

SCIENCE AND AFRICAN CULTURE

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I. SCIENCE AND AKAN CULTURE

Metaphysically and epistemologically, African culture is very hospitable to scientific inquiry. Yet at the time of the encounter with European culture Africa was rather deficient in scientific achievement despite the glories of ancient Egypt and of the rich civilizations of a considerable number of pre colonial African empires. If both statements are true, we have a paradox on our hands. But the chances are that the first might evoke some skepticism. We will endeavor to show that it is true at least in regard to the cultures of the Akans and the Yorubas. However, if we are successful, we will only get a paradox, and a paradox is to be solved, not sold. Since not everything can be done at once or by the same persons, we will leave the solution to others beyond a preliminary conjecture.

Metaphysically, the most significant consideration is that African ontologies tend to dispense with such dichotomies as those between the natural and the supernatural and the physical and the spiritual. In the absence of such dualisms, the world order, from an African standpoint, becomes a fundamentally homogeneous order of things, in principle, susceptible to the same principles of explanation. The widespread importance of an issue of this kind in Western philosophy is evident in the historical struggles between naturalism and anti naturalism which show no signs of abating in our own time. But there is an interesting distinction between naturalism and the African standpoint. In naturalism, in general, there is the category of the natural and that of the supernatural, except that while the former is full, so to speak, the latter is empty. By contrast, in the African case, there is no category of the supernatural and there is, therefore, no category of the natural.

Since this is a somewhat subtle conceptual claim, it might be too bold to attribute it to all or even most Africans. So, although it seems likely that such an attribution is not totally whimsical, we will restrict ourselves to two African peoples of whom we have some close knowledge, namely, the Akans mostly considered in this first part of our presentation and the Yorubas mostly considered in the second . No remote semblance of infallibility is hereby pretended, however.

To return, then, to the naturalism/anti naturalism opposition, it may sound curious enough to say that the concept of the supernatural has no place in any conceptual framework discoverable in Akan discourse. But to say the same regarding the concept of the natural is likely to look like crossing the boundary of rational suggestion. Yet a look at the Akan language must quickly dissipate such qualms. The word that those speakers of Akan, who take it for granted that there must be a conceptual equivalent of the English word "nature" in Akan, will give in translation is Abode. This is, in fact, the word that Christaller, Locher and Zimmermann, three classic lexicographers of the Akan language, offer. But the word abode etymologically means "created things," and quite definitely includes the phenomena involving all the "spirits" ever dreamt of among the Akans. Since belief in such phenomena is what is routinely referred to in the literature on African thought as belief in the supernatural, this means that in this system of thought the natural swallows up the supernatural. In more prosaic terms, this means that, actually, you don't have the distinction between the natural and the supernatural. This thought seems to be at work, albeit mysteriously, in the writings of some celebrated exponents of African thought. Thus Mbiti says in his *African Religions and Philosophy* that in African thought "no line of distinction is drawn between the spiritual and the physical" And Busia also notes "an apparent absence of any conceptual cleavage between the natural and the supernatural" in Akan traditional thought. What is mysterious is that both authors go on to credit or, more strictly, debit the African mentality with a virtual fixation on the spiritual and the supernatural.

Suppose that one abides steadfastly by the insight that the distinction has no place in the system of thought under study. A question that might arise is whether or not having that distinction is not a mark of conceptual poverty. I will pass over this question with only the observation that its coherence cannot be taken for granted. But another question, more relevant to our purposes here, arises, and it is as to how the homogeneous ontology in question might stand vis a vis scientific inquiry. It is not clear whether it would be apt to incline or disincline the mind towards science. However, if it is allied to an empirical outlook, then all things being equal, the prospects must be favorable to science.

This then brings us to the epistemological angle. Akan thought is empirical in case. I here contrast the empirical with the transcendental not with the a priori. A conception is empirical if it is supposed to be conversant only with entities that exist in time and space; it is transcendental if its objects are conceived to exist in some sphere other than space and time. On the other hand, the constituent concepts of a

proposition that is true a priori may all be empirical. If so, it is empirical, not indeed in its propositional significance, but in its cognitive genesis. And when talking of the cast of a conceptual network it is the latter that is important.

The most fundamental explanation of the empirical cast of Akan thought is that the concept of existence has a locative meaning in the Akan language. In truth, this may be the most fundamental aspect of Akan metaphysics and epistemology, and any analyst of Akan thought who grasps this will find that she has to come back to it over and over again in the exposition of that system of thought.

In Akan, to exist is to *wo ho*. Strictly, this means to be there, at some place. Existence, then, is expressly locative in Akan. It might appear that such a notion of existence is too restrictive. How, for example, does one speak of the existence of numbers, if equipped only with a locative concept of existence? It might be suggested further that other languages, such, to be sure, as English, may have begun with such an understanding of existence but have evolved beyond it to a more abstractly endowed conception. The authors of this suggestion might point to the phrase "there is" as a relic of the primeval acceptance. Only a hint at a rapid response will be given here. The suggestion is that metaphorical resources are available in Akan for talking of numbers and other metaphorical entities. If, however, the objection is pressed, Platonically, to the effect that numbers are, though abstract, real entities and must therefore elude such trafficking in metaphor, it would be apparent that the issue has become metaphysical and is no longer just semantical. In that case, there would be at hand, an illustration of how the empirical bent of the Akan language discourages such things as the ontology of abstract entities.

In general, the Akan conceptual framework is inhospitable to entities that are not directly or indirectly accessible to empirical cognition. The forbidden class includes not only abstract entities but also spiritual ones. Belief in abstract entities, though arguably counter to metaphysical good sense, does not, perhaps, automatically run counter to scientific habits of thought, but belief in spiritual entities often does. Thus, for example, some high powered mathematical logicians have believed in "the need for abstract entities in semantic analysis" and this does not appear to have hampered their scientific pursuits. But the very bifurcation of reality into the physical world and the spiritual seems to betray a truncated conception of the reign of law in the workings of the world.

By contrast, the Akan belief in the reign of law is unqualified. One of the most famous quotes from the Akan repertoire of drum texts says that "The creator

created death and death killed him" This is the strongest possible affirmation of the universal operation of law in phenomena. Order, that is, cosmological order, is simply a system of laws, and, as far as laws are concerned, an exception, far from proving them, destroys them. But not even God can destroy a law of existence. Therefore, laws are exceptionless. This seems to be the thought embodied in the drum text. This thought is reinforced by another drum verse asserting the cosmological priority of order. Referring to the process of creation by Odomankoma the Creator , the metaphysical drummer asks, "What did he create?" and answers,

He created Order

He created Knowledge

He created Death

Notice that order comes first. Without order, you have no cosmos, and without the cosmos, there is nothing knowable to be known and no knower to know it. With order comes knowable objects and knowing subjects. The reference to death is a hint at the processes of transformation that characterize phenomena in general and life in particular.

The belief in order, thus showcased in Akan thought is, to say the least, not in conflict with the spirit of scientific inquiry. The matter may be seen in even stronger light if it is noted that the Akan conception of order is a causal one. That all events are caused is among the commonest sayings among the Akans. This uniform operation of causality is perceived in both human action and non human events. Explanation of phenomena, then, is, generally, of a causal character and couched in a conceptual framework that is empirical in constitution.

In view of the foregoing, it is not surprising that African cultures are not at all short on observational knowledge. The Akans, for example, are known to have had a measure of technology which, while not spectacular, was still not inconsiderable. For the purposes of war they devised usable weapons, and for the purposes of peace some artifacts pleasing in themselves and others useful in a variety of ways. Abraham notes that "The Akan had iron and steel enterprises. Iron and steel implements have been discovered; and the sites of some foundries have also been unearthed They had precious metal ornaments, and their artistry and skill in the treatment of gold and jewelry impressed the early European visitors." These accomplishments presupposed a good deal of careful observation and some experimentation. This fact is even more evident in the case of traditional medicine, which, as Abraham also notes, reached in pre colonial times "a high degree of efficacy" loc. cit . This observation applies to

the Yoruba with an especial clarity. It is difficult, in fact, to think of an African culture to which it does not apply.

Nevertheless, the question remains alive, why was science not developed to great heights at the time of the fateful encounters between Africa and her eventual colonizers? An explanation that might seem plausible is that African cultures were excessively focused on spiritistic beliefs. Spiritistic beliefs are those that explain things in terms of the activities of spirits, such as the ancestors, and agencies, such as witchcraft. Such habits of mind, on this showing, are a substantial impediment to the cultivation of scientific inquiry.

It is true that spiritistic explanations are a commonplace in African culture. It must be conceded, furthermore, that such explanations are not scientific. This circumstance, however, cannot explain the slow progress of science in Africa, because in those places in the West where science is highly developed, spiritistic beliefs were historically rampant and are even to this day quite widespread. Moreover, in addition to a considerable component of spiritistic thinking in Western cultures, there is a large element of spiritual beliefs. The availability of scientific explanations can frequently nullify spiritistic ones; but spiritual beliefs are quite intractable in the face of scientific criticism.

Spiritistic entities are those that are conceived, as far as imagery is concerned, in physical terms but are supposed to be exempt from some of the ordinary laws of dynamics. Ghosts, for example are spiritistic entities. They are supposed to be visible on occasion and they come clad in white raiment. But they cannot, according to believers, be pinned down and are reputed to be capable of disappearing at will. We might more generally call such entities quasi physical.

Belief in quasi physical entities is encountered both in Africa and the West. Because, however, of the empirical character of thought systems such as that of the Akans, spiritual conceptions do not belong in them. One should, in this connection, resist the temptation to describe spirits in the quasi material sense i.e. spiritistic entities as spiritual. They are not; they are in conception, largely physical. Spiritual entities are supposed to be totally non physical, immaterial. Accordingly, they are inaccessible to scientific probing. Such conceptions are, to repeat, absent from Akan thinking. In this matter, then, one might antecedently, have expected Akan thought, for instance, to be more scientifically inclined than well known Western cultures. What this means is simply that the appeal to a supposed African fixation on "spirits" cannot explain the state of science in traditional African culture.

A more plausible explanation is this. There are, indeed, demonstrations of observational and experimental skills in traditional African cultures, but science is not just observational and experimental; it is also mathematical. Now, if a culture does not habitually rely on writing, the chances of developing and sustaining the mathematicization of knowledge are low. Although indigenous systems of writing are reported in various African cultures, writing does not seem to have become a way of life among a large enough proportion of their populations. Actually "large enough" need not be very large, for in those cultures that have gone far in science the achievement has depended on quite a small number of individuals.

These reflections raise a still deeper question: Why did writing not become a way of life among the appropriate groups in the African cultures in question? We cannot now avoid openly resorting to speculation. External historical causes cannot be ruled out, but an internal consideration that may be part of the explanation, as far as Akan culture is concerned, is this. This culture abounds in art motifs that individually encapsulate whole philosophies. On the other hand, to use writing in embodying these thoughts in communicable forms one has to start with elements that are not immediately meaningful and combine them in various ways in order to begin to be expressive. A mentality that is impatient for meaning and gifted with art and wit may prefer the direct avenue of an art motif. Whether this speculation is plausible with respect to the Akans, not to talk of the Yoruba and other African peoples is a fair question. There is, however, no doubt that the situation of science in Yoruba culture bears remarkable analogies to that in Akan culture, although the Yoruba case has its own rich individuality. This is demonstrated by the discussion below.

II. SCIENCE AND YORUBA CULTURE

The point of the research project on African Thought/Philosophy undertaken by Barry Hallen and J. Olubi Sodipo, was to apply the techniques of what has become known as ordinary language philosophy to the discourse of the Yoruba of southwestern Nigeria. The Yoruba vocabulary or fields of discourse preselected as of particular interest were those relevant to three primary foci of academic philosophy: epistemology or the theory of knowledge, ethics and aesthetics, and the philosophy of the natural world. The primary sources for information about this vocabulary and the forms of discourse in which it occurred on the ordinary, everyday level were individualized discussions over a 10+ year period with Yoruba onisegun

once stigmatized as 'witch doctors', but best regarded as herbalists or alternative medical doctors in a single town in the Ekiti region of Yorubaland.

In Western epistemological theory the most problematic and controversial sub category of information is what has come to be known as propositional knowledge. Generally this is associated with information in written or oral propositional sentential form that is supposed to be knowledge and therefore believed as well as true, but which the individual recipient is in no position to test or to verify. When one reflects upon what a member of Western society may 'learn' in the course of a lifetime, it becomes clear that most people's 'knowledge' consists of information they will never ever be in a position to confirm in a firsthand or direct manner. What they 'find out' from a history book, 'see' via the evening news on television, or 'confirm' about a natural law on the basis of one elementary experiment in a high school physics laboratory ó all could be and sometimes are! subject to error, distortion or outright fabrication.

Propositional knowledge is therefore generally characterized as secondhand, as information that cannot be tested or proven in a decisive manner by most people and therefore has to be accepted as true because it 'agrees' with common sense or because it 'corresponds' to or 'coheres' with the very limited amount of information that people are able to test and confirm in a firsthand or direct manner. Exactly how this coherence or correspondence is to be defined and ascertained is still a subject of endless wrangling in Western epistemological theory. What is relevant to the present discussion is that this wrangling is evidence of the intellectual concern and discomfort in academic parlance it becomes one of the 'problems' of philosophy on the part of Western philosophers about the weak evidential basis of so much of the information that people in that culture are conditioned to regard as knowledge, as true.

The distinction made in Yoruba language culture between "imo" putative 'knowledge' and "igbagbo" putative 'belief' reflects a similar concern about the evidential status of firsthand versus secondhand information. Persons are said to "mo" to 'know' or to have "imo" 'knowledge' only of experience they have witnessed in a firsthand or personal manner. The example most frequently cited by discussants, virtually as a paradigm, is visual perception of a scene or an event as it is taking place. "Imo" is said to apply to sensory perception generally, even if what may be experienced directly by touch is more limited than is the case with perception.

"Imo" implies a good deal more than mere sensation, of course. Perception implies cognition as well, meaning that persons concerned must comprehend that

and what they are experiencing. The terms "ooto"/"otito" are associated with "imo" in certain respects that parallel the manner in which "true"/"truth" or "certain"/"certainty" are paired with "know"/"knowledge" in the English language. In the English language "truth" is principally a property of propositional knowledge, of statements human beings make about something. While in Yoruba "ooto" may be a property of both propositions and certain forms of experience.

The noun "igbagbo" and its verb form "gbagbo" arises from the conflation of "gba" and "gbo." The two components are themselves verbs, the former conventionally translated into English as "received" or "agreed to," and the latter as "heard" or "understood." Yoruba linguistic conventions suggest that treating this complex term as a synthesis of the English language "understood" in the sense of cognitive comprehension and of "agreed to" in the sense of affirming or accepting new information one comprehends as part of one's own store of secondhand information is perhaps the best way to render its core meaning. Igbagbo encompasses what one is not able to see for oneself or to experience in a direct, firsthand manner. For the most part this involves things we are told about or informed of; this is the most conventional sense of 'information' by others.

What makes it different from the English language "believe"/"belief" is that igbagbo apparently applies to everything that may be construed as secondhand information. This would apply to most of what in English language culture is regarded as propositional knowledge: the things one is taught in the course of a formal education, what one learns from books, from other people and, of particular interest in the special case of the Yoruba, from oral traditions. While English language culture decrees that propositional or secondhand information, since classified as 'knowledge', should be accepted as true, Yoruba usage is equally insistent that, since classified as igbagbo 'putative belief', it can only be accepted as possible to see.

The cross cultural ramifications of these differing viewpoints on the truth status of propositional or secondhand knowledge are worth considering. Yoruba language speakers would likely regard members of English language culture, who are willing to assign so much certainty to and put so much trust in information that they can never test or verify, as dangerously naive and perhaps even ignorant. While members of English language culture might criticize their Yoruba counterparts' identification of optimal knowledge with 'you can only know what you can see' as indicative of a people who have yet to discover the benefits of institutionalized knowledge and formal education.

From a more specifically Western philosophical perspective, two of the three criteria stipulated by the standard definition of propositional secondhand knowledge as "justified true belief" need not apply to "mo"/"imo." Supplemental forms of reliable evidence are not needed to confirm firsthand experience, and it would be nonsensical to insist that one must have secondhand information to back up what one already has knowledge of firsthand.

The criteria that define the respective extents of and the interrelations between imo and igbagbo stipulate that any experience or information which is not firsthand, personal and direct must by definition fall under the heading of igbagbo. The sense of igbagbo may therefore be paraphrased as "comprehending, and deciding to accept as possible as 'possibly true' rather than as 'true', information that one receives in a secondhand manner." Imo firsthand experience and igbagbo information gained on the basis of secondhand experience together would then exhaust all of the conventional information that human beings have at their disposal. If and when my imo is challenged by other persons who have not undergone a similar firsthand experience and who therefore doubt what I say I actually saw happen, the best way to convince them would be to arrange for some kind of test whereby they will be able to see the thing happen for themselves. If I cannot arrange for this kind of direct testing, the next best I can do is to ask any others who may have personally witnessed my own or a similar experience to come forward and testify. In this case my firsthand experience cannot become the challengers' own imo, but if they are influenced by the combined testimony they may decide to 'believe' me/us and accept the information on a secondhand basis, as igbagbo.

A simple example may serve to clarify things. If I claim I have seen for myself imo that a certain friend drives a specific make and model of car and another friend challenges my claim, the best way to resolve the dispute is to visit the friend and see imo what kind of car she actually has. If the friend lives a thousand miles away, a more practical solution would be to ask other mutual friends who have seen imo the car themselves to tell us igbagbo what kind it is. Or perhaps to telephone my friend direct and ask her to tell us igbagbo what kind of car she is driving.

If and when my igbagbo is challenged by another person, again the best solution would be to arrange some form of empirical test. In this case since this is information I myself only know secondhand, the most reliable solution for all concerned would be to test it directly, so that the information would progress from being igbagbo to being imo for all concerned, myself included. Next best would again be to call upon all relevant witnesses who may have heard the same or similar

secondhand information *igbagbo* or, even more definitively, have firsthand *imo* experience of what I can only claim to know on a secondhand *igbagbo* basis.

When agreement or a consensus among disputants is reached on the level of *igbagbo*, the applicable term comparable to the role of "truth" with reference to knowledge, or of "oto" with regards to *imo* is "papo," which may be rendered colloquially as 'the words have come together'. The antecedent process of testimony, discussion and reflection on the basis of which the consensus is reached is described as "nwadi" an expression whose meaning may be compared to the English language 'let's get to the bottom of this matter'.

A suitably modified version of our simple example may also be helpful here. Although I myself have not seen it, I have heard *igbagbo* that a friend drives a specific make and model of car. If another friend disputes my *igbagbo*, the best way to resolve the dispute would be for both of us to go there and see for ourselves *imo* what kind of a car the friend actually drives. If the friend lives a thousand miles away, a more practical solution would be for us to ask other mutual friends to tell us *igbagbo* + *nwadi* what kind of car they have seen *imo* or heard *igbagbo* that she drives. Or perhaps to telephone the friend direct and ask her to tell us *igbagbo* what kind of car she is driving.

The system that emerges from these criteria appears to be three tiered. *Imo* is the sole category of experience or of propositions entitled to be regarded as certain and as true *oto*. *Igbagbo* that is in principle open to empirical testing, verification, and thereby transformed into *imo* *oto* is the next best. *Igbagbo* that can never be verified and can only be evaluated on the basis of testimony, explanation, discussion and reflection *nwadi* is the least certain.

The significance of all this for cross cultural understanding and comparisons is complex. The most obvious and perhaps important point is that Yoruba discourse does employ explicit terminology and systematic criteria for the evaluation of any type of information. The criteria involved are also emphatically empirical. These are priorities to which African systems of thought were once said not to attach special importance. Their most important knowledge was said to be preserved in the form of oral tradition, which could encompass anything from medicinal recipes to children's stories. The bias against tradition has always been epistemological ó its questionable reliability as a source of and justification for knowledge. What was said to be distinctive about African oral traditions was the relatively uncritical manner in which they were inherited from the past, preserved in the present, and passed on to future generations. So regarded, traditions resembled 'rules' governing the 'game of

life' that determined in a relatively absolute manner what Africans believed and how they behaved, and which they therefore had no intellectual incentive to articulate, explain, and certainly not to challenge.

One problem for this admittedly simplified portrait of the African intellectual attitude towards tradition is that it is contradicted by the manner in which the Yoruba employ "mo" and "gbagbo" in discourse. If my grandfather tells me that he knows the recipe for a potent headache medicine that he in turn learned from his grandfather, and teaches it to me ó this exchange of information would still be on the level of igbagbo, of secondhand information. I could not be said to have imo of this medicine as medicine until I myself had prepared it, administered it to someone, and witnessed its curative powers.

The same would hold for other traditions inherited from the past. Whether a military strategy or an agricultural technique, a tradition only deserves to remain as a tradition if it proves effective, if it does what it is supposed to do. Until this has been proven in a direct and personal manner its empirical status can be no more than hypothetical, something that may possibly be true or false and therefore must be classed as igbagbo.

The ethical or moral ramifications of this discussion of Yoruba epistemology become evident once one recognizes that the primary source of propositional or secondhand information in a significantly oral culture is other persons. For, if that is the case, knowledge of those other persons' moral characters iwa ó their honesty, their reliability as sources of information ó becomes a fundamental criterion to evaluating the reliability of secondhand information obtained from them.

Knowledge of another person's moral character is said to be obtained, most reliably, from observing firsthand their behavior isesi . And in Yoruba discourse 'behavior' conventionally extends to 'what they say' and 'what they do', which also pretty much corresponds to the standard Western notions of verbal and non verbal behavior. What is again in evidence here is the priority the Yoruba place upon hard empirical evidence, upon only being able to "know" what you witness in a firsthand manner. For the point is that a person's verbal and non verbal behavior are construed as firsthand evidence imo of their moral character iwa .

The onisegun would also refer to character iwa when speaking of a natural or human made object, but when this occurred there was an interesting shift in the criteria governing usage of the term. The character iwa of the natural or human made was measured or valued on the basis of its utility, its usefulness, to human beings. In other words, character iwa is determined by viewing the natural or the

human made from the standpoint of the human community and valuing it on the basis of its usefulness to that community. The word "iwa" is, therefore, no longer being used in the conventional sense of a thing's moral character, as was the case with human beings. Iwa still has something to do with a thing's character, but now it is character as defined and determined on the basis of a pragmatic criterion of a thing's utility to human society in general or to individuals dealing with a specific situation

Needless to say, a person's moral character *iwa* is not as readily observable as everyday material objects, such as a tree or a table. Obviously a process of inference is involved in order to move from observing a multiplicity of individual actions to a generalization about character. But with specific reference to epistemological concerns of the person as a source of reliable secondhand information of the interplay between knowledge *imo* and belief *igbagbo* appears to be as follows. On the basis of a number of specific previous occasions when you have had the opportunity, firsthand *imo*, to verify the truth *ooto* of a person's statements, you are justified in using those firsthand experiences as the basis for a generalization about their moral character. This generalization may then serve as a kind of character reference for evaluating the reliability of future statements made by this same person but, strictly speaking, such evaluations must remain hypothetical or tentative until also confirmed in a firsthand manner.

What the overall process appears to involve is a kind of sliding scale for gauging varying degrees of epistemic certainty about the moral characters of and/or information provided by other persons. Those you have associated with directly and therefore have had ample opportunity to observe in a firsthand manner are those whose character you are in a position to know best, and thereby to judge whether information of which they are the source is likely to be reliable or unreliable. Those you have not associated with at all and therefore have had no opportunity to observe in a firsthand manner or even to have heard at least something about in a secondhand manner are those whose character you do not know, and thereby have no substantive basis on which to judge whether information of which they are the source is likely to be reliable or unreliable.

A person who makes an informative statement may be obliged to recount the precise circumstances in which he or she came by it. A person is expected to say whether there is any cause for uncertainty or imprecision about the information. Determining whether the information is derived from the speaker's firsthand *imo* or secondhand *igbagbo* experience is part of this process. A person's diligence in

doing all of this also is considered important evidence of their moral character *iwa* . With specific reference to this interplay between the epistemic and the ethical that has been designated "moral epistemology," at least four positive behavioral values are emphasized: 1 being scrupulous about identifying the epistemological basis for whatever one claims to know, to believe, or to have no information about; 2 being a good listener, with the emphasis upon cognitive understanding rather than a polite and respectful demeanor; 3 being a good speaker, with the emphasis upon speaking in a positive, thoughtful, and perceptive manner rather than mere elocution; 4 having patience, with the emphasis upon being calm and self controlled in judgment and intellect rather than merely in manner and demeanor.

The public in Western societies have become concerned about exercising control over the quality of information put out by the media. In a significantly oral culture the media are people's mouths. These four values, in effect, set broadcasting standards for those mouths. 'Speaking well' and 'hearing well', as values, further reinforce the importance of providing accurate information or reliable advice, and being forthright about the epistemological origins of that information and advice. A consciousness that cultivates 'patience', especially in difficult or problematic situations, is more likely to maintain self control and thereby optimal communication with its environment. 'Speaking well', 'hearing well', and 'patience' are not, then, moral values in any conventional sense. They are rather epistemological virtues because of their instrumental value for promoting the accuracy of information based, essentially, upon critical empirical observation.

Given the preceding, it should be understandable that the ensuing discussion of 'science' in the indigenous 'African' context must begin from vested conceptual interests. Presuming a non controversial and satisfactorily vague working definition of "science" as: the formal including conceptual and empirical study of the world, when considering a selection of relevant Yoruba discourse it makes sense to begin with the kinds of things one is able to 'know' about that world, and what it is about the nature of those things that such knowledge reveals.

"Nature" or the "natural" side of such things will be privileged here because, when Hallen and Sodipo first outlined a projected trilogy devoted to Yoruba philosophy, the order set out was that the first volume would concentrate on epistemology reference the preceding discussion of the status of firsthand versus secondhand information . The second volume was then to see how those epistemic criteria apply to how and what one is able to 'know' about one's own and other persons' moral or immoral characters ethics , as well as whether and how one may

ëknow' beauty ewa ó aesthetics . Finally, the third volume was to focus on what was then envisioned as a Yoruba philosophy of the natural world.

With hindsight it is not at all evident that the sense attributed to the word "natural" at the time was clearly stipulated, apart from the banality that it was somehow meant to encompass 'everything else'. Frankly, coming to detailed terms with the contents of the third volume of what was then only a projected trilogy seemed a fairly distant prospect. Presumably it meant the physical world exclusive of human beings. That kind of orientation, therefore, eventually formed the basis for a series of relevant discussions with the onisegun, and that therefore is what you must receive here today as one very limited example of an ordinary language approach to some ideas relevant to 'Western' science in the Yoruba context. But be forewarned that, while those first two volumes have been written and published, work on the third is only just about to begin. And that, on the basis of past experience, it takes approximately four to five years to produce a single volume. Therefore it should be obvious that, at this point, most of the generalizations about to be hazarded regarding Yoruba discourse are uncomfortably hasty and resoundingly tentative in nature.

It makes good sense to begin with the straightforward question of whether there is a Yoruba word that may serve as a secure counterpart to the English language "nature"? At this point, for purposes of this very preliminary presentation, it is not at all clear that there is. But a possible Yoruba candidate that would make the trilogy truly symphonic ó even cyclic and epic in the Wagnerian sense ó would be a more expansive meaning of "iwa," the term in the second volume that was said to be used to refer to the moral or immoral nature of a person, or of a thing when rating its utility to human beings.

Those familiar with Yoruba discourse may complain that this term is too intimately associated with the moral ramifications of human behavior, and therefore it would be a violation of ordinary usage as well as ordinary language philosophy to less than scrupulously yank it out of such a rich field of discourse and plunk it down in a comparatively barren, not even adjoining, field to orchestrate this final portion of the saga in a euphonious manner.

Perhaps. But there are also some deliciously, enticingly, tantalizingly apropos uses of the term "iwa" in the discussions about the 'natural' world with the onisegun that make this a wishful thought that may deserve further analysis. What those usages seem to indicate is that natural phenomena themselves are structured and have an order to them that was and is imposed by their Creator ó the Supreme Deity

ó Olorun in his role as the Eleda. The onisegun were not reassuring when it came to the issue of whether human beings can discover or understand why they and the world were/are created the way they were/are. But just as human beings are said to attribute iwa to an object based on its utility or usefulness to human beings, the presumption clearly articulated by the onisegun is that we and the world which we cannot perhaps ever fully understand were/are created as such because this is what the Supreme Deity found useful to it. In other words that, in a sense, the whole of creation ourselves included itself is presumed to be viewed by that deity as something that has iwa ó that is useful for whatever purposes it had/has in mind.

What this would also mean is that the various phenomena ourselves included that constitute that world can be characterized, indeed recognized, on the basis of certain predictable forms of behavior ó sort of a 'this is the way the world works' view. Such 'works' are neither moral or immoral from a strictly human point of view. They are those more or less extra human things or forces with which we must contend. But it is these distinctive traits that constitute their distinctive nature, character or iwa ó that make them 'be' what they are. And this is not so different from the English language "nature" if taken to mean "the collective phenomena of the world or universe, including or excluding humans Coates 1998, 3."

Another noteworthy expression that frequently crops up in the discussions about the natural world is "ase Olorun." "Ase" is usually translated into English as "order" or "command," so the expression as a whole conveys a meaning that might seem akin to the Christian "will of God." But this could easily become a misrepresentation if taken to be indicative of a mentality comparable to the fatalism sometimes popularly associated with the Muslim "the will of Allah." For the contexts in which this expression occurs in discussions with reference to the natural world would seem to indicate a meaning closer to something like natural law ó regularities in the created world that imbue it with structure and order.

For example, lightning as a sign ami of rain Os 5 , that different life forms are suited for different environments Os 14 , that different life forms cannot literally change into one another Os 21 , that human beings are able to transform the 'natural' world into environments more or less conducive to human habitation Os 21 , that human beings are able so successfully to dominate other life forms Aj 15 , that human beings have the ability to talk/speak/communicate Fab 11 , the regular rising and setting of the sun Fap 1 , that lightning has the ability to cause a fire Fap

4 , the order of the seasons Fab 4 , and so forth. All of these were mentioned as examples of the ase Olorun.

Two other terms deserve at least brief mention because of their apparent importance to discourse about the 'natural' world. They are "agbara" and "ami." Agbara is conventionally translated as "power" or "force." With reference to the natural world, it appears to indicate the energy or powers latent or internal to phenomena that make them distinctive. In other words, the relation between Olorun/Eleda and the created world is not that of his being the constant conductor of some magnificent orchestra. Rather, that world contains a wide variety of phenomena that, as created, have internal to them the powers or forces that are characteristic of their 'nature' iwa . In this sense one could also refer to the distinctive powers of human nature, as well as of the different sexes.

"Ami," on the other hand, is apparently used to refer to the causal elements that link the forces of different natural phenomena, many of which can be learned via empirical observation by all sentient creatures. Conventionally this term has been translated as "sign," but what is important here is that its meaning be taken as more than purely phenomenal in some simplistically sequential sense, so that the fact that thunder is preceded by lightning, or that human beings can talk, for example, are regarded as the consequences of substantive causal relations.

BIBLIOGRAPHY

- Beattie, John. 1973. "Understanding Traditional African Religion: A Comment on Horton." *Second Order: An African Journal of Philosophy* 2/2: 3 11.
- Bello, A. G. A. ??? "Methods and Systematic Reflections." *Journal of Ultimate Reality and Meaning* ???: 53 69.
- Dennis, Carolyne. 1972. "Scientific Explanation and Common Sense." *Second Order: An African Journal of Philosophy* 1/1: 53 65.
- Emmet, Dorothy. 1972. "Haunted Universes." *Second Order: An African Journal of Philosophy*, 1/1: 34 42.
- Ezeabasili, Nwankwo. 1977. *African Science: Myth or Reality*. New York, Washington, Atlanta, Hollywood: Vantage Press.
- Finch, Charles S. 1990. *The African Background to Medical Science: Essays on African History, Science & Civilizations*. London: Karnak House.
- Hallen, Barry. 1995. "Indeterminacy, Ethnophilosophy, Linguistic Philosophy, African Philosophy." *Philosophy* 70, no. 273: 377 393.
- . 1996. "Analytic Philosophy and Traditional Thought: A Critique of Robin Horton." In *African Philosophy: A Classical Approach*, edited by P. English and K. M. Kalumba, 216 228. Englewood Cliffs, N.J.: Prentice Hall.
- . 1997. "African Meanings, Western Words." *African Studies Review* 40, no 1: 1 11.
- . 2000. *The Good, the Bad, and the Beautiful: Discourse About Values in Yoruba Culture*. Bloomington and Indianapolis: Indiana University Press.

- . 2002. *A Short History of African Philosophy*. Bloomington and Indianapolis: Indiana University Press.
- Hallen, Barry and J. Olubi Sodipo. 1997. *Knowledge, Belief, and Witchcraft: Analytic Experiments in African Philosophy*. Rev. ed. with a new Foreword by W. V. O. Quine and a new Afterword by Barry Hallen. Stanford: Stanford University Press.
- Harding, Sandra. 1997. "Is Modern Science an Ethnoscience? Rethinking Epistemological Assumptions." In *Postcolonial African Philosophy: A Critical Reader*, edited by E. C. Eze, 46 70. Malden, Mass. and Oxford: Oxford University Press.
- Horton, Robin 1964. "Ritual Man in Africa." *Africa* 34/2 April : 85 102.
- . 1967. "African Traditional Thought and Western Science." *Africa* 37, nos. 1 2: 50 71 and 155 187. Reprinted in Horton 1993.
- . 1972. "Spiritual Beings and Elementary Particles: A Reply to Mr. Pratt." *Second Order: An African Journal of Philosophy* 1/1: 21 33.
- . 1973a. "Levy Bruhl Among the Scientists: A Reply to Mr. Skorupski." *Second Order: An African Journal of Philosophy* 2/1: 14 30.
- . 1973b. "Paradox and Explanation: A Reply to Mr. Skorupski, Parts I & II." *Philosophy of the Social Sciences* 3, nos. 3 4: 231 256 and 289 312. Reprinted in Horton 1993.
- . 1982. "Tradition and Modernity Revisited." In *Rationality and Relativism*, edited by M. Hollis and S. Lukes, 201 260. Oxford: Blackwell Publishers Ltd. Reprinted in Horton 1993.
- . 1983. "Social Psychologies: African and Western." An essay accompanying the reprint of Meyer Fortes, *Oedipus and Job in West African Religion*, 41 82. Cambridge: Cambridge University Press.
- . 1993. *Patterns of Thought in Africa and the West: Essays on Magic, Religion and Science*. Cambridge: Cambridge University Press.
- Horton, Robin and Ruth Finnegan, eds. 1973. *Modes of Thought*. London: Faber and Faber.
- Huggins, Willis N. and John G. Jackson. 1999. *Introduction to African Civilizations*. Baltimore: Inprint Editions. A reprint of the original 1937 edition.
- Irele, Abiola. 1992. "In Praise of Alienation." In *The Surreptitious Speech*, edited by V. Y. Mudimbe, 201 224. Chicago and London: University of Chicago Press.
- Lienhardt, Godfrey. 1967. "Modes of Thought." In *The Institutions of Primitive Society*, edited by E. Evans Pritchard et. al. Oxford: Blackwell Publishers Ltd.
- Makinde, M. Akin. 1988. *African Philosophy, Culture, and Traditional Medicine*. Athens: Ohio University Press.
- Martin, William G. and Michael O. West, eds. 1999. *Out of One, Many Africas: Reconstructing the Study and Meaning of Africa*. Urbana and Chicago: University of Illinois Press.
- Mosley, Albert. 2000. "Science, Technology and Tradition in Contemporary African Philosophy." *African Philosophy* 13/1 March : 25 32.
- Oelschlaeger, Max. 1991. *The Idea of Wilderness: From Prehistory to the Age of Ecology*. New Haven and London: Princeton University Press.
- Ogunbumni, Supo and Henry Olaitan. 1998. "Elements of Physics in Yoruba Culture, Parts I & II." In *African Philosophy: An Anthology*, edited by E. C. Eze, 163 166 and 167 170. Malden, Mass. and Oxford: Blackwell Publishers Ltd.
- Owomoyela, Oyekan. "Africa and the Imperative of Philosophy: A Skeptical Consideration." *African Studies Review* 30/1 March : 79 99.
- Pratt, Vernon. 1972. "Science and Traditional African Religion." *Second Order: An African Journal of Philosophy* 1/1: 7 20.
- Schmidt, Peter R., ed. 1996. *The Culture and Technology of African Iron Production*. University of Florida Press.

- Selin, Helaine, ed. 1997. *Encyclopedia of the History of Science, Technology, and Medicine in Non Western Cultures*. Dordrecht: Kluwer Academic Publishers.
- Selin, Helaine and Arne Kalland, eds. 2003. *Medicine Across Cultures: History and Practice of Medicine in Non Western Cultures Science Across Cultures*, 3. Dordrecht: Kluwer Academic Publishers
- . 2003. *Nature Across Cultures: Views of Nature and the Environment in Non Western Cultures Science Across Cultures*, 4 . Dordrecht: Kluwer Academic Publishers.
- Skorupski, John. 1973a. "Levy Bruhl Among the Scientists." *Second Order: An African Journal of Philosophy* 2/1: 3 13.
- . 1973b. "Science and Traditional Religious Thought, Parts I & II; Parts III & IV. *Philosophy of the Social Sciences* 3, 97 115 and 209 230.
- Sodipo, J. Olubi. 1972. "Greek Science and Religion." *Second Order: An African Journal of Philosophy* 1/1: 66 76.
- Stich, Stephen. 1990. *The Fragmentation of Reason*. Cambridge, Mass. and London: MIT Press.
- Theron, Stephen. 1995. *Africa, Philosophy and the Western Tradition: An Essay in Self Understanding*. Frankfurt and New York: Peter Lang.*
- Van Sertima, Ivan, ed. 1983. *Blacks in Science: Ancient and Modern*. New Brunswick and London: Transaction Books.
- Verran, Helen. 2001. *Science and an African Logic*. Chicago and London: University of Chicago Press.
- Wiredu, Kwasi. 1976. "How Not to Compare African Thought with Western Thought." *Ch'Indaba* no. 2 July December : 4 8. Reprinted in *African Philosophy: An Introduction*, edited by R. Wright. Washington, D.C.: University Press of America, 1977 and in *African Philosophy: Selected Readings*, edited by Albert G. Mosley. Englewood Cliffs, N.J.: Prentice Hall, 1995.
- . 1980. *Philosophy and an African Culture*. Cambridge and New York: Cambridge University Press.
- . 1985 "The Concept of Truth in the Akan Language." In *Philosophy in Africa: Trends and Perspectives*, edited by P. Bodunrun, 43 54. Ife, Nigeria: University of Ife Press.
- . 1992. "Science, Technology and Humane Values." In *Paths to Human Flourishing: Philosophical Perspectives*. Seoul: Korean Philosophical Association.
- . 1996. "Time and African Thought." In *Time and Temporality in Intercultural Perspectives*, edited by D. Tiemersma and A.E. Oosterling. Amsterdam and Atlanta: Rodopi.
- . 2000. "Our Problem of Knowledge: Brief Reflections on Knowledge and Development in Africa." In *African Philosophy as Cultural Inquiry*, edited by I. Karp and D.A. Masolo, 181 186. Bloomington: Indiana University Press.
- Wilson, Bryan, ed. 1974. *Rationality*. Oxford: Blackwell Publisher Ltd.