DEPOSITION FROM A CURVED SHALLOW FLOW TREATED AS A MOVING BOUNDARY OF CONSTANT FORM

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Dams and terraces deposited from supersaturated flows or supercooled flows are known to occur in nature. Examples of the former include the travertine deposits at Mammoth Springs, Yellowstone National Park, U.S.A., the calcareous deposits of Pammukale, Turkey, and the siliceous deposits forming the Pink and White Terraces which existed in New Zealand prior to the Tarawera volcanic eruption of 1886 [9,10]. Examples of the second type include an ice-sand dam, formed from pressure melt water, which has been known to develop at the toe of the Mueller Glacier in the Southern Alps of New Zealand [3].

These formations are quite large (of order 1 m in height and of considerable horizontal extent), suggesting that the observed repetitive (wavelike) solid profiles are final forms which have developed at large times. The fluid flows giving rise to deposition are likely to be quite shallow, and may range from thin laminar to turbulent flow regimes. Evidently the scale of flow depth is very much smaller than the scale of the depositional features.

One mechanism whereby these deposits might be produced has been described recently [9,10], and the present short article is intended to review some aspects of the problem and provide a few additional comments. The notation previously used will be retained, and a definition diagram (Figure 4 in [9,10]) is also useful.

2. PROBLEM DESCRIPTION

If a shallow turbulent flow is assumed, which has been justified *a posteriori* in the former work, it is convenient to use Dressler's