

INTERDEPENDENCE BETWEEN GLACIER EROSION AND GEOLOGICAL FEATURES

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ABSTRACT. A strong relationship between the shapes of glacier excavation and some specific structures of the bedrock seems to exist in all the cases observed by the authors. Important examples of this kind include present and Quaternary glaciers in the Iberian Peninsula, the Alps, and the Peruvian Andes. A preliminary mathematical model has been developed, a brief description of which is given in this paper. Within the framework of this model the above interdependence can be interpreted. In this way the excavation mechanism that occurs in stationary glaciers can be explained without requiring the use of more sophisticated theories implying quite complex morphological phenomena. Suggestions for further studies are also made.

CHARACTERISTICS AND ORIGINS OF THE DEBRIS AND ICE, MATANUSKA GLACIER, ALASKA

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ABSTRACT. The physical characteristics of the ice and debris of the Matanuska Glacier, Alaska (lat. $61^{\circ} 47'$, long. $147^{\circ} 45'$) and their consistent variation in a vertical stratigraphic column of the glacier indicate multiple origins for both. The two zones of ice recognized in the glacier are the upper englacial zone, which comprises the bulk of the glacier (est. 300 m thick), and the thin (3 to 15 m thick) basal zone, which contains an estimated 97% of the sediment transported in the glacier. The physical characteristics of the ice and the quantity and mode of distribution of debris in it define two ice facies in each zone. The englacial zone consists mainly of the debris-poor (0.002 volume per cent) diffused facies. White coarse-bubbly ice and blue coarse-clear ice (2 to 10 cm diameter) comprise most of this facies. The bubble-rich banded facies (debris bands) contains abundant debris (25 to 50 volume per cent), varies in lateral and vertical extent, and occurs randomly in the diffused facies.