

Material Composition Studies of African Arts: Path to Burden of Proof and Heritage Conservation

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Abstract

African arts have been part of major museum collections all over the world; describing African art objects physically alone is not enough. The medium, material content, provenance, stylistics, and contextual studies are needed for classificatory and documentary purposes of African arts. A secured scientific and cultural data of African art objects would provide a database for purposes of identification and taxonomy of African art objects. Procedural papers in material compositional studies and art history were used for this discourse. The modes of research employed are qualitative and evaluative. The discourse concludes with recommendations that research institutes, museums, and African governments need to develop programmes in material compositional studies for African art and museum objects because of their scientific and historical significance.

Keywords: Material analysis, art authentication, African art history, the provenance of art, heritage, conservation.

Introduction

The National Museum of African arts, Smithsonian Institution Washington DC commissioned a building in September 1987 to house collections, exhibitions and research of African art objects. The occasion witnessed the recognition of the past, present and future of African art studies. In a symposium organised for the event, four distinguished scholars of African studies presented papers: A.A. Gerbrands, H.J. Drewal, Rowland Abiodun, and Suzanne P. Blier. The panel of discussants included seasoned Africanists and scholars of African art studies such as Ekpo Eyo, John Pemberton III, Mikelle Smith Omari, and Simon Ottenberg. Submissions and contributions from the panelists resulted in the publication of a book titled: "African Art Studies: The State of the Discipline" in 1987. A review of several comments made by the Africanists in that publication is a pointer that the state of African art studies discipline must be improved to such an advanced level with a kind of holistic investigation that is comparable to other studies elsewhere. Excerpts of comments of the participants form the fulcrum of this discourse.

From Roy Sieber "...papers and comments are here presented as, we hope, a contribution to the state of our discipline and as a fitting publication celebrating the new home in the United States that will be in charge of collection, exhibition and study of African arts" (1987:10).

In the words of Sylvia H. William "The discipline of African art studies does not have a long history: still developing with considerable vigour, the field is drawing upon insights and mode of inquiry from many disciplines; among them are history, anthropology, archaeology, history, and religion (1987:7).

In line with the foregoing, John Pemberton III argues that: "The future study of African art must be understood as a collaborative enterprise between Western scholars and African scholars" (1987:141).

Henry J. Drewal has also observed that the:

"Studies of meaning in African art are also the product of interdisciplinary thinking... this is an era of experimentation, dialogue and debate, processual approaches, and a new level of collaboration. To a certain extent, the field of African art studies anticipated this new era primarily in its eclecticism but also in its forays into the process and collaborative effort"(1987: 37-49).

According to Suzanne P. Blier,

"We have seen as well the growth of a body of different perspectives on African art: structural analysis, and ethno-scientific treatises, semiotic studies, stylistic overviews, historical analyses, and functional perspectives, to name but a few"; "...art history is in an enormous intellectual reevaluation"; "...despite considerable historical and art historical evidence against it, there is an assumption (again another myth of the primitive) that African societies and their arts are conservative, that is, they exhibit relatively little real innovation"... New avenues of investigation in African arts are

vital both to the discipline of art history and to the future of African Art”...., “although the term primitive art was eradicated from thoughtful anthropological inquiry...years ago, it is still very much a part of contemporary art-historical writing and thinking”(1987: 91-102).

Further, Ottenberg argues that:

“...most African art displayed in museums appears in predominantly white-run museums for a largely white audience”, few Westerners, however, will ever know African languages or have insights into African religious beliefs and knowledge. According to Pemberton III (1987:140), “The complexity, the rich variety, and the interrelatedness of forms of cultural expression in African societies require students in African humanities, above all in art history to adopt a catholic approach to studying African art” (1987:128-131).

In a contrary reflection, Pemberton III (1987:138) recounts his conversation with Sir Ernst Gombrich¹ in 1985 who asked the question “Is there African art? To what are we referring when using the term art?” While reflecting on the question, Pemberton III thought Gombrich was quite wrong when he seemed to deny the African artist the capacity to create an object that ‘forced (us)’ to let our imagination play around it. While the dialogue lasts between them, Pemberton asked Gombrich whether he had seen the exhibition *Treasures of Ancient Nigeria*, put up by Ekpo Eyo in 1980. The following conversation ensued between Pemberton and Gombrich about the exhibition “*Treasures of Ancient Nigeria*” (all italics are of the authors):

“I (*Gombrich*) was overwhelmed. The Ife bronzes and terra-cotta heads and many of the Benin sculptures were very impressive.” I (*Pemberton III*) asked whether these sculptures were thought of as art. He (*Gombrich*) paused and then said, “Yes.”...” Do you believe that the Ife and Benin pieces were the work of Africans?” Gombrich asked. I (*Pemberton III*) replied “...all historical and archaeological evidence pointed to such a conclusion. He (*Gombrich*) observed that artistic ideas often accompany the transmission of technologies and that perhaps the artistry of the sculptures could be attributed to foreign, that is, non-African sources. I (*Pemberton III*) responded that iron and bronze technology did appear to have come to West Africa from the northeast. The use of technology to create objects of the level of sophistication found among the Ife and Benin peoples, however, depended upon a particular social and political history – a cultural context where religious symbols, discursive thoughts, and artistic imagination were nurtured. “Yes, that is so” he (*Gombrich*) agreed.
(Pemberton III, 1987:138)

¹ Sir Ernst Hans Josef Gombrich (1909-2001) was an Austrian-born art historian who lived most of his life working in the United Kingdom; he published many works of art and cultural histories; notable among which is *The Story of Art* first published in 1950; and, *Art and Illusion* (1960).

From the ensuing comments above, one can see the interplay of traditions of African essence and reality with accompanied myths and stereotypes about Africans and African arts. All the Africanists quoted from the foregoing forayed into the future of African art studies with visionary declarations enshrined in the richness of African arts and artists. As observed earlier by Blier (1987: 91-102), the latter comments seemed to have deep roots in racial prejudice: a kind of derogatory perception inherited from Western history which is outright denials of meaningful, intellectual, scientific, cultural, and historical proofs of everything African. Such avoirdupois comments and perceptions are common with early European philosophers and aestheticians, many of whom had never stepped onto the soils of Africa and the majority of those who came arrived towards the latter part of the 19th and early 20th centuries with myths and stereotypes about Africa. Without deep knowledge of what African arts portend in meaning, aesthetic contemplation, and scientific bases. The contributions of such armchair scholars to world knowledge could be classed as monumental lies, myopic, and prejudice of stupendous whole which emanated from the writings of early European philosophers. Such is the German philosopher, Georg Wilhelm Friedrich Hegel in his *Philosophy of History* (1956); and the Scottish philosopher, David Humes in *Essay and Treatises* published in 1768. It has therefore become exigent to examine material compositional information of African arts through the lens of literature.

Literature Review

A sizable number of studies have focused on the material nature (composition information) of works of art from Africa. For instance, Underwood (1949) examined the bronzes of West Africa; Fagg and Underwood (1949), and Moss (1949) studied the Olokun heads from Ile-Ife; Willett (1959) and Barker (1965) examined Ife Bronze figures, and Shaw (1970) examined the Igbo Ukwu Bronzes; while the focus of Willett (1964) is on the spectrographic analysis of Nigerian bronzes. Werner and Willett (1975) investigated the composition of brasses from Ife and Benin; while the study of Willett and Fleming (1976) chronicled the important Nigerian copper-alloy castings dated by thermoluminescence.

Others include the studies on lead isotope analyses and plausible metal sources of Nigerian bronzes and the characterization of various copper alloys in West Africa (Goucher *et al.* 1978, Joel *et al.* 1995, and Willett & Sayre 2006). Craddock and Picton (1986) examined medieval copper alloy production and West African bronzes. Olabanjiet *al.*(1990) focused on the correlation of elemental patterns of Esie statues with surrounding rocks using PIXE and XRF techniques. Ige *et al.* (1998) and Ige & Swanson (2008) analysed the composition, use and provenance of Esie sculptural soap stones. Ige, Ogunfolakan and Ajayi (2009) conducted an ICP-MS analysis of the chemical characterization of some potsherd pavements in Yorubaland, southwestern Nigeria; while Olaleye-Otunla(2020) analysed the material properties of Yoruba pottery objects.

Some museum laboratories in industrialised countries have also developed technical examination alongside art historical studies for the determination of the material constituents and provenance studies of art objects. TheHarper and Meyers' report of Sasanian silver (1981); Stone's report of Renaissance bronzes (1982); the Chinese bronze studies reported by Bagley (1987); and, the Investigation of Himalayan bronzes by Reedy and Meyers (1987) are

good examples. The studies on the effective use of technologies for understanding artifacts (Fehrenbach 2010); the chemical compositional studies of earthenware ceramics from Southeast Asia (Stork *et al.* 2010); and the origins, craft economies, and craft production systems of bronze metallurgy (White and Hamilton 2009); as well as studies of stone, glass beads and other ornaments (Bellina 2003), have identified the potentially abundant sources of technical data in earthenware ceramics. All these studies have demonstrated the position of provenance examination with stylistic studies.

African Art Conjectures Resolved through Material Content Research

Some conjectures about African arts have been resolved through the careful examination of the material contents of such works of art. Two notable instances are the *Ori Olokun* in Ile-Ife, and, the existence of an early Glass-working tradition among the Yoruba in southwestern Nigeria. Firstly, the case of *Ori Olokun* purportedly excavated in Ile-Ife and copied by Leo Frobenius between 1910-12; this event had been visited for over a hundred (100) years and still raging in peoples' minds, local and international (Read 1911; Frobenius 1913; Moss 1949; Fagg & Underwood 1949; Williams 1974, Werner & Willett 1975; Willett & Fleming 1976; Willett 1967, 1976; Shaw 1978; Goucher *et al.* 1978), with continued exacerbation in further technical studies (Craddock & Picton 1986; Craddock & Hook 1995; Joel *et al.* 1995; Craddock *et al.* 1997; Craddock 2009; Drewal & Schildkrout 2010; Platte 2010). Craddock *et al.* (2013) revisited the *Ori Olokun* with full scientific and technical examination and concluded beyond doubt that the existing *Ori Olokun* is the original and not a copy as envisaged by Fagg & Underwood (1949).

Secondly, the conjectures about the existence of an early Glass-working civilization among the Yoruba of southwestern Nigeria are much attributed to the importation of glass materials and the technology involved. Frobenius' (1913) account of Ile-Ife gave credence to the existence of glass-encrusted crucible fragments in shafts dug in Olokun Grove; there are also reports of necklaces, armlets and anklets made of glass beads recovered from excavated sites in Ile-Ife (Garlake 1974, 1977; and, Willett 1977, 2004). Davison *et al.* (1971) and Davison (1972) however argued that Ile-Ife beads originated from medieval Europe. To resolve issues surrounding the provenance of Ife beads, Lankton & Dussubieux (2006) emphasized the originality of Ife glass beads among the other bead compositional groups found globally. According to Babalola *et al.* (2018), from established data of the earliest beads recovered from south of Saharan Africa, they have fingerprints that reflected compositions from established production areas common with the eastern Mediterranean, Middle East, and East Asian territories (Dussubieux *et al.* 2008; Robertshaw *et al.*, 2009, 2010; Wood 2016). Lankton *et al.* (2006) established the existence of local primary glass production peculiar to (Ile-Ife) southwestern Nigeria.

Discussion

The praxis, connoisseurship and history of works of art from Africa have been established with the human sensory organs for many years. According to Lo (2004), with advanced technology, current physics research has found their ways into the traditional humanity stronghold of arts and archaeology. In the observation of Vansina (1984), works of

art must be helped as much as historical inquiries can reveal. African art studies are still being viewed under the traditional methods of investigation and modes of inquiry which gives more room to doubts and conjectures. This study however argues that there have been recent acceptable standards of examining works of art other than the conservative human sensory organs. Investigatory constructs of African arts have proven to be more advanced in position globally, that is, scientific ways of confirmation, and burden of proof. Apart from the formal, iconographical and iconology analysis, the 21st century Art historical studies treat challenging trends in its development with the use of technology for studying works of art. This conviction is borne out of the fact that recent art historical investigation is not complete without material compositional studies. Vansina (1984:24) argues that the description of an object should go beyond mere impressions given to the eyes alone, but to understand/confirm the medium of works of art. Traditionally, cursory inspection has been seen as adequate in African art historical studies but recent developments have proven that laboratory studies enrich the discovery and description of the true nature of materials used in works of art.

The 1987 experience at the Smithsonian Institution Washington DC's National Museum of African art which featured influential and highly rated Africanists projected the future of African art historical discipline. Forayed into the future, the discussants envisaged the possibility of exploring probe technologies to understand the material nature of works of art from Africa. However, it is a recognized fact that the provenience and provenance of African arts are shrouded in mysteries, especially as expressed by Blier (1987: 91-102) in the case of primitivism about African art objects.

The prospecting for material constituent information for African art got little scholarship; the ever-continuous traditional investigation of African art has laid emphasis more on iconographic analysis with formal attributes, and that of ethnographic contexts; while the insignificant focus on medium examination calls for concern. From that purview ignoring the material information of a work of art with other hidden information about how its constituent materials are different from others in its category may constitute a severance of the genetic affinity between a work of art, the material used, as well as all its identifiable constituents. The question of what is the exact material nature of a particular work of art is much sought after today considering such questions as to what is in a work of art. There is a need to understand the origin, mode of fabrication, material constituents, identifiable similarities and differences from other works of art from the same source and what style(s) gave rise to such creativity.

This discourse, therefore, is an introspection of material compositional studies - a multidisciplinary process with well-defined intellectual boundaries towards establishing heritage evidence, preservation and conservation. Placing this discourse within its context, it will be pertinent to define and understand the nature of this new scientific African art study. The intellectual dictates involved in this discipline therefore should be a compendium of studies that embraces art historical studies, archaeology, museum studies, anthropology, material science, geology, art authentication, art forgery and theft, and the physical sciences. This kind of scientific study would lead to an enhanced, comprehensive provenance and provenience determination of African arts with the effect of projecting the genuineness of African works of art.

All over the world, there are institutions dedicated to the collection, storage, display, research and exhibition of natural and cultural materials that are dated back many decades. The museum cares for all aspects of human endeavours and art is no exception. However, part of the problems faced by African art studies with other enterprises catering to works of art are frauds, theft, fakes, forgery, conjectures, vandalism, misidentification, jurisprudence, and lack of standardised art historical analysis. Where such situations arise, material compositional information queries are much desired. Vansina (1984) argues that art history seeks to provide information about authenticity, place and period of production, the producer/artist, artist's style and medium of production, as well as the meanings inherent in such work(s) of art. Further, art history seeks to provide information about the socio-cultural context under which such works were created, with the examination of the inherent idiosyncrasies when compared with other common works of art. Of course, yes! these are the qualities of a work of art creation both internal and external that must be subjected to scrutiny.

There is a dearth of discourse on material information of African art objects as scholars seemed less concerned about material compositional information of works. The exact source of many works of art in museums cannot be determined. A notable example is the Nok terracotta and ceramic sculptures of which no material analysis has been conducted to establish the origin of the parent clay material used, despite their dating and the significance ascribed to them in African art history.

Prejudice and Oversights in Previous African Art Studies

When African art objects arrived in Europe around 1470, they were not considered works of art but regarded as curios from distant nations (Vansina 1984). However, with growing interest and an increase in knowledge, historical studies of African art objects developed; and by the 18th Century, museums all over Europe started acquiring works of art from Africa as specimens of material culture.

By happenstance, during the 1897 British soldiers' punitive expedition to the Benin Kingdom; thousands of works of art were illegally amassed from the Benin palace museum. By 1905, the 20th-century European Avant-garde artists discovered the richness of African artistic rendering of forms such that it received a boom. However, this does not come without the attendant anomaly, the social contexts, meaning and material content information about African works of art were out of focus (Lewis 1990). The discoveries of naturalistic Ife heads contributed to the realisation of great works of art in (and from) Africa². In the early 1950s, African art gained consideration as part of the anthropological discipline but its art historical investigation received little attention. The turn of the 1950s witnessed the attention of anthropologists and archaeologists who saw the relevance of African art studies and resultantly opened up its historical investigation.

²Frobenius (1913) *Voice of Africa I & II* reported the first sets of antiquities (bronze and terracotta heads) discovered in Ile-Ife in 1909 and 1938

During the 1990s there were interventions by Adrian Gerbrands (1917-1997)³, and Frank Willett (1925-2006)⁴. These archaeologists-anthropologists and many others addressed the gap between anthropology and African art historical studies. The studies of African art from that point thus developed to an enviable standard before ascendancy was thwarted by art mercantile. Paradoxically, African art mercantile development eventually stifled aspects of African art history and the provenance and provenience studies of African arts.

Over the years, the museums, private collections and galleries had served as archives and repositories for many African works of art. Resultantly, several African works of art were shielded from negative influences such as destruction, and theft. Ideally, the prerequisite to the storage of works of art (especially when large numbers of works are involved) is that when objects/works of art are collected, they should be given some data labels containing collection date, source or origin and other relevant field information; these fields are lacking in several collections housing African works of art. Such data labels present bases for frameworks in art historical scholarship and could eventually be the standard for assessing any other undocumented works of art collected. What is referred to as the cataloguing system in museums and repositories is a systematic referencing that gives regard to the dating of works of art, their description, iconography, critical reviews and how such works of art/objects compared with others in the same category.

Provenance is associated with any piece of art; the determination of provenance in African art historical studies is essential to understanding the source of a particular work of art/object. The provenances of several African works of art are yet to be carried out. For instance, in ceramics or terracotta works of art, the comparison of local soil geology, and clay samples with compositional analysis of the constituents in such works will provide a clear-cut view of what each work is made of; this will allow investigation into the production sources and techniques, as well as the direction of movement of such objects during the artistic development of its place of origin. Sadly though, material content information is left out in African art studies for a long time; the high value attached to African antiquities had continued to encourage illegal prospection, excavation, forgeries, and keeping of trade origins secret on a large scale. Most documented information on African art objects and antiquities has been modified by art and antiquity vendors to boost their illicit business. Many African works of art that exhibit classicism, their provenience remained questionable⁵.

The rich and inviting art market in Africa had given more room for fakes, forgeries, and several conjectures about many African works of art. Greedy African artists and their

³ Adrian Gerbrands, Dutch, Leiden University Professor of cultural anthropology (1966 to 1987) and a museum curator between 1947-1966.

⁴ Frank Willett (CBE,FRSE), British, an anthropologist, ethnographer, archaeologist; and a Professor of Art History, African Studies and Interdisciplinary Studies at Manchester University. He was the former Director of Hunterian Museum and Art Gallery at the University of Glasgow (1976-1990); Curator, Royal Society of Edinburgh (1992- 1997); and Vice-chairman, Scottish Museum Council (1986-1989). He has several publications about African arts to his credit. These include *Ife in the History of West African Sculpture* (1967); *African Art: An Introduction* (1971); *The Art of Ife: A Descriptive Catalogue and Database*; and, *A Chapter of Accidents: Archaeological Discoveries in Ife* (2006).

⁵ A very good case is that of Ori Olokun purportedly excavated in Ile-Ife and copied by Leo Frobenius between 1910 and 1912. See Craddock et al. (2013).

European cohorts also aid illicit art ventures: several works of art introduced into the art markets have make-belief origins, with speculated dating. Regrettably, art curators, collectors, and many owners of such works of art/antiquities approach the market with warp art-historical information. Therefore, to expose and militate against the problems, the investigation of objects and works of art needs forensic examination in standardized laboratories.

The description and provenance studies of many works of art and antiquities in Africa have remained largely elusive. The dating of works of art, material composition information studies and art historical scholarship must be seen as complementary. African Art historians have not given due attention to scientific probing of works of art because of the paucity of funds. Other challenges against executing such research projects include the absence of facilities and expertise, as well as a lack of institutional willpower on the part of the Government. The problem of anonymity in African art, especially among traditional artists, has also made provenance more cumbersome. Worst is the experience with indigenous African ceramists and potters whose works adorn many collections; only works such as paintings and sculptures received little attention.

Looking at the genetic and immanent stages of formal analysis, describing works of art without information about their constituent materials would lead to disruption of the relationship in formal analysis. In the contextual analysis of works of art, the definition of an art object with its attendant material compositional information enables a fixed registration for that object far above cursory inspection. Laboratory analyses will dictate further information about the basic materials, techniques and every other influence associated with such works of art. In that regard, the work of provenance, provenience and material analysis may be considered comprehensive when the work of identification and documentation is completed.

The foregoing may however be considered in addition to other pieces of evidence from photographs and digital measuring instruments giving rise to the chronology (absolute or relative) of objects/works of art in a particular collection. Many techniques of examination of works of art are now identified and accepted the world over which allows the chorology of familiar objects or works of art to be arranged against each other with the inclusion of other information from oral, written and laboratory tests for holistic art history. When all these are put in place, these exercises are referred to as Art authentication.

Authenticity ascertains that the true source, authorship, and other information about an object is true to what it claims to be or profess. It is a concept developed shortly after the Renaissance, and by the 14th century, there were more demands for works of art, with growing interests in antiquities; these informed an increase in the monumental value of works of art. Works of art produced by deceased artists became more relevant; a development that created an increase in value, and thus subsequent acquisition of works of art from distant nations extending to contemporary time. One of the traditional purposes of art was to propagate religions, as such, little values are attached to the identities of artists. The art patrons knew the artists with their products: renowned art masters were recognised to have apprentices that understudied them and used their master's techniques. Many works produced by such apprentice(s) in the similitude of their masters' techniques are often presumptuously

attributed to such masters. To differentiate the products of masters from that of their apprentices', art authentication is thus an important exercise that could say exactly the differences.

Art authentication reveals more about analytical dimensions of art production: connoisseurship, curatorial, legal, ethical, theft, historical and others. The discipline of art authentication is multi-disciplinary: it requires special skill, training, facilities, policing and prosecution in its dictates. Several disciplines have been attached to art trade and management: conservationists, law enforcement agencies, analytical chemists, criminologists, forensic experts, legal authorities, prosecutors, as well as art historians and others have much to do about art authentication. Unfortunately, many of these disciplines are lacking in many African settings in the areas of art production, sale, and conservation.

Art authentication reduces the incidence of art theft and pilferage; besides it discourages art fraudulent practices and boosts the art trade. In the admission of evidence in the court of law, Art litigations require that art authentication presents particular context and content of material compositional information about an object under query. Also for provenance and provenience determinations in art historical studies which is much lacking in African contexts, all the burden of proof so needed are provided by art authentication. Regrettably, the trend in art forgery, theft, misidentification, and so on has not abated in Africa, and elsewhere around the world, because art objects and antiquities have assumed objects of commercial entities. Due to so much evidential burden involved in art criminal prosecutions, it has become a difficult exercise even though art forgery attracts severe penalties. Crime in the art industry has thus grown astronomically and in several dimensions around the world today.

In the art authentication process, several methods, techniques and technology such as carbon dating, X-ray, X-ray diffraction (XRD), X-ray fluorescence (XRF), Stable Isotope Analysis (SIA), Thermoluminescence (TL), Ultraviolet Fluorescence (UF), Infrared Analysis (IA), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), Atomic Absorption Spectrophotometry (AAS) among others are used in confirming documentary evidence in art fakes and forgery cases. Stork and Johnson (2006) argue that occluding-Contour Analysis (OCA) is a sophisticated method derived from forensic analysis of digital photographs which analyses the outer boundary of the light pattern of an object's photograph. Further, Upadhyay and Singh (2011) posit that video authentication is an essential tool in surveillance, forensic investigations, law enforcement, and context ownership. Video authentication establishes a given video content is the originally captured moving image recorded to discredit any form of video tampering.

Findings

Generally, while collecting museum specimens, objects are removed out of their social and natural contexts to a secondary context – museum buildings and showcases. The occurrence, history and the nature of the raw materials used for such objects as well as the place/origin, and their disposition are information that is going to bring about the reasons behind their production and acquisition. There are now institutionalized provenance projects in many establishments dealing with the art industry: for one simple reason, provenance helps in

determining the authenticity of a work of art, the historical importance, legitimacy, movement of such works overtime and every other event surrounding contacts with such works of art are brought to the fore. Good examples can be found in the Metropolitan Museum, Harvard University Art Museum and a host of others in art and antiquity management. Today, repositories collect objects and generate a database that is curated. Any data that is generated in the event of managing a collection need provenance and that is to be done scientifically (Upadhyay and Singh 2011). There is now a compelling need for authentication of works of art, museum objects, and any archival material for their historical studies.

In Africa holistic studies of material composition analysis have not been embraced, therefore, this discourse expounds on the prospects of material compositional information for art history and museum studies. In this part of the world, museum-related material information seems to suffer oversight, documentation, conservation⁶ and analytical studies. For example, pottery studies are of great relevance to ceramists, archaeologists, museum experts and conservators for the valuable information it provides for the understanding of several aspects of the human past. Pottery, textile, and other African arts have value, functionality, and embellished decorations with regional, symbolic and spiritual connotations; they have much to tell about the civilization of African people, yet they are presently suffering from the material content investigation.

Summary and Conclusion

It has been observed that the inability of museums to carry out material composition tests and forensic examinations on collected art objects in many parts of Africa is a result of no standard conservation laboratories. However, the efforts of the Nigerian National Commission for Museums and Monuments (NCMM) among others need to be commended in tackling theft, forgery, and the challenges of storage and exhibitions of artworks. This discourse establishes that scholars and practitioners of art historical studies in other parts of the world today no longer use the traditional means of sensory organs in making observations and judgments. European, Middle Eastern and Caribbean researchers have embraced the use of technologies to enhance their art historical studies. Art historical studies have gone hi-tech and multidisciplinary using the physical sciences' methods and techniques of the probe for material compositional information going beyond the traditional formal and iconography analysis. Complementing dating of artifacts, material compositional analysis, and computer algorithms are now used to investigate the nature of various works of art. Museums in Africa are awaiting such tests; many art departments and institutions dealing with antiquities are aware of these facilities which are already in operation in highly industrialised countries. African governments need to take proactive measures in establishing research centres with such facilities because of the derivable advantages. Material compositional analysis has very wide applications in Geology; Soil testing, Agriculture, Fine and Applied Arts, Physical Sciences, and Pharmaceutical industries among others.

⁶On the challenges of conservation and preservation of works of art, see Oyinloye and Ijisakin(2012).

In Africa, the adoption of, and the establishment of material compositional analysis will deter forgeries, theft, and fraud in the art industry: once an analysis is carried out, a chemical fingerprint is established (like DNA code in the biological sciences) for each particular work of art and be organised into databases made accessible to the art world. Certificates of provenance and authentication will therefore be required before works of art are put on sale or auctioned. Apart from that, this approach will deter art thieves and forgers from carrying out their nefarious acts. Furthermore, this development will create the foundation for literature that could be used to conduct future studies as scholastic opportunities for material compositional studies of works of art and antiquities still abounds.

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