isolated national growth of periglacial research in the early part of the century. One of the objectives of the I.G.U. commission was to provide acceptable definitions of periglacial terms, but in this it has not been productive.

It is consequently a pleasure to record the publication of an illustrated glossary of the major elements in the periglacial landscape. The book is divided into three parts: the first describes features that result from the presence of ice in the ground, on the surface (including snow) and floating ice; the second illustrates the features developed by running water and wind action in periglacial environments; and the third deals with periglacial patterned ground and mass movement. Over fifty distinct phenomena are identified, illustrated with photographs, and described briefly, often with reference to the earliest use of the term. Nearly half the illustrations, in keeping with the field experience of the two authors, are from Canada, and the remainder, equally, are from other northern lands and Pleistocene periglacial regions.

The choice of terms to be described was obviously not easy. For example, the effects of frost shattering are depicted adequately whilst the section on patterned ground is, for this reviewer, too brief; the simple classification introduced by Washburn is followed and consequently the great variety of 'frost-soils' is not emphasized. Possibly, if space was limited, it would have been better to leave out the landforms which are *sensu stricto* periglacial, having been formed adjacent to glacier ice as in the discussion of ice thrust moraines illustrated from Axel Heiberg Island. Several of the sections are outstanding. Note should be taken particularly of the essay in French on ice wedges. Inevitably field workers will find detail to criticize in pioneer work of this nature, but congratulations are deserved for the authors and for the former Geographical Branch for encouraging this study.

The decision not to restrict the glossary to one language, but to make it bilingual, English-French, not only has the effect of reaching a wider audience, but has brought out most effectively the differences of approach between French (including many French-speaking Canadians trained in France and Belgium) and Anglo-American periglacial geomorphologists. It has long been obvious that there are subtle and, in some cases, not so subtle differences in the translation of periglacial terms between English and French. Indeed, there is often no term in the one language for a word used in the other. The authors have, in these cases, been forced to retain the term in the other language or, in some cases, to translate it directly into English. It follows that rather unusual words appear in the English section as, for example, nivo-karst, for the microforms that commonly develop on carbonate surfaces in the presence of melting snow.

Before the glossary could be completed, the English language co-author (F. Cook) died and no attempt was made to achieve close agreement between the English and French descriptions of the various phenomena. The result is that a highly interesting study can be made of the contrasting descriptions of the English and the French versions. In most cases, they are similar although rarely is a direct translation used. In a few cases, however, there are major differences and these have been retained. For example, in the section on Involutions, the English view is apparently that they are a periglacial phenomenon whereas the French opinion is more guarded and leads to a choice of origins. This difference between a somewhat dogmatic approach in the English version and a greater awareness on the French side of the value of several hypotheses is evident in places. The result is a book that will be of interest and value as an introduction to the subject in the field whilst close analysis will provide rewards for the advanced worker.

Laval University Press has shown considerable imagination in the production of a book where page layout was complicated by large numbers of photographs, diagrams and references, but it was perhaps unfortunate that a more pleasing type face was not chosen. The glossary is, however, an excellent piece of work and one which must be recommended to all arctic field workers, whether or not they are specialists in periglacial morphology and additionally, to earth scientists who can expect to find many of the sediments and landforms that are described in fossil localities in mid-latitudes.

J. Brian Bird

GUIDE TO THE CLIMATIC MAPS OF CANADA. By M. K. Thomas and S. R. Anderson. *Canada Department of Transport, Meteorological Branch, 1967. 8½ x 11 in. 108 pages. $1.00.*

This publication brings under one cover the references to all or nearly all published climatic maps (since 1938) of Canada. It is divided into four parts: Part I is an index of national climatic maps arranged alphabetically by climatic elements such as clouds,

fog, humidity, rainfall, snow, temperature, etc. Part II is an index of Regional and Provincial maps arranged in the same manner as Part I. In both Parts I and II each reference contains the author's name, year of publication and title. Part III is an index by authors arranged alphabetically. Under each author's publication the title, reference, year, map scale, size of maps, list of individual maps and period of record together with other notes of the data are listed. Lastly Part IV is a subject index.

This publication will be of great assistance to professional and technical people of many walks of life who make use of climatological information. The authors of this guide are to be highly complimented. They set a pattern and an example which could well be followed by Environmental Science Services Administration for the United States.

P. E. Church

THE AGRICULTURAL CLIMATE OF SASKATCHEWAN. By G. A. McKay, O. R. Mooney, J. Maybank, W. L. Pelton. *Climatological Studies Number 10. Toronto: Canada Department of Transport, Meteorological Branch, 1967. 8½ x 11 in. 18 pages. Maps and tables.*

This publication is listed as an "augmented reprint from the Guide to Farm Practice in Saskatchewan — 1966" which was not available to the reviewer.

Included in this interesting publication are a number of tables on such useful features as cardinal growth temperatures for a number of crops (wheat, sweet corn, beans, etc.), base temperatures to compute growing degree days, January and July air temperatures, seasonal water requirements and length of growing season for a number of crops, average monthly precipitation for more than twenty stations. There are maps showing the average number of May through September degree-days above 42°F., May to September average precipitation, average annual frost-free period, and basic hail insurance rates.

The textual material discusses in an elementary way the effects of a number of climatic elements which are basic to agriculture. These include, among others, light, air temperature, precipitation, evaporation, and a host of weather hazards such as frost, hail, tornadoes, drought, excessive rainfall and strong winds. For some of these elements the average and extreme values are given; these are especially helpful to agricultural people of Saskatchewan as well as to students of Climatology.

One item the reviewer misses is a discussion of the amount of incoming solar radiation monthly during the growing season and the total annual amount. This has been measured at Swift Current for a number of years and could have been included.

One serious typographical error was noted: it is stated that the lowest air temperature "is 70°F. at Prince Albert in February 1893"; it should read: −70°F.

P. E. Church

INDEX