List of Danish Geodetical and Geophysical Publications 1961

(Compiled by Dansk Geofysisk Forening)

Published in Copenhagen 1961 unless otherwise stated

H. C. ASLYNG & B. FRIIS NIELSEN: The radiation balance at Copenhagen. Arch. Met. Geoph. Biokl. B. 10, 1960: 342–358.

At the Climate and Water Balance Station of the Danish Hydrotechnical Laboratory near Copenhagen incoming radiation has been recorded continuously since 1954 by means of Moll thermopiles in Kipp & Zonen solarimeters and further, since 1955, reflected radiation, too. Since 1956 also net radiation and net long-wave radiation has been recorded by means of thermopiles in heat flow transducers from Beckman & Whitley used as radiometers.

Mean daily values are given for incoming radiation as well as monthly mean values for reflected radiation, net long-wave radiation and net radiation. Recorded and calculated values of net long-wave radiation are given and discussed.

H. C. ASLYNG: Evaporation and radiation heat balance at the soil surface. Arch. Met. Geoph. Biokl. B. 10, 1960: 359–375.

Evaporation from an area covered with short clover-grass has been determined by means of evapotranspirometers (4 m^2), open (12 m^2) and screened (1/3 m^2) evaporimeters, and it has been estimated on the basis of Penman's and Thornthwaite's theories, too. The results of the measurements with the various instruments are compared with each other and with the results derived from the cited theories.

Further, radiation heat balances have been made, including evaporation and heating of soil and atmosphere.

H. C. ASLYNG & LORENS HANSEN: Water evaporation and wind speed at The Danish State Experiment Stations. Tidsskr. Planteavl 64, 1960: 185–212.

Evaporation and precipitation have been recorded at 17 State Experiment Stations scattered over Denmark, and at the Climate and Water Balance Station, Højbakkegaard (The Royal Veterinary and Agricultural College) 1956–59, and wind speed 1957–59. Since 1958 the number of stations has been 21, the most of which have had observations at 2 places with different shelter. Few of the records are obtained in orchards. Results are given in tables and diagrams.

H. C. ASLYNG: Radiation energy balance recorded at soil surface. Report I.S.S.S. Congress Comm. I. Madison 1960: 179–187.

The investigations are carried out at 55° 40′ N and 12° 18′ E. Incoming radiation and reflected radiation are recorded by means of Moll thermopiles in Kipp & Zonen solarimeters. Net long-wave radiation and net radiation are recorded by means of thermopiles in heat flow transducers from Beckman & Whitley.

Energy consumption by water evaporation in latent heat of evaporation multiplied by actual evapotranspiration. The evapotranspiration by heating the soil is determined from temperature measurements and heat capacity to 7 m depth. The remaining net radiation is assumed to be energy for heating the atmosphere.

In the diagrams average monthly results are given for the years 1954 or 1956 to 1958. Average yearly incoming radiation has been about 88000 cal cm^{-2}, which in per cent is spent as: 23 reflected, 48 net long-wave radiation, 27 for evaporation and 2 to the atmosphere.

H. C. ASLYNG: Behov og muligheder for kunstig vanding i Danmark. Amtsvandinspektørforeningens Årsskr. 32, 1961: 54–64.

There is given a survey of the water balance and the irrigation requirements and possibilities in Danish Agriculture.

H. C. ASLYNG & K. J. KRISTENSEN: Water balance recorder. Proc. A.S.C.E., 87, J.Irr. and Drainage Div. 1, 1961: 15–21.

This paper presents a detailed description of the design and construction of a semi-floating lysimeter. The installation consists of two tanks, one inside the other. The inner tank is partly

floating and partly counterbalanced. Based on change in weight, the change in water level between tanks is amplified and recorded on a clock-driven chart. Results, based on the use of such a recorder, are presented.

H. C. ASLYNG: Klima, jord og vandbalance i jordbruget. 3. udgave 1961. De studerendes Råd, Den kgl. Veterinær- og Landbohøjskole. (Kulturteknik I).

Textbook.

H. C. ASLYNG: Vanding i jordbruget. 2. udgave 1962. De studerendes Råd, Den kgl. Veterinær- og Landbohøjskole. (Kulturteknik II).

Textbook.

H. C. ASLYNG: Afvanding i jordbruget. 1. udgave 1962. De studerendes Råd, Den kgl. Veterinær- og Landbohøjskole. (Kulturteknik III).

Textbook.

W. DANSGAARD: The Isotopic Composition of Natural Waters (Thesis). Medd. om Grønland 165, No. 2, pp. 1–120.

The mass spectrometrical technique for measuring the heavy oxygen isotopic component of water, H_2O^{18}, is described in details.

At normal temperature the vapour pressure of H_2O^{16} is approx. 1% higher than that of H_2O^{18}. Formulae are evaluated for the resulting isotopic fractionation in evaporation and condensation processes. The ratio between the absolute enrichments of the two heavy components, HDO and H_2O^{18}, is shown to be close to 1.5.

Whereas ocean waters have rather uniform isotopic composition, the O^{18} content of fresh waters decreases with the temperature at the site of formation. A linear correlation is found between the annual means of the air temperature and the O^{18} content of the precipitation at ocean coast stations at sea level and with temperate or arctic climate. The O^{18} depletion is 1.33 ppm/°C. Another linear correlation is found between mainly the same parameters at Greenland ice cap stations with high altitudes. The O^{18} depletion is here 1.70 ppm/°C The isotopic latitude effect along the west Greenland coast is −0.93 ppm/° lat. The seasonal isotopic variation of the precipitation corresponds roughly to the seasonal variation in air temperature. The isotopic variations during individual periods of rain are discussed.

Isotopic stratification in deuterium and O^{18} is demonstrated in an iceberg and a temperate glacier. The main lines are given of a defermination of the age of 11 icebergs by the C^{14} method (described in detail by Scholander et al., 1961). 9 out of 11 icebergs were younger than 1000 years. The oldest one was 3100 ±150 years. A detailed description is given of a method for determining the sites of formation on the ice cap for each of the 11 icebergs: Firstly, the mean annual air temperature at the site of formation is found from the O^{18} measurement by using the linear correlation mentioned above, Secondly, the site of formation and its distance from the outlet glacier is derived from the knowledge of the temperature distribution on the ice cap. The distance passed by the 11 dated icebergs ranged from 60±20 m to 460 ±80 km. The mean velocities ranged from 110±30 m/year to 270±140 m/year with the weighted mean 154±15 m/year. The results indicate a faster turnover for great parts of the ice cap than suggested by various theoretical considerations. None of the investigated icebergs could have sunk down to the deep strata of the inland ice.

If the O^{18} contents of the 11 icebergs are corrected for latitude effect, they show a linear correlation with the ages foreshadows the possibility of an iceberg dating on the basis of O^{18} measurements.

E. ELIASEN: On the Interactions between the Long Baroclinic Waves and the Mean Zonal Flow. Tellus 13, pp. 40–55, (Stockholm).

A theoretical study of the development of wave motions in a jet-like westerly current.

E. ELIASEN: Den almindelige cirkulation i den nedre atmosfære. Naturens Verden 1961, pp. 193–204, 223–224.

A popular review concerning the general circulation of the lower atmosphere.

BØRGE FRISTRUP: Beringstræde-problemer. Vor Viden 1960–61, pp. 525–531.

A short summary of the problems involved in plans for construction of a dam across the Berings Strait and its geographical aspects.

BØRGE FRISTRUP: Danish Glaciological Investigations in Greenland. Geology of the Arctic, Vol. II, pp. 735–746.

A summary of the results from the four Danish glaciological stations in Greenland during the IGY. Because of the temperature conditions in the ice, the glaciers in southern Greenland will be more sensitive to increasing temperature while the glaciers in North Greenland will react rather slowly upon rise in yearly average temperature. In North Greenland the glaciers on the other side will be very sensible to variation in amount of precipitation. The formation of superimposed ice is of great importance for most Greenland glaciers, both for the temperate and the polar glaciers.

BØRGE FRISTRUP: Den internationale glaciologiske ekspeditions arbejde i Grønland. Naturens Verden, januar 1961, pp. 1–13, 24–31.

A summary of the organisation, the realisation and the preliminary results of the interna tional glaciological expedition 1957–60 to the Greenland Ice Cap.

BØRGE FRISTRUP: Flydende isøer. Grønland 1961, pp. 161–168.

A description of the floating ice islands in the Arctic with description of Danish observations of ice islands along East Greenland and in North Greenland.

BØRGE FRISTRUP: Studies of Four Glaciers in Greenland. Publication no. 54 of the I.A.S.H. Snow and ice commission, pp. 265–271.

A summary of glaciological investigations which were carried out in Greenland in 1956–58 as part of Danish contribution to IGY under direction of the author. The main program of the investigations was to study the glacier types in relation to geomorphology and climatology of Greenland. Four special selected glaciers were investigated as representative for particular geographical provinces, all being local glaciers outside the Greenland Ice Cap, and all of medium or small size; it was presumed that small glaciers will react more sensitively to less pronounced changes of climate.

BØRGE FRISTRUP: Redaktion og afsnittet "Sydpolarlandet" i Schultzes: Antarctica.

Description of the new glaciological and geographical results from the IGY expeditions to Antarctica.

BØRGE FRISTRUP: Dänische glaziologische Untersuchungen im Internationalen Geophysikalischen Jahr. Polarforschung Band V, Jahrgang 30, 1960. Hef 1/2.

A summary report of the observation results at 4 typical Greenland glacial stations. The main emphasis of the researches was laid on their physical conditions with regard to the climate and the forms of the ground. It has been ascertained that all the types of glaciers laid down by Ahlmann are to be found in Greenland.

BØRGE FRISTRUP: Studies of Four Glaciers in Greenland. Folia Geogr. Danica. Vol. IX, pp. 63–66.

Four Greenland glaciers are investigated, their morphology is studied in relation to physiography, climate and change of climate. The relation between the climate and the temperature of the ice is demonstrated, and the time for the retreat of the glacier is related to the thermal conditions of the ice.

BØRGE FRISTRUP: Climatological Studies of some High Arctic Stations in North Greenland. Folia Geogr. Danica. Vol. IX, pp. 67–78.

The paper summarizes the observations from 3 stations in North Greenland: Jørgen Brønlunds Fjord, Station Nord and Thule Air Base (Dundas), a comparison is made with the stations: Alert and Eureka in Ellesmere Land. Diagrams of pressure, temperature, clouds, wind and precipitation are demonstrated, and a map gives the present information concerning the aridity of the Greenland stations.

BØRGE FRISTRUP: The International Glaciological Expedition. Folia Geogr. Danica. Vol. IX, pp. 79–83.

The International Glaciological Expedition is organized by five countries: Austria, Denmark, France, Germany, and Switzerland, and the technical realization has been carried out by the Expéditions Polaires Françaises under direction of Paul Emile Victor. The organization, realization, and scientifical programme are described.

KNUD FRYDENDAHL: Nouvelle méthode de détermination des changements de l'énergie rayonnante du Soleil. Proceedings of the INQUA meeting, Warszawa 1961.

A re-examination of a bulk of sunshine registrations from all parts of the World makes the author, using quite new criteria, convinced of a just discernible increase of the "solar constant", to which the recent climatic fluctuation may be ascribed.

KNUD FRYDENDAHL & INGOLF SESTOFT: Mulighederne for varsling af kartoffelskimmel/ Prediction of potato blight on meteorological criteria. Summary in the Proceedings of the Union of agricultural Associations in Jutland, Skanderborg, October 1960.

Extensive data concerning outbreaks of potato blight, correlated with changing weather conditions, are analysed and a few practical rules for a lucrative prediction are traced out.

Geodætisk Institut:

Bulletin of the seismological station Ivigtut:

No. 21. 1955–1960. 127 earthquakes. For 1957–58 microseismic readings every 6 hours and additional microseismic readings for IGY days and periods. For 1959 readings of microseismic storms and microseismic readings for Regular World Days and World Meteorological Intervals. The station was definitely closed down in June 1960. Therefore this is the last seismic bulletin from Ivigtut.

Bulletin of the seismological station København:

No. 78. Jul.–Dec. 1959. 206 earthquakes and microseismic readings every 6 hours.
No. 79. Jan.–Dec. 1959. Readings of microseismic storms and microseismic readings for Regular World Days and World Meteorological Intervals.

Bulletin of the seismological station Nord:

No. 6. Jan.–Jun. 1959. 444 earthquakes and microseismic readings every 6 hours.

Bulletin of the seismological station Scoresbysund:

No. 39. Jul.–Dec. 1959. 123 earthquakes and microseismic readings every 6 hours.
No. 40. Jan.–Dec. 1959. Readings of microseismic storms and microseismic readings for Regular World Days and World Meteorological Intervals.

LORENS HANSEN: Hydrometermetoden til bestemmelse af jordens tekstur. Grundförbättring 3, 1961: 177–188.

This paper deals with a comparison between the hydrometer and the pipette method for soil texture analysis. It is pointed out, that the particle size ought to be defined as "equivalent diameter" of a sphere, and that the time of settling has to be calculated according to Stokes' law for spherical particles. Sometimes the particle size is defined as the edge of a cube. This complicates the comparisons of texture analyses made at different laboratories.

The pipette analysis is carried out according to standard method by taking samples after 4^{48} min at a depth of 10 cm for the determination of particles $\leq 20\ \mu$, and after 4 hours at a depth of 5 cm for the determination of particles $\leq 2\ \mu$. For the hydrometer analysis is used a Bouyoucus hydrometer with a scale 0–60 grammes pr. litre. The effective depth and the time of settling are calculated according to the theory of Day (1950). Determinations of particles $\leq 20\ \mu$ are made by reading the hydrometer after periods according to a calculated table. For determination of clay ($d \leq 2\mu$) readings are taken after 2 and 16 (night) hours, and then interpolation to accurate readings for $d = 2\ \mu$, by use of a diagram.

For the investigation are used 25 soil samples each replicated 2–3 times. The hydrometer and the pipette analyses are carried out on the same suspension. The two methods proved to give identical results.

JØRGEN HJELME: Seismiske eksperimenter ved Rømø. Meddelelser fra Dansk Geologisk Forening Bd. 14, pp. 406–412.

A seismic refraction profile has been measured in the southern Jylland. The source was explosions near the island of Rømø. The instrument was a Willmore seismograph, which was moved along the line. The results are interpreted and compared with other investigations.

HENRY JENSEN: Statistical Studies on the IGY Microseisms from København and Nord. Geodætisk Institut, Meddelelse No. 39, 67 pp.

A continuation of the investigations described by the author in Geod. Inst. Medd. nos. 34 and 38. It is emphazised that the determination of the direction of approach of the microseisms is necessary together with the reading of amplitude and period if it shall be possible to sift unusual events from the usual microseisms. The routine determination of the directions in København has shown that the microseisms may be described as consisting of R- and L-waves in approximately equal parts. — The method of the empty half-plane is evaluated in some greater detail as in the earlier papers. It is shown that in some cases inhomogeneous instrument sets may be used. Station Nord is an example. — The most frequent direction of approach is from N in København and from SSW at station Nord. No microseisms at all are reaching Nord from the deep Polar Ocean.

KNUD LASSEN: Day-Time Aurorae Observed at Godhavn 1954–56. Danske Met. Inst. Meddelelser no. 15, Charlottenlund 1961, 108 p.

A group of aurorae which may be seen at Godhavn on nearly all clear mornings is described, and statistics are given on hour of onset and on variation of direction and zenith distance of arcs. Unlike other auroral occurrences these aurorae are not accompanied by magnetic disturbance. On the contrary, they show a tendency to occur less frequently on magnetically disturbed days than on other days. They are accompanied by a characteristic disturbance of the E- and F-regions of the ionosphere, which is described and compared with continuous auroral observations.

KNUD LASSEN: Diurnal Variation of High-latitude Auroral Frequency on Magnetically Quiet and Disturbed Days. Nature, Vol. 192, No. 4800, p. 345. (London).

All-sky camera observations at Nord during the winters of 1957–58 and 1958–59 revealed that the inner border of the auroral zone is on disturbed days at noon situated not far to the south of Nord. On quit days a different type of aurorae appear above the station. These aurorae have a double maximum in the day hours. They look like the morning aurorae at Godhavn and show, like these, a perceptible decrease of frequency on magnetically disturbed days.

I. LEHMANN: S and the structure of the upper mantle. Geophys. Journ. 4. The Earth Today, dedicated to Sir Harold Jeffreys, 124–138, også som Lamont Geolog. Obs. Contr. 449. (London).

The European as well as the north-eastern American observations of S at small epicentral distances indicate the presence of a low velocity layer. In Europe its upper boundary seems to be at a depth of about 140 km. Since late S phases are observed at epicentral distances down to about10° there is likely to be an abrupt increase of velocity (as well as of velocity gradient) at the lower boundary of the layer at about 220 km depth. Late S phases beyond 20° can be accounted for if a futher strong increase of velocity gradient at a greater depth is assumed.

ASGER LUNDBAK: Atmospheric Properties up to 500 km concluded from Circular Satellite Orbits. Danske Met. Inst., Meddelelser No. 14, 1961.

It is stated how formulas for determination of scale height etc. can be derived by applying circular satellite orbits. The orbits of the carrier rockets of Sputnik IV and V have enabled evaluation of scale heights in the midmost part of the thermosphere, i. e. 225–340 km altitude, and the orbit of a fairing originating from Midas II has enabled evaluation of scale heights up to an altitude of about 500 km. The gradual thinning of the atmosphere appears to be rather pronounced above the F_2-layer, and a corresponding decrease of temperature must take place here too, presupposed that the gas laws are applicable.

ASGER LUNDBAK: Sputnikker og Pionerer samt alle andre drabanter. Naturens Verden 1961, pp. 165–179.

All of the artificial satellites and their results up to 1961.

ASGER LUNDBAK: Om rumforskning og indtryk af besøg i Sovjet. Naturens Verden 1961, pp. 343–352.

The article deals with visual tracking of satellites in U. S. S. R., astronomical studies, arctic studies, and the Moscow University.

ASGER LUNDBAK: About air densities at altitudes of 400–700 km (Remarks on Reference Atmosphere). H. C. van de Hulst, C. de Jager and A. F. Moore: Space Research II; North-Holl. Publ. Co. 1961, pp. 1005–1012.

Air densities in the region from about 400 to 700 have been obtained from satellite observations, by studying approximately circular orbits. Further, a special method is demonstrated for derivation of accurate orbital periods and deceleration rates by comparing bodies launched contemporarily.

Meteorologisk Institut:

Magnetic Yearbook 1960. Part 1: Denmark (except Greenland).
Magnetic Yearbook, Part 2, Greenland, A Godhavn, 1952.
Magnetic Yearbook, Part 2, Greenland, A Godhavn, 1957.
Magnetic Yearbook, Part 2, Greenland, A Godhavn, 1958.

Meteorologisk årbog I: Danmark/ Meteorological Yearbook I: Denmark 1955 and 1956.

Klimatologisk månedsblad/ Monthly climatological Report: 1–12.

Ugeberetning om nedbør m.m./Weekly climatological Bulletin: 1–52.

JENS OLESEN & J. W. WRIGHT: The relationship of low-height ionosonde echoes to auroral-zones absorption and VHF D scatter, Geophysical Research 66, pp. 1127–1134. (Richmond).

Weak diffuse HF reflections at heights between 75 and 95 km in the auroral zone are designated $E_S d$. Diurnally, $E_S d$ occurs most frequently at noon at all seasons, and shows a pronounced minimum of occurrence around 2000 hours local time. There is little evidence for a seasonal variation from the year's data presented here. It is suggested that $E_S d$ is related to the anomalies of auroral-zone absorption and that it is the layer responsible for VHF forward scatter.

JOHANNES OLSEN: Lufthavet omkring Jorden, Munksgård, Copenhagen, 93 pp.

Six lectures broadcasted at the Sunday University of Danmarks Radio are published, giving a review of the study of the Earth's atmosphere from the ancient time up to the age of rocketts and satellites.

JOHANNES OLSEN: Strålingen omkring Jorden, Naturens Verden 1961, p. 97–105.

A review of the van Allen Belt that surrounds the Earth.

SVEND SAXOV: The vertical movement of Eastern Greenland (Angmagssalik), Meddelelser Dansk Geologisk Forening 14, pp. 413–416.

Repeat-measurements of the old bench-marks at Gustav Holms Ø near Angmagssalik indicate an annual uplift of 7 mm during the period 1950 to 1957 thus confirming that an uplift of Greenland has taken place for the last 15 to 20 years.

SVEND SAXOV: Dansk Geofysisk Forening, 1936–1961, Meddelelser Dansk Geologisk Forening 14, pp. 417–425.

This is a historical review of the Danish Geophysical Society on occassion of its 25th anniversary. Included are the rules and a membership list.

INGOLF SESTOFT: Théorie géophysique des Glaciations. Proceedings of the INQUA meeting, Warszawa 1961.

A further development of the geophysical Ice Age theory, at first advanced at the UGGI meeting, Oslo 1948.

INGOLF SESTOFT: Blæsevejr/Wind and gale. Søens Verden, Nr. 12, 1960–61, p. 353-366.

The effects of the wind and its turbulence and related practical problems are surveyed, especially from a maritime point of view. A comprehensive wind scale table is added.

JENS SMED: Monthly Anomalies of the Surface Temperature in Areas of the Northern North Atlantic in 1959. — Monthly Anomalies of the Surface Temperature in an Area off the Eastern Coast of Scotland in 1959. — Annales Biologiques, Vol. XVI, pp. 22–23 and p. 53.

Whereas the yearly averages of monthly anomalies (the period 1876–1915 being taken as standard) are negative in the two areas south of 55° N. they are still positive in all other areas considered. There is, however, a clear tendency towards lower temperatures in the whole region, excepting the areas immediately to the north and east of Scotland.

HENRIK TAUBER: Danske kulstof-14 dateringsresultater I, *Meddelelser Dansk Geologisk Forening* 14, pp. 386–405.

The present date list includes all previously published C-14 dates from the Carbon-14 Dating Laboratory in Copenhagen. Samples k-101–156 were measured with the solid carbon technique before the summer of 1955, the remainder was made with the carbon dioxide gas-counting technique. Sample descriptions may be found in previous publications.

HENRIK TAUBER: Latitudinal effect in the transfer of radiocarbon from stratosphere to troposphere. Science 133, pp. 461–462. (London).

Latitudinal variations in the descent of bomb-produced radiocarbon from the stratosphere is suggested by differences in tropospheric carbon-14 activity. The magnitude of a similar latitudinal effect in the pre-bomb steady state is estimated. This effect may be part of the explanation of the short-term oscillations in carbon-14 activity found in treerings from the last 1300 years.