of the expansion contains a function of the heat sources, and for the other terms it contains the second derivative along the vertical coordinate from the previous expansion term.

Thus advection makes the main contribution to the heat transfer, and temperature in a glacier is distributed along the particle paths, changing simultaneously under the influence of heat generation. A relatively thin conducting boundary layer adjoins the upper and lower surfaces of a glacier, playing the role of a temperature damper in the ablation area. The equation of heat conduction (at the free surface) or of heat conduction and heat transfer (at the bottom) with the boundary conditions, and with the condition of the connection with the solution of the problem for the internal temperature distribution, is being solved for the boundary layer because of its small thickness. Beyond the limits of the boundary layer, heat conduction makes a small change in the temperature distribution, which can be calculated with any degree of accuracy.

TEMPERATURE DISTRIBUTION IN A SUB-ISOTHERMAL GLACIER

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ABSTRACT. In sub-isothermal glaciers heat conduction plays the main role in the formation of the temperature field, and the contribution of advection is relatively small. The dependence of the strain-rate on the temperature is simplified by a linear approximation. If the whole range of the temperature change in a glacier does not exceed ≈ 3 deg, with the power rheological law the quasi-steady temperature distribution is described by a simple analytical dependence. In the upper part of the ice, the temperature varies with depth almost linearly; the deflection from the linear distribution is essentially in the lower part.

THERMAL CONSEQUENCES OF THE PRESSURE FLUCTUATIONS IN INTRA- AND SUBGLACIAL WATER DRAINAGE CHANNELS

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ABSTRACT. Recent measurements of the water level (pressure head) in drill holes and natural moulins on two glacier tongues in Switzerland (Oberaletschgletscher and Gornergletscher) have confirmed that in those holes which link up to a well developed subglacial drainage system the daily piezometric fluctuations are in the order of 100 m (10 bar) and more. From the fact that it is relatively easy to establish such links (in our experiments at ice depths between 150 and 300 m), it is implied that an extended network of subglacial channels and cavities will be subjected to equally large pressure fluctuations with a mean water pressure considerably below the mean ice pressure at the bed. The scope of the present paper is to discuss some of the thermal effects of the low water pressure and its fluctuations.