stations of the Danish primary triangulation.

SVEND SAXOV: Mining Geophysics. *Nature* 185, No. 4711, pp. 436–437. (London).

A review of the second Nordic meeting for Mining Geophysics held in Copenhagen December 7th–8th, 1959. Twelve technical papers were presented. At the business meeting a committee was established to consider the problem of courses in mining geophysics and education of mining geophysicists. The third meeting is planned to take place in Sweden.

SVEND SAXOV: Discussion of the paper "some pressure effects on the behaviour of Worden gravity-meters" by C. Gantar and C. Morelli. *Geophysical Prospecting VIII*, pp. 111–117.

An unexpected change in the Worden gravimeter scale constant during a flight to Greenland in the summer of 1959 is discussed.

SVEND SAXOV: Old Water Marks in Bornholm. — *Geografiska Annaler* 41, pp. 256–260.

In 1886 Holmström established water marks at three localities in Bornholm. Two of the marks were re-found in 1958 and levelling between the old points and the Danish geodetic levelling system was carried out. However no conclusions with regard to vertical changes can be drawn from the two sets of levellings. An analysis of the water level station around the Baltic Sea is given and an interpolation of the change-of-level coefficients reveals that most probably no change or at most a very slight uplift has occurred in Bornholm during the last 70–100 years.

O. SIMONSEN: Summarizing Remarks and List of Geo-Potential Numbers. — Association Internationale de Géodésie. Commission Internationale des Nivellements Européens. Report stencilled by the Danish Geodetic Institute, Copenhagen 1960.

This list of geo-potential numbers cancels the former list of 1959, confer the 1959-list.

JENS SMED: Synoptic Hydrographic Charts, October–December 1958.

Monthly charts showing surface water temperature and salinity for the North Sea and adjacent waters; for the Kattegat, Belts and western Baltic also wind and current. For details see the 1953 list.

JENS SMED: Monthly Anomalies of the Surface Temperature in Areas of the Northern North Atlantic in 1958. — Monthly Anomalies of the Surface Temperature in an Area off the Eastern Coast of Scotland in 1958. — *Annales Biologiques*, Vol. XV, pp. 14–15 and p. 34.

Positive anomalies (the period 1876–1915 being taken as standard) are still highly predominant. In the northern North Atlantic region as a whole the average anomaly over the year is 0.8°C ., i.e., 0.1°C . higher than in 1957. In the Scottish area the average anomaly is 0.5°C ., as compared with 0.6°C . in 1957.

HENRIK TAUBER: Post-Bomb Rise in Radiocarbon Activity in Denmark. *Science* 131 No. 3404, pp. 921–922.

During the summers of 1958 and 1959 the increase in concentration of bomb-produced radiocarbon in Denmark was several percent higher than the average increase for the hemisphere. This additional increase is probably a carbon-14 equivalent to the spring peaks in strontium-90 fallout in the North Temperate Zone in the same years, and suggests latitudinal variations in carbon-14 contamination.

HENRIK TAUBER: Copenhagen natural radiocarbon measurements III, Corrections to radiocarbon dates made with the solid carbon technique, *Am. Journ. Science, Radiocarbon Suppl.* 2, pp. 5–11.

In order to check the magnitude of the Suess effect in the Copenhagen area and to determine the corrections to be applied to previous measurements by Anderson and others, the black-carbon materials of the former standards were combusted and measured with the carbon dioxide method. After normalization to a common C^{13}/C^{12} ratio these measurements showed an average depression of 2.5 ± 0.5 percent in carbon-14 activity compared to 95 percent of the measured activity of the NBS oxalic-acid standard. It was calculated that 200 ± 40 yr should be added to all dates in the Copenhagen I and II lists. The corrected dates, in years before 1950, are given for the pollen-zone boundary II/III and III/IV, and for the average ages of the Neolithic dwelling places Egozwil-3 in Switzerland and Mul. I in Denmark. Measurements made up to June 1955 and not included in the Copenhagen I and II lists are also given; only dates from periods with no radioactive contamination of the atmosphere by fall-out products are included. These include dates of samples from Alaska, Greenland, Iceland, Italy, and the Netherlands.

HENRIK TAUBER: Copenhagen radiocarbon dates IV. Am. Journ. Science, Radiocarbon Suppl. 2, pp. 12-25.

Radiocarbon ages, expressed in years before 1950 and measured at the National Museum in Copenhagen, Denmark, are reported for geologic- and pollen-dated samples from the Netherlands, Denmark (including Greenland), Poland, and Colombia; and for archeological samples from Greenland, Arctic Canada, Denmark, Iceland, Germany, Syria, and the United States of America.

E. H. WILLIS, HENRIK TAUBER and K. O. MÜNNICH: Variations in the atmospheric radiocarbon concentration over the past 1300 years. Am. Jour. Science, Radiocarbon Suppl. 2, pp. 1-4.

The results are reported of a joint project undertaken by the radiocarbon dating laboratories at Cambridge, England, Copenhagen, Denmark, and Heidelberg, Germany, designed to extend present knowledge of variations in atmospheric radiocarbon as demonstrated by DE VRIES and to serve as an exercise in interlaboratory cross-checking. A fully documented section of a sequoia tree was chosen for the experiment. Samples were taken at 50-year ring intervals, and each sample was subdivided into three parts, one going to each of the three laboratories. Since only one tree is involved, possible variation due to geographic position is eliminated, and isotopic fractionation effects from sample to sample reduced to a minimum.

Results are presented graphically and a general correspondence over the last 300 years with DE VRIES' concentration curve is noted. The results appear to confirm the existence of short-term oscillations in radiocarbon concentration, with a period of the order of 150 to 200 years superimposed upon an oscillation with a period of the order of 1200 years. The underlying cause of the oscillations and their possible correlation with climatic phenomena remain obscure. In general, however, the experiment demonstrates that over the past 1200 years the fundamental assumptions of the radiocarbon dating method are empirically correct to about 1.5 percent. This error may be disturbing for very recent samples but is of little significance for older samples.