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Petrie's Egyptian Core #7
An Advanced Primitive Machining Explanation

By Joel M Williams (text and images ©2015)

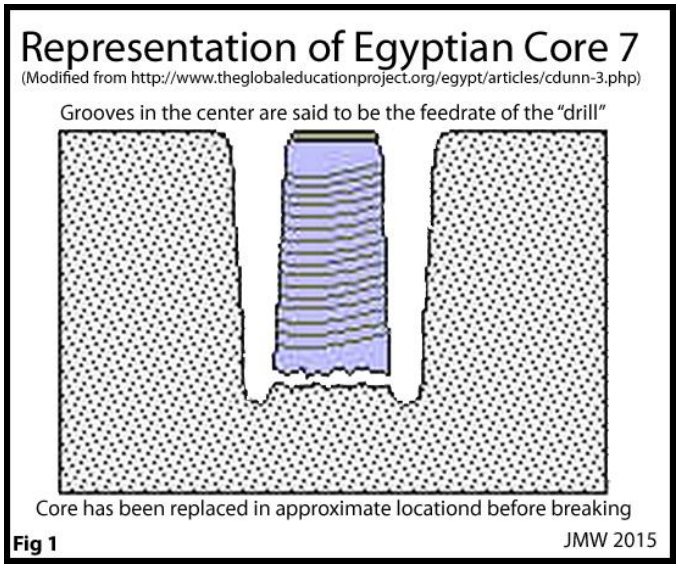
Abstract

Based on the chemistry of minerals, Petrie's "Infamous Core #7" is shown to have been produced easily by milling techniques far less advanced than those espoused to exceed modern milling technology.

A value of a TV series that suggests that the technologies of ancient civilizations must have come from "aliens" is that the viewer is exposed to many unexplained archeological wonders that exist on our planet earth. While watching the "Ancient Impossible - power tools" episode on the Egyptians being able to drill into granite many times faster that even 21st century machines can, I became very skeptical of the claim. So I decided to investigate.

The basis for the claim that the Egyptians had boring capability greater than is currently possible was some granite cores that William Flinders Petrie collected back in the late 1880s; specifically, that which is known as the "Infamous Core #7". This is not a treatise on its discovery, but a treatise on how "Core #7" could have been generated with advanced primitive methodology.

Fig 1 on the right is a modification of Christopher Dunn's figure representing Petrie's "core #7". I have placed the center core where it would have been before it was broken away. Petrie (an engineer) claimed that the cutting rate into the granite was an astonishing 0.1" for each 6" diameter revolution. Dunn (a self-described technologist) examined[1] "core #7" (the core is shown in his hand in the reference) and determined that



- The depths of the grooves were .002 and .005 inch. Dunn stated that the actual measurement would be between .000 and .005 inch as the groove varied in depth as it circled the core, and at some points was a faint scratch
- The distance between the grooves, which are scoured into the core along the entire length, was .040 - .080 inch.
- A clockwise double helical groove from top to bottom with a .110 - .120 inch pitch.
- The spiral groove cut deeper through the quartz than through the feldspars

To generate "core #7", Dunn proposes[2] that the Egyptians used an "ultrasonic" drilling technique with bits that wore away to create the wide start to narrow bottom. I did not see what he had in mind for the drill bit material. What is suggested here and in the TV program is that "core #7" was created ONLY by machining and that it was superior to anything we have in the 21st century! That those ancient Egyptians could have had pragmatic experience in the chemistry of materials was totally ignored.

Being a chemist who has built houses and concrete culverts, generated polymeric materials, run saws, lattes and milling machines, the wider material removal at the top and the wider taper of the center core at the bottom did not appear to me to be high-tech stuff. When I showed it to my wife (a scientist without machining experience, but who has lots of culinary experience, including cookie cutting), she instantly noted that the opposing slants of the main block and that the core did not make sense to her! So, what follows is an advanced, primitive method for producing "Petrie's Core #7".

When your tools "do not cut the granite", you either develop better tools or you treat the granite to make it easier to cut. The emphasis to legitimize the claim that extraordinary machining capabilities were involved has been on the "better tools" approach. Pragmatic application of chemistry is something that those Egyptians could have done, but that was not addressed.

Firstly, the grooves on the center core DO NOT mean that they were produced when the granite in the void space was removed.

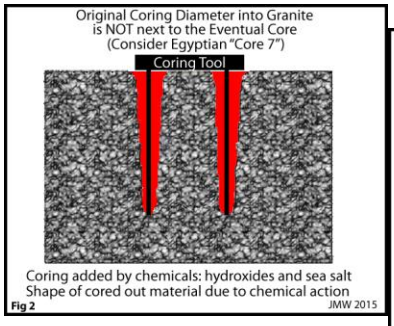
Since the early 1970s, considerable research has been done on the dissolution of minerals. One of the driving forces has been the "hot dry rock" geothermal process[3], at the Los Alamos National Laboratory, that had to handle scale buildup during coring and the openings and closings of fracture.♦

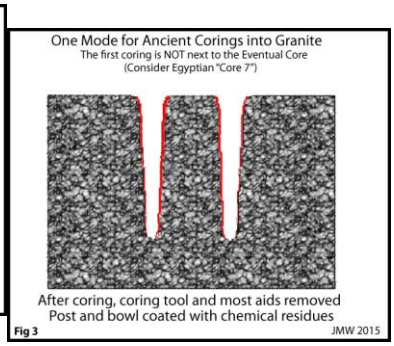
Several research papers are cited in the reference section on the dissolution of minerals in aqueous media.[4] Data on the interaction of chemicals with granite, pertinent to potential chemical applications in the generation of core #7, are summarized in bullets below with cited reference texts and graphs:

- Quartz can be highly reactive relative to other constituent minerals[4b]; in fact, at pH's above 10, the rate of dissolution of quartz is several orders of magnitude greater than that of kaolinite (a clay), and greater than that of diopside (a MgCa silicate), forsterite (a Mg silicate), and feldspars [anorthite (CaAl silicate), and albite (NaAl silicate)][4c (Fig 5.1, p152)]
- Quartz dissolution rate is ~3-orders of magnitude greater at pH 12 than pH 6[4b (Fig 2.1, p22)]
- Quartz dissolution rate is over 2-orders greater at 70°C than at 25°C[4b (Fig 2.1, p22)]
- Quartz dissolution rate can be increased ~5x with NaCl (sea salt) [4b (Fig 6.9, p138)]

The data above indicates that granite is highly susceptible to strong hydroxide and added salt — more so than are feldspars; just the behavior that Dunn noted when examining "core #7! Coring with these chemicals would be far more facile than with the water or sand-water used in the TV portrayals. Let's look now at what would happen when these chemicals are used to generate "core #7".

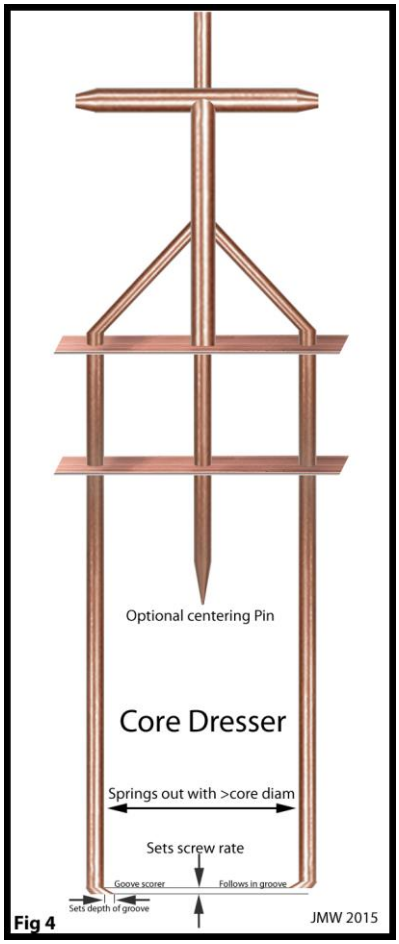
Fig 2 demonstrates what would happen for an initial coring with a tool greater than the diameter of the final center core. As the coring tools descends into the granite at a rate that may be much slower than that possible today (!), chemical dissolution continues at the entry point. When the initial coring tool has reached the desired depth, it is removed. Some dissolution will continue until the dissolving material is emptied out. What will remain is a crust as indicated in Fig 3. Now it is time to "dress" the center core by removing the encrustation.



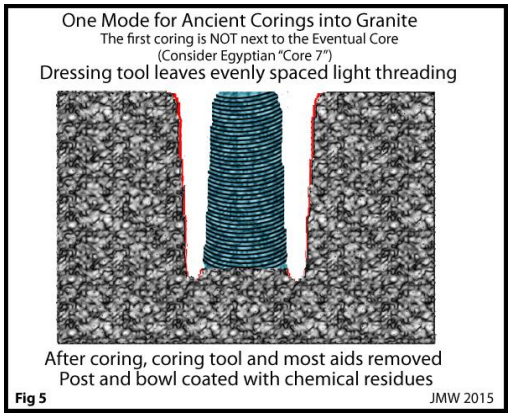


♦ The HRD project initiated in the LASL (now LANL) CMB-13 group. Jeff Tester was a principle of the program before becoming a professor at MIT. JMW was a staff member of that group at the time, but not associated with his program.

Petrie and Dunn indicated that the "machine marks" on core #7 were regular, but with a feed rate far greater than is possible with today's machining — this is based on the coring of the granite block being a single step process. In a two step process, the center core's encrustation is removed with a different tool. This task can be done with a very simple tool; either free-hand or with a simple devise to steady the tool. Fig 4 shows a tool that is sufficient for the task. I have included an optional "centering" pin.



The "pitch" of the threads is set by how much downward force is applied to the tool as the first groove is cut by the lowest bit when the tool is turned. Once the upper bit encounters the groove cut by the lower bit, it stays in the groove and dictates where the front-running, lower bit will cut. Removal of the encrustation should NOT be difficult, especially when soft. The "grooving" can be rapid as Petrie's core #7 indicates. As the tool progresses down the center core, the groove cutting bits will spring outward as they do not "mill away" that core's greater diameter. The resulting center core will now have the encrustation removed. Fig 5 indicates the situation before the center core is broken loose.



I have visited Egypt and its Museum of Egyptian Antiquities. I mourned the lost of the great library at Alexandria, when I visited there. I marveled at the pyramids, the massive pillars and obelisks at Karnak, the exquisite, huge and symmetrical, marble statues at Luxor, the Egyptian "light bulb" in the crawl tunnel at Dendera, the beautiful tunnel interiors at the Valley of the Kings, etc, etc. There are MANY fascinating ancient ruins *throughout the world* that indicate that ancient civilizations had plenty of savvy! Unfortunately, about the only "artifacts" remaining are those TOO huge to be carted away by a few folks contributing to the downfall of an old or the upstart of a new civilization or just not being discovered, like Tut's tomb. Petrie's salvaged core #7 provides some insight into past technology. However, *Core #7* and its ilk do NOT demonstrate that ancients had milling skills with efficacies far greater than are possible today! Were they "teaching" blocks?

ADDENDUM

Many civilizations have risen and fallen in just the past few millennia, even while the earth's temperatures have been "relatively stable" and "warmish"! I have generated a paper[5] with videos of how mankind's movement window has varied with global temperature over the past 422,800 years.

While generating this paper on the machining of core #7, I extended my enquiries of ancient Peruvian technology beyond those of the Nazca lines and figure[6]. When I looked at photographs of the H-blocks and other artifacts of Puma Punku, I wondered if their machining had also been chemically facilitated, just as core #7 had been. Mankind's technology is NOT tied to a single location for very long, even when oceans intervene!

REFERENCES

[1] Dunn, C., *Petrie's Infamous Core 37, part 2, 1999* (with picture of the core); http://www.gizapower.com/petrie/chris6.htm

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[3] a) Smith, Mort, *The Hot Dry Rock Program*, Los Alamos Science, Winter/Spring 1983, p87, http://library.lanl.gov/cgi-bin/getfile?07-10.pdf;

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[5] Williams, JM, *The Molding of Mankind - Planet Earth in a Thermal Vise*, http://gsjournal.net/Science-Journals/Essays/View/5982

[6] Williams, JM, *The Nazca Lines - A Non-mysterious, Non-extraterrestrial Explanation*, http://pages.swcp.com/~jmw-mcw/The%20Nazca%20Lines%20-%20web.htm