A Flint Concretion from Northern Germany - Geofact or Artifact?

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The flint concretion shown in Figure 1 was recovered in 1986 from glacial till at a gravel quarry near Hamburg in northern Germany. As viewed in the photograph, the object is 129 mm in height. Its weight is 327 g. On its surface are removal scars having the appearance of nonrandom distribution. This report addresses the question of whether the stone acquired its current appearance entirely through natural processes or partially through artificial modification, presenting an assessment of the physical evidence by Dr. Eric Law, petrologist and professor of geology at Muskingum University in New Concord, Ohio.

Figure 1

The exposed interior rock is well patinated, indicating that the scars are not of recent origin, therefore not the result of damage by quarrying equipment. In the time between this flint nodule's erosion from the host rock and its retrieval from glacial till, natural impact forces sufficient to cause the visible damage almost certainly could have been present only in one or both of these two circumstances:

1. Concussion and abrasion by surrounding rock fragments during mass-movement glacial debris flow in which water played a minimal role.

2. Damage in a river channel by collision with rock debris, as bedload of high-energy glacial meltwater flow.

In looking for evidence of the first scenario one notices that no scratches, striations, or grooves are present on the stone's smooth surface, ruling out the possibility that the fractures seen on the surface were caused by glacial

debris flow. In the second case, impact during water transportation, such impact scars would almost certainly occur in a random distribution, not in the patterns that are evident here. Altogether, it would be virtually impossible for the multiple scars confined to the separate small areas of internal rock exposure to have been caused by glacial or water transportation.

Figure 2

Figure 3

Most of the fractures visible on the surface of this object required multiple, sequential, and adjacent strikes within limited geometric parameters. Specifically, Figures 2 and 3 show bezel-like trimming around the circumference of the flat circular surface at the bottom of the object as viewed in Figure 1.

Figure 4

In a similar case, Figure 4 shows at least five sequential surface removals along the arc-shaped fracture scar, all delimited at their vertical extents by cortex removal.

Figure 5

Figure 6

Figure 7

Figure 5 shows a fracture scar produced by a single blow. In contrast to this are the multiple removals shown in Figures 6 and 7, confined to small areas and likely produced by impact from a hard and more or less pointed object.

On the basis of the above observations (and, circumstantially, the overall appearance of the object), it seems highly probable that the impact scars visible on this flint nodule are not the result of natural processes, but are artificial and intentional.

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