THE ENGLISH LANGUAGE EDITION OF THE GEOCRYOLOGICAL MAP OF RUSSIA AND NEIGHBOURING REPUBLICS. P.J. Williams and I.M.T. Warren. 1999. Ottawa: Collaborative Map Project. Handbook: 32 p, soft cover. ISBN 0-9685013-0-3. Map: 16 sheets (95 x 66 cm per sheet), scale 1:2,500,000. $US350.00.

Approximately one-third of the world's permafrost is found within the boundaries of the former Soviet Union (FSU), covering an area of 11 million km^2. The Russian Federation, which accounts for almost all of this figure, has the greatest extent of permafrost of any country in the world. It is not surprising, therefore, that the Russian geocryological map under review consists of 16 sheets at a scale of 1:2,500,000. The level of detail within these 16 sheets is unprecedented, even by Russian standards, and the publication of an English-language handbook means that this information is, for the first time, accessible to non-Russian speakers. Being a geocryological map, freezing-ground conditions in every part of the FSU are covered. Early on in the handbook, the frequently misinterpreted word 'geocryology' is defined, quickly dispelling the idea that this map is only of use to those interested in permafrost.

Access to Russian geocryological maps of this scale and coverage, accompanied by translations of legends and explanations of awkward terminology, is long overdue. Western geocryologists will at last be able to refer to a comprehensive Russian geocryological map with relative ease. Companies wishing to participate in the industrial development of the Russian north, particularly those interested in Russia's enormous hydrocarbon resources, will find this publication invaluable. For those at the planning stages of a construction project, the map will provide an excellent first impression of regional geocryological conditions anywhere in the FSU.

The English language edition is the result of collaboration between Moscow State University, the Scott Polar Research Institute, and Carleton University. It should be noted that for the English language edition, comprising the 16-sheet map and handbook, only the handbook has been translated. Map reprints would have been prohibitively expensive. However, the handbook provides all the information needed to negotiate the map and its numerous legends.

The handbook is divided into two parts. The first, 'A guide to the English edition of the map,' contains sections on usage, map characteristics, references, and, for those unfamiliar with geocryology, a very helpful glossary. Most valuable to those with some knowledge of Russian geocryological terminology is section 2.2, which lists terms that are often mistranslated into English or misinterpreted. An example is *talyye porody*, literally 'thawed ground,' but often used in Russian to describe ground that is unfrozen and that may not have been frozen previously. The second part, 'Legends and captions: English translations,' is to be used with the map sheets. Although a first glance through this section might cause some apprehension amongst even the most seasoned map users, the 13 legends accompanying the main and inset maps transfer simply, in black and white but with numbers to facilitate cross-referencing between the English and Russian versions. Considerable effort has been made to ensure that the reader knows precisely how to match up the translated versions in the handbook with the original Russian language legends on the map sheets.

The equivalent maps for Canada and Alaska are less detailed in their geocryological coverage. Several phenomena not found on geocryological maps of North America are included in this map. One important example is the cryopeg, defined in the handbook as a body of unfrozen soil, within or immediately below permafrost, containing a high concentration of dissolved materials, which lowers its freezing point. The amount of information contained in the map itself may seem excessive, for example the inclusion of soil science data, but, as the reader is rightly told, this additional geological information is 'fundamental to the interpretation of the geocryology of a region.' Geocryological data are presented in a layered format. In permafrost regions, for example, the following data are found at any given location: distribution and mean annual temperature of frozen and unfrozen ground (including types of seasonal freezing and thawing of ground), permafrost thickness, distribution of cryogenic phenomena, genetic types of strata, and their geocryological characteristics. Where relevant, additional layers indicate depth and thickness of relict permafrost and distribution and thickness of permafrost containing cryopegs. The map also deals well with the contentious issue of permafrost boundaries. In reality, permafrost zones differentiated by spatial distribution of frozen soils (continuous, discontinuous, island) do not and cannot have clearly defined boundaries. It is, therefore, pleasing to see that the Russian geocryologists have addressed this by including pockets of permafrost that occur beyond the generally accepted boundaries indicated on the map.

The new map not only provides geocryological information but also enlightens the reader as to the way in which geocryological research has been organized in the FSU. The map is essentially a compilation of several regional geocryological maps published in the Soviet Union in the 1980s, a fact made apparent by the inset map at the bottom left of sheet 1. Due to its size, the Soviet Union was broken up into regions for the purposes of geocryological research, each of which has been the preserve of only one or two institutes or universities. The regional maps tended also to be 1:2,500,000 and covered, for example, the West Siberian plain (one of the most thoroughly researched regions, notable for its hydrocarbon resources and studied mainly by the PNIIIS engineering survey institute) or the vast republic of Sakha–Yakutiya (home to the Permafrost Institute of the Siberian Branch of the Russian Academy of Sciences). This map unifies all of these, together with updated material.

Publication of the map and handbook set will be welcomed by both academic and commercial communities and is all the more timely for the latter as conditions for foreign investment in the FSU continue to improve. (Ben Seligman, Manor Farm, West Chelborough, Dorchester, Dorset DT2 0PY.)

BY AIRSHIP TO THE NORTH POLE: AN ARCHAEOLOGY OF HUMAN EXPLORATION. P.J. Capelotti. 1999. New Brunswick, NJ, and London: Rutgers University Press. xix + 224 p, illustrated, hard cover. ISBN 0-8135-2633-7. $US26.00.

After an unsuccessful attempt in 1896, which came to nought because of the lack of the essential southerly winds, in 1897 the Swedish explorer Salomon August Andrée started from Virgohamna on the north coast of Danskøya in Svalbard in an unpowered hydrogen balloon, *Örnen*, hoping to reach the North Pole. This event has become widely known, largely because of the disappearance of the balloon, Andrée, and his two companions, and the remarkable discovery of their camp and skeletons on Kvitøya in 1930. The fate of the expedition was revealed by diaries found at the camp and by photographs that, when developed, graphically illustrated the details of that fate, although the film had lain undeveloped for 30 years.

In 1906, 1907, and 1909, Walter Wellman, a reporter for the *Chicago Record-Herald*, made three attempts at reaching the Pole from the same location in Svalbard, but using powered dirigibles. In 1906 it was found that the engines had serious defects and the dirigible was not even inflated; in 1907 the dirigible flew about 24 km and in 1909 about 64 km.

The first part of *By airship to the North Pole* traces the history of these events, placing them in the context of the history of Arctic exploration and of the development of balloons and dirigibles in general. In both cases the author castigates these over-ambitious 'explorers' for failing to undertake field trials of their craft before taking them to the Arctic. His discussion is seriously weakened, however, by a total lack of maps to show where the two men had planned to go, and what they actually achieved. It is further weakened by several factual errors or misuse of terminology. On several occasions Capelotti refers to the permanent pack ice of the Arctic Ocean as the 'polar ice cap'; the term ice cap refers to a large glacier, such as the Devon Island Ice Cap, and should never be applied to sea ice. The spelling of the name of George W. De Long's ship was *Jeannette*, not *Jeanette*. On page 12 Capelotti states that the start of the drift of *Fram* was close to that of De Long's *Jeannette*; *Jeannette*'s drift, however, began to the east of Ostrov Vrangelya, that of *Fram* to the northwest of Ostrova Novosibirskiye, more than 1700 km, or well over 1000 miles, farther west. On page 60 Capelotti states that during his 1898–99 expedition to Zemlya Frantsa-Iosifa, Wellman's team 'explored and discovered a few small islands in the archipelago.' Ostrov Greem Bell, one of these 'few small islands,' is actually one of the largest islands in the archipelago, covering approximately 2800 km^2. Mistakes such as these, with reference to easily checked data, tend to cast doubt on the calibre of the author's own research.

In 1993 Capelotti mounted a thorough archeological examination of the abundant relics of these various early attempts at Arctic aviation at Virgohamna: the remains of Wellman's impressive balloon hangar, the remains of two of Wellman's craft, the residues from the operations for producing hydrogen used by both men, and much more. This discussion is rendered almost incomprehensible by a total lack of maps of the site, although (page 156) Capelotti does mention that he produced a planimetric map of his archeological investigations.

A large part of the book is occupied by the author's attempts at demonstrating the value of his type of archeology. One hypothesis he attempts to prove is that the frequency of occurrence of labels or trade-marks on artifacts found on the site at Virgohamna, when compared to the frequency of occurrence in Wellman's writings or of advertisements in Wellman's *Chicago Record-Herald* should prove or disprove the accusation levelled at Wellman that his were purely advertising stunts, rather than genuine attempts at exploration. Since only five brand names were found on artifacts on the site, this effort was rather inconclusive. Similarly Capelotti attempts to prove or disprove Wellman's veracity in general, on the basis of his statement that the iron used to produce the hydrogen for his dirigible was tainted. Capelotti proves to his own satisfaction that this statement is correct — but this one example of verification is scarcely enough on which to assess a man's reputation.

Capelotti has made useful contributions by unravelling the details of the structures and artifacts still surviving at Virgohamna — structures and artifacts that have often been misidentified by other writers — and by identifying the crucial flaws in both Andrée's and Wellman's polar attempts. But even these contributions are badly flawed by the map problems. And surely such a study could have been better reported in a rigorous, concise journal article, rather than in a 'popular' book. (William Barr, Arctic Institute of North America, University of Calgary, 2500 University Drive NW, Calgary, AB T2N 1N4, Canada.)

DEVELOPMENT IN THE ARCTIC. Tom Greiffenberg (Editor). 1999. Odense: Danish Polar Center. 132 p, illustrated, soft cover. ISBN 87-90369-29-7. Price DK 150.00.

Development in the Arctic is the record of the proceedings from the Seventh Nordic Arctic Research Forum Symposium, which was held in Slettestrand, Denmark, in January 1998. Published by the Danish Polar Center, the report is attractively presented in A4 softback format. A compilation of 15 papers, the book features a number of monochrome illustrations and maps, contact information for the participants, and a short list of other Nordic Arctic Research Forum publications. All of the material is in English.