



The Byzantine Basilica of Adulis, 5th century. Photo: Denis H / Polarsteps.

## WHEN FRAGMENTS SPEAK: THE MILLENNIAL BIOGRAPHIES OF CERAMICS FROM ERITREA

Pottery fragments are most of the time seen as "silent" finds in archaeological excavations. Yet, pottery is one of the most important sources of information on ancient cultures, which needs to be studied using different approaches in order to probe into mysteries behind the technology of their production and use. When and where was the object produced? How was it manufactured, and for what purpose (function) was it produced? My work involves the study of pottery fragments from the 1st millennium CE excavated in the archaeological site of Adulsi in Eritrea by cooperating with geologists, chemists and physicists.

The study of pottery fragments using archaeological and scientific approaches is a reconstruction of the trail of the actions of the potter/s who produced the materials in the past. The quest is therefore to look for the specific processes in the production of pottery materials using analytical methods developed by geologists, chemists and physicists and will end by interpreting the information sufficient for producing the biographies of these materials.

A work to be done properly requires the cooperation of archaeologists and scientists trained in the analysis of archaeological materials. The first step essentially involves a selection of materials for analysis to be done in order to ensure the representation of the different forms of pottery objects. It is also common to collect raw clay samples that could have been used to produce pottery in the past as well as remains of ancient pottery kilns to be studied in the laboratories.

Once the samples of pottery remains, raw clays and remains of furnaces (if any) are brought to the lab, the main objective of the

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POSTED ON

20 January 2021



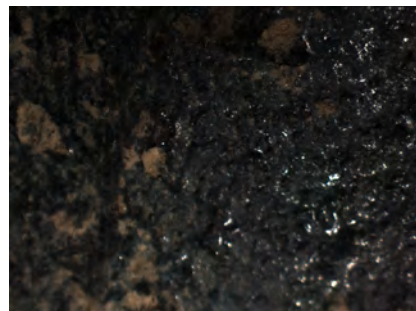
analyses lies in the determination of the composition of the materials in order to establish where and how different pottery samples were produced.

The material constituents of pottery objects can be studied by special microscopy used in geosciences: allowing us to study the mineral components used to produce pottery and to relate them to a geology of a specific area. In other words, with this approach we can trace the source of the raw materials and know where the pottery was produced. Similarly, it is well known that potters in the past applied different forming techniques to pottery before or after firing; we can observe these techniques by using electron microscopy and thus know better how the pottery objects were manufactured. With the electron microscope we can also assess what happened during firing and what structures developed when pottery objects were fired at certain temperatures.

It is also possible to acquire information on pottery objects using X-ray techniques. One specific technique often used in pottery studies is called X-ray diffraction and allows us to identify minerals present in the pottery objects and the different phases resulting from firing of these objects. On the other hand, chemical analyses are done on pottery samples using different techniques to have information on their chemical composition. With the chemical approaches we can distinguish which objects were produced from similar raw materials or in the same place and which ones were produced using different materials.



Amphora from Adulis



Residues on walls of Pottery object

Residues that stick to the walls of the pottery objects can be useful to understand the use of pottery objects in the past. Regarding the function of the pottery objects in the past, there are analytical techniques developed by chemistry and bio-molecular sciences and thanks to some analytical protocols established by laboratories we are able to extract these residues from the pottery fragments and analyze them. Information will be eventually obtained on what kind of food was consumed or what kind of liquids or dry substances were stored to be traded over distances.

In summary, silent pottery objects from excavations or museum storages are probed using these techniques to produce their biographies by interpreting all the above-mentioned information. By doing so, in this research we intend to provide archaeologists with information on the patterns of pottery production and distribution from and to the archaeological site of Adulis.