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## Binary Synthesis, Epistemic Naturalism and Subjectivities: Perspectives for Understanding Gender, Science and Technology in Africa

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### **Introduction**

CODESRIA's 2003 Gender Institute on Gender, Science and Technology was an exceedingly important one. Science and technology have, for more than three hundred years, been the most important factors shaping the modern world. In the process, they have revolutionised gender relations in both the home and the workplace. As Alvin Toffler (1999:9) notes, 'the most important economic development of our lifetime has been the rise of a new system for creating wealth, based no longer on muscle but on mind.' A new knowledge system came into being, resulting from the study and practice of science and technology. Before Toffler, Shirley Burggraf (1997) had written:

Two hundred years is just a blink in evolutionary time, but within two centuries, we have developed from a frontier economy in which women were dependent on men for economic and physical survival (hunting, tilling the land, fighting) to an industrial economy with care taking, clerical, retail, and processing jobs at which women could support themselves at a low level but were still dependent on man for earning better wages and for fighting wars, to a post industrial economy based on knowledge, information, and service skills at which women seem to be as naturally adept as men.

In spite of this major and irreversible development in the social division of labour along gender lines, the momentous revulsion over gender inequity felt by Western feminists has continued to be steadily and increasingly stimulated since at least the

mid-twentieth century. Consequently, gender and feminist studies, which easily slide into one another, have been appositional, adversarial, robustly political and therefore power-driven, especially in the West.

The intention of the CODESRIA 2003 Gender Institute to interrogate the role of women in science and technology in Africa can best be understood against this background. This is why this paper already situates itself in a doubleness of relation to the other: first, to the role of women in science and technology as, for instance, against that of men; and second, to the role of women in S&T in Africa as against that of women in S&T in the West. Both issues connote some essentialisation and homogenisation of women in S&T at the same time as they highlight differences on a global scale, where they exist, and subvert the idea of the fundamental sameness of the human species, that is, the elements that make both men and women human. Admittedly, gender studies, as already suggested, announce themselves as partial, but this partiality need not be seen in adversarial and binary oppositions, as is the case in West.

For this reason, the perspective I want to bring to bear in this paper is that of binary synthesis, of complementary dualities, which, among the Igbo of Southeastern Nigerian, for example, depict an ontological order that displays the mutual co-existence of things that are as they are. This perspective is necessary for gender studies in Africa so that scholarship in the area, while not legitimating any inequitable gender relations, does not spawn the unwarranted antinomies, binary oppositions and adversarial politics that have bedeviled gender scholarship in the west. Consequently, the paper draws inspiration from the Igbo ontological view of existence in which all beings need one another in a harmonious relationship, in which nature is seen as a model for technological development and in which ordered subjectivities are framed on the notions of autonomy and individuation rather than on gender. These notions are respectively spelt out in the three parts of this paper.

Part 1, Binary Synthesis, Gender, and Existence among the Igbo, deals with the Igbo notion that *ife di abuo abuo; nkaa kwulu, nkaa akwudebe ya* ('Things exist in twos; when one thing stands, the other stands beside it'). Part 2, Epistemic Naturalism in Science and Technology among the Traditional Igbo, examines the concept expressed in the proverb *okpu uzu lee egbe anya na-odu* ('Let a would-be smith look at the tail of the kite'). Part 3, Subjectivities and Gender Relations Among the Traditional Igbo, focuses on the Igbo saying *one an nke ya, onye na nke ya* ('Each person to his or her abilities'). The term 'epistemic naturalism' deserves some explanatory remarks. In using this term, I draw inspiration from three philosophical doctrines: foundationalism, naturalism and naturalised epistemology. I use the term as both a model of learning and as the name of a concept that makes knowledge and its transformation possible by making nature the norm and source of amassing knowledge that can be used to design and manufacture instruments that enhance human productivity. The methodology adopted in this paper is largely 'archival' and interpretive. By archival in this context, I mean going back to folklore, particularly as represented by proverbs, in order to use this knowledge as a site for the retrieval of cultural memory. The

proverbs that are ‘mined’ in the process serve as quasi-theoretical postulates that share in the contestation to stabilise the world by offering certain principled statements about the way the world is. As forms that posit and at the same time share in the contestation for meanings, they make themselves subject to and available for interpretation. In using the archival and interpretive method, I follow a path trodden by many social scientists and literary scholars. In the specific area of gender and feminist research, I follow the examples of Mary Daly, Clarisa Pinkola Estes, M. Esther Harding and Charlene Spretnak, to name just a few who have drawn extensively from myths, legends and folktales in their works.

Let me begin with an act of transgression constructed to typify the Igbo understanding of binary synthesis. Among the Igbo of Southeastern Nigeria, the tradition of kolanut breaking, along with its accompanying ritual, has long become anecdotal. In the process, such widely accepted statements that are often preparatory, even apologetic, have evolved. Two outstanding examples of such statements are: ‘he who brings kola brings life’ and ‘kolanut does not understand English’. The latter is uttered by way of apology and deference to the use of the Igbo language when the kolanut is being broken in a multi-lingual setting (Opata 1988). The act of transgression that I want to commit lies in my use of English to perform this ritual. I will be offending the ancestors of Senegal, whose language is not Igbo, but as the act is not committed within Igbo land, I feel confident that when I get back home, I will settle the matter with my ancestors.

*The Act of Transgression*

*Our people say that he who brings kola brings life.*

*Oh God, come and take Kola!*

*The land of Senegal, come and take kola*

*The land of Nigeria, come and take kola*

*The land of Africa, come and take kola*

*All land come and take kola; for all land is one*

*Human beings responsible for assigning some parts to some people.*

*Let the Sky come and take kola, and let the Earth come and take kola*

*Let there be life abundant for what is up, and let there be life abundant for what is below*

*Let man live, let woman live*

*Let there be life for fish, let there be life for water*

*Let the kite perch and let the eagle perch, the one that says no to the other may its wings break*

*The person who has come to our place, let him not bring us bad luck; when he departs, may he not grow hunchback*

*Let our life be blessed, and let the life of those that come after us be more blessed*

*Let what we will eat come, let what will kill us depart*  
*We have come to Dakar in peace, we shall go in peace.*  
*Let CODESRIA live, let the participants of the 2003 Gender Institute live*  
*In this Institute, we shall encounter no evil spirits; we shall encounter no evil people*  
*If what will destroy us is behind, let us be in front; if it is in front, let us be behind*  
*What we meet in Dakar that is good, we shall take home; what is bad in*  
*Dakar we shall leave behind us*  
*All this we ask in God's name*

This act of transgression is not really new. It is something that must be done in the service of scholarship. Chike Aniakor (1979) did a similar thing, thus:

*Ancestors take kola*  
*We are only children who wash ourselves around the belly*  
*Give us life*  
*Give us children*  
*Give us wealth*  
*With which to raise our children*  
*Let the kite perch*  
*Let the eagle perch*  
*Any that says no*  
*Let the wings be clipped*  
*If one says yes, the Gods echo their support.*

The principle of complementary duality is evident in the text, but Aniakor's analysis goes to point out that if one has life, one has need for children, if the kite perches, the eagle shall also have a perching space, etc. One thing stands in relation to another. This is what foregrounds binary synthesis among the Igbo.

### **Binary Synthesis in the Igbo Worldview**

The acts of transgression just depicted represents the fundamental Igbo orientation to life, capturing the idea of binary synthesis or complementary dualities so evident in Igbo life and thought. The fact that this ritual takes place, in a more or less elaborate form depending on the context, each time kola is broken among the Igbo serves not only to propagate the tradition but also to reinforce its importance, especially among the younger generation. This fundamental perspective is best captured in the Igbo proverb *ife di abuo abuo, nkaa kwulu, nkaa akwudebe ya*, meaning 'things exist in twos; when one thing stands another stands besides it'. This proverb is further strengthened by another proverb to the effect that 'what is one is a finished

thing' (*ife di naa gwuru agwu*). Any kolanut that has no lobes is thrown away as an evil object. Any hen that hatches only one chick is killed along with its young. The simple reason is that such occurrences break the ontological perception of the Igbo about the nature of existence.

In a seminal work, *After God Is Dibia: Igbo Cosmology, Healing, Divination and Sacred Science in Nigeria* (1997), J. A. Umeh explains that the number one is the unique attribute of God, whereas the number two represents *okwu na abo chukwu kwulu*, i.e., 'the two words known by God'. According to Umeh, the Igbo give a more detailed explanation of the two spoken words of God in the following manner:

*Nwoke na nwanyi* (men and woman/male and female)

*Onwu na ndu* (death and life)

*Oku na mmili* (fire and water/energy and liquid)

*Uchichi na eshishe/efife* (day and night).

*Kpakpando di n enu na aja di n'ana/kpakpando na aja di n' ana*

(stars above and sand on the ground)

*Enu na ana* (heaven and earth/up and down/sky and ground/above and below).

*Oso na ije* (running and walking).

*Ula na imu anya* (sleeping and being awake)

*Obele na nnukwu/ukwu na nta* (tall and short).

*Ocha na oji* (white and black).

*Ji na ede* (yam and coco-yam)

*Be mmuo na be mmadu* (spirit home and human world).

*Nnu na ose* (salt and pepper).

And so on to infinity, pairings continuing without end.

It is no surprise, therefore, that this complementary duality cannot but frame the way the Igbo think about all facets of existence. Umeh, a Professor of Estate Management but also chief priest to the Idemili shrine in Nobi, Southeastern Nigeria, a diviner and herbalist, adds an explanatory note to these endless pairings:

[T]he number 2 is encapsulated in the Igbo mystical idiom of 'the two words of God', namely *eeye/Aa* (yes) and *ee - ehimba* (no). It is only human beings that add a third word namely: *Ee - ee - eh* (yes and no or yes-no), which introduces obscurity, falsehood, deception, fraud and other evils' (1997:34).

While not wishing to challenge Umeh's mystical insight, for which I have no competence, I would add that human beings' addition of a third word is an indication of human limitations, of the inability to make definitive statements that can only emanate from God. This would also seem to account for the conceptual emphasis on

complementary dualities rather than on binary oppositions, because limited human knowledge is best understood within the notion of complementarities rather than oppositions. One can conclude by noting that Umezina and Animalu (1988), along with others, have also observed the pervading sense of binary synthesis or complementary dualities among the Igbo.

A very important principle, which results from this overarching sense of complementary duality among the Igbo, is that of connectedness. The principle of connectedness among things (existents) ensures that some type of synergy resulting from the natural release and correspondent absorption of energy by existents takes place. Trouble starts when the kite perches but refuses the eagle a perching space, when the kite, in other words, occupies more space than its size and needs require, thereby encroaching on the perching space of the eagle. It is in order to avoid such trouble that the principle of accommodation becomes not only necessary but also a guiding principle of living among the Igbo.

### The Place of Gender Within the Igbo Worldview

One of the creation accounts in Genesis talks of how God created male and female. Among the Igbo, things that exist in the world are posited as *oke na nne*, that is, male and female. Any creature that is neither male nor female is abominable, although male creatures can be castrated and lose their maleness. Even plants exist as male or female. The famous Igbo kola also has male and female lobes. Musical instruments have male and female counterparts. Natural phenomena like rain and sunlight are also described in male and female terms. It is interesting to note, however, that *oke and nne* are not only denotative but also connotative. Thus, *oke* also means 'great', while *nne* can also mean 'caring'. Let us look at the following examples:

<i>oke mmadu</i>	great human being
<i>oke nwanji</i>	great woman
<i>oke mmili</i>	heavy rain/great rain
<i>oke annu</i>	severe drought
<i>oke obodo</i>	great town
<i>iji oke ugwo</i>	being greatly indebted,

On the other hand, *nne nwanji* can mean 'mother' or 'caring woman', a female who encapsulates the essence of womanhood through motherhood and caring. We can also have *nne mmadu* meaning, again, a woman who has mothered a child. The use of *nne* as mother is evident in such Igbo expression and names as *mmenna* (mother of [one's] father), *nne mmuo* (a woman old enough to be accorded some privileges reserved for men who have been initiated into masquerade cults) and *nne-ukwu* (grandmother or godmother).

The word *oke* is further used to depict male virility and the subjugation of the female, despite the evident binary complementarity, which does not, in any case, mean equality. This virility is shown in the connotative use of the word *oke*. In traditional societies, and still today, when a female animal is on heat, the Igbo de-

scribe the condition as *icho oke*, that is, 'searching for male'. The animal is then taken to a place where there is a male counterpart. Here, the female is tethered to a rope, while the male is let loose. When the female animal has been served, it is taken home. From this condition of the she-animal on heat, the Igbo derive the term *iche mmadu n'oke*, implying that when a human being behaves as if he or she is on heat, the person is subdued, put in his or her proper place or made to behave in a normal way. The metaphor is very important, because an animal on heat behaves irrationally, impulsively and in an uncontrollable manner. Thus, *iche mmadu n'oke* is a metaphor for control and subjugation. This connotative use of *oke* does not apply to the word *nne*.

The word *oke* is also used to depict the physical superiority (in terms of strength) of the male over the female. Thus, the Igbo proverb *mbe n'abo nuo ugu, a mara nke bu oke* (when two tortoises fight, the male one will be known) means that when two tortoises fight the male one will overcome and illustrates this Igbo understanding of the greater physical strength of males. Opata (2003) has done a more extensive study of this proverb. In addition, the derogatory Igbo word for a bachelor is *oke-okporo (okokporo)*, which literally translates as 'empty male'. This is not just to suggest that a man ought to marry, but that a man who fails to marry has not actualised his maleness. This may further suggest that the essence of being *oke* (male) is to have a woman under one's care.

But if the word *oke* is denotatively and connotatively used in Igbo language to depict maleness as greatness, virility and even superiority, pronominalisation in Igbo language is gender-sensitive. Igbo pronouns are not genderised. Whereas most European languages have feminine and masculine forms of the pronoun, Igbo language has just one common pronoun. Thus, there is no parallel to the English usage of 'man', 'mankind' and so on to generically refer to both male and female persons. This is a particularly important point, because such a linguistic structure embeds the subordination of woman, but among the Igbo, this is not the case.

One other important feature among the Igbo when it comes to naming is that a woman never loses her maiden name when she gets married. The contemporary situation in which a woman changes her name after getting married to a man is a cultural importation. This situation makes a woman lose her ancestral identity and take on the identity of the husband. The phenomenon of hyphenated names can only be a manifestation of the conflict attendant upon altered identities after marriage.

### Binary Synthesis, Gender and Notions of Equality

Equality, it must be stated, is a nebulous concept. The ideal it is supposed to capture is highly problematic. What is evident in nature everywhere is an overwhelming manifestation of inequality in both the size of things and the opportunities and capacities they have to survive. The political and constitutional notion of equality as developed over time in Western scholarship is totally inadequate for a meaningful understanding of gender relations among the traditional Igbo.

The Igbo say *isbi na isbi ha bu n'onu*, literally meaning 'one head is equal to another only in the mouth'. In other words, the equality of human beings is only a verbal affirmation, not a real condition. If all human beings cannot be equal, it will be a false statement to affirm in Igbo that *nwoke na nwanyi ha* (male and female persons are equal) because, as the Igbo also say, *onwere nwanyi ka nwoke*, i.e., there are instances of women who are greater than men.

Consequently, I want to abandon the use of the concept of equality and settle for such other things as rights and opportunities. These rights and opportunities no doubt exist in a socially structured society with dominant organisational hierarchies. Within what has been explained as binary synthesis in the Igbo worldview, there is a need to find out how the rights and opportunities of individuals define their self-actualisation. To start with, among the traditional Igbo, there are things allowed to people as rights. These rights take two major forms: rights due a person on account of age or status, and rights due to person's sex. Some of the rights are not seen in legal terms but in a normative way, in that the society feels that such things ought to be. Let me give an example. In my village, Umoda, Lejja, Nsukka local government area of Enugu state, when-ever there is a social gathering and there is palm wine, it is the right of younger persons to be served palm wine before older ones. In the same vein, if there is meat in the food being served, it is the right of an older person to be served meat before a younger person. It is through this complementarity of rights across age ranges that social harmony is achieved. It is also to be noted that these rights go with responsibilities, so that, whereas the older persons are concerned with contemplation and legislation, the younger ones are more engaged in action and implementation of social and customary policies. What is important here is the idea of complementarity.

There are also rights and responsibilities spread along gender lines. Women cannot preside over ancestral deities; they cannot wield the traditional mace, they cannot inherit ancestral land and they do not perform kolanut rituals, at least in terms of petitioning ancestors, etc. The reasons for this are to be found in the patrilineal and patrilocal social structure predominant among the Igbo. Within this arrangement, it would appear illogical for a woman, for instance, to preside over an ancestral deity, since the woman's ancestors belong to another town or community. It is not that women are incompetent to perform such functions—after all, there are women priestesses among the Igbo—only that the deities they serve are not ancestral. On the other hand, women have rights to farmland in their place of marriage and rights to certain parts of slaughtered animals. Just like men, they have specific rights to specific economic trees, etc. For instance, a child growing teeth in certain Igbo communities is entitled to one palm tree, but the right to harvest fruit from the tree devolves on the grandmother. This means that a woman has rights even from the reproductive labour of her daughters. But what is important here again is not who has more rights, but the manner in which the rights are exercised. The rights are exercised to complement one another, perhaps in an asymmetrical relationship to the responsibilities.

The opportunities for self-development of both males and females are again largely defined by patrilineality and patrilocality, as well as by perceptions of gender roles as dictated by compelling social realities. This is evident in early childhood, when children are socialised into doing different things according to their sex, not according to their abilities, which have not yet been determined. To the traditional Igbo, it made no sense, for example, for a father to take his daughter with him to the farm and ask the son to remain behind to help the mother with domestic work. It made more sense for a father to teach a son the ‘masculine’ things and for a mother to teach the daughter ‘feminine’ things. It was largely a matter of learning by gender association. The father prepared the son to be a father, and the mother prepared the daughter to be a mother. The important thing was that fatherhood and motherhood were seen as complementary, not oppositional.

### **Epistemic Naturalism and the Practice of Technology Among the Traditional Igbo**

The Igbo proverb *okpu uzụ lee egbe anya na—odu* (let a would-be smith take a look at the tail of the kite) has a variant that goes like this:

*uzụ amaro akpu ogene ya nee egbe anya n’odu* (the blacksmith who does not know how to fashion the twin iron gong should observe the tail of a kite)

Umeh (1997), who documents this variant, goes on to make the following explanation of the proverb:

Whatever your profession or calling may be, if your receptive and perceptive faculties are open and alert, you will observe that nature is the supreme adept and the ultimate. Nature is the best scientist, the best architect, and the best estate surveyor and value, the best doctor, the best in anything, just name it.

Nature as source and model of learning can best be understood as resulting from the human mediation of the creatively given through a consistent application of human thought. Thus, a people’s technology is not just a record of their practical modes of production and the accompanying capital but also a history of their thought. As James Redfield (1993) has observed, ‘History is not just the evolution of technology. It is the evolution of thought.’ For the traditional Igbo, thoughts about how to model their life, about how to provide for basic necessities and about how to survive in their environment start with learning from nature.

The appropriation of nature for the advancement of human interest varies across societies and across gender lines. The origins of gender divisions in hunting and gathering societies, where biology fitted men for hunting and women for food gathering and taking care of the domestic front, and with biology making child-bearing the exclusive role of women, conditioned the later development of human societies. Men concerned themselves with the making of such tools as hoes, knives, spears, clubs, guns, security instruments, etc., and women concerned themselves with food, cloth, art and domestic technologies such as palm oil extraction, castor oil

extraction, midwifery techniques and medication, childcare techniques and medication, weaving, pottery, body and wall decoration, etc.

There are instances among the Igbo that not only show that the above is generally true but also that there is historical continuity in the persons engaged in these technologies. Perhaps the most telling example is that of Asele, the legendary designer that excelled in the land of the living and the dead. Emeka Agbay (2003) gives us more information on Asele:

In Igbo (Nimbo) mythology, Asele is the being that excelled so well in drawing and painting in Uli medium. Her dexterity was such that she soon outclassed all other artists on earth. Because of the interconnectedness of life on earth and life beyond, she also got to the land of spirits where she performed the same feat, thus emerging as the best artist of all time.

The case of Asele is particularly interesting because it points to many possibilities of what traditional Igbo women must have been in the very distant past. Designing is a highly intellectual activity that falls within the area of fine arts. If women could achieve such mythic proportions in the area of fine arts, then the sky was their limit in applied arts. Pottery, weaving, dyeing cloth, cotton processing, midwifery, etc., were all areas where traditional Igbo women excelled and exercised dominance. The reproductive functions that they carried out, and which kept them largely in the domestic sphere, created the necessity for them to know most intensely the basic requirements for survival within their environment. They were as close observers of nature as the men who went outside the home to hunt and to cultivate crops. It can therefore be said that nature opens itself to man and woman alike, so that each may contribute to the growth of the other. It then appears that only reproduction was biological, given the roles performed by men and women. Indeed, women were more publicly visible in traditional Igbo society than is the case now.

However, the Igbo, like most societies worldwide, have witnessed dynamic changes in their way of life. Among the Igbo, colonialism, which brought along with it new knowledge, new technologies and new values, is the single most important factor that changed the traditional life patterns. These changes affected even the superstructure of Igbo society. Traditionally, a married woman among the Igbo was simply referred to as *mwunye* (mama), but she also retained her maiden name. With the advent of colonialism and Christianity, a Western form of marrying and naming was introduced; the word 'Mrs.' was translated as *oriaku* that is, someone who depends on the husband for her welfare and survival. However, Igbo women showed great dissatisfaction with this, and some argued that they should be addressed as *odoziaku* that is, someone who takes care of wealth. Later, there was an attempt to adjust the name to mean *okpataku*, someone who *creates* wealth. Women were also confused as to what they should call their husbands. Some adopted *oga* or *namukwu* both meaning 'master', and this is still largely the practice among many married women in contemporary Igbo society.

These changes to the superstructure were only a reflection of the changed subculture of the society. The Western education that came with colonialism set the

pace for this change. Males were the first to be educated, so they were also the first to get paid employment. This meant leaving one's town, local area or even region, as the states were then called. Most employed men took their wives along with them to their places of work. Since many of the women had no education, they had little choice but to stay at home taking care of the children and serving food and dispensing care to their husbands when they came home from work. It was not that they could not acquire skills or engage in productive roles, but they were dislocated from their traditional homes, where their upbringing had been patterned after their social and natural environment. In their natural environment, the women acquired skills that were relevant to their society. Transplanted from this environment, and having little earning capacity (except for a few that became seamstresses, etc.), they led a life completely dependent on their husbands. It was a natural consequence for such women to regard their husbands as *ogaa* (masters). In the transformed social environments in which many women then found themselves, nature ceased to be a source and model of learning. Imported technologies, imported knowledge and imported values, mostly of a higher-order value, were introduced. Both men and women were naturally disconnected from their roots. Borrowing from Chinua Achebe, it can be said that things fell apart, this time more dramatically and more damagingly for women. The new order made them dependent on men for many reasons. They were either kept out of school or had fewer years of schooling than their male counterparts, they were socialised into new forms of submission and obedience by Christianity, and the English language, through the use of 'he' as a generic pronoun, impressed on females the idea of being subordinate to males. The monopoly of the public realm by males—in politics, in industry, in education, etc.—further heightened this sense of subordination. The early years of colonisation must, therefore, have proved very traumatic to the female population not only in Igboland, but also throughout Africa.

Thus, it was not surprising that women started crying marginalisation and demanding more education for girls. This arose from their justified indignation at the manner in which society had used education to confine women in the domestic sphere. Despite serious efforts by successive Nigerian governments to reduce the gender imbalance in education, a yawning gap continues to exist in educational access in Nigeria. The masculine perspective in education, the preponderance of male teachers, the pervasive emphasis on male perspectives in curricular materials and the insidious influence of culture and religion—all conspire to relegate women in Nigeria to the background as far as access to education is concerned.

In the area of science and technology that is the concern of this paper, a National Workshop by the Women Education Branch of the Federal Ministry of Education was organised in December 1987. Its goal was to promote a greater role by girls and women in science, technology and mathematics for national development. As a result of the workshop, the Nigerian Association of Women in Science, Technology and Mathematics was launched and was 'charged with the responsibility of promoting science, technology and mathematics education among girls and women

in Nigeria?. However, in spite of such measures, there is still a very noticeable gender disparity in the ratio of men to women engaged in science and technology studies and employment in Nigeria. For example, fewer girls offer further mathematics at their senior secondary school certificate examination in Nigeria. This further restricts the access of girls to engineering courses, which provide the major technological base in any contemporary society.

It is this restriction in access to science and technology that women and feminists find disturbing. It is equally that the import of epistemic naturalism, of using nature as a source and model for knowledge acquisition becomes important. Nature reveals itself equally to all human beings. People then draw from nature according to their various mental abilities and capacities to implement the insights they get from it. That Igbo women did not practice blacksmithing in the past was not because of any mental disability, but because of the physical exhaustion involved in heating up and hammering metal into form. In any case, the women themselves did not complain about being excluded from that profession, nor was their absence from it held against them. After all, as we saw in the first part of this paper, things exist in twos to complement each other. This complementarity stems from the fact that all things have some intrinsic qualities, which define them essentially and give uniqueness to their mode of existence. In the final part of this paper, we shall see that the identity of beings derives from this uniqueness and that the harmonious manifestation of this uniqueness leads to progress and development in society.

Mathematics, like the kite, is obviously open to everyone, as is the idea of quantitative reasoning, that is, taking stock in terms of the frequencies with which things happen in life and the number of times the happenings affect people. If mathematics is perceived as difficult, it is not because the people who find it difficult cannot reason quantitatively. Rather, mathematics is perceived as difficult because it is constructed in a highly stylised, formal language. In other words, it is the axiomatisation of quantities and frequencies that makes mathematics appear difficult, and this is what removes it from epistemic naturalism.

As we confront the issue of gender, science and technology in Africa, it is not enough to identify the obstacles that prevent the greater entry of women into science and technology courses and professions. Unless there is a revolutionary conceptualisation of mathematics in such a way that the language used to teach and speak it is understandable by everyone, the problem of gender gap in science and technology, especially in the area of engineering sciences, will continue, not only in Africa but everywhere in the world. The language of contemporary mathematics is not a natural language. In the same way, gender inequality is not natural. But suppose it were?

### **Subjectivities and Gender Relations Among the Igbo**

Among the Igbo, it is said that the flute calls a human being in the manner the person behaves. This conveys the idea that one's identity is socially constructed, and that it

is largely constructed from what one does. This much is evident in Igbo praise names, which are often titular. Here are some examples:

*Ekwueme* - One who matches words with action

*Omengbeji* - One who gives out when he or she has

*Uchichi na egbu okwu* - Night that kills a case (used for someone who goes from place to place at night to talk to warring parties and bring about peace between them)

*Egenba* - Someone undeterred by threats when pursuing a course of action.

*Egbeevumbe* - 'A kite cannot carry a tortoise' (used for someone who is clever and hardly caught out in actions, etc.)

These examples demonstrate that one is known and identified by what one does. In life, there are many things to be done, things too numerous to be mentioned. People engage in activities in which they are talented, activities in which over time they have acquired expertise. Talent and expertise are relative to persons, history, geography and time. Individual and societal differences therefore exist and are both biologically and socially explainable. Personhood is thereby biologically and socially defined. One is born a male, a female or, occasionally, a hermaphrodite. One also points to oneself according to what one regards as the cumulative attainments of the self at any point in time. Among the Nsukka Igbo, there is this proverb: *omaba siri na -itiji nkegi m tiyi nke m bu ka-anyi ji aga* (if you put your own and I put my own, that is the way we move forward). This proverb points to a fundamental principle of existence; life is essentially a question of cooperation, a process of walking and working together. This much is evident in the Igbo idea of binary synthesis and complementary dualities, because there is an up if only there is also a down. The world cannot be understood in either/or terms, because if there is no good, then there is no evil, and the good can only exist in contradistinction to that which is not good. It is within this understanding that I want to situate the remaining part of this lecture. In the process, I intend to examine how the proverb mentioned earlier, *onye na nke ya, onye na nke ya* (each person to his or her ability), can inform gender relations in science and technology in Africa. The emphasis of this section will be on the descriptive nature of the process, in other words, on what the proverb implies ought to be the case and in what is supposed to be the norm.

Earlier we posed the question, what if gender inequality is natural? This question has not been posed in order merely to arouse debate. Again, does the statement 'each person to his or her own talent' mean the same thing as 'each woman to a woman's talent and each man to a man's talent'? These questions are not easy to answer because of the dense and complicated nature of traditional Igbo thought and, I should add, of the thought of other cultures too. However, this discussion cannot move forward unless an attempt is made to answer these questions.

First, let me make it clear that the statement 'each person to his or her ability' is not limited by gender perceptions. This is because there is another Igbo proverb

which states: *nke nwoke dire nwoke, nke nwanyi diri nwanyi* (let that for man be for man, and the one for woman be for woman). This proverb clearly signals the division of labour by gender, a universal phenomenon, at least of all traditional societies. It is this perception of the division of labour along gender lines that led the Igbo to construct another proverb to the effect that, when a palm tree is felled, a woman climbs it. This arose from the practice whereby women were not allowed to climb palm trees of a certain height. However, with the introduction of the ladder, some women began to use this to climb and cut down palm fruit heads. In other words, inequality in gender capabilities can be overcome by technology and cultural advancement. This is also borne out by current developments in education, for as Francis Fukuyama (1999:12) notes, '[e]ducated, ambitious and talented women broke down boundaries, proved they could succeed at male occupations, and saw their incomes rise'.

If the statement 'each person to his or her ability' is not overtly limited by gender perception, can it, in Irigaray's terms, 'suspend its pretensions to the production of a truth and of meanings that are excessively univocal' (quoted in Freundlieb and Hudson 1993)? Univocality may be a virtue in Western discourse, but consider the following Igbo proverb: 'when a proverb is used, the wise person understands, and when it is used for the uninitiated, the person flies into the bush'. This suggests already that univocality is not a treasured virtue among the Igbo. After all, when masquerades speak, the negative of what they say is what they mean, making it possible for them to easily catch the uninitiated, who take them at face value. In addition, Igbo words are polysemous and, in orthographic representation, can mislead the uninformed. Thus, the understanding of discourse is a privileged phenomenon among the Igbo, and this privileging can only arise from the multivocality of discourse.

Against this background, the statement 'each person to his or her ability' refers to what biology and the environment have given an individual or enabled the individual to acquire. It suggests the provision of an unfettered opportunity to enable an individual to benefit from his or her biology and environment, in terms of both innate and acquired abilities. It does not affirm equality of persons, nor does it affirm sameness of persons. It also recommends a way of being in the world and contributing to that world, which implies that a world in which every person is allowed to do what he or she has talents for is a harmonious world. Indeed, this is the key idea of the statement; it is also what connects it with the notions of binary synthesis, complementary dualities and epistemic naturalism. Thus, the Igbo may easily agree with M. Esther Harding (1970) that '[t]he first condition for an impartial investigation into the relationship between man and woman is to rule out old assumptions of the superiority or the inferiority of one to the other.'

However, this does not mean that there are no proverbs in Igbo that inscribe women as inferior to men. They are abundant. However, there are also proverbs that depict the awe in which women are held and the mystery that woman is to man (Opata 1992). The question of men writing women and women writing men is a

question of power and must be distinguished from the context in which men and women engage in discourse about human beings. This is also the point made by Rosemarie Tong when she writes:

Is there easily a way to treat women and men differently yet equally without falling into some version of the pernicious 'separate but equal' approach that characterised the official race relations in the United States until the early 1960s? Or must liberal feminists work towards the elimination of differences as the first step toward true equality? If so, should women become like men in order to be equal with men? Or should men become like women in order to be equal with women? Or should both men and women become androgynous, each person combining the correct blend of positive masculine and feminine characteristics in order to be equal with every other person (Tong 1989).

The issue of inequalities in society should not be smudged within a universalising narrative. The five fingers are not equal, as most cultures recognise. There are the rich and the poor, the privileged and the dispossessed, the politically powerful and the politically marginalised, etc. There must be differences in life, a diversity of talents which when pooled together lead to progress and development. Undoubtedly, the major difference between men and women is sex, not gender, since gender is a fluid and shifting human construct. The signaling of this difference is the performance of reproduction by women. No human being chooses what sex he or she wants to be, at least not at the time of birth. The reproduction/mothering function of women is what mainly delays or impedes their equal entry into certain professions, but it is not enough for women to repudiate that function and begin to see it as a curse. In Africa, especially in the area of science and technology, this is true for at least two reasons. First, parental care of the child, especially the role of the mother, is not yet 'paradise lost', even when deep and rugged inroads have been made into that paradise. The tokenism with which the West marks and brackets off 'lost worlds' must not be encouraged in Africa. There is no need, for instance, to devote one day or year to the international day or year for the child in a society where people live their lives *for* the child, in a society where a child is the child of all, at least as the traditional Igbo adage would have it.

Secondly, science and technology have taken roots in Africa, and very strong roots for that matter, but there has been no adequate measurement of their impact on the family. The extended family system is fast disappearing; even the nuclear family is endangered as both men and women have fewer and fewer hours to spend with their families. We do not, in Africa, want the family dead so that we can declare an international day for the family. In 1996, President Clinton had the issue of the family as one of his major platforms for campaign for re-election. In Africa, we do not want things to get so bad that the recovery of the family ideal should become a campaign issue for politicians.

When the products of Western science and technology have wrecked the world with violence and made international peace a distant rumbling of the already-violated sky, an international year for peace will no doubt be declared. How can there

be peace in a world where might, created by science and technology, has displaced and killed right?

It would be foolhardy to argue that Africa should reject Western science and technology as a whole. However, there must be a strong dose of African humanism, as encapsulated in the Igbo adage that prescribes a level playing ground for each person to actualise his or her talents. A man should be left to do what he is best at doing, and a woman should also be left to do what she is best at doing. Things exist as male or female, not in binary opposition but in complementary duality. If a male entity stands and there is no female entity that stands by it, then incompleteness is on parade. The same thing applies if a female entity stands when there is no male standing to complement it. Let the kite do what it has talents for and let the eagle pursue its nature too. So long as each human person has the opportunity to pursue what he or she is good at, there will be peace and harmony in the world.

*Onye na nke ya, onye na nke ya!* What a resolute encapsulation of diversity—the very stuff of life. However, if any person would use the privilege of difference to stunt the development of another person, may the person's wings be broken; in other words, may the person be stripped of the essence of his or her humanity.

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