

summer visitors and many lakes, headlands and islands still awaited discovery and naming. On the whole, the geography of Northern Canada remained a patchwork affair, assembled from the results of expeditions, some of them centuries old. By the 1920s, however, it was beginning to be possible to tie the information together with some assurance. Annual government expeditions by sea between 1922 and 1929 seemed a very promising beginning to a plan to explore and map the whole of the North but policies changed and no major advance proved possible for more than a decade.

Faced with the enormous task of providing accurate maps of Canada, the available resources were quite naturally marshalled for use in the South. As late as 1927 the basic geodetic network, the foundation of all really accurate maps and the locating of specific points within the country, was still edging its way through the southern part of the provinces. It would be decades before anything comparable would become possible in the Arctic. However, maps there had to be, even to remote regions, and they were produced using the best data available. In the early 1940s topographic mapping to a scale of eight miles to the inch finally reached the shores of the polar sea. That the information came in large part from early and sometimes single explorers and was often far from accurate, was less important than that the maps existed. Canada had at last been delimited after a fashion. Dotted lines showed uncertain coasts and large blank areas revealed little but the state of topographic ignorance, yet the maps set the stage for the major surveying and mapping campaign that soon followed.

Systematic exploratory surveys in the North were first undertaken by the Federal Government after the First World War. They were, in effect, an extension into higher latitudes of the techniques that had been used on the prairies, in the western Cordillera and on the southern part of the Canadian Shield. The search for minerals was moving northward and maps were needed to assist geologists and prospectors; improved administration of the area was urgent, as was better transportation.

If only for reasons of convenience, the area that benefited first was the Mackenzie Valley. Although not remote, it was described by Charles Camsell in 1921 as an area about which very little was known. In that year surveys were extended northward from Alberta along the waterway and down to the Arctic Coast. This was a combined operation by topographic surveyors, geologists, hydrographers and geodesists. As a consequence, the Valley was linked securely to Southern Canada and a framework laid down so that more detailed exploration and mapping could go ahead. For the first time there were maps of the Mackenzie River itself—along which stern-wheeled steamers had been navigating by faith and the skill of Indian pilots for several decades. How much remained to be done is illustrated by the fact that Great Slave Lake, a water body of nearly 11,000 sq. miles discovered by Samuel Hearne in 1771 and crossed by Mackenzie in 1789, was not shown on maps with even reasonable accuracy until 1924. The major attempt to extend mapping northward by traditional means demonstrated clearly that, without new time- and labour-saving techniques, the task would be all but impossible. The introduction of aircraft and radio eventually transformed this situation.

During the 1930s, surveying and cartographic techniques were being tried out which, when perfected, made it possible to complete the first mapping of Canada within a few years. It was the aerial camera that made this practicable and much of the original experimentation was carried out under the urgent need to map the North. In its early stages, using oblique air photographs which included the horizon, the detail was transferred to paper with the aid of an ingenious perspective grid etched on a glass plate. This method happened to be particularly useful on the relatively level, lake-strewn Canadian Shield. Vertical photographs were also used but they covered a smaller area so that the mapping took longer. In the more rugged western mountains, the camera was also useful but, because aircraft could not then be employed, rounds of photographs were taken from the higher peaks.

During the Second World War more dependable and longer-range aeroplanes became available, along with more elaborate cameras and plotting equipment, and the coverage of Northern Canada went ahead swiftly. At first the trimetrogon system was used, by which a high-flying aeroplane carried three cameras, simultaneously photographing ahead and to