ARTICLES IN REVIEW

LA MODERNA UTILIZZAZIONE DEI CRONOGRAFI IMPRIMENTI
(Modern utilization of printing chronographs)

by Prof. Jean VERBAANDERT

« Bollettino di Geodesia e Scienze Affini », Firenze, XVIIth Year, No. 3, July-August-September 1958

The invention of the quartz clock and the setting of the phonic motors has made it possible to realize rotation movements of almost perfect regularity. These inventions have also allowed important simplifications in the mechanical part of printing chronographs, greatly increasing their precision. Since 1951 at Uccle we have had the opportunity of modernizing old-type printing chronographs. At the beginning of the I.G.Y., we proceeded to modernize the printing chronograph of the Italian Time-Service Station of the Capodimonte-Naples Station which operated at Uccle during the entire I.G.Y. together with the Belgian Station.

In this article are given principles of modern utilization of these printing chronographs and the essential technical details for their adaptation to electronic circuits.

THE ANNUAL VARIATION OF THE SLOPE OF THE WATER SURFACE IN THE GULF OF BOTHNIA

« Societas Scientiarum Fennica », Helsinki, XX, 6, 1957

and

DETERMINATION OF THE SLOPE OF THE WATER SURFACE IN THE GULF OF FINLAND

« Geophysica », 5:4, Helsinki, 1958
by Eugénie LISITZIN

These two papers deal with the conditions causing the average surface slopes in the Gulfs of Bothnia and Finland and their annual variations. The influences of density variations, the air pressure and the winds are studied and their combined effects are compared with the observed surface slopes derived from tide gauges. These two independent sets of observations show a satisfactory correlation in the Gulf of Bothnia, where the wind's influence is most pronounced. Thus the calculated values differ from the observed surface slopes by a mean error of only about 10 % of the amplitude of the annual variation. For the Gulf of Finland, on the other hand, the mean error reaches 30 %. However, the annual variation of the surface slopes is small here because the resultant

wind component is weak. In this Gulf, the method does not lead to a satifactory correlation, because disturbances in the wind field ant the small annual variations of all factors produce a considerable scattering of the results.

PRESENT STATUS AND FUTURE DEVELOPMENT OF OCEANOGRAPHY

by Richard H. FLEMING

« Proceedings of the Eighth Pacific Science Congress », Quezon City, Vol. III-A, 1957

Speaking from the view point of a university professor daily engaged in the training of students in the broad field of oceanography, Professor Fleming addressed the Pacific Science Congress on the present stage of marine sciences and on future developments.

Oceanography is the science of the seas and deals with the oceans in all their aspects. Although individual investigators may concentrate their efforts upon the physical, chemical, biological or geological features of the oceans, the science of oceanography itself is concerned with developments on a comprehensive basis. The oceans exert a tremendous influence on men, and the understanding of their characteristics and processes is essential in order to solve many practical problems. The oceans have played a key role in the geological and biological history of the earth, and it is from a study of ocean waters, marine life and sediments that we must learn how to interpret the sory of our planet. Oceanography is a pioneer field; it is young, and the number of investigators is small. Advances in recent years have revealed the value of marine research, and the demand for trained oceanographers has caused an increase in the number of universities offering training facilities. It is because the requirements and nature of the training differ in certain ways from those of older fields of science and because of the interest of students in the field that this brief review was submitted to the Pacific Science Association.

OCEANOGRAPHIC INFORMATION FOR ENGINEERING SUBMARINE CABLE SYSTEMS

by C.H. ELMENDORF and Bruce C. HEEZEN

« The Bell System Technical Journal », Vol. XXXVI, No. 5, September 1957

During the early stages in the development of oceanographic knowledge, cable steamers considerably contributed to this science by the collection of soundings and bottom samples. Nowadays, oceanographic knowledge is widely used in the engineering of submarine cables in order to select properly their tracks, avoid possible disturbances due to the submarine topography and gather information on their environment.

The publication under review not only summarizes very usefully the application of oceanography to the engineering of submarine cables, but also opens to the oceanographer some interesting aspects of his science. Starting with a general description of echo-sounding technics, the topography of the North Atlantic Ocean, which is accompanied by a very interesting chart of

physiographic provinces, is then discussed. Submarine topographic features, such as the mid-ocean canyon of the Northwest Atlantic and the Mid-Atlantic Ridge, are clearly illustrated and their relation to cable breaks and earthquake epicentres is demonstrated.

Another section discusses the influences and the distribution of the bottom temperature. The nature of the sea floor is described, together with methods of taking photographs of the bottom, and some pictures are reproduced, showing different types of bottom structure.

A final section discusses catastrophic changes in the ocean bottom, due to earthquakes and turbidity currents.

HYDROSTATISCHE ELBUBERGANGE IM RAHMEN DES NORDSEEKUSTENNIVELLEMENTS

(Hydrostatic levelling across the Elbe as part of levelling operations along the North Sea coasts)

by Hans-Ullrich SANDIG and Günter SCHEEL

« Mitteilung Nr. 19 des Instituts für Angewandte Geodäsie », Frankfurt am Main, 1957

This publication describes the performance and evaluation of the hydrostatic levelling operation across the Elbe River which was carried out in 1955 by the Institut für Angewandte Geodäsie, by order, and with the assistance, of the Bundesanstalt für Gewässerkunde, the Land Survey Offices of Niedersachsen and Schleswig-Holstein and the Hamburg Survey Office. The former crossing near Scheelenkuhlen was very unfavourable for hydrostatic measurements because of the wide tidal flats on the southern bank of the Elbe River. Nevertheless it had to be measured as a second crossing because of its shorter distance to the coastline. The measurements of the new crossing near Twielenfleth yielded acceptable results without any difficulty.

Near Blankenese it was possible to measure a loop by way of the isle of Nessand located in the Elbe River. Levellings were carried out from the isle of Nessand to both the banks, and also directly from one bank to the other passing by the island. The discrepancy in the loop of 5 km in length amounted to only 0.13 mm. Since the 3 levellings were executed on different days and were completely independent, this result may be considered as a foundation for the external accuracy of exactly performed hydrostatic levellings.

HET VERLOOP VAN HET ZOUTGEHALTE IN DE ZEESCHELDE

(The variation of salinity in the lower Scheldt river)

by R. CODDE

« Revue C-Tijdschrift », I- No. 6, 1958, Antwerp

The author first stresses that the chlorine content of the river's discharge itself is negligible.

Measurements of salinity in the lower Scheldt are carried out in two ways :

(1) chemically by the application of Mohr's method,
(2) by measuring electrical resistivity.

Saline content is practically constant throughout any given cross-section, and the Scheldt river seems to be rather an exceptional case in this respects. The author discusses the results of the measurements carried out at Antwerp, the variations of salinity in the course of a single tide, and the seasonal variations.

He indicates the influence of the upper river's discharge on the existence of a correlation between the mean annual upper river's discharge and the salinity, to define the corresponding annual upper river's discharge.

Finally some data are provided on the variation of salinity throughout the maritime section of the Scheldt river.

REPORT OF PROCEEDINGS OF THE FRENCH NATIONAL COMMITTEE ON GEODESY AND GEOPHYSICS

(For the year 1957)

(Minutes of General Assembly held on 28 January, 1958)
189 pages, 16 × 24 cm
published by the Committee's General Secretariat, 19, rue Auber, Paris 9e.)

The following is an extract from the Report of the Triangulations Section and may be of interest to hydrographers :

4 — *Hydrographic survey of the West Coast of Africa* (Mouth of the Rio Nunez).

West Coast of Africa (Mouth of the Rio Nunez).

Attention should be called to a rather unusual geodetic operation which consisted of connecting the Conflict reefs, which are situated twenty-five miles off shore and only uncover about 1.5 metre at low water, to a geodetic datum. The method used was to take simultaneous night sights on a light signal shown by the *Beautemps-Beaupré* at five successive anchorages. These sights were made, on the one hand, from three theodolites on land, and on the other, from one theodolite on a 12-metre metal tower erected on the reefs. The first three sights fixed the position of the *Beautemps-Beaupré* at each anchorage, and the sights carried out from the reefs, reduced to a common datum (in the form of a light signal about 3 km away on another outcrop of the reefs), fixed the position of the reefs themselves. A star azimuth was also obtained. The position of the *Beautemps-Beaupré* was fixed to the nearest metre by this method, and the position of the reefs (the calculation of which included the measured azimuth) to the nearest 10 metres.

Obviously it was only possible to operate at low water as the reefs were covered at high water and this caused vibrations in the tower.

FIRST-ORDER TRAVERSING WITH THE TELLUROMETER

by G.J. HUMPHRIES and H.H. BRAZIER

« Empire Survey Review », London, Vol. XIV, No. 109, July, 1958

In this article, the writers give a detailed description of the progress of work on a first-order precise traverse which had been planned for measurement

with a new tellurometer in the Tana River Valley in Kenya. The operation also served as a test of the instruments under bush conditions. The establishment of the observation points, using transportable observation towers, was rather difficult in this area and a big party was necessary for the operation and for clearing the site. The instruments worked very well under the hard treatment to which they were subject on these traverses, but the power packs gave considerable trouble, and the operation was only finished in time because a spare pack was available. Measurements of a high degree of accuracy were obtained with the Tellurometer and the writers discuss the effects of the height of the rays above the vegetation. An analysis of the observations is given and it is considered that the used velocity of light may be a little too high.

GRAVIMETRIC DEFLECTIONS OF THE VERTICAL

by J.C. BHATTACHARJI

« Bulletin of the National Institute of Sciences of India », No. 11, 31 July 1958

A method of computing absolute values of gravimetric deflections of the vertical at any point on the earth's surface has been described, knowing the gravimetric deflections and the geoidal heights at the point as computed by Stokes's formula by considering gravity anomalies limited to 100 miles radius only.

ISRAEL'S NEW PORT

« Reed's Marine Equipment News », London, Vol. 2, No. 9, September 1958

Construction of Israel's new Mediterranean port of Ashdod, 20 miles south of Tel Aviv, will begin in 1959 and the first stage of this project, which envisages a handling capacity of 1 million tons of dry cargo a year, should be completed within three years.

CHANGES IN SAND LEVEL ON THE BEACH AND SHELF AT LA JOLLA, CALIFORNIA

by D.L. INMAN and G.A. RUSNAK

« Contributions 1956 », Scripps Institution of Oceanography, La Jolla

Accurate determination of sand level changes over the near-shore area is important in making engineering analysis of littoral movements. Derivation of the relation between these changes and the waves, water level and tide forces which produce them would make it possible to predict future changes. A new technique for recording such changes in sand level by means of reference rods driven into the bottom of the sea and read by divers has been developed and is described. Extremely accurate measurements of sand level changes have been made for a three-year period by periodic diver observation of the sand level

against these reference rods. This report presents the results of these observations and also draws comparison with the results obtained by electronic sounding methods, demonstrating that unless great care is taken, large daily differences may be erroneously observed in acoustic measurements.