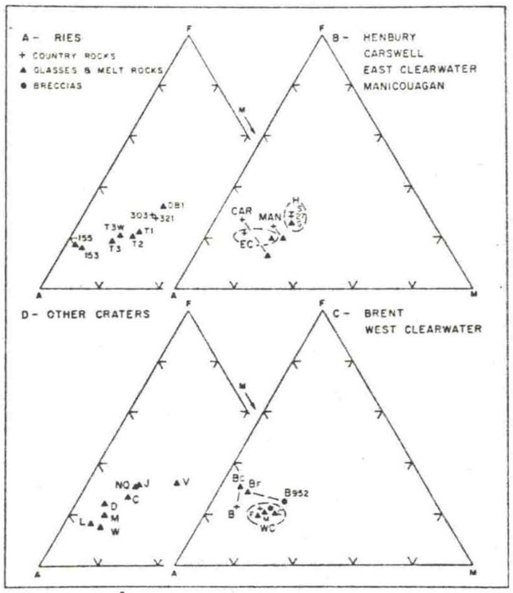

Fig. 2. Ternary plots, for fifteen craters, of the ratio iron (F) : magnesium (M) : alkalis (A). Sources and description of analyses given in Table 2.

and remain relatively undisturbed. In large craters collapse of the uplifted rim materials initiates deep sliding, which results in uplift of the crater floor in the center and down drop of the crater rim (Figure 4*b*). The crater lining has a passive role in these events and largely retains its original relationships, except in the center where it is pierced by peaks of the central prominence. Melt and breccia will, however, fill fractures that may open up in the underlying basement rocks in the final stages of adjustment.

The model provides four mechanisms by which the composition of the consolidated melt rocks may differ from that of the adjacent country rocks: (1) addition of meteoritic material to the melt; (2) selective melting of low-melting-point components of country rock; (3) differences between the composition of the target rock actually melted and the mean or calculated composition of the adjacent country rocks; (4) alteration during the following consolidation.

Differential vaporization close to the point of impact has also been suggested, but such vaporized materials are likely to be widely dispersed and need not be considered in this discussion.

1. *Contamination by meteoritic material.* This process leads to enrichment of the melt rocks in nickel, cobalt, iron, and, in the case of chondrites, magnesium, as well as in certain trace elements. Of these nickel, being two or three orders of magnitude more abundant in meteorites than in average crustal rocks, is potentially the most useful indicator of meteoritic contamination. Nickel-iron anomalies are well known in glasses from Henbury and other

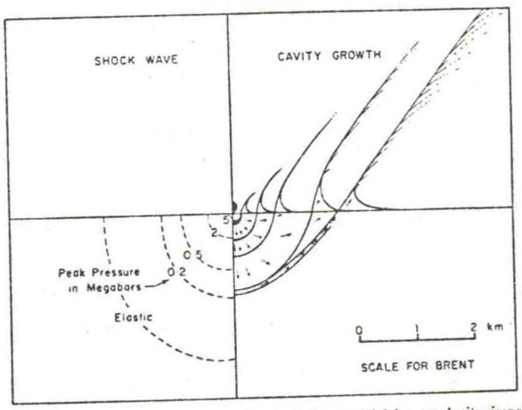

Fig. 3. Model of the excavation stage of a typical terrestrial hypervelocity impact crater based mainly on analysis of data from Brent crater. On the right, stages in the excavation are depicted with vectors of particle motion after *Gault et al.* [1968]. On the left are shown the corresponding positions of the attenuating shock wave.

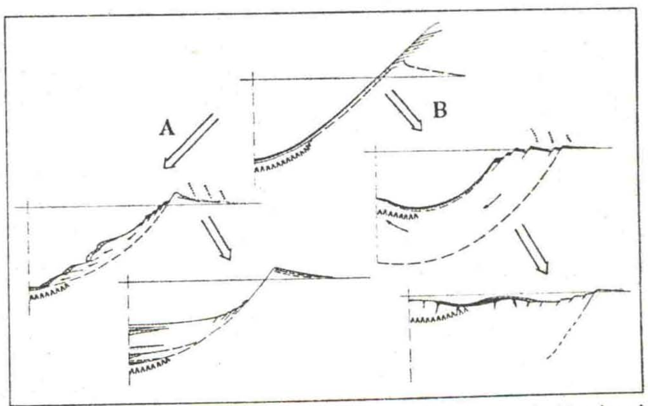

Fig. 4. Two alternative post-excavation histories of an impact crater. (*a*) Slumping of the crater walls to give a simple crater of the Barringer-Brent type. Melt and breccias lining the excavated cavity are disrupted and incorporated into a central bowl-shaped body of breccias. (*b*) Deep-seated sliding of the crater walls to give a central uplift, ring uplift, and depressed rim, as in a complex crater of the Clearwater-Manicouagan type. The crater lining remains largely intact but fills fractures in the underlying basement rocks. Limits of shock deformation of the basement rocks shown by inverted V's.