

Holleford Impact Structure

Ontario, Canada N 44° 28' W 76° 38'



Photo courtesy Charles O'Dale

- Type: Simple
- Age: 550 ± 100 ma
- Diameter: 2.35 km
- Shock
Metamorphism:
Planar Deformation
Features (PDF) in
quartz grains
(Robertson, Bunch,
1968)

The Holleford Impact Structure is located 27 kilometres north of Kingston and 132 kilometres south-west of Ottawa in southern Ontario. Confirmation of the structure as an impact site dates only to the mid-1950's. Aircraft had been flying overhead for years without anyone noticing that this may be an "unusual" structure. This is not surprising as the depth of the structure is only about 30 m (Beals 1960).

A systematic study of 200,000 aerial photographs of areas of the Canadian Shield started in the early 1950's when the Pingualuit Crater (formerly Chubb and then New Quebec) and the Brent Crater were confirmed as impact structures. As a result, Holleford was identified as a "structure of interest." Over the years since that search, scientists have pieced together much of the Holleford Structure's geological history (UNB 2003).

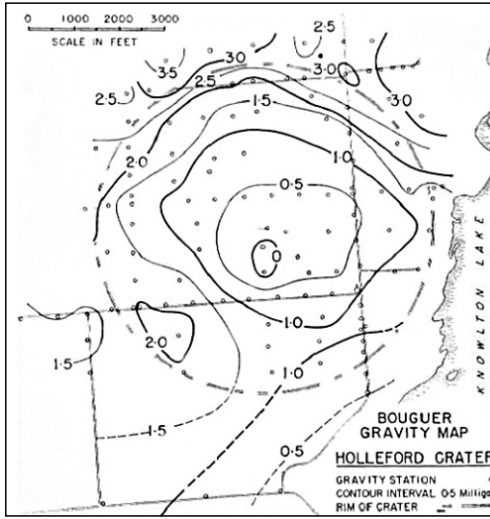


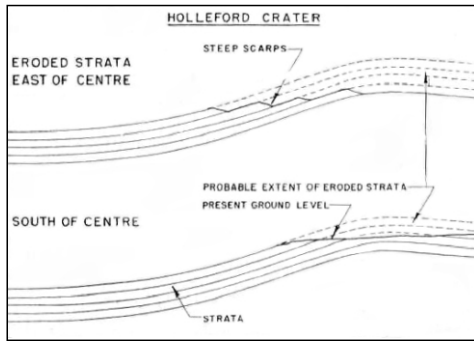
Illustration by C. S. Beals,
Dominion Observatory

Negative gravitational anomaly over the Holleford Crater.

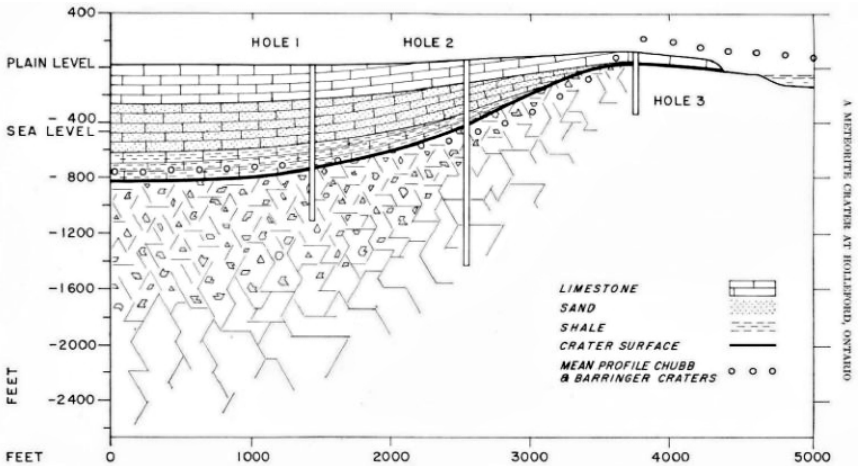


550 million years ago, the Holleford Crater wall would have looked like this.

Photo courtesy Charles O'Dale



Explanation of ground topography based on eroded strata.

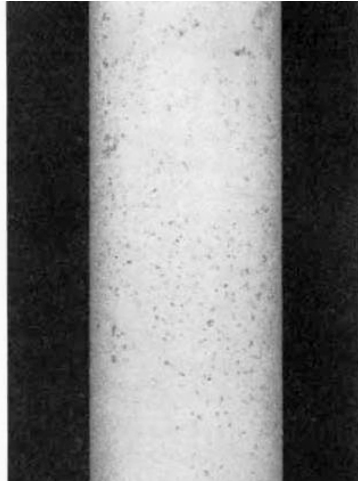


Profile of the Holleford Crater as reconstructed from drill-hole and surface observations. The original crater surface dips nearly 800 feet below plain level, while the zone of fractured rock extends to an estimated depth of about 2,400 feet.

Illustrations by C. S. Beals, Dominion Observatory

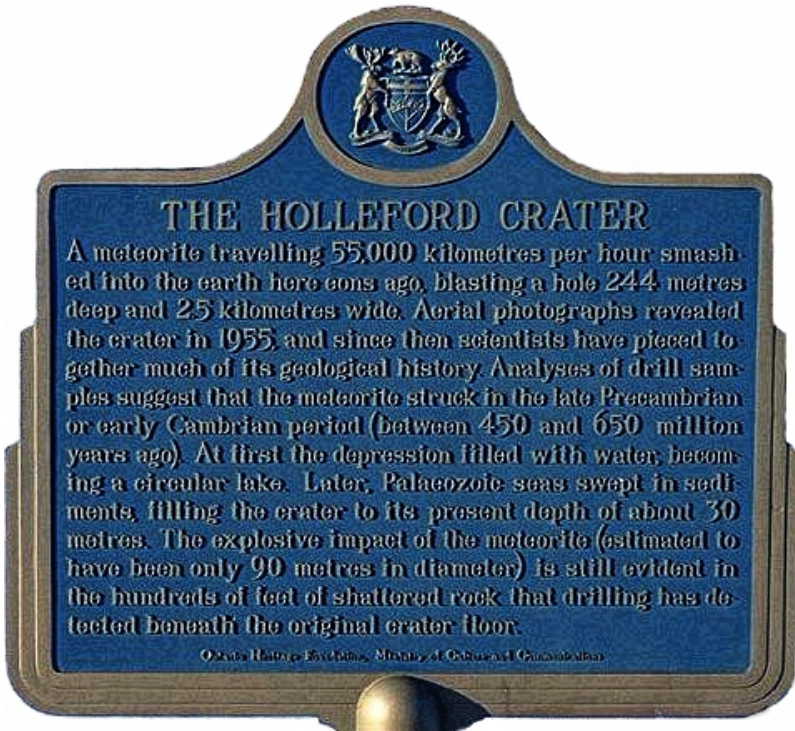


Angular clasts from different origin intermixed in a consolidated matrix cemented together



Undisturbed bedrock from which the crater was blasted

Image by K. R. Dawson,
Geological Survey of Canada



THE HOLLEFORD CRATER

A meteorite travelling 55,000 kilometres per hour smashed into the earth here eons ago, blasting a hole 244 metres deep and 2.5 kilometres wide. Aerial photographs revealed the crater in 1955, and since then scientists have pieced together much of its geological history. Analyses of drill samples suggest that the meteorite struck in the late Precambrian or early Cambrian period (between 450 and 650 million years ago). At first the depression filled with water, becoming a circular lake. Later, Palaeozoic seas swept in sediments, filling the crater to its present depth of about 30 metres. The explosive impact of the meteorite (estimated to have been only 90 metres in diameter) is still evident in the hundreds of feet of shattered rock that drilling has detected beneath the original crater floor.

Ontario Heritage Foundation, Ministry of Culture and Communications