RETHINKING THE IGBO-UKWU CHRONOLOGY RIDDLE: RADIOCARBON DATING AND HISTORICAL FUZZY MATH

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Abstract

This study restates the crucial relevance of the Igbo-Ukwu archaeology in West African history. It tackles the persistent questions surrounding the ninth-century date amidst the concerns scholars have raised about carbon dating. The result corroborates the original timeline identified with the artifacts.

Considering the monumental archaeological work Igbo-Ukwu symbolizes, and the heated concerns scholars have raised about the carbon dating, the time is long overdue to take advantage of advances in scientific research to propose a resolution to the lingering questions surrounding the ninth-century date. Since 1970, experts have produced techniques for ameliorating radiocarbon errors, including dendrochronology, and the Uranium-Thorium method (used to recalibrate not to measure), hailed by Batler as "radiocarbon dating's final frontier."[1] Averaged means of the five significant Igbo-Ukwu findings computed from the initial radiocarbon figures, the dendrochronology corrections, and U-Th recalibrations show that Samples 1-2008 (902 CE) and Hv-1514 (923 CE) could not have been anywhere later than the first half of the tenth-century. Samples Hv-1515 (894 CE) and 1-1784 fall within the ninth century, and Sample Hv-1516 (1469 CE) belonged to the mid-fifteenth-century.

In 1939, Igbo-Ukwu, a small town in eastern Nigeria, took a protuberant place in the domain of African archaeology when a laborer digging a water reservoir (*ọmị*) in the compound of the Anozies (Isaiah, Richard, and Jonah) found a cache of bronze artifacts.[2] Similar findings in 1949 a few feet away led Bernard Fagg, then director of Nigerian Federal Department of Antiquities (NFDA), to invite Thurstan Shaw, a British archaeologist, to conduct an expert study of the area. Shaw tagged the three sites that were the focus of his research after their owners: Igbo-Isaiah, Igbo-Richard, and Igbo-Jonah. The recovery of I65,000 pieces of glass and stone beads, 1,300 iron, copper, and bronze objects, over 20,000 broken fragments of pottery, and some whole ornate vessels from the excavation

revealed an ancient Igbo civilization with advanced bronze metalworking.[3]

The results of the excavation that appeared first as an "Interim Report" in *Man* (1960) drew widespread enthusiasm among scholars. In his review of Shaw's work, for instance, an appreciative Guy Atkins described it as "nothing comparable" ever "known from Nigeria or elsewhere in West Africa."[4] The eminent historian A. E. Afigbo captured the popular sentiment fully when he greeted Shaw's effort as a "renaissance" (that is a development that was to bring about the validation of accounts already produced from oral sources and conjectures) in Igbo historical studies. Afigbo noted that the Igbo, as evident with other precolonial ethnic groups lacking a widely developed writing culture, are "anxious to discover their origin and reconstruct how they came to be who they are," and to appreciate "the reality of their group identity which they want to anchor into authenticated history."[5] Four decades later, archaeologist Benedicta Mangut added that the Igbo-Ukwu artifacts stand as "a good example of indigenous processes of trade expansion, social stratification, and urbanization in Igboland in the ninth, tenth, and eleventh centuries."[6]

In perspective, the period between the 1950s and 1970s was both exciting and depressing as scientists went back and forth with conflicting reports on the usefulness and complications of radiocarbon dating.[7] In questioning the authenticity of the Igbo-Ukwu periodization, critics cast doubt over the history behind the ancient settlement. This turn of events punctured the celebration of Igbo-Ukwu as the most influential post-World War II era archaeological discovery in West Africa. By implication, the Igbo search for its historical past scholars had predicated on the archaeological discoveries turned into a mirage. It is vital to seek a resolution to the periodization deadlock because there are critical historical questions connected with the ancient settlement that deserve precise answers. For instance, were the Igbo-Ukwu people an ancient civilization as ethnographers and colonial officers such as M.D.W. Jeffreys concluded several decades before the Igbo-Ukwu findings?[8] Did the ancient Igbo directly or indirectly participate in the trans-Saharan trade as contended by some scholars and disputed by others?[9] Did the Igbo-Ukwu artifacts predate the famous Benin and Ife terracotta objects?[10] Getting the Igbo-Ukwu timeline right holds the answers to these questions. The key is to use the post-Igbo-Ukwu radiocarbon research to revisit the chronology. First, a quick review of the radiocarbon technique and its mathematical principles is imperative. Following this is a brief highlight of the major questions that scholars have raised about the ninth-century chronology. The last section presents a revised Igbo-Ukwu periodization computed from averaged means of radiocarbon, dendrochronology, and the Uranium-Thorium dating method.

RADIOCARBON SCIENCE AND HISTORICAL DATING

A product of Willard Libby's research published in 1952, radiocarbon isotope No. 14 (C^{14}), is the technique of determining the age of organic material by measuring the level of its carbon content.[11] The instrument emerged on the scientific fact that every organic material (both plants and animals) absorbs, at a steady ration, two types of carbon – namely carbon 14 and carbon 12 (C^{12}). The term *organic* is crucial because the material in question must have lived in the past to be able to absorb these two kinds of carbon. In other words, the idea of carbon-dating iron, rocks, and other nonliving things is almost conjectural.[12] With no exception, absorption of both C^{12} and C^{14} ceases once the life ends.

In alignment with the Igbo understanding of the world as a function of dualism, a phenomenon Chike Aniakor identifies as "the inseparable unities of Igbo cosmology,"[13] Carbon 12 is very stable and not susceptible to change in form after absorption or after the organism dies. Carbon 14 stands as the antithesis of C^{12} in that it is precarious and, in fact, will automatically activate a process of alteration soon after life ended. Each C^{14} nucleus drops an electron (i.e. decays) at an unbroken pace or pattern. Experts, including Libby and the palaeobiologist, Edward Deevey measure the rate at which the decay process in C^{14} unfolds at its "half-life" – that is the length of time it takes for an object to lose precisely half of the amount of carbon 14 stored in it.[14] The process of shedding carbon at a half-life is constant, and the cycle continues at the same pace forever. The initial scientifically formulated half-life of carbon 14 was 5,568 ± 30 years (BP - Before Present), but a revision made in the 1970s raised the figure to 5,730 ± 40 years (BP).[15] In other words, it will take 5,730 years (on average) for an object that absorbed a total of 1,000 grams of C^{14} to shed 500 grams (i.e. half its original amount). To carbon date a fossil, scientists test the amount of carbon 14 stored in the sample and then compare it to the initial amount of carbon 12 retained at the time of death.[16]

Assuming, for example, that the carbon 14 content in a fossil is 35 percent compared to the living sample, the carbon date is computed using the formula.

$$t = \left[\frac{\ln\left(\frac{N}{N_0}\right)}{(-0.693)}\right] \bullet t_{\frac{1}{2}}$$

Here, $t_{½}$ is the half-life of the isotope carbon 14, *t* represents the age of the fossil (i.e. the date at death) and in () is the natural logarithm function. If

the fossil retains 35 percent of its carbon 14, then its age could be determined as follows:

$$t = \left[\frac{\ln\left(\frac{35}{100}\right)}{(-0.693)}\right] \bullet 5730$$

$$t = \left[\frac{\ln(0.35)}{(-0.693)}\right] \bullet 5730$$

$$t = (1.5149)(5730)$$

$$t = 8680$$

The result shows that the fossil is 8,680 years old.[17]

The term *estimat*e is central in radiocarbon dating because, as J. Terasmae has noted, "the overenthusiastic users" of the method "have expected greater accuracy than the method can normally offer, and this has led to disappointment and sometimes rather unwarranted criticism."[18] Deevey asserts that the radiocarbon method has only a slight error and that scholars can "live with a dating method that has only this moderate high probability . . . and if it is necessary to measure all the dates several times in order to get accurate averages, historians can afford to be patient."[19] The points made by Terasmae and Deevey cautions users not to throw away the child with the bathwater. Indeed, recalibrating the Igbo-Ukwu findings to get its chronology right is a noble venture because of all that is at stake. Terasmae reminds us that "a date is based simply on the best estimate of radiocarbon content of the sample submitted to the laboratory," and that sampling errors are common, including those that are physical and biological in nature that can affect the date. In short, "the reported date is a mean value with a stated error figure," hence a radiocarbon date of 11,180 ± 180 years BP implies that the pendulum of error revolves within the range of 11,000 and 11,360.[20]

IGBO-UKWU CHRONOLOGY QUESTIONS

Table 1 shows the five dates at the center of the Igbo-Ukwu debate. The two columns to the right respectively show Shaw's 1975 revisions using the 5730-year after-life and dendrochronology (a measurement of age by tree-rings).[21]

Table 1
Igbo-Ukwu Artifacts: Dendrochronological Adjusted Chronology

Laboratory number	Provenance	Radiocarbon age Half-life 5568 years bp	ad	Radiocarbon age Half-life 5730 years bp	ad	Dendrochronol-ogically corrected range ad
I-2008	Wood from the stool, Igbo Richard	1100±120	850±120	1133±120	817±120	730-1010
Hv-1514	Composite charcoal sample Pit VI, Igbo Jonah	1075±130	875±130	1107±130	843±130	730-1030
Hv-1515	Composite charcoal sample Pit IV, Igbo Jonah depth 1.37-1.68 m	1110±110	840±110	1143±110	807±110	730-1000
Hv-1516	Composite charcoal sample Pit IV, Igbo Jonah depth 1.52-1.68 m	505±70	1145±70	520±70	1430±70	1350-1430
I-1784	Composite charcoal sample Pit IV, Igbo Jonah depth 1.6-2.9 m	1110±145	840±145	1143±145	807±145	690-1020

Source: Thurstan Shaw, "Those Igbo-Ukwu Radiocarbon Dates," *JAH* 16, no. 4 (1975), 504

While the revised timeline shows consistency among four out of the five dated samples, the correction obtained from dendrochronology pushes back the Igbo-Ukwu dates from the ninth-century to the eight-century. In a 1974 review of Shaw's *Igbo-Ukwu*, James Bellis had noted the obvious that "the most compelling evidence for a ninth-century assignment," is that four out of the five dates "cluster tightly within the ninth-century" C.E.[22] But Babatunde Lawal, one of the most aggressive critics of the Igbo-Ukwu timeline, thinks otherwise. Lawal, whose primary research is on the Yoruba visual arts, sees the point that "the four ninth-century dates are consistent enough to suggest that the fifteenth-century date must be the 'odd man out.'" Nonetheless, Lawal strongly disputes any chance that the four dated clusters are accurate. He anchored his contention on the observation that all the five dates are from samples collected from two out of the three excavation sites. Four of the samples came from Igbo-Jonah, one from Igbo-Richard but none from Igbo-Isaiah. Thus, Lawal posed the rhetorical question whether the ninth century would still hold had four dates came from Igbo-Isaiah and/or three additional dates.[23]

In general, the copious works produced in the 1970s in the disputation of the Igbo-Ukwu chronology converge on a fundamental but presumptuous argument related to climate. The implied argument is that since the radiocarbon 14 dating technique relies on the carbon present in an artifact to determine its age, contamination from outside carbon ultimately compromises the dating accuracy. Given the fast rate of plant and material decays in the Igbo region, Lawal, in particular, questions how the pieces of wood and textile materials discovered at Igbo-Ukwu could have survived

the equatorial rainforest climate since the ninth-century if they were not produced in a period much later than we know.[24] The counter-proposition then is that all the Igbo-Ukwu materials must have belonged to the fifteenth-century and nowhere close to the ninth-century.

It is to reflect more in-depth on the imbalance in sampling that Lawal contends along with the broader question related to climate. While Lawal's questions are legitimate, one observes that he chose not to address the designation of Sample I-2008 (a piece of wood from Igbo-Richard) as the A1 class. Sample I-2008 is not only distinctive by its supposed preservation with the copper bosses found in the pit, as Shaw argued. Instead, the uniqueness of the sample resides in its easy validation with the use of dendrochronology, a scientific measurement of age by tree rings.[25] The issue then is that Lawal underplayed a piece of scientific evidence over philosophical rhetoric foisted on a disproportional sampling.

In a 1977 rejoinder to Lawal, M.A. Onwuejeogwu and B.O. Onwuejeogwu expressed frustration that the Igbo-Ukwu critics would reject results "if radiocarbon dates came disproportionately from some two sites" out of three and presume that the third site would "alter the overall results of the former dates."[26] The Onwuejeogwus see a grave problem with an approach to a historical debate devoid of the benefit of scientific confirmation that comes with fieldwork. "Any analysis of African traditional or even modern cultures and societies that not based on some sort of fieldwork may be considered one-sided." Thus, the Onwuejeogwus add that "researches on Africa based only on documentary sources are apt to end up in echoing anachronistic assumptions."[27]

Even a more problematic issue with the Igbo-Ukwu dating debate is the inherent supposition that the ancient people produced or procured (in case of acquisition through trade) the artifacts at the same time and/or even within the same generation. Experience from ethnographic fieldwork among the Achi community of eastern Nigeria in the 1990s and early 2000s revealed considerable diversity in periodization among the collection of cultural artifacts under the custody of the village's Chief Priest, Mr. Abraham Abiazieije.[28] The items examined at the site included a 280-pound carved sacred wooden gong dated 230 years in 2001, remains of two cow heads dated 260 years, and eleven carved wooden representation of the deity Eze-Ala Akubaa and his family. All the wooden images were found in varying states of decay – thus indicating they were produced at different times in the past.[29]

In essence, it is a naïve idea to think that because the Igbo-Ukwu artifacts show variations in dating, they must have belonged to the fifteenth-century. Ritual and kinship paraphernalia change as society change. If the Igbo-Ukwu findings belonged to the ancient rulers of the Nri Kingdom, who, in observance of the *ọbụ* (or *ọdụ*) tradition kept storehouses for mate-

rials related with the Nri sacred title system as Onwuejeogwu suggested or the masquerade institution as Emeka Nwabueze proposed, it is evident that these objects have changed hands across the centuries.[30] Scholars are yet to ascertain why the owners of the Igbo-Ukwu objects abandoned them. It is reasonable to assert that as homesteads collapsed, and chiefly authorities changed hands among the Igbo-Ukwu people, so did the ritual paraphernalia. Thus, Eluwa et al. postulate that most likely, the custodians abandoned Igbo-Ukwu bronze vessels - seemingly "used for ritual or ceremonial purposes," in a hurry because of a raid or death, and as sacred objects, no one wanted to touch them.[31]

Concerning the broader question on climate, a similar problem is common in the field of archaeology and radiocarbon dating. When politics is not in the way, and concerning the Igbo homeland, the damp climate and dryness that come with changing seasons of the rainforest zone along with the activities of termites bring about the destruction of many cultural artifacts. A new study by Sturt Manning and others at the Cornell University Tree Ring Laboratory tells us that in the southern Levant, there is a "substantive and fluctuating offset in measured radiocarbon ages between plant materials growing in the southern Levant [which vary from] the standard Northern Hemisphere."[32]

In another study published in 2015, Imperial College physicist Heather Graven points out that the vast quantity of fossil fuel spewed by humans in the past few decades has affected the steady process of C^{14} manufacture in the atmosphere by minimizing its size to C^{12}. The implication is that the excess carbon emission will further skew the radiocarbon dating since the after-life is determined by using C^{12} as a base. Graven concludes that:

Over the next century, fossil fuel emissions will produce a large amount of C_{O2} with no 14C because fossil fuels have lost all 14C over millions of years of radioactive decay. Atmospheric C_{O2}, and therefore newly produced organic material, will appear as though it has "aged" or lost 14C by decay. By 2050, fresh organic material could have the same 14C/C ratio as samples from 1050 and thus be indistinguishable by radiocarbon dating. Some current applications for 14C may cease to be viable, and other applications will be strongly affected.[33]

Although those who dispute the Igbo-Ukwu dates have no scientific evidence to support their case, it is notable that they raised the climate question long before Graven.

VALIDATING AND RECALIBRATION IGBO-UKWU CHRONOLOGY

At first glance, the accuracy of the radiocarbon 14 dating appears inadmissible, and those who contest their validity see no remedy for the system's

shortcomings. A satisfactory reconciliation to the Igbo-Ukwu chronology question not only holds the key to moving Igbo revisionist history forward but also upholding the honor Shaw's unrivaled work rightly deserves. The prospects for this revision had never been better because the science of radiocarbon dating has improved since the 1960s. While radiocarbon dating remains prone to errors and contamination through the infiltration of outside materials (including $C_{O2)}$, technological advancement and innovative research are assisting users in making the technique more accurate and, in some instances narrow its margin of error to within a few decades.

Drawing inspiration from Graven's 2015 work, Peter Köhler, a physicist at the Alfred Wegener Institute in Bremerhaven, Germany, has put forth an idea he called "the Suess Effect" that can help correct probable radiocarbon errors. The new focus is on Carbon 13 (C^{13}), a stable isotope that comprises about one percent of the earth's atmosphere. Köhler shows that levels of C^{13} in a sample will benefit scientists in determining whether C_{O2} emissions have compromised a specimen's carbon 14 content, in which case its date is not to be trusted.[34] This new insight adds another layer to other available carbon dating authentication processes, among them the science of dendrochronology – technique scientists have found very useful.

It is noteworthy that a 1990 study by Bard and co-researchers showed that plants and animals are not subject to C_{O2} contamination. This is because the dead animal and plant "can no longer accumulate fresh carbon, and the supply of the organism at the time of death is generally depleted."[35] About Igbo-Ukwu, this means, as Nwabueze argues, that the human bones, wood materials, and the remnant of textile materials found at the site may indeed belong to the ninth-century.[36]

Bard and others are emphatic on the effectiveness of dendrochronology in recalibrating radiocarbon dating inaccuracies. This optimism emerging in the 1970s motivated Shaw's 1975 revision of the Igbo-Ukwu dates. The science of dendrochronology reveals that throughout their lives, trees build a new ring each growing season. Each of the rings reflects the climatic conditions of that growing season. When studied alone, a single record offers limited information about the ecological conditions of the time in the tree's life and at what age the tree fell.[37] However, when scientists collect the tree-ring records in the hundreds, they access a unique trove of data that is hard to come by.

Among other things, the tree-rings can convey the precise year that certain tree-ring grew and the carbon content in the sample. The specific information is vital to deciphering the age of organic material.[38] The process involves comparing the volume of the radiocarbon-14 isotope in the artifact against the tree-ring data for calibration. While the system unfail-

ingly produces an absolute date for the object, scientists still include a margin of error. Accurate tree-ring age record is available for 9,000 years BP.

Yet, the most important result of the research related to the post-Igbo-Ukwu radiocarbon dating is the revelation that the Uranium-Thorium (U-Th.) dating technique, which makes use of electrons, can be used to recalibrate (not to measure) and correct figures determined with radiocarbon 14 technique. For clarity, U-Th, which dates objects up to half a million years, is more suitable for marine organisms than land animals and plants because uranium is abundant in seawater than in most soils. Despite the discrepancy in purpose between carbon 14 and U-Th dating techniques, the latter, with the aid of a mass spectrometer that speeds up streams of atoms, dates objects by using magnets to sort them out following mass and electric charges. According to the study, the significant deviation between the use of Uranium-Thorium dating and radiocarbon 14 dating is 3,500 years for samples that are 20,000 years old.[39] When applied to Igbo-Ukwu using the ninth-century base, the artifacts are about just 1,100 years old – that is 9,000 years short of the age where the most substantial deviation occurs. Assuming for a while that the most significant deviation applies to Igbo-Ukwu, the result will be a ratio of 1: 5.7 if we use ±800 CE as a point of analysis.[40] This calculation will put the Igbo-Ukwu materials 213 years later than the highly disputed ±800 CE date. In other words, Igbo-Ukwu timeline will be somewhere around the eleventh-century – i.e. ±1000 CE

However, the accurate possible deviation (APD) applicable to Igbo-Ukwu is APD-193. Column 5 in Table 2 shows a revision of the dates using Uranium-Thorium to recalibrate at both the most substantial possible deviation (LPD-213) and the actual possible variance (LPD-193). The computation is based on the carbon dates determined from 5,730 half-life. This step adds another layer of validity and analysis to Shaw's 1975 dendrochronological adjustment of the original Igbo-Ukwu timeline.

Table 2: Igbo-Ukwu Artifacts: Uranium-Thorium Adjusted Chronology

Laboratory number	Provenance	Radiocarbon age Half-life 5730 years bp	ad	Dendrochronol-ogically corrected range ad	Uranium-Thorium Recalibrated Range lpd-213	adp-193
I-2008	Wood from the stool, Igbo Richard	1133±120	817±120	730-1010	1030±120	1010±120
Hv-1514	Composite charcoal sample Pit VI, Igbo Jonah	1107±130	843±130	730-1030	1056 ±130	1036±130
Hv-1515	Composite charcoal sample Pit IV, Igbo Jonah depth 1.37-1.68 m	1143±110	807±110	730-1000	1020 ±110	1000±110
Hv-1516	Composite charcoal sample Pit IV, Igbo Jonah depth 1.52-1.68 m	520±70	1430±70	1350-1430	1643±70	1533±70
I-1784	Composite charcoal sample Pit IV, Igbo Jonah depth 1.6-2.9 m	1143±145	807±145	690-1020	1020 ±145	1000±145

As shown, four out of the five U-Th recalibrated dates put the Igbo-Ukwu artifacts to the eleventh-century. This recalibrated date is closer to the ninth-century than the sixteenth-century Posnansky, Lawal, and others had projected, while completely dismissing the possibility that the Igbo could have entered the trans-Saharan trade early as asserted by Shaw and others.[41]

Table 3
Igbo-Ukwu Artifacts: Consolidated Chronology Averages

Laboratory number	Provenance	Radiocarbon age Half-life 5730 years bp	ad	Averaged Dendrochronology range ad	Averaged U. Th range lpd-213 / adp-193	Consolidated Average
I-2008	Wood from the stool, Igbo Richard	1133±120	817±120	870	1020	902
Hv-1514	Composite charcoal sample Pit VI, Igbo Jonah	1107±130	843±130	880	1046	923
Hv-1515	Composite charcoal sample Pit IV, Igbo Jonah depth 1.37-1.68 m	1143±110	807±110	865	1010	894
Hv-1516	Composite charcoal sample Pit IV, Igbo Jonah depth 1.52-1.68 m	520±70	1430±70	1390	1588	1469
I-1784	Composite charcoal sample Pit IV, Igbo Jonah depth 1.6-2.9 m	1143±145	807±145	855	1000	890

Table 3 offers the overall mean chronology determined from averaged dates obtained from the initial radiocarbon calculations, the dendrochronology corrections, and recalibrated Uranium-Thorium averaged dates. The result shows that Samples 1-2008 (902 CE) and Hv-1514 (923 CE) could not have been anywhere later than the first half of the tenth-century. Samples Hv-1515 (894 CE) and 1-1784 fall within the ninth-century, and Sample Hv-1516 (1469 CE) belonged to the mid-fifteenth-century. To the best knowledge of this study, no archaeological work has ever passed through this level of scrutiny. Thus, one corroborates Garlake view that "Certainly there is no concrete support for alternative interpretations" of Igbo-Ukwu as a ninth-century civilization.[42]

It is now time to return to the three central questions that are the focus of this analysis. (1) Were the Igbo-Ukwu people an ancient civilization as ethnographers and colonial officers speculated decades before the Igbo-Ukwu findings? (2) Did the ancient Igbo directly or indirectly participate in the trans-Saharan trade as the ninth-century dating of the artifacts suggests? (3) Did the Igbo-Ukwu artifacts predate the famous Benin and Ife terracotta objects? Already, the third question is self-explanatory, and if the trans-Saharan trade query is satisfactorily resolved, the rest is clear.

The question on whether Igbo-Ukwu predated Benin and Ife artworks (in woods, ivory, and brass) is perhaps the easiest of the three questions because every study on these three arts acknowledges that Igbo-

Ukwu's *cire-perdue* style was an outlier among its West African cohorts. Perceiving it as exotic, Shaw pushed the idea that an experienced slave artisan who married his technical skill to African traditions and African forms such as the calabash, the shell, woodcarvings, and plaited and twisted string bindings perhaps introduced the *cire-perdue* style in Igbo-Ukwu. Shaw further sees the possibility that the filigree work and detailed overall decoration came from the Arab world.[43] There is no evidence to date that the precolonial Igbos imported slaves from outside. What we know is that the Igbo were one of the chief exporters of slaves. Thus, the hard-to-prove attempt to externalize the *cire-perdue* style is a consequence of a standard error when scholars enter the field of historical research with the assumption that they know what happened.

A piece of vital information from The British Museum, London, indicates that most of the Ife and Benin arts and sculptors belong to the periods 1550-1650, and 1200-1500 respectively.[44] Ife's development into an arts center with the famous bronzes, terracotta, and stone sculptures ran from 1200 -1500.[45] Thus, whether the consensus is the ninth, tenth or eleventh-century, Igbo-Ukwu remains primordial to both Ife and Benin. The collective agreement among Igbo scholars is that the Igbo have lived in their present homeland since the third millennium before Christ, and the movement of people inside and outside the Igbo territory continues today.[46]

The trans-Saharan trade hypothesis is critical to the envisaged Igbo revisionist history because it raises a broader but more complex problem that the Onwuejeogwus describe as a "grandiose diffusionist theory."[47] This matter is more profound than the eastern versus western trans-Saharan trade route debates among Shaw, Timothy Insoll, J.E.G. Sutton, Lawal, and Posnansky, among others.[48] The burial of tusks found at the feet of the old Igbo-Ukwu chief at Igbo-Richard along with elephant features on four of the twelve pendants recovered from the excavation is the proof that the elephant was influential in the Igbo culture. Posnansky insists that since the gold of Guinea anchored the trans-Saharan; it is difficult to see why ivory from the Igbo area should have entered into the Saharan trade when there were abundant supplies of ivory about a thousand miles to the north in the Lake Chad. Although both agree on the attempt to externalize the Igbo-Ukwu materials, Posnansky's no-elephant-from-Igbo-area argument in the trans-Saharan trade falters where Lawal acknowledges that there is indeed evidence to show importation of brass and copper rods to West Africa before the arrival of Europeans. Lawal rejects any suggestion that the Igbo people participated in the trans-Saharan trade with the definite assertion that "Igbo-Ukwu is far removed from any known trans-Saharan trade route."[49]

A 1997 study by Thurstan Shaw and Timothy Insoll reinforced the trans-Saharan trade hypothesis while proving Posnansky and Lawal wrong. The study, which involved excavations in the ancient city of Gao in eastern Mali, found a substantial collection of local and imported beads. On a closer examination, the Goa beads proved in many ways to be similar to those uncovered at Igbo-Ukwu. The parallels between the two collections are suggestive of inter-regional trade along the River Niger. Thus, Shaw and Insoll reasserted that Egypt is the likely source of many of the beads and that Gao may well have been the intermediary between Igbo-Ukwu and Egypt. This study was, in essence, a revision of the earlier proposal by Shaw, which claimed a direct trade between North Africa and the Igbo country through the eastern trans-Saharan highway.

The revised account by Shaw and Insoll offer the Gao route as a more satisfactory explanation than a direct east-west trade across the Sudanic zone, which Shaw previously presented as a channel of international trade for Igbo-Ukwu.[50] Shaw had earlier declared that the glass beads found at Igbo-Ukwu might be of Indian and, to some extent, Venetian origin, and they must have found their way to Igbo-Ukwu in the first millennium. In a 2011 study, J. E. Sutton rejected Shaw's revisionist Gao-route paradigm, insisting that an eastern Sahelian routing from Lake Chad to the Middle Nile instead of the Gao to Igbo-Ukwu idea seem most probable.[51] Nevertheless, Lawal, among others, strongly dispute any manner of an idea based on the ninth-century because there is not enough evidence in its support. Lawal contends that our knowledge of specific Middle Eastern sources of beads is scant, and places like Hebron in Israel may have supplied the North African market. Moreover, both Lawal and Posnansky insist that the possible time the glass beads arrived in Igboland must be around the sixteenth century.[52]

All considered, the question of whether the Igbo participated in the trans-Saharan trade may remain a riddle, but one could not agree more with the Onwuejeogwus that it is disbelieving to dispute the legitimacy of the Igbo-Ukwu dates just because they are radiocarbon dates while the validity of other similar sites, especially those recorded for Nigeria is not in question. Pointing to a list of 72 radiocarbon dates collected by Shaw, the Onwuejeogwus observed that eight came from Igbo-Ukwu, and forty-three from other archaeological sites within Nigeria's tropical forest region, including those from Nok, Ife, Benin, Iwo Eleru, and Afikpo rock shelters.[53] It is curious that while concerns over radiocarbon dating in the forest region are common, disputation over the dates from the other seventy-one sites is uncommon.[54] There is no similar charge of "disproportionate sampling" Lawal made against Shaw elsewhere in Nigerian archaeological studies. This inconsistency resonates with Bruce Brew's observation that "If a C-14 date supports our theories, we put it in the main

text. If it does not entirely, contradict them, we put it in a footnote. And if it is completely out of date, we just drop it."[55]

The critical question about when the Igbo people evolved as a distinct ethnic group is difficult to pin down despite what oral accounts tell, hence Elizabeth Isichei, an authority on Igbo history, talks about the "elusive problem of Igbo Identity."[56] In broad terms, there are two theories floated by scholars in connection with the question of Igbo origins. These are the creationist and evolution theories. In brief, the creationists argue that the Igbo are autochthonous to their present homeland in eastern Nigeria. For instance, the Nri tradition of origin claims that Eri, a mythical entity, came down from the sky and settled down at Aguileri town (Anambra state), where he met an autochthonous group who had no memory of their origin. By implication, in Igbo culture, only new towns like Aro, Onitsha, Ibiza, and Ọgwásiukwu can claim the origin of certainty. The rest of Igboland depend on similar mythical origins of uncertainty.

The evolutionists' account uses documented creation theory in the Bible or the Koran to advance theories of Igbo origins. The proponents of this paradigm have tried to tie the Igbo with "the lost tribe of Israel" based on some assumed similarities between Igbo culture and that of ancient Hebrew. In 1794, Olaudah Equiano, an Igbo ex-slave, contended that the Igbo were a branch of the Jews and that Christianity, which enlightened "barbarian Europe" was a Jewish culture. However, as a former slave, Equiano may have tried to redeem his predicaments, misery, enslavement, and poverty with a claim to a noble ancestry. The point Equiano wanted to prove is that the ancestors of the Igbo came from the East, in this case, Israel. Thus, since it was from the East that humankind got its civilization, it means that Igbo, as a race, is associated with a superior civilization.

In 1912, Archdeacon G. T. Basden, a British ethnolinguist, reflected on specific structures in the Igbo language and corroborated Equiano's claim that the Igbos originated from Israel. Because certain Igbo rituals such as circumcision and words such as *Uburu* sounds like Hebrew, Basden concluded that Igbo culture probably evolved under the influence of the Levitical Code.[57] Additionally, colonial officer, Sir Herbert Richmond Palmer, examined the Aro and the Nri religious and ritual practices with the conclusion that both Igbo communities had hermetic blood in their veins and that it was under their leadership that the highest character of Igbo culture evolved.[58]

The salient point is that in their explanation of Igbo origin, Equiano and the British colonial scholars fell prey to the allure of the "oriental hypothesis." Unfortunately, these traditions have little or nothing to offer in an attempt to reconstruct Igbo cultural history. Consequently, the circle of

imaginations on Igbo origins widens, and the "renaissance" that was expected to lift the haze of conjectures in Igbo historical studies falters.

Igbo-Ukwu archaeology remains central to West African history in general and, in particular, to appreciate the reality of Igbo identity that Igbos want to anchor into authenticated history. It is dangerous to make the Igbo-Ukwu archaeological findings a victim of the characteristic Yoruba-Igbo ethnic struggles disguised in the form of academic debate. Shaw alluded to this in response to the critics in the 1970s, and Garlake decried this manner of "cultural chauvinism," regretting that Igbo-Ukwu has been misunderstood, distorted, -- in one instance, in a peculiarly unpleasant, foolish and tendentious way – and used as weapons in contemporary Nigerian rivalries."[59] Whatever might be the case, the materials unearthed at Igbo-Ukwu are confirmation of West African cultural achievement predating the European arrival.

NOTES

[1] Michael Batler, "Radiocarbon Dating's Final Frontier," *Science* 313, no. 5793 (2006): 1560-3. For a similar view, see Edouard Bard, "Extending the Calibrated Radiocarbon Record, *Science* 292 no. 5526 (2001): 2443-4.

[2] Thurstan Shaw, "The Igbo-Ukwu Bronzes," *African Arts* 6, no. 4 (1973): 18-19. Some artifacts recovered from the site earlier in 1922 constituted part of those included among those later labeled "Igbo-Isaiah" by Shaw. See S.C. Ukpabi, Review: "The Archaeology of Iboland," *African Studies Review* 14, no. 2 (1971): 336-41.

[3] See Thurstan Shaw, *Igbo-Ukwu: An Account of Archaeological Discoveries in Eastern Nigeria* (Evansville, IL: Northwestern University Press, 1970), 222, 239, 282; Thurstan Shaw, "Excavations at Igbo-Ukwu, Eastern Nigeria: An Interim Report," *Man* 60 (1960): 161-4, Raphael Chijioke Njoku, "Igbo-Ukwu," *Oxford Research Encyclopedias*, Oct-Dec. 2018; and Babatunde Lawal, "'The Igbo-Ukwu Bronzes': A Search for the Economic Evidence," *Journal of the Historical Society of Nigeria* 6, no. 3 (1972), 313-21.

[4] Guy Atkins, review of "Igbo-Ukwu," *Bulletin of SOAS* (1971): 680; and Ukpabi, "Archaeology of Iboland," 337. Frank Willet, Review: "The Archaeology of Igbo-Ukwu," *JAH* 13, no. 3 (1972): 514-6, extolled the Igbo-Ukwu materials for their "technical complexity," 515.

[5] A. E. Afigbo, "Prolegomena to the Study of the Culture History of the Igbo-Speaking Peoples of Nigeria," in F. Chidozie Ogbalu and E. Nolue Emananjo (eds.), *Igbo Language and Culture* (Oxford: Oxford University Press, 1975), 28; and A. E. Afigbo, "On the Threshold of Igbo History: Review of Thurstan Shaw's Igbo-Ukwu," *The Conch* (I971), 213 [205-I8].

[6] Benedicta N. Mangut, "Igbo-Ukwu," in Kevin Shillington (ed.), *Encyclopedia of African History, Vol. 1*(New York: Routledge, 2013), 676-7.

[7] The radiocarbon frenzy generated tones of studies and commentaries such as V. R. Switsur, "The Radiocarbon Calendar Recalibrated," *Antiquity* 47 (1973): 131-7; Colin Renfrew, "The Radiocarbon Calendar Recalibrated Too Soon? An Archaeological Comment," *Antiquity* 47 (1973): 314-17.

[8] Michael Jeffreys' 1930s ethnographic work inspired a generation of African scholars such as Afigbo, Onwuejeogwu, and others who have continued to assert the antiquity of the Igbo civilization using mostly oral evidence.

[9] For instance, while Shaw and Timothy Insoll affirm this, Posnansky and Lawal disagree.

[10] A similar question has been the focus of several studies among them Babatunde Lawal, "The Present State of Art Historical Research in Nigeria: Problems and Possibilities," *JAH* 18, no. 2 (1977): 214 [193-216]; Willet, "Archaeology of Igbo-Ukwu," 515.

[11] W. F. Libby, *Radiocarbon Dating* (Chicago: University of Chicago Press, 1952). In 1956, Beek applied radiocarbon dating for early South Arabian chronology, with the declaration, "we now have a clear time-point, established by a stratigraphically controlled excavation and an impartial agency" (7). G.W. Van Beek, "A Radiocarbon Date for Early South Arabia," *Bulletin of the American Schools of Oriental Research* 143, (1956): 6-9.

[12] Argon-argon (Ar-Ar) or Potassium-argon (K-ar) techniques are most suitable for dating rocks and other nonliving objects.

[13] Chike Aniakor, "Household Objects and Igbo Space," in Mary Jo Arnolde et al. (eds.), *African Material Culture* (Bloomington: Indiana University Press, 1996), 229.

[14] See W. F. Libby, "Radiocarbon Dating," *Philosophical Transactions of the Royal Society of London* 269, no. 1193 A Symposium on the Impact of the Natural Sciences on Archaeology (Dec. 17, 1970): 1-10; and Edward S. Deevey, Jr., "Radiocarbon Dating," *Scientific American* 186, no. 2 (1952): 24-9.

[15] See George Kubler, *The Art and Architecture of Ancient America: The Mexican, Maya, and Andean Peoples Third Edition* (New Haven: Yale University Press, 1990), 473; and Barbara Ann Kipfer, *Encyclopedic Dictionary of Archaeology* (New York: Kluwer, 2000), 470. See also An Zhimin, "Radiocarbon Dating and the Prehistoric Archaeology of China," *World Archaeology* 23, no. 2 Chronologies (1991): 193-200.

[16] Ben Panko offers an excellent explanation of this process, in "Thanks to Fossil Fuels, Carbon Dating is in Jeopardy. One Scientist May Have an Easy Fix," *Smithsonian*, Dec. 7, 2016. Panko based his synthesis on Peter Kohler's "Using the Suess Effect on the Stable Carbon isotope to distinguish the Future from the Past in Radiocarbon," *Environ. Res. Lett* 11, no. 124016 (2016): 1-9.

[17] See the University of Regina, Canada (accessed on October 1, 2018, at http://mathcentral.uregina.ca/beyond/articles/ExpDecay/Carbon14.html).

[18] J. Terasmae, "Radiocarbon Dating: Some Problems and Potential Developments," *Developments in Paleontology and Stratigraphy* 7 (1984): 2 [1-15].

[19] Deevey, "Radiocarbon Dating," 28.

[20] Terasmae, "Radiocarbon Dating," 2.

[21] Thurstan Shaw, "Those Igbo-Ukwu Radiocarbon Dates: Facts, Fictions and Probabilities," *JAH* 16, no. 4 (1975): 504 [503-17]. See also E. K. Ralph, H. N. Michael, and M. C. Han, "Radiocarbon Dates and Reality," *Masca Newsletter* 9, no. 1 (1973), 1-20; and Thurstan Shaw, "Radiocarbon Dating in Nigeria," *Journal of the Historical Society of Nigeria* 4, no. 3 (1968): 460 [453-65].

[22] James O. Bellis, Review: "Igbo-Ukwu: An Account of Archaeological Discoveries in Eastern Nigeria," *American Anthropologist* 76, no. 1 (1974): 184-5; and Marla Berns, Review: "Unearthing Igbo-Ukwu," *African Arts* 11, no. 4 (1978): 14, 17-19.

[23] Babatunde Lawal, "Dating Problems at Igbo-Ukwu," *JAH* 14, no. 1 (1973): 1 [1-8].

[24] Lawal, "Dating Problems," 7; Merrick Posnansky, Review: "Igbo-Ukwu: An Account of Archaeological Discoveries in Eastern Nigeria by Thurstan Shaw," *Archaeology* 26, no. 4 (1973): 310 [309-11]; Berns, "Unearthing Igbo-Ukwu," 14, 17-19; and P. Emeka Nwabueze, "Igbo-Ukwu Revisited," *Transafrican Journal of History* 18, no. 19 (1989): 190 [187-92].

[25] Shaw, "Igbo-Ukwu Radiocarbon," 504. Kenneth P. Oakley, *Framework for Dating Fossil Man* (London: Weidenfeld and Nicholson, 1964), 7, notes that samples of this nature belong to the A1 class of evidence.

[26] M.A. Onwuejeogwu and B.O. Onwuejeogwu, "The Search for the Missing Links in Dating and Interpreting the Igbo-Ukwu Finds," *Paideuma* 23 (1977): 171 [169-88]; and Lawal, "Dating Problems," 8.

[27] Onwuejeogwu and Onwuejeogwu, "Missing Links," 171; and Nwabueze, "Igbo-Ukwu Revisited," 187-8.

[28] Abraham Abiazieije, Interviews, June 15, 1998; Dec. 20, 2001; Albert Abiazieije, Interview, July 12, 2008.

[29] The structure housing Eze-Ala Akubaa, the Achi village principal deity, was close to the *ọbụ* (sacred storehouse). The Chief Priest disclosed that he inherited most of the items in the store from his father, who in turn received them from his grandfather.

[30] The *ọbụ* is a hut where ceremonial goods associated with the title system, masquerade deity or shrine is stored and used in gaining access to the spirits of former lineage members. See G.I. Jones in "Ohaffia Obu Houses," *The Nigerian Field* 6, no. 4 (1937): 169-71; and G.I. Jones, "Mbari Houses," *The Nigerian Field* 6, no. 4 (1937): 72-9. See also M. A. Onwuejeogwu, *An Igbo Civilization: Nri Kingdom and Hegemony* (Benin City: Ethiope, 1981), 82-95; Nwabueze, "Igbo-Ukwu Revisited," 187-92; and Francis Chuks Madukasi, "Ozo Title: An Indigenous Institution in Traditional Religion that Upholds Patriarchy in Igbo Land South-Eastern Nigeria," *The International Journal of Social Science and Humanities Invention* 5, no. 5 (2018): 4640-52.

[31] G.I.C. Eluwa, M.O. Ukagwu. U.N. Nwachukwu and A.C.N. Nwaubani. *A History of Nigeria for Schools and Colleges* (Enugu: Africana-Fep Publishers, 1988), 13.

[32] Sturt W. Manning et al., "Fluctuating Radiocarbon Offsets Observed in the Southern Levant and Implications for Archaeological Chronology Debates," *PNAS* (2018): 2 [1-6].

[33] Heather D. Graven, "Impact of Fossil Fuel Emissions on Atmospheric Radiocarbon and Various Applications of Radiocarbon over this Century," *PNAS* (2015): 1 [1-4].

[34] Köhler, "Using the Suess Effect," 1-9. See also Helene Muri, "The Role of Large-Scale BECCS in the Pursuit of the 1.5^{o}C Target: An Earth System Model Perspective," *Environ. Res. Lett* 13 (2018): 1-10.

[35] E. Bard, B. Hamelin, R. Fairbanks, and A. Zindler, "Calibration of the 14C Timescale Over the Last 30,000 Years, Using Mass Spectrometric U. Th Ages from Barbados Coral," *Nature*, (1990): 345: 405, 410; and Malcolm W. Brown, "Errors Feared in Carbon Dating," *New York Times*, May 31, 1990.

[36] Nwabueze, "Igbo-Ukwu Revisited," 190; and Njoku, "Igbo-Ukwu." Nwabueze asserts this optimism because the Igbo-Ukwu fabrics were indigenous to the Igbo area and connected with the masquerade tradition in the Nri-Awka areas.

[37] Peter Ian Kuniholm, "Dendrochronology and Radiocarbon Dates for Gordion and other Phrygian Sites," *Notes in the History of Arts Archaeology* (1986): 5-8.

[38] Grant L. Harley, "Tropical Tree ring and Environmental Change," *Southern Geographer* 53, no. 1 (2013): 1-3.

[39] Bard et al., "Calibration of the 14C Timescale," 345: 405, 410. See also Leon T. Silver, "Uranium-Thorium-Lead Isotope Relations in Lunar Materials," *Science* 167, no. 3918 (1970): 408-71.

[40] Other techniques for validating the radiocarbon dating errors include the Robust Bayesian statistical method, which has a ratio of 1:4. See Maarten Blaauw and J. Andres Christen, "The Problem of Radiocarbon Dating," *Science* 308, no. 5728 (2005): 1551-3.

[41] Lawal, "The Igbo-Ukwu 'Bronzes,'" 315-6; Posnansky, "Igbo-Ukwu," 309-11; Afigbo, "On the Threshold," 213-8; and Insoll and Shaw, "Gao and Igbo-Ukwu," 9-23.

[42] P.S. Garlake Review: "Unearthing Igbo-Ukwu by Thurstan Shaw," *Africa* (1979): 90-1.

[43] Shaw, *Igbo-Ukwu: An Account*, 283; V. E. Chikwendu, "More Bronzes from Eastern Nigeria," *Anthropos* 79, no. 1/3 (1984): 260-3; and Ukpabi, "Archaeology of Iboland," 337, 339-40.

[44] The British Museum, "Benin: An African Kingdom," London, Learning and Information Department, undated, 1-12; Frank Willett, *Ife in the History of West African Sculpture* (New York: McGraw-Hill, 1967), 108, 210, and Graham Connah, "Archaeological Research in Benin City, 1961-64," *Journal of the Historical Society of Nigeria* 2, no. 4 (1963): 473-4.

[45] Department of the Arts of Africa, Oceania, and the Americas, "Ife (from ca. 6th Century)," in Heilbronn Timeline of Art History, New York: The Metropolitan Museum of Art, 2000– http://www.metmuseum.org/toah/hd/ife/hd_ife.htm (originally published October 2000, last revised September 2014).

[46] A. E. Afigbo, *Ropes of Sand: Studies in Igbo History and Culture* (Ibadan: University Press, 1981), 8; Eluwa et al., *History of Nigeria*, 63. Both sources put the date of Igbo settlement in the present location at about 2,500-2,000 BCE.

[47] Onwuejeogwu and Onwuejeogwu, "Missing Links," 169.

[48] Shaw, *Igbo-Ukwu, Volume 1*; and Shaw, "Igbo-Ukwu Radiocarbon," Lawal, "Igbo-Ukwu 'Bronzes,'" 317-8; and Lawal, "Dating Problems," 1-8; Insoll and Shaw, "Gao and Igbo-Ukwu," 9-23.

[49] Lawal, "Igbo-Ukwu 'Bronzes'" 313-21; Lawal, "Dating Problems," 7; and Posnansky, "Igbo-Ukwu," 310.

[50] Insoll and Shaw, "Gao and Igbo-Ukwu," 9-23.

[51] J.E.G. Sutton, "Igbo-Ukwu and the Nile," *The African Archaeological Review* 18, no. 1 (2001): 49 [49-62].

[52] Babatunde Lawal, "Archaeological Excavations at Igbo-Ukwu - A Reassessment," *Odu: A Journal of West African Studies* 8 (1972): 72-97; and Lawal, "Igbo-Ukwu Bronzes,'" 316-8. Shaw defends the results of the radiocarbon dates by pointing to the absence of tobacco pipes, whose presence would indicate a post-seventeenth-century date, rouletted decoration on pottery and cowries.

[53] See G. Connah, "Radiocarbon Dates for Benin City and Further Dates for Daima, N.E. Nigeria," *Journal of the Historical Society of Nigeria* 4, no. 2 (1968): 313-20; Berns, "Unearthing Igbo-Ukwu," 9; and Chikwendu, "More Bronzes," 260-3.

[54] Onwuejeogwu and Onwuejeogwu, "Missing Links," 174; Shaw, "Radiocarbon Dating in Nigeria," 453-65; and Lawal, "Dating Problems," 1-8.

[55] Bruce Brew, cited by Ian Stott, *The God Solution: Are You Ready* (Bloomington, IN: Xlibris LLC, 2013), 38.

[56] Elizabeth Isichei, *A History of the Igbo People* (New York: St Martin's Press, 1973), 3.

[57] G.T. Basden, "Notes on the Ibo Country, Southern Nigeria" *The Geographical Journal* 65, no. 1 (1925): 32-41.

[58] NNAE, Palmer, H.R. ARODIST 1/7/33, Aro People (Memo dated 1/5/21 by Palmer H.R.).

[59] Shaw, "Igbo-Ukwu Radiocarbon Dates," 503-17; and Garlake, "Unearthing Igbo-Ukwu," 90-1.