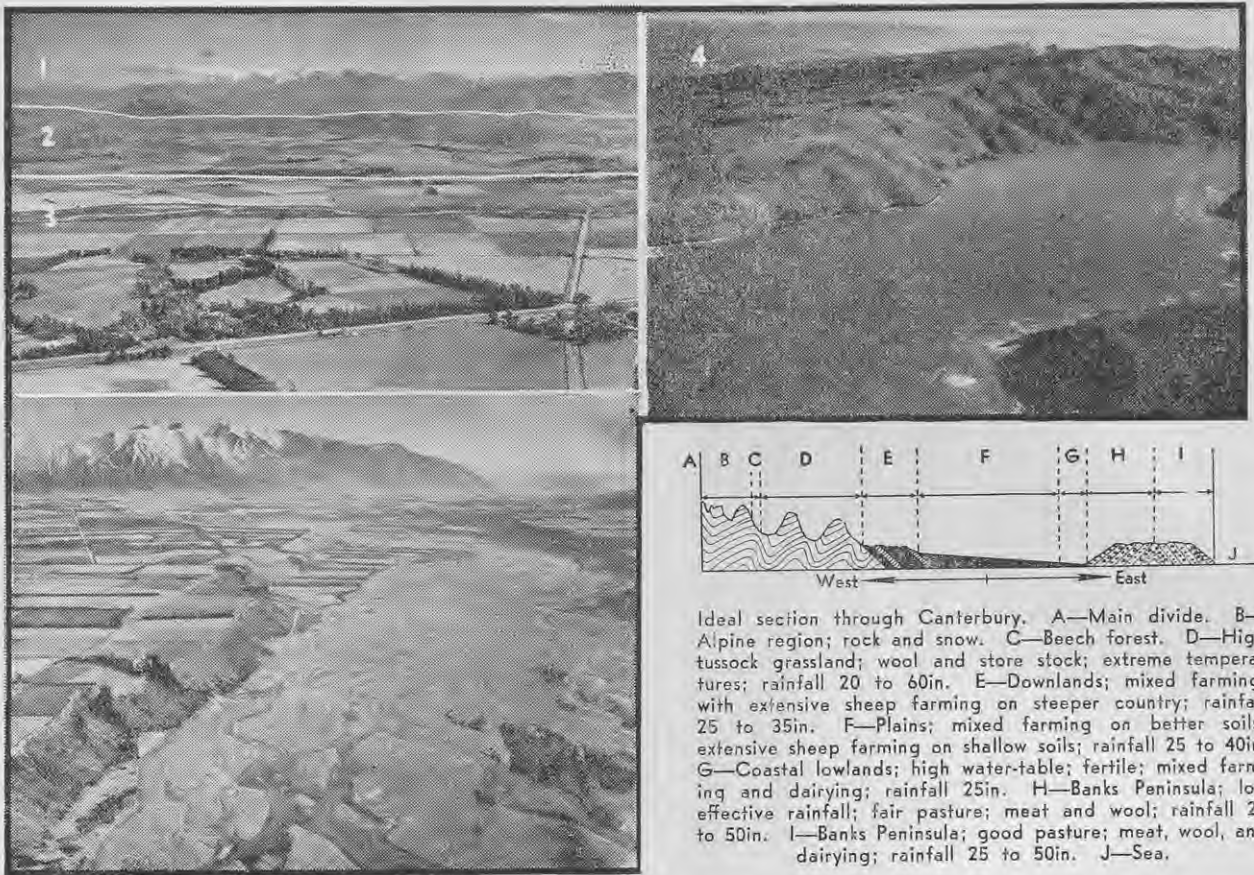


THE TOPOGRAPHY OF CANTERBURY



[Photograph at top left by Whites Aviation Ltd.; others by V. C. Browns.]

The district can be divided into (1) the Southern Alps and foothills, (2) the downlands, (3) the plains, and (4) Banks Peninsula.

(1) THE SOUTHERN ALPS AND FOOTHILLS

The rugged mountain chain, with a north-east trend, increases gradually in height southward. Numerous subsidiary ranges, some at right angles and others parallel to the main divide, are separated by deep valleys and broad basins such as the Hanmer basin in the north and the Mackenzie basin in the south. The distance from the main divide to the outer edge of the foothills varies from 30 to 40 miles; thus the high country occupies a large proportion of the area of Canterbury. The soils of the area are derived from the greywacke rock of which the mountains are mainly composed.

(2) THE DOWNLANDS

Practically along the whole length of the foothills there stretches eastward an area of down country which at either end of the district extends to the sea coast. However, in the northern downlands area undulating country alternates with steeper hills. Most of the downlands are composed of a considerable depth of loess underlain by sandstone, limestone, volcanic rocks, and gravels.

(3) THE PLAINS

Between the foothills and ranges to the west, the Pacific Ocean to the east, and the downlands to the north and south lies the almost level expanse of the Canterbury Plains, about 120 miles long and having a maximum width of 40 miles. With a grade of 30 to 45ft. per mile the plains slope gently from almost sea level to about 1000ft. They are traversed by broad shingle rivers.

The plains were formed in an era during which the alpine region had a greater elevation and during which glaciation was extensive. The glaciers then occupying the head waters of the

major rivers disgorged an immense amount of rock debris eroded from the greywacke mountains into the glacial rivers. This rock debris, composed of gravel, shingle, sands, and silts, was deposited by the rivers in the form of huge fans. The major river fans grew to such proportions that they eventually joined and overlapped one another as they spread eastward. When the land again subsided and the extent of glaciation declined the supply of debris fell away and the rivers began to cut down through the earlier deposits leaving terraces of considerable extent. Most rivers in their upper reaches are now well entrenched between gravel banks, as indicated in the above illustration of the Rakaia River.

The more fertile parts of the plains occur at the outer margins of the great river fans, in the coastal lowlands, in the depressions between the fans, and along the banks of the rivers.

(4) BANKS PENINSULA

Midway between the northern and southern boundaries of the district, Banks Peninsula rises abruptly from the eastern portion of the plains. The present peninsula, with one peak reaching 3000ft., is the remnant of a once larger mass of volcanic rock formed principally by two volcanoes which had their craters in the Akaroa and Lyttelton Harbours. Natural erosion has greatly increased the extent of the interior slopes of the volcanic cones and it has also formed the system of radiating valleys and spurs which occur on the outer slopes. This is shown above in the illustration of Akaroa Harbour and the southern part of the peninsula. The spurs have a relatively easy grade and reach the sea in wave-beaten sea cliffs. The soils of the peninsula are derived mainly from loess.

The loess, the very fine rock flour product of glacial erosion, was swept up from the beds of the glacial rivers of the plains by the north-west winds, and considerable amounts were deposited on the peninsula, particularly on the lower slopes, obliterating in most parts the underlying volcanic soils.