

THE HISTORY OF THE BRITISH FLORA. H. GODWIN. Cambridge, The University Press, 1956. 384 pages, 119 text-figures, 26 pages of plates, 28.5 cm. Price £4 10s. *od.*

THIS monumental work by Dr. Godwin falls into three distinct parts, the central one being "The Plant record". This, the largest section, p. 69 to p. 292, is a catalogue of all the plants which have been recorded in deposits from the beginning of the Ice Age up to historic times. The catalogue is in great detail and not only gives the references to the records but comments on their significance, usually giving the present distribution of the plant.

This is the factual evidence on which his thesis is based. For others who are not botanists but who are interested in what the plants tell of climate and climatic changes during the Ice Age and Post-glacial time, the chapter on "The background scale of Quaternary change", Chapter III, gives a full summary of the stratigraphy and results which have emerged from the recent studies of interglacial and Post-glacial deposits, largely based on the technique of pollen analysis.

Correlation tables, such as Fig. 29, p. 62, show in a comprehensive way the details of late glacial and Post-glacial time, that is, for the last 12,000 years. In this table vegetation type, archaeology, geology and climate are all shown in a way which makes the correlation of these various items easy to follow.

To many interested mainly in glaciology and in the way the effects of ice cover and climatic change are recorded by the plants, Chapter VI "Pattern of change in the British Flora" p. 293-349 will be of great interest; naturally the evidence so far obtained for the interglacial and glacial periods is small compared with that of late glacial and Post-glacial times but Dr. Godwin states (p. 303) "The more we learn of the interglacial floras the more similar they seem to be to one another, and indeed the less they differ from our Post-glacial flora". However, he also notes that each interglacial flora does show differences from the Post-glacial and other interglacial floras which enable it to be identified on its flora.

Chapter VII "Conclusion" is short, only 6 pages—but these give a summary of the whole thesis in a masterly way and emphasize the importance of the detailed work which has been necessary to arrive at a proper appreciation of the history of our flora and the lessons which it can teach. Dr. Godwin contends that he has been able to show that much of our flora was present in Britain while ice fields occupied the northern parts of the country, and that before the North Sea filled up again practically the whole of the present flora which had not "wintered" here had been able to migrate in from the continent.

The "Plant record" is a most valuable reference book but the other chapters, particularly the last two, make fascinating reading as Dr. Godwin develops his thesis to its natural conclusion.

W. B. R. KING

CORRESPONDENCE

The Editor,

The Journal of Glaciology

SIR,

The Mechanical Measurement of Glacier Motion

In his article on this subject (*Journal of Glaciology*, Vol. 2, No. 19, 1956, p. 642) Mr. Galloway speaks of measurements of the movement of Lyngsdalsbreen with a new instrument which one can class in the general category of *Gletscheruhr*; he also cites earlier experiments in this direction. These investigations should meet with great general interest since we know far too little about the actual course of glacier movement, particularly over very short periods of time. At the same time it seems that Mr. Galloway is not aware of the fact that I have also carried out measurements in Norwegian glaciers, particularly in Nigardsbreen (Jostedalbreen), with an instrument which I designed expressly for the purpose, and I would therefore like to draw attention to this work. (See references below.)

The Cryocinegraph which I developed was erected on a glacier tongue after laboratory tests, and was in operation there for several weeks, the results being to some extent surprising; I published these results in due course. (See below.) According to my experience of the results obtained with

instruments of this type they must be regarded sceptically when insufficient attention is paid to ablation and when the forces exerted on the instrument are not taken into account.

It would be very desirable if Mr. Galloway would say a little more on this aspect of the problem since I find difficulty in understanding how this, after all, rather heavy instrument can move with the glacier ice without prejudicing the accuracy of the measurements.

The carrying out of measurements with this instrument above the glacier end seems to me essential, even though really favourable conditions for its setting up do not always exist. Generally there are only a few places where it can be erected and this applies too to the glacier end. Otherwise there is little prospect of success.

W. EVERS

Schulenburg Landstrasse 3, Hannover-Hainholz, Germany
16 April 1956

REFERENCES

1. Evers, W. Ein wichtiges Problem der Gletscherforschung und ein Vorschlag zu seiner Lösung. *Zeitschrift für die gesamte Naturwissenschaft*, Jahrg. 6, Folge 1-2, 1940, p. 17-23.
2. — Der tägliche Bewegungsrhythmus von Gletschern. *Die Umschau in Wissenschaft und Technik*, Jahrg. 45, Ht. 33, 1941, p. 520-23.
3. — Der Thermo-Cryocinegraph, ein Instrument zur Registrierung der Bewegung von Gletschern. *Zeitschrift für Instrumentenkunde*, Jahrg. 61, Ht. 10, 1941, p. 347-52.
4. Bolte, H. Beschreibung einer von W. Evers konstruierten Gletscheruhr. *Zeitschrift für die gesamte Naturwissenschaft*, Jahrg. 6, Folge 1-2, 1940, p. 27-29.

(An interesting early investigation of "Hourly glacial motion" by theodolite is described by H. B. Washburn in the *Geographical Journal*, Vol. 87, No. 6, 1936, p. 490. Still earlier records of short-term forward and lateral movement in firn were made by F. Pfaff in a paper entitled Ueber die Bewegung des Firnes und der Gletscher, *Abhandlungen der k. bayer. Akademie der Wissenschaften*, 2 Cl., Bd. 12., Abth. 2, 1876, 23 p. Ed.)

The Editor,

The Journal of Glaciology

SIR,

I am most grateful to Professor Evers for pointing out the references to his important papers on this subject which had indeed escaped my notice.

Our measurements in Lyngen were taken over such a short period of time that the problem of ablation scarcely arose, but this could become very serious over longer periods as Professor Evers points out. However, its effects can be minimized by mounting the apparatus on tubes driven deep into the glacier and filled with a freezing mixture of ice and salt. Over a considerable period of time the pull of the wires would undoubtedly cause a movement of the instrument towards the valley side, thus introducing an error, but this can be minimized in the same way as the effect of ablation. On a narrow glacier it should be possible to have two instruments on the same mounting, but with wires running to opposite sides of the valley so that this error would then be entirely eliminated. It is true, however, that in its present form the instrument cannot record lateral movements which may be very important. Indeed periods of apparent reduction in forward speed of the glacier as recorded by the instrument may in fact correspond to periods of intensified lateral or upward motion. Very much remains to be found out about glacier motion and with further testing and development "glacier clocks" may become a source of much interesting information.

R. W. GALLOWAY

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4 October 1956

GLACIOLOGICAL LITERATURE

THIS selected list of glaciological literature has been prepared by J. W. Glen with the assistance of T. H. Ellison, W. B. Harland, Miss D. M. Johnson, G. T. Warwick and the Staff of the Scott Polar Research Institute. Its field is the scientific study of snow and ice and of their effects on the earth; for the literature on polar expeditions, and also on the "applied" aspects of glaciology, such as snow ploughs, readers should consult the bibliographies in each issue of the *Polar Record*. For Russian material the system of transliteration used is that agreed by the U.S. Board on Geographic Names and the Permanent Committee on Geographical Names for British Official Use in 1947. Readers can greatly assist by sending reprints of their publications to the Society, or by informing Dr. Glen of publications of glaciological interest.

GENERAL GLACIOLOGY

FINSTERWALDER, R. Geschichte der Alpenen Gletscherkurse. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 2, 1956, p. 257-61. [History of the Alpenen Gletscherkurse, now the Kurs für Hochgebirgsforschung.]