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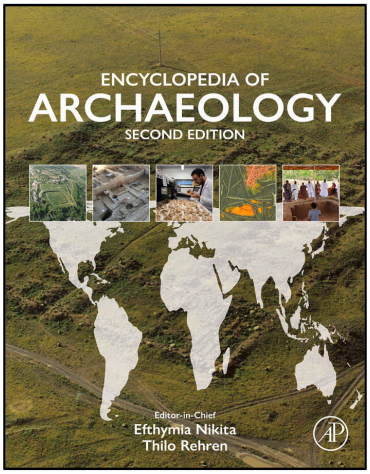

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Forgeries and Archaeology

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Key Points

- Forgers use archaeological and art historical research to select their target objects and target audience
- Sleeper objects, known artifacts lost in time, and rare archaeological antiquities are ideal targets for forgery
- Forgers use published analytical research to avoid scientific detection, though looting and smuggling of archaeological artifacts is more common than forgery
- An "arms race" develops whereby forgers and scientists are trying to defeat the developments of each other

Abstract

The art world is a multi-billion-dollar industry which captures world headlines on a regular basis. However, also in archaeology and museum science, high-profile objects regularly have experts arguing about their veracity. Some may have been looted, others may be fakes, some may be heavily restored or misattributed. In these cases, analytical science is often called on to settle the dispute. This contribution discusses the context and meaning of attribution and provenance determination of objects, and the different approaches to identifying forgery of archaeological objects.

Introduction

According to the 2022 Art Basel and UBS Global Art Market Report, in 2021 the global art trade was estimated to have been in excess of 65 billion USD. Huge prices are being paid at the top end of the market, mostly through auction houses and dealers in the USA, the UK and China. Despite its great value, the art market is one of the least regulated in the world—payments are often done in cash, and buyers and sellers largely rely on a word and a hand-shake. This leads to an ever-present threat of criminal activity: the FBI estimates that thieves steal art objects worth between 4 and 6 billion USD worldwide every year. Also, looted antiquities have been identified by law enforcement agencies to be a significant source of terrorist funding, further damaging cultural assets. It is claimed that art and antiquities is the third biggest criminal market, after drugs and weapons.

A survey of industry professionals conducted by Deloitte in 2016 reported that "… authenticity, lack of provenance, forgery, and attribution … are the biggest threats to credibility and trust in the art market." Despite the known problems of forgery and smuggling, only limited resources have been committed to policing art crime. Instead, greater pressure is put on the business world and on cultural institutions to ensure they are dealing with works of established provenance. This entry discusses the context of such provenance determination and that of detecting forgery of archaeological objects in particular.

Overview

While there exist different interpretations of what fakes and forgeries constitute, a good definition is provided by Craddock (2009), listing four categories of copies and alterations to objects with fraudulent intent: a forgery is defined as a whole new work, in

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imitation of something else. A fake is an object that has been altered, such that it appears to be something else (usually more valuable); a pastiche is then something composed of period but unrelated pieces; while a genuine object can also be deceptively restored, so that serious damage is hidden or disguised.

Provenance (sometimes *provenience*) is a term that has two meanings in the overlapping world of art and science (Shortland and Degryse, 2022: 146). To a scientist, the provenance of an object is either where it was made, or perhaps more usually where the materials that the object is made of came from (e.g., quarries, mines …). Conversely, to most in the art world the provenance of an object is the history of that object from its manufacture to now, preferably backed up by the names of those who have owned it. This is proven by paperwork such as sales catalogs, receipts and invoices, or scholarly works recording the existence and importance of the object. In an ideal world, the provenance documentation would stretch in an unbroken line from the artist's studio or archaeological excavation to the current owner, and each change of ownership is carefully documented. For some objects this is effectively the case, especially when art has been kept in royal collections or aristocratic houses. However, for most objects this is not the case. This leaves, of course, many opportunities for deceit. Forging paperwork is one way to make possible the sale of real but stolen objects, but it can also increase interest and thus value in the object, for example by associating it in some way with a famous person or event. Additionally, when creating new objects, or copies of known objects with the aim to deceive, one will normally also require at least some false provenance to reinforce their credibility.

Remarkably, forging is something of all ages (e.g., Shortland and Degryse, 2022: 175). In the European Middle Ages, there was almost an industry in the production of fake religious relics, driven by the huge demand from churches and pilgrims. Other periods, such as the Italian Renaissance and the late Victorian period in the UK, saw a proliferation of copying early designs in homage to them, not usually intended as deliberate fakes, but now often not easily differentiated from the originals, as both methods and styles of production were deliberately copied. In the last decades, the huge rise in the price of art and antiquities has fueled the type and number of fakes and forgeries. The sheer monetary gain of successfully selling for example a high-profile fake painting is now a huge incentive. However, the last decades have also seen an increase in the application of science to the subject matter, making faking, while more lucrative, also harder and more risky.

Key Issues

The Connoisseur

There are different approaches to establishing whether an object is what is claims to be, other than checking the paperwork. The first and foremost technique has not changed in hundreds, perhaps thousands of years: the eye of the connoisseur. These specialists will pick up a piece and relatively quickly, perhaps in seconds, will come to a conclusion as to whether it is a genuine piece or a later copy/forgery. Occasionally, they might change their minds upon examining a piece in detail, but this is rather rare. Asking how they come to their conclusions often elicits a rather vague response, using vocabulary and arguments such as line or composition, none of which are easily defined or tested by any scientist. Perhaps the connoisseurs themselves do not know: it is truly a gut instinct that instructs them whether a piece is right or not. The best of them have what seems to be an instinct, refined by decades of study of a wide range of objects in their area of expertise. This instinct is commonly known as the "eye" of the connoisseur. Nevertheless, when the eye is tested by independent analysis, it is almost always right. It is worth remembering that in the art world, only a minute number of objects are ever analyzed. For almost everything that is sold, it is down to a connoisseur to tell you that the piece is what the piece looks to be.

The "eye" is of course a very personal opinion of one individual, based upon expertise and knowledge of similar objects to compare to, formed by seeing many similar pieces and having an innate feeling for the material type and the period. This remains in essence a subjective opinion, and can leave much room for debate, especially when dealing with unique objects. In the latter case, there exist no direct *comparanda* to work from. The Getty Museum's kouros, for example, a large statue of a standing, single figure of a naked youth, is one of only a dozen remaining complete statues, dating from the late seventh through the sixth centuries BCE. These statues are thus very rare, and there are little objects to compare to when discussing style and feel of the piece (for a full discussion, see Shortland and Degryse, 2022: 55–64). Experts are only human, and thus have biases and wishes which they consciously or unconsciously hold. Often, they may really want an object to be right, either because they are a curator and the object will be in their museum, or because they just want to be associated with finding a spectacular new object, valuable both monetarily and historically. This desire can influence an opinion without it even being obvious to the person expressing it.

Not only may there be implicit bias in assessing objects, but when one really desires an object to be the real thing, debates on authenticity tend to become tainted with personal sentiments. Opposing experts/opinions may then "dig in," prohibiting an objective, academic debate over whether the object is in fact real. This can be especially true when lawyers become involved, or are threatened to be involved. Also, as museums (especially American museums) have always bought extensively from the market, objects of interest can fetch very high sums. When enthusiastic curators believe they have discovered a "sleeper"—an important lost artifact, misidentified as something trivial in the past but actually of much greater historical (and, of course, financial) value—things can go further wrong. In all these cases, it is clear that another independent approach will be needed to verify the "eye" of the connoisseur.

The Scientist

It is increasingly common (though, as noted above, still rare overall) for the opinion of the connoisseur to be complemented by that of a scientist. In the ideal circumstances, these opinions will be completely independent and the scientist will not know the opinion of the connoisseur before undertaking the work. However, this rarely happens in practice—the scientist will usually know something of the connoisseur's concerns or otherwise beforehand. The first stage of any analytical approach to ancient objects is to determine the material used to make the object. This technological study essentially looks for anachronistic features, revealing a technique or material not consistent with the region and time period, for example, the presence of the wrong mineral raw materials, the use of a modern binder or an industrial adhesive. Analytical data obtained on the object under study is compared to the widespread literature in art history or archaeological science on the raw materials used in ancient technological processes.

Knowing how ancient objects were made informs us on everyday life in the past, and scientific analysis is a common part of such investigations (Degryse and Bentley, 2018). Next to providing information on the composition of an object, this approach uses a plethora of scientifically measurable properties to link an artifact to a particular source or production site. The basis of chemical provenance analysis in archaeological science is the principle that some elemental signature, ratio or isotopic composition of the artifact under investigation is identical, within analytical uncertainty, to that of the geological raw material(s) from which it was derived. The premise of this approach is that different geological resources are characterized by distinct compositions. Therefore, determining the elemental and/or isotopic signatures of the raw materials used for ancient craft production in their different chronological and geographical contexts, coupled to the analysis of the artifacts themselves, is an important subfield of the archaeological sciences. The efficacy of several different methods and techniques for the characterization and source-discrimination of archaeological materials has been demonstrated over the past decades. Overviews have been created that show the compatibility between archaeometrical methods and techniques, and archaeological materials (e.g., Artioli and Angelini, 2010; Pollard and Heron, 2008; Price and Burton, 2012). Ideally, their interpretation should combine analytical-scientific results with evidence from archaeological excavations, historical sources and typo-chronological study.

A well-known case of applying such integrated scientific approach concerns ceramics from Hacılar (southwest Anatolia, late 7th–6th millennium BCE). This Neolithic site is well-known for the discovery of a large assemblage of high quality anthropomorphic and zoomorphic figurines. While multiple (broken) examples have been excavated, soon after their discovery also more complete and even higher quality examples emerged on the antiquities market. Given their systematically better preservation state, these unprovenanced objects were suspected of being forgeries, but they could also have come from other areas of the site (e.g., not excavated areas and funerary contexts) and/or could have been looted.

A significant research project to tackle both the issue of provenance of the complete figurines and the identification of possible forgeries was started by the Metropolitan Museum (NY), the Ashmolean (Oxford, UK) and Bristol Museum (Bristol, UK). Their approach is an excellent example of combining dating techniques (using TL), compositional analysis for mineralogy and chemistry, technological reconstruction by firing experiments and optical examination of surface encrustations. Although typo-chronology is a main tool in characterizing ceramic materials, this could not be applied here successfully because of the disparate nature of the excavated assemblages as opposed to the unprovenanced objects.

Thermoluminescence is currently the most successful absolute dating tool used for ceramic materials, to date the last firing (or heating) event of an object. In case of the Hacılar ceramics project, most of the studied materials provided a recent firing date. One could argue that these ceramics might have been in a low fired state and were fired again to harden them for optimal preservation (not dissimilar to what happens with cuneiform objects today). However, a newly developed pre-dose TL technique could tell if more than one firing event had happened, and this was not the case here. The chemical composition of the excavated Hacılar ceramics, compared with clays from the region as control samples, showed only one homogenous compositional group. All of the genuine TL dated materials and a minority of the more recently fired materials were consistent with this group. Conversely, most of the recently fired pieces formed a compositionally distinct group. Two separate production events could thus be identified, one local to Hacılar, and one associated with an unknown, different clay. The firing temperature of all the pieces was within a similar range of 650–750 °C, providing no differentiation. Surprisingly, nitric acid tests on the encrustations on the objects proved to be very informative. Calcite layers on genuine objects, the result of burial in calcareous soils around the site, could be easily discriminated from softer white clay-based layers. These observations are in line with the outcome of the dating and compositional results. The latter difference appears to be a clear oversight in the production of the forgeries, as a simple test is sufficient to identify such forgery. A total of 48 out of 66 objects were characterized as forgeries by the full analytical procedure. The problem remains, however, what to do with the genuine yet unprovenanced and thus possibly looted ceramics that are part of different (museum) collections worldwide.

If the use of a correct material for the expected time and region is proven, the object is "consistent with the ancient date," as scientists would phrase it. However, again, such evidence is not absolute. Even though a correct raw materials source was used for an object, this does not mean that the object was made in a particular time period. It is perfectly possible, as long as a source is not exhausted, for a knowledgeable forger to use that particular source. The material used can, therefore, almost never show that an object is from the correct period, but if anachronistic materials or techniques are used, it can give a solid indication that it is a fake. It shows that if it is a fake, the forger took care to use materials consistent with the period. The approach is, therefore, analogous to all provenancing—it is much easier to say it is not consistent with a source (and thus a fake) than that it is consistent and that it is, therefore, genuine.

An example of an object that illustrates some of these points is the rather famous case of the Amarna Princess. This is a 50 cm or so tall alabaster statue of an Egyptian princess thought to date to the Amarna period (the middle of the 14th century BCE). In 2003, it was bought with considerable fanfare by the Bolton Museum and Art Gallery in the UK for £440,000. While much praized at the time, it soon came under suspicion, partly owing to a police investigation into the seller of the object, an elderly gentleman called George Greenhalgh. Further concerns were raised when a newly arrived curator at the museum, an expert in stone statuary (the "connoisseur") started to point out some disturbing inconsistencies in the style and composition of the object. Following the standard pattern, science was called upon to attempt to verify whether the statue was "right" or not. The analysis concentrated on the stone type, described as "alabaster." A little known fact is that alabaster is one of a number of vague art historical terms that covers at least two completely distinct mineral compositions. In Egypt, alabaster is always calcite, so calcium carbonate. Elsewhere in the world, alabaster can refer to gypsum, calcium sulfate. Several easy and rapid tests, including hardness, mineralogical or elemental analysis, can confidently tell them apart. The stone of the Amarna Princess was gypsum and thus almost certainly not sourced to Egypt. In fact, the statue was made in Bolton by Shaun, the seller's son, quite literally in the garden shed. When this was raided by the police, a number of other, less successful Amarna-style and other "Egyptian" statues were found still there, along with exhibition catalogs and other books that acted as guides and patterns. After many unhappy years in police stores, the Amarna Princess is now back in the Bolton Museum, where it can be admired, and its story enjoyed. It is probably an even more popular exhibit with the general public now than it was when it was thought to be genuine.

A second approach is to use absolute dating by scientific means to give a calendrical date, i.e., when an object was made. However, absolute dating can be quite difficult. The problem is that the date needed is when an object was produced, not when its materials were formed. It is often possible, if the correct sample could be taken, to date when the raw materials used in an object were formed. An extreme, but important example of this is stone, where there are standard geological techniques used throughout the world by geochronologists for dating rocks by radioactive decay of elements such as rubidium or uranium. However, a date for the formation of the rock of a stone object would not be of much use to determine when it was carved, as it would frequently be different by hundreds of millions of years. The development of absolute dating methods such as radiocarbon and thermoluminescence should have made it more difficult to fake materials, but there are still issues. Samples are required, as the technique is destructive, and a forger can go through the trouble of finding material of the right date to work from, then to "improve" it. For example, a canvas of the right period with a new image placed upon it will give a seemingly correct "old" date when tested by ^{14}C dating.

Two more examples show some of the issues that even absolute dating has and further illustrate problems in working on fake material. Chinese glazed ceramics are highly collected and, therefore, often of great financial value. In the recent past, the key test for authenticity has been thermoluminescence dating, especially for earlier period pieces such as Tang Dynasty *Sancai*-glazed figures of horses. In this case, there are only two possibilities: the pieces were period, so first millennium CE, or modern, and TL was a very capable technique for distinguishing the two. However, these pieces were, and are, heavily copied and faked. Forgers realized that TL was being used and started to inset fragments of period ceramics into areas of the figure where the sample was likely to be taken (underside of horse body, bottom of base, etc.). The horse figure would therefore give a period date if the sample was taken from these substituted areas. This is an example of the "arms race" that exists in many areas where forgers are attempting to overcome scientific analysis and hence prevent detection. TL analysts started to take their samples from non-obvious areas, and this improved matters; however, it led onto the next stage of this battle. Forgers have apparently started to try to defeat TL completely by giving modern copies of early wares very high doses of radiation in an attempt to mimic the natural radiation dose that an object would receive through centuries of existence. This could potentially be done in hospital radiotherapy units, for example. It is unclear how good this technique would be at replicating an early TL signal, but the rumor that it is possible has made experts much more cautious at taking TL dates at face value. This is a story that goes on and on.

The second example that is worth considering concerns radiocarbon dating. The Shroud of Turin is perhaps the most controversial of all historical objects and believed by many to be the burial cloth of Jesus Christ. The Shroud has a long history of more or less scientific study, but the key event occurred in 1988, when the Turin Museum and Vatican authorities gave permission to take samples which were dated by three independent AMS dating laboratories: Oxford, Tucson and Zurich. The result dated the Shroud to the 13th or 14th centuries CE, corresponding to its first clear appearance in the historical record. For almost all radiocarbon scientists, and the great majority of scientists in general, this is the end of the story—the Shroud is a medieval piece, brilliantly done, but not the burial cloth of Christ. However, this is not the end of the story for many. Believers in the Shroud have attempted to argue that the samples were taken from medieval repairs, were somehow contaminated, or the dates incorrectly calculated. Some have even suggested collusion between the laboratories and deliberate attempts to falsify the actual date. A more general point is highlighted here, which is a frequent reluctance of some, especially the owners of an object, to accept that it might not be all that they hoped it would be. This seems to be especially true of objects with potential religious connections. The Shroud experience has led to some scientists being less than willing to be involved in future projects where a controversial result might be produced.

Perhaps the best material for the forger is effectively stone. The main problem with this material is that only the surface is changed with shaping the object, and finding a dating technique that can help to date this carving is exceptionally difficult. Much effort has been put into studying weathering and patina formation on stone objects to analyze whether it has spent centuries in soil, or weather or if it was artificially aged, but so far, with little success. Every stone weathers differently in different environments under different circumstances.

There are very few materials that cannot be faked, though some are more difficult than others. Nevertheless, if a particular object type is very rarely faked, then it is far less likely that it will be subjected to the degree of scrutiny that a frequently faked type would be, which could again be an advantage for the forger. Science can thus attempt to validate the opinions of other experts, and

sometimes cases will be proven beyond reasonable doubt, but others will remain to be argued over. Scientists draw evidence from a range of skills, techniques and resources. Several overviews explain the particular approach to attribution and authenticity (Craddock, 2009; Artioli and Angelini, 2010; Ragai, 2017).

The Forger

Some forgers have given some insight into their motives. Financial gain is one reason; however, almost all forgers, excepting almost industrial workshops of fake antiquities, have more complex motives. The relationship of the forger with the art world that they are trying to fool is complex. Forgers are obviously talented people, artists in their own right, but who failed to make a name for themselves. Often there is an element of revenge in what they are doing. Other motives can be the joy of fooling people, or even to gain access to the very establishment they are fooling. Additionally, a forger can be a hero in the newspapers, despite what they are doing being essentially fraud: the idea of the underdog getting one over on the élite art market is very attractive to the general public. For the forger, the essential element is to find a receptive audience. The best forgeries are deliberately targeted at particular gaps in the market, or even individual experts. A common way of both providing a back story for an object and a hook for the unwary buyer is to reproduce a known object lost in history. The idea of discovering a lost masterpiece is hugely attractive to a curator or a dealer. Combined with pretend ignorance on the part of the person presenting the object, the thrill of finding this important object makes an impartial assessment much more difficult.

Fake Sites

While most of this entry has discussed objects, archaeological sites are also vulnerable to something that is at least analogous to forgery. This can exist in a spectrum depending on intent and the degree of alteration, just as in the case of objects. At one end of the spectrum are copies of archaeological sites that are clearly marked as such and, therefore, not intended to defraud. Conservation issues and/or sheer visitor numbers often drive this. The best examples are the replicas of decorated Palaeolithic caves in France and Spain, including Lascaux, Chauvet and Altamira. The most modern replicas not only reproduce the cave and cave art, but also the damp atmosphere and sounds of the cave. Similarly, and for the same reasons, a replica of Tutankhamun's tomb can be found in the garden of Howard Carter's dig house in Luxor. Made of polyurethane and plaster, the replica is accurate down to millimeter scale. These replicas are becoming more common and will continue to do so as the drive for more tourists but less damage to original sites becomes increasingly a priority.

In the middle ground, genuine archaeological sites have been restored. Conservation of sites is, of course, vital, but there are many cases where the conservation of a site, the prevention of further damage and safekeeping for future generations moves into wholesale restoration. This anastylosis is almost as old as the sites themselves, and the sympathetic reconstruction of walls and columns from fallen remains is not usually controversial. What becomes more controversial is when all the pieces for the reconstruction are not there, having been removed and lost. What follows is some degree of more imaginative reconstruction, which, when done well, can enhance the site and its interest. However, there are examples where imagination has won out over reconstruction. Newgrange in Co. Meath, Ireland is a good example. The megalithic passage tomb was completely reconstructed in the 1960s and early 1970s, such that much of what can be seen today is modern. Worse, the façade of the burial mound consists of white quartz pebbles, found on the site, set into modern concrete. This means that standing in front of the tomb today, almost nothing that can be seen is original, and most of it looks nothing at all like it would have done when the tomb was in use. This reconstruction was controversial at the time, and the succeeding decades have not improved it. While these reconstructions, especially historical ones, were carried out with the best intentions, it is often the case that what is period and what is modern is far from clearly marked. Even with a good deal of searching at some sites and through their tourist brochures, it is far from clear that the scene that is presented is largely modern. Honest reconstruction can then stray into the field of fraud—and the site starts to have many of the key elements of a fake.

At the extreme end are sites that are entirely fake and intended deliberately to defraud. These are relatively rare, but two examples can highlight some of the issues. During the 18th century in northwest Europe follies were built in the grounds of great houses replicating Roman temples, pyramids, ruined castles, monasteries and stone circles. The extent that these were intended to fool visitors into believing that they were real is questionable—some undeniably were not, but others, more subtle, have some element of fraud to them. The other way of creating a site is by bringing in period pieces from elsewhere. A modern, famous example of this concerns the Palaeolithic of Japan. Japanese archaeologist Shinichi Fujimura, a senior academic, had made his reputation on finding remarkably preserved palaeolithic sites in Japan of very early date. Some of his sites involved finds of not only stone tools, but pits and postholes associated with very early structures dating back 600,000 years and rivaling China in antiquity. Remarkably, 90% of all Japan's early palaeolithic sites and tools had been found by just one man. Unfortunately, this was all too good to be true. A newspaper reporter managed to video Fujimura early one morning salting one of his sites with tools from his own collection—pushing them into the ground and patting them in. He was likely responsible for planting evidence in at least 42 sites and permanently damaging the interpretation of the Japanese Palaeolithic.

Summary and Future Directions

Scientific analysis possibilities will improve further with time as equipment becomes better and existing techniques will require smaller or no samples to be taken. Detection limits and accuracy will improve so that more minor differences between fakes and genuine objects can be identified. Occasionally, a brand-new technique appears, which can do things that were not thought possible before. The development of radiocarbon dating in the 1950s and then its AMS improvements in the 1980s are an excellent example of such a game changing tool. Curiosity-driven or blue-sky research on ancient materials and objects provides an opportunity to gather a database of workable scientific techniques and accurate chemical compositions, a body of knowledge on art and science that, on the one hand, can be used to comment on cultures of the past and human behavior, but on the other can help to identify those objects that are more of the present than the past. Such work is mostly done initially by analyzing excavated archaeological material, as really accurate work requires sampling of objects. This is much easier with excavated material which is usually already broken and/or fragmentary, directly coupling this work to archaeology. However, similar work is possible in museums collections. Naturally, scientists publish their results, and how they detect forgeries becomes known in the trade. This, however, allows forgers to work out new ways of fooling these techniques. What develops is essentially an arms race, where each side is trying to identify, understand and defeat the latest developments of the other.

See Also: Looting and Illicit Trafficking of Archaeological Heritage.

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