List of Danish Geodetical and Geophysical Publications 1956

(Compiled by Dansk Geofysisk Forening)

Published in Copenhagen 1956 unless otherwise stated

EINAR ANDERSEN, T. KRARUP and BJ. SVEJGAARD: Geodetic Tables. — Geodætisk Instituts Skrifter, 3. Række, Bd. XXIV.

The tables give for each minute of arc of the latitude φ the natural values of the following functions in the interval 0°–90°

$W = (1-e^2 \sin^2\varphi)^{\frac{1}{2}}$ to twelve decimal places; $\frac{1}{M}$ and $\frac{1}{N}$, the principal curvatures of the ellipsoide of reference to twelve significant figures; the theoretical gravity in *m*Gals and hundreths of *m*Gal; $\varphi - \varphi^*$, where $\operatorname{tg}\left(\frac{\pi}{4}+\frac{\varphi^*}{2}\right) = \operatorname{tg}\left(\frac{\pi}{4}+\frac{\varphi}{2}\right)\left(\frac{1-e\sin\varphi}{1+e\sin\varphi}\right)^{\frac{e}{2}}$, to six decimal places of the second of arc; and $\varphi/2MN$ in seconds of arc to four decimal places.

In the preface one finds a compilation of the different auxiliary functions and constants used with the ellipsoide of reference. The tables are made by differencing methods by punched card equipment.

K. P. ANDERSEN: *Hydrographic Conditions in the Southern Part of the Norwegian Sea 1954.*

Short Report on the hydrographic investigations carried out from R/V "Dana" in this area in 1954.

K. P. ANDERSEN: Hydrographic Conditions in the Southern North Sea, the Bløden Ground Area in 1954.

Short Report of R/V "Dana"'s investigations in the important herring area in 1954.

Annuaire Météorologique, 1ére partie: Le Danemark (excepté le Groenland), 1954.

Annuaire Météorologique, 2ème partie: Le Groenland, 1951, 1952, 1953, and 1954.

HANS BUCH: Hemispheric wind conditions during the year 1950 (General circulation project, final report II). — Mass. Inst. Techn. Boston 1954.

The basic material is a tabulation of daily values of both the zonal and the meridional wind components for a large number of stations throughout the northern hemisphere. For each individual station and for six standard pressure levels in the free atmosphere yearly mean values of the two wind components are calculated together with their standard deviations and values of the local momentum flux. The hemispheric distributions of the different statistical quantities are represented by isolines drawn on circumpolar maps, and, finally, *zonally averaged values of each quantity are evaluated by integrating along the latitude* circles.

J. EGEDAL: The lunar-diurnal magnetic variation and its relation to the solar-diurnal variation. — J. Geoph. Res. vol. 61, pp. 748–749. — Washington 1956.

Reexamining the question of a relation between the lunar-diurnal and the solar-diunal variations, it was discovered that an abnormally large lunar-diurnal variation of Z existed at Amberly (New Zealand) during the night hours.

J. EGEDAL: On the effect on geomagnetism of solar eclipses. Solar Eclipses and the Ionosphere (Special Suppl., Vol. 6, to J. Atmosph. Terr. Phys.) pp. 228–235, London, 1956.

While earlier observations on the effect on geomagnetism of solar eclipses have given more or less doubtful results, some recent results seem to be more promising. L. A. Bauer in an

early paper outlined a theory of the phenomenon .and S. Chapman in 1933 worked out a theory, according to which the effect manifests itself as a diminution of the departure of the daily variation. The maximum magnetic effect occurs simultaneously with maximum obscuration, and the diminution of the departure of the daily variation is of the order given by the theory.

J. EGEDAL: On the computation of lunar-daily variation in geomagnetism. Two simple methods. — Publ. Dsk. Met. Inst. Comm. Magn., pp. 1–25.

Describes how the lunar-daily variation may be calculated in a simple way from hourly mean values of the geomagnetic elements.

J. EGEDAL and N. AMBOLT: The effect on geomagnetism of the solar eclipse of 30 June 1954, (supplementary communication). — J. Atmosph. Terr. Phys., 8, Nos. $^1/_2$, pp. 105–107. — London 1956.

Observations of the magnetic declination compiled from Russian observatories near the path of totality of the solar eclipse of 30 June 1954 have been examined as to the magnetic effect of the eclipse. It is shown that the maximal magnetic effect takes place in close connection with the passage of the eclipse and it is shown that a diminution of the daily variation of the order found by Chapman from an investigation based on theoretical considerations is verified.

ERIK ELIASEN: Numerical Solutions of the Pertubation Equation for Linear Flow. — Tellus, Vol. 6, pp. 183–91, Stockholm 1954.

Two-dimensional nondivergent perturbations of linear flow are considered. By means of a simple numerical treatment indications concerning the conditions of exponential instability are obtained. Numerical solutions are further used to represent the approximate development of initial perturbations. Finally perturbations of a symmetrical harmonic velocity profile are considered in relation to the question about the instability in a barotropic atmosphere.

J. ESPERSEN, P. ANDREASEN, J. EGEDAL and J. OLSEN: Measurements at Sea of the Vertical Gradient of the Main Geomagnetic Field during the Galathea Expedition. — Journal Geophysical Research Vol. 61, pp. 593–624, Richmond 1956.

During the Danish Galathea expedition, 1950–52, investigations were made of the vertical gradient of the geomagnetic field, in an attempt to test the probability of the new "fundamental" theory for the main geomagnetic field proposed by P. M. S. Blackett in 1947.

Three relative, self-recording magnetometers — one needle instrument measuring the Z-component, one needle and one rotating-coil instrument measuring the H-component — are decribed. All instruments may be lowered to extreme depths in the sea in non-magnetic containers.

In the Pacific Ocean, a series of trial measurements were carried out, and at least one of the H magnetometers proved to be of the desired accuracy of 10γ during a single relative measurement. All trial stations were situated in places with locally disturbed geomagnetic field, which makes the gradient results unreliable, and a breakdown of the technical equipment of the surveying vessel prevented measurements at stations better suited to magnetic work. However, summed up, the trial results indicate a case against the fundamental theory — in accordance with gradient measurements ashore in mines and collieries.

Geodætisk Institut: Bulletin of the seismological station Ivigtut, No. 17 (1948), No. 18 (1949), No. 19 (1950), No. 20 (1951–53).

The readings of 105, 83, 106, and 126 earthquakes respectively.

Bulletin of the seismological station København, No. 63 (1953) and No. 64 (1954).

The readings of 475 and 443 earthquakes respectively.

Bulletin of the seismological station Scoresbysund, No. 24 (1950), No. 25 (1951), and No. 26 (1952).

The readings of 242, 375, and 522 earthquakes respectively.

F. HERMANN: Hydrographic Conditions in the Eastern Part of Labrador Sea and Davis Strait 1954. — Ann. Biol. Cons. Intern. Explor. Mer., Vol. XI, pp. 25.

Short report of the hydrographic investigations carried out from R/V "Dana" in West Greenland waters 1954.

J. HJELME: Rystelsesmålinger foretaget i Danmark. — Ingeniøren 64, pp. 976–77 (1955).

Vibrations from pile-driving have been observed with a vertical seismograph in very short distances. The records are demonstrated having the same feature as records from distant explosions.

KRISTIAN HØJENDAHL: Maximum and Minimum Thermometers for the Determination of the Temperature of the Soil. — Nordisk Jordbrugsforskning 38, pp. 327–334.

A number of different maximum and minimum thermometers have been tested during the last five years, by daily registration of temperatures in the soil of Landbohøjskolens Undervisningsmark in Copenhagen. In order to obtain good contact with the soil, thermometers which need not be taken up, but in which the index may be shifted by means of a magnet, are to be preferred. It is found advantageous to use a maximum and a minimum thermometer in place of a Six thermometer, because the latter cannot be repaired if it fails. Most favourable is a bent mercury maximum thermometer, giving the instantaneous and the maximum temperature; and a bent toluene minimum thermometer, showing how much is the minimum below the instantaneous temperature. Maximum and minimum thermometers are used in the air, at the surface, and at 5, 10 and 20 cm depth of soil.

At greater depths the daily temperature variation is insignificant. Here a special implement is employed, consisting of a wooden rod on which three brass cylinders with thermometers are clamped, the cylinders being mutually insulated by means of corks. The whole implement is inserted in an eternite pipe placed in the soil.

The mean temperature is obtained by taking the average of the seven maxima and the seven minima of the week. Such mean temperatures for the air, the surface and 1 m. depth in a rye field as well as in bare soil are plotted against time in a diagram. The curves thus obtained are correlated with the rainfall and with the weekly quantity of red light, as measured by means of a combinations of a selenium photocell with red filter, and a Siemens E.2. voltameter. As would be anticipated a clear sky in winter causes low temperatures, and in summer high temperatures. This particularly is the case for the surface of bare soil, because the vegetation catches part of the radiation. For the rye just before harvest this shadow effect is 7^0 C. at the surface, and 1^0 C. for 1 m. depth of soil. Similar shadow effects were found earlier for other crops; the greatest effect was found for beets and the smallest for flax.

KURT MØRCH JENSEN: Forecasting of Sea-Level Pressure by Advection of Sea-Level Vorticity. — Geophysica 6 pp. 13–24, Helsinki 1956.

The following is a description of a method for preparing a forecast of the sea-level pressure chart or of the 1000 mb-isohypses. The method is rather "geometrical" but nevertheless it is based on a certain amount of now available knowledge on the physics of the weather. It may only be considered as a "basical principle" for routine forecasting.

The space mean streamline pattern of the 592-mb level is used as a steering field and the sea-level vorticity is selected as object of prognostication. By the aid of the observed pressure tendencies the vorticity is corrected for "development", and then displaced in the steering field.

AXEL JESSEN: Nivellementets tyngdekorrektion. — Nordiska Geodetmötet i Helsingfors 1956, bilag 22, II. — Præcisionsnivellement og tyngdemålinger. — Landinspektøren 21.

It is possible, by adequate combining geodetic levelling with gravity measurements, to obtain definite heights and the tilt of the equipotential surfaces, without the necessity of computing gravity-corrections for the levelling net.

ELVIN KEJLSØ: Re-Calculations of older Determinations of Latitude. — Geodætisk Instituts Meddelelse No. 30.

Re-calculation of determinations of latitude made by »Den Danske Gradmaaling" in the years 1890–1905.

T. KRARUP and BJ. SVEJGAARD: A Method for Matrix Multiplication, Matrix Inversion and Problems of Adjustment by Punched Card Equipment. — Geodætisk Institut Meddelelser No. 31.

The different topics indicated in the title have all been treated from a common point of view. It is shown, how a system of sorting may be established, which makes possible the formation of sums of products, which is the base for the solution of these problems.

The problem of solution of simultaneous linear equations has been treated both in the insymmetric and symmetric case. Adjustment by least squares is made immediately from the equations of condition and of observation.

Programs are given for an IBM 602A Calculating Punch, and it is seen how the same numerical problems may be treated in different ways.

I. LEHMANN: Danske Jordskælv. — Medd. D. Geol. For. Bd. 13, pp. 88–103.

The 50 earthquakes known to have been felt in Denmark are listed and the areas in which they were most strongly felt are indicated in a map. The seismicity is greatest in Northwestern Jutland where 22 of the earthquakes are known to have been felt. In eastern Seeland there were 11 earthquakes.

I. LEHMANN: The velocity of P and S waves in the upper part of the Earth's mantle. — Publ. Bur. C. Seism. Intern. A, 19, pp. 115–123, Strassbourg 1956.

In Europe the velocity of longitudinal waves may be taken to increase below the Mohorovicic discontinuity, quite slowly at first and lower down more strongly. It is shown that the depth at which the strong velocity increase sets in cannot be calculated from the timecurve. Reference is made to investigations which seem to show that the depth is 200–300 km. — The velocity of the transverse waves varies in a different way, possibly decreasing in the uppermost part of the mantle. This implies that the compliance of the material increases.

ASGER LUNDBAK: Combined Analysis of Gravimetric and Magnetic Anomalies and some Palaeomagnetic Results. — Geophysical Prospecting, vol. IV, pp. 226–235, Leiden 1956.

The mathematic basis of the said analysis is presented. Results are computed for Seeland, Jutland and Northern Holland. It appears that the deepseated primitive rock, in the cases considered, has a remanent magnetic declination about ÷ 160° and a remanent inclination about ÷60°.

ASGER LUNDBAK: Le Raz de Marée de la Mer du Nord du 1er Février 1953. — Revue Hydrographique Internationale, Mai 1956.

An article from Geografisk Tidsskrift 1955 (cf. the 1955-list of publications) is presented in French translation with a complementary post scriptum.

ASGER LUNDBAK: Jagten på den nordlige magnetpol/ De internationale polarår 1882–83 og 1932–33 / Det internationale geofysiske år 1957–58. — Grønland, 1956, pp. 113–120, 241–250, 428–440.

Geomagnetic and similar activity since 1800, especially in Arctic Regions, and the planned geophysical investigations 1957–58 are described.

V. MIKKELSEN: The salinity of the water contained in brackish-water sediments compared with the content of diatoms and other organisms in the same sediments. — Bulletin of the Geological Society of Denmark Vol. 13, pp. 104–11.

By comparing the salinity of water contained in sediments with the content of organisms in the same sediments it is shown that the salinity of the interstitial water does not correspond to that of the water in which the sediments were laid down; hence, the hypothesis advanced by B. Kullenberg in 1952 cannot be tenable. The reason for this missing correlation must be the high coefficient of diffusion found by Kullenberg for chlorine in the interstitial water but disregarded by him because of some of his results.

V. MÜNTHER: Grænsen mellem Granitten og Neksøsandstenen belyst gennem magnetiske målinger. — Bulletin of the Geological Society of Denmark Vol. 13, pp. 254–55.

The border between the Granite and the cambrian Neksøsandstone at Bornholm examined by means of magnetic measurings.

Nautisk-Meteorologisk Årbog / Nautical-Meteorological Annual 1955.

JOHANNES OLSEN: Forsøg på bestemmelse af solens rotationstid ved hjælp af jordmagnetiske undersøgelser. — Nord. Astr. Tidsskr. pp. 41–50, 1956.

An examination of the variation of the geomagnetic horizontal forces at the magnetic observatory at Godhavn, Greenland gives the result, that the sun through the years 1926–1941

with regard to magnetic effect has had a fixed rotation period of 26.87 days. At the same time it turned out, that the magnetic disturbance at Godhavn during the first half of this period is principally different from the disturbance during the last half.

SVEND SAXOV: A Gravity Survey of the Vicinity of Ottawa. — Publications of the Dominion Observatory Ottawa, vol. XVIII No. 11. (Ottawa, Canada 1956).

A detailed gravity survey of an area of about 400 square miles in the vicinity of Ottawa has been completed. Calibration factors for the various gravimeters employed are assessed and the adopted values of gravity for a short range calibration base line reported.

The gravity measurements are presented in the form of Bouguer anomalies plotted on a geological base map prepared by the Geological Survey of Canada. Correlation of the gravity anomalies with the geology and with the magnetic anomalies are discussed. The results of local traverses over certain major faults are also given, and are compared with results obtained with the torsion balance some years ago.

SVEND SAXOV: Some Gravity Measurements in Thy, Mors and Vendsyssel. — Geodætisk Instituts Skrifter, 3. Række, Bd. XXV.

A gravity survey including some 1250 stations are given, the area covered being Thy, Mors, Vendsyssel, and Læsø. The observations are carried out by means of Worden gravimeter No. 142 and an account of the accuracy of the observations is presented. Comparisons between the present survey and previous measurements by means of a Nørgaard vertical gravimeter show a deviation of about $2^1/_2$ % of the scale constants of the gravimeters employed. The Bouguer anomaly map is discussed. Data afforded by geology, and seismic refraction shooting are presented. Information regarding nearby earthquakes is discussed including details of the earthquake of October 18, 1954 which had its epicentre in the neighbourhood of Hurup, Thy. A new magnetic map originating in observations carried out by means of the la Cour BMZ magnetometer was put to the editor's disposal. Correlation of the gravity anomalies with geology and with the magnetic anomalies are discussed. The two salt domes at Mors and Thyholm are examined and the depth to the top of the domes as the thickness of the domes are estimated.

INGOLF SESTOFT: A difference-method for predicting night-frost. — Netherlands Journal of Agricultural Science, vol. 4, pp. 118.

A new frost formula: a frame method for predicting night-frost is developed, based on new, entirely empirical principles. To the last night's minimum temperature Tn additional terms are added, all consisting in the differences between the last 2 values of the most important, mutually independent climatic functions: wind, cloudiness, temperature and humidity (or: wet bulb temperature) and all of them with a coefficient, which has to be determined empirically beforehand. Eventually, a synoptic term must be added, given by radio from the public Weather Service, and expressing casually the probable influence, for the whole region considered, of expected greater changes in wind and weather, front passages etc.

INGOLF SESTOFT: Færøernes Vejr- og Klimaforhold. — Den Færøske Lods, 6. udgave.

A new climatological description of the Faroes, reprinted from Den Færøske Lods, 6th edition. — A table of normals is given for the experimental farm at Hoyvig, near Thorshavn, 1926–50, and some supplementary tables for the wind directions at 3 different stations (Klaksvig, Thorshavn and Kvalbø). In the short general description pressure, temperature, wind, precipitation cloudiness and visibility is mentioned. Especially fog and thunderstorms display very interesting features at these Atlantic islands.

JENS SMED: Synoptic Hydrographic Charts, August 1955–July 1956.

Monthly charts showing surface water temperature and salinity, wind and current for the North Sea and adjacent waters. For details see the 1953 list.

JENS SMED: Monthly Anomalies of the Surface Temperature in Areas of the Northern North Atlantic in 1954. — Monthly Anomalies of the Surface Temperature in an Area off the Eastern Coast of Scotland in 1954. — Annales Biologiques, Vol. XI, pp 11–13 and pp. 43.

Positive anomalies (the period 1876–1915 being taken as standard) still predominate in 1954, though the tendency from 1953 to 1954 is towards lower values.

HENNING SØRENSEN: Uran og Thorium (Mulighederne for forekomster af disse metaller i Vestgrønland. — Grønland 1956, pp. 217–26.

A review is given of the uranium- and thoriumminerals and of their types of occurrence. The radioactive minerals so far found in West Greenland are mentioned: allanite, fergusonite, euxenite, monazite, zircon and steenstrupine.

H. TAUBER and OLFERT VOSS: Atomfysik og Arkæologi. Fra Nationalmuseets Arbejdsmark 1956.

The article gives a breaf description of the principles and the technique of the carbon-14 dating method, further it deals with the known sources of errors, i.e. the statistical error, the error in computing the original activity, contamination, and possible lack of contemporaneity between sample and prehistoric event.
A number of archaeologically important dating results are mentioned.

K. THIESEN: On the determination of D by means of QHM. — Geophysica 5: 2, pp. 63–69, Helsinki 1956.

Describes the determination of declination by QHM using a method which eliminates the effect of afterworking in the quartz-fibre.

HELGE THOMSEN and M. V. L. LORCK: The state of the ice in the arctic seas 1953. — Appendix to the Nautical-Meteorological Annual 1953.

J. TROELS-SMITH: Neolithic period in Switserland and Denmark. — Science, Vol. 124 No. 3227 pp. 876–81.

Dating of the dwelling place Egolzwil 3, Luzern, Switzerland, to 2740 ±90 B.C. (late atlantic time, immediately after a strong decline of the beech) and the dwelling place Mulbjerg I, Aamosen, Zealand, Denmark, to 2620 ±80 B.C. (late atlantic time, immediately after a marked decline of the elm, and older than the real land occupation).