KAMITUDE:
Catalyst for African Scientific Renaissance
Asar IMHOTEP

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1. Introduction

"God and Nature first made us what we are, and then out of our own created genius we make ourselves what we want to be. Follow always that great law. Let the sky and God be our limit and Eternity our measurement."—Marcus Mosiah Garvey (1887-1940)

It cannot be underscored enough the contributions made by the ancient rmṯ n ḫnt (People of Ḫnt) in the domain of the empirical sciences.¹ Ancient Egyptian explorations into astronomy, mathematics, physics, engineering, medicine and philosophy have laid the foundation for the industrial and technological marvels we witness today. But what was the paradigm that guided these early discoveries? Was there a unique approach that allowed the ancient Black-Africans to discover the secrets to these sciences without the aid of modern instruments—many of which have only recently been rediscovered (i.e., quantum mechanics)?² Did they have a name for this theoretical framework? More importantly, what can we learn from their approach today? How can this approach to innovation stimulate African economies?

I argue that the ancient Egyptian approach to science and technology was called mdw nṯr (medu netcher, Tshiluba Madu-

Mdw Nfr is more popularly known as the name of the Ancient Egyptian writing script (hieroglyphs). Mdw Nfr, however, is more than a writing script, but is a paradigm, a pedagogical method which teaches one how to be inspired by nature and how to imitate its functional genius in order to solve human problems. Today this methodological approach in modern science is called Biomimicry (also known as Biomolecular Materials and Processes, Bioinspiration, Biomimetics, and Bioderivation) coined by Janine Beynus.\textsuperscript{3} Due to the colonial and enslavement efforts in Africa, starting with the Persians in 525 BCE, Africa has been on a rapid decline in the areas of the sciences that it once dominated.\textsuperscript{4} This is due, in part, to the loss of sovereignty of African states and because of the enormous depopulation of the continent as a result of slavery.\textsuperscript{5} Science flourishes when the state machine is backing its development.

Africa has since been on a mission to regain its agency, and its sovereignty. It is this author’s contention that this African renaissance will happen as a result of the (re)adoption of Mdw Nfr (Biomimicry) as a scientific and cultural value system, paradigm and practice. We are not talking about the adoption of science in general—as there has been and continues to be African scientists—but an approach to scientific

\textsuperscript{4} However it is slowly picking up momentum.
innovation and discovery that has the potential to develop Africa more sustainably.

1.1 *Madu-Ndele* as an African-Centered Pedagogy

For the sake of self-determination (*kujichagulia*) and African agency, the adoption of *Madu-Ndele* (*mdw ntr*) as a pedagogical framework is critical for the stability and development of African states. The great Senegalese scholar Cheikh Anta Diop reminds us of the importance of the transference of scientific knowledge in relationship to the viability of any society: “*On the other hand, the way a society goes about transmitting knowledge, for example, is fundamental to the development of its technology and crucial to its overall expansion.*”

In other words, the very survival of a society is predicated on the approach by which it acquires, processes and transfers knowledge. I argue that the ancient Africans passed on scientific knowledge by a *process* the Ancient Egyptians (*rmt*) called *mdw ntr* (*madu-ndele*) and this approach and framework can be utilized today in the development of the continent of Africa and its children in the Diaspora. *Mdw Ntr* is an approach rooted in the African philosophical framework which sees nature as a living textbook from which to learn. The earth, through the process of evolution, has developed very efficient ways in which to solve problems as a result of the constant flux of forces which challenge the very existence of living organisms. As a

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6 Ibid., p. 245.
result of the challenges of being human, the objective then is to discover viable processes and develop innovations that will allow man to live sustainably and in harmony (m²t, maât) with the environment utilizing the wisdom and framework by which the Creator creates its living systems.

The general African communitarian virtue ethics presupposes a person capable of harmony as a social practice. Human flourishing, therefore, is best realized in a context of harmony with God, nature and other human beings. Maulana Karenga informs us that maât is the ground for human flourishing and is a social practice for doing good and seeking worthiness (im²’h): worthiness of God, human beings and nature. For African people, the Creator (which directs and manifests itself in nature) is the highest example of excellence that must be emulated. This excellence is demonstrated in the eloquent designs of the living systems of nature (nûr).

Madu-Ndela™ is an educational framework, and a school of thought that 1) looks to Africa as a resource and not simply as a reference, and 2) seeks to attract more Africans into the empirical sciences by appealing to their heritage. The importance of culture to this process cannot be underscored enough. Innovation is a by-product of culture.

As the Nobel Peace Laureate winner of 2004 Wangari Maathai of Kenya noted in her acceptance speech, “Culture plays a central role in the political, economic and social life of communities. Indeed, culture may be the missing link in the

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development of Africa. Culture is dynamic and evolves over time, consciously discarding retrogressive traditions, like female genital mutilation (FGM), and embracing aspects that are good and useful. Africans, especially, should re-discover positive aspects of their culture. In accepting them, they would give themselves a sense of belonging, identity and self-confidence.”

Adebayo Ogungbure of Nigeria reaffirms this notion of the importance of culture in relation to technological development when he states, “Hence, this emphasis on culture is based on the idea that technological advancement without the skillful exploration of a people’s culture is impossible, because culture is the driving force that fuels and inspires technological accomplishments in human society.”

It is imperative that we see culture, and Kamitude in particular, as a vehicle of economic power. Culture and economic systems are ultimately social systems. There are systems of coherent, cohesive, social values, attitudes, relations, arrangements and behaviors consensually shared by a distinguishable group, a group which possesses and expresses a group consciousness, self-consciousness, awareness and identity, all held together and motivated by a group-based, self-interested system of ideas or ideology. These factors and more coalesce to form a group-based idea system, philosophy or ideology which in turn provides the necessary reasons and

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rationales for the construction of social institutions and social structures whose means power can be generated, enlarged and effectively applied.

By rediscovering madu-ndele as a system of thought and practice, with full support of local and state governmental bodies, Africa can once again regain its agency and can once again become a world leader in science, technology and philosophy. Ultimately politics has the responsibility to encourage, formulate and finance this rehabilitation, this thrust for economic and political power and to open the doors of schools and universities to our heritage, culture, and our ancestral Kamitude.\(^{10}\)

Because of the negative impact modern technologies and capitalism has had on the environment (both physical and social), it is imperative that Africa not adopt wholesale the mindset and negative methodologies created by the European approach to innovation that caused these catastrophic disharmonies in the first place. Our approach from the beginning must stress the importance of eco-friendly, energy efficient technologies, and the need for new economic and political models (grounded in African culture/Kamitude) as critical for the sustainability of Africa (and the earth in general) thousands of years into the future. What good is science and technology if its usage renders the environment unusable for human and animal occupation? Mdw N\(\text{Nr}\) (madu-ndele), as a

catch-phrase for the emerging African cultural paradigm, already possesses the necessary framework and is pregnant with viable solutions to its most difficult challenges: political, environmental, social and technological.

To better understand the ancient application of *mdw nṯr*, it would benefit us to examine this philosophy in its modern form and practice through the scientific approach to innovation called *Biomimicry*.

2. What is Biomimicry?

The framework called *Biomimicry* (from *bios*, meaning life, and *mimesis*, meaning to imitate) is a new discipline that studies nature’s best ideas and then imitates these designs and processes to solve human problems.\(^{11}\) This strategy relies on first learning the mechanistic principle used by a living system to achieve a particular function. One then attempts to adapt that principle to achieve similar function in a synthetic material.\(^{12}\) The idea is to emulate nature’s genius. In order to do this one has to look at nature differently: as a *model*, *measure* and *mentor*. *Biomimicry*, therefore, is a science that studies nature’s models and then emulates these forms, processes, systems and strategies to solve human problems—sustainably. *Biomimicry*


uses an ecological standard to judge the sustainability of human innovations (measure). Therefore, nature becomes a guide (a mentor) from which we learn how to innovate holistically.

2.1 Biomimicry in Agriculture

**Problem:** Modern forms of irrigation, fertilization, and pesticide inputs, upon which modern food crops depend, both deplete and pollute increasingly rare water and soil resources. The Land Institute of Salina Kansas has been working successfully to revolutionize the conceptual foundations of modern agriculture by using natural prairies as a model. What they have discovered is that by using deep-rooted plants which survive year-to-year (perennials) in agricultural systems which mimic stable natural ecosystems—rather than the weedy crops common to many modern agricultural systems—they can produce equivalent yields of grain, maintain and even improve the water and soil resources upon which all future agriculture depends. The secret is in the diversity of the prairie which goes against the modern practice of using monocrop plots in farms. As a result of emulating nature’s genius, they have in turn created a system of food production that is productive, resilient, self-enriching, and ultimately sustainable. This “new” method of agriculture, however, has been the method utilized by Africans since before colonial times, maybe as far back into Proto-
Saharan times.\textsuperscript{13} Biomimicry is “rediscovering” this ancient practice.

2.2 Biomimicry in Technology

\textbf{Problem:} The round-shaped front of the original bullet trains in Japan caused a pressure wave ahead of it when it soared through tunnels. This caused a sonic boom-like sound as the train exited the tunnel which can be very nerve-recking in a residential neighborhood. To solve the problem, engineers mimicked the design of the kingfisher’s beak. Kingfishers are a group of small to medium sized brightly coloured birds in the order \textit{Coraciiformes}. Kingfishers do not cause ripples at the beginning of their descent into the water to catch fish. This is so because of the design of its long, pointy beak which minimizes splash while maximizing speed. The Kingfisher’s aerodynamic beak inspired the redesign of the bullet trains in Japan. This in turn quieted the train and made it go 10\% faster.

3. What is Mdw Ntr?

While modern biologists are touting that Biomimicry, Bioinspiration, Biderivation, etc., is a “new” science, this scientific approach and framework is very old and was practiced

in ancient times on the continent of Africa. What Janine Benyus calls Biomimicry, the ancient Egyptians called mdw ntr.

Mdwntr (medew netcher), as told to us by mainstream Egyptology, means “God’s Words” and applies to the pictorial writing script of Ancient Egypt (Greek hieroglyphs “sacred writings”). Alain Anselin\(^\text{14}\), on the other hand, argues that the term is applied to the writing script as a late and final association, which in earlier times referred to their oral tradition evident in the phrase nb mdw ntr “Lord of the Spoken Word” instead of nb sš “Lord of Written Words” or “Lord of Script.” The initial writing script was a development inspired by and which borrowed images from nature. The very phonemes and ideograms were representations of the natural environment: mammals, trees, human beings, human occupations, birds, parts of animals, celestial bodies, mountains, rivers, etc.


The Egyptian word mdw derives from a simpler form r ← “word, speech, mouth” (plural rw ←| “utterances”). This can be demonstrated in Yoruba and Tshiluba-Bantu: Yoruba ṣorò “word, speech, mouth,” orò “roar”; Tshiluba eela “utterance, command, word” (<di-yi “speech, command, divine law”). A rule in Niger-Congo states that [l + i > di]. In other words, often, when an l (r) is followed by an i sound, the l turns into a d (i.e., Yoruba àsálà “to escape,” sálò “to run away, flee, elope” > sádi “to take refuge under the protection of another”; Egyptian sni “to rescue, to save”; śḍi "to break, to rescue, to take away, to maintain, to secure, to recover, to cut out”). The transformation of l > d can also happen as a result of the nasalization of r/l (i.e., Tshiluba ngulu > ngundu “power, strength”; Eg. tr “forsooth, pray”; ciLuba tenda, tendelela “worship, pray”)

This is how r/rw in Egyptian becomes m-dw (with old Kongo-Saharan noun-class prefix m-). We can further demonstrate this in Yoruba as well by examining variations of this same root: Yoruba odú “oracular utterances” (<òrò); èdè “language.” The Tshiluba language reveals more to this root, which the Yoruba practice of Ifà reaffirms. In Tshiluba the Egyptian rw takes on the following forms with appropriate affixes: RaW > W-Rw > aru-Bw/Bw-alu “Word, History, Science” (Bw-Alu, Ma-aru / Ma-adu / Malu). As we can see, Tshiluba introduces us to two other meanings not given in Egyptological dictionaries: “history and science.” Given that these societies were primarily oral based at the formation of these concepts, the transmission of history and science were not found in books, but in the mouths of highly skilled oral specialists (Bambara doma, Yoruba babalawo, Bakongo nganga, etc.).
The word $ntr$ derives from a $t-r$ root that means “water” and “rain” as a fructifying and purifying agent. In the vast majority of the world’s languages, the concept of God is associated with the “sky, heavens” and “rain.”

Among the Azande of central Africa, for example, we have:

- $toro$ is “rain” (cleansing/fructifying agent)
- $Ma-toro$ is “God”
- cf. Hebrew $ma-tar$ “rain” (cf. Hebrew $thr$ “be pure”)
- $tal$ “dew” (uncontaminated water)

The ancient Egyptians, and other African nations, associated their gods with the purity and the life causing essence of water.

<table>
<thead>
<tr>
<th>Language</th>
<th>Word</th>
<th>Meaning</th>
</tr>
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<tbody>
<tr>
<td>Egyptian</td>
<td>$ntr$</td>
<td>“natron” (cleansing agent)</td>
</tr>
<tr>
<td></td>
<td>$ntr$</td>
<td>“God” (unseen fructifying agent; Coptic noute)</td>
</tr>
<tr>
<td>Twi</td>
<td>$ntoro$</td>
<td>“spirit of patrilineage”</td>
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<tr>
<td>Yorubá</td>
<td>$ntori$</td>
<td>“because”</td>
</tr>
<tr>
<td>Lugbara</td>
<td>$adro$</td>
<td>“guardian spirit”</td>
</tr>
<tr>
<td></td>
<td>$Adro$</td>
<td>“God” (also the whirlwind found in rivers)</td>
</tr>
<tr>
<td>Mbuti, Efe</td>
<td>$Ndura$</td>
<td>“God” (&lt;of the rainforest)</td>
</tr>
<tr>
<td>ciLuba</td>
<td>$Ndele(a)$</td>
<td>“divine, begetter, Ancestor”</td>
</tr>
<tr>
<td>Gurma</td>
<td>$Unteru$</td>
<td>“God”</td>
</tr>
<tr>
<td>Gurmantche</td>
<td>$Untenu$</td>
<td>“God”</td>
</tr>
<tr>
<td>Fulani</td>
<td>$Ntori$</td>
<td>“God”</td>
</tr>
<tr>
<td>Masai</td>
<td>$Naiteru$</td>
<td>“God”</td>
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</tbody>
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Kwasio  
Mombutu  
Ewe  
Ijo  
Tonga  
Amarigna  
Wolof

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<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>Ntare</td>
<td>“sacred”</td>
</tr>
<tr>
<td>Noro</td>
<td>“God”</td>
</tr>
<tr>
<td>Tre</td>
<td>“clan spirit, fetish”</td>
</tr>
<tr>
<td>Toru</td>
<td>“river” (Eg. i-trw “river”)</td>
</tr>
<tr>
<td>Tilo</td>
<td>“blue sky, God”</td>
</tr>
<tr>
<td>Anänga</td>
<td>“pure”</td>
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<tr>
<td>Twr</td>
<td>“libation” (Eg. twr “libation”)</td>
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<tr>
<td>Ker-twr</td>
<td>“protecting god”</td>
</tr>
</tbody>
</table>

A ntr is the purest essence from which all phenomena arise (<twr "be clean, cleanse, purify, cleanliness, purification"; “show respect to, hold sacred”). It is the “principle, cause, and engenderer of life.” Water becomes the perfect symbol for this concept as water is clear, pure and is the substance from which all life emerges (i.e., Eg. nwn). When you strip down matter to its barest essentials, there you will find ntr—the Grand Unified Field. It is my contention that ntr is where we get the word “nature” from in Indo-European. Nature means: c.1300, "essential qualities, innate disposition," also "creative power in the material world," from O.Fr. nature, from L. natura "course of things, natural character, the universe," lit. "birth," from natus "born."

In Tshiluba the word ntr is reflected in the following forms: nDela “numerous offspring”; ndelu “generation, offspring, progeny;
BaNdela “those who create,” eBandeli “start/commence” (Lingala); Ndele (Lingala) “forever, continuance, perpetuate”; ndedi “cause,” ciLedi “cause, origin, source”; <lela “breed, birth, cause, produce, family” [n + l> n, l + i> di] (Eg. rdil/di “give, put, place, appoint, send, cause, permit, to say, grant, make”; Yoruba èrèdidi “a cause, a reason”; Urhobo arido “the creative power of the spoken word”; Fulani ardo “to lead”; Eg. gd “say, speak, speak of, utter, recite, expect”).

We get further support from the following examples: Egyptian ir(i) “to make, to do, to create, to beget, to act, to achieve” (Coptic eire); Yoruba ro “to make, to fabricate, to manufacture,” èro “a machine;” ère “a sculpture, an idol”; Tshiluba eela “to act” (<diyi “command, divine law” [l + i> di]). Another rule in Tshilikuba can be stated as [n + i> nyi]. By examining a variant of the word madu it reinforces its relationship to science: dimanya “awareness, knowledge, concept, science” (<maalu = knowledge, science(s), discipline; business, things; events; problems (as in to solve?), also used to mean “objectivity”). So we interpret mdw not simply as “words,” but as a “discipline, a science, an epistemology.”

MdW Ntr (Madu-Ndele(a,u)), therefore, is the “science/laws by which phenomena comes to be.” MdW-Ntr can also mean "Science of the Principles of Root Causes" and "Science-Primordial Principle or First Cause.” It is the study/history of nature’s becomings (Eg. hpr “to be, becoming, bring forth”). It is a strategy to learn the mechanistic principles used by living systems to achieve a particular function. The script then acts as a mnemonic device that reminds us how to adapt these principles to achieve similar functions in synthetic materials and
social systems. The writing script was a social technology designed to stimulate creativity—the prerequisite for solving human problems.

The ancient Egyptians used the mdw ntr writing script as a pedagogical tool to teach science by recording pictorially the various functions of nature (ntr) so that they could imitate its genius, not only in terms of engineering or technological innovations, but in terms of social structure as well. The objective was to restore (srwd) the perfection that existed during the tp spy “first time” and to contribute to its flourishing (rwD). The aim was not so much to duplicate it, but to emulate it: to build a society based on the Maātian model.

Madu-Ndela can be considered an inventive problem solving technique whose aim is to build for eternity that which adds life to life. Mdw Ntr doesn’t limit itself in terms of architecture, art, and technology, but also seeks to understand how nature can guide us in terms of health.

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19 Usually part of a phrase srwd tA- “restoring the world” (Tshiluba aaluja/alwija “restore, replace what had been removed or deleted”; aaluka “return, retrace”). The word srwd (with s- prefix) derives from rwD “strengthen, maintain, perpetuate, flourish, be prosperous, success, enduring, permanent, sturdy, steadfast, remain firm.”

20 Karenga, op. cit., p. 211.

21 There is a distinction here that needs to be made. Madu-Ndel(e) with final –e is the name for the overall framework (mdw ntr). Madu-Ndel(a)TM with final –a is the name of the company which I founded that promotes this methodology.
3.1 An Example of Ancient ciKam: The Healing Power of Light (Ra)

In the chapter called “The Legend of the Death of Horus,” in Budge’s Legends of the Gods, the narrative describes an incident in which the god Hrw (Horus) was bitten by a scorpion and how the healing power of Ra (light, the sun) was used to cure Hrw and resurrect him from the dead.

[Djehuti speaks] I have come from the heavens to heal the child for his mother (...) Verily that which is in the mouth of Ra shall go round about (i.e., circulate), and the tongue of the Great God shall repulse [opposition]. The Boat [of Ra] standeth still, and travelleth not onwards. The Disk is in the [same] place where it was yesterday to heal Horus for his mother Isis, and to heal him that is under the knife of his mother likewise. Come to the earth, draw nigh, O Boat of Ra, make the boat to travel, O mariners of heaven, transport provisions (?) of (...) Sekhem to heal Horus for his mother Isis, and to heal him that is under the knife of his mother likewise. Hastene away, O pain which is in the region round about, and let it (i.e., the Boat) descend upon the place where it was yesterday to heal Horus for his mother Isis (...) Be filled, O two halves of heaven, be empty, O papyrus roll, return, O life, into the living to heal Horus for his mother Isis, and to heal him that is under the knife likewise. Come thou to earth, O poison. Let hearts be glad, and let radiance (or, light) go round about.²²

Here we have a clear example of the power of light, symbolized as the “fluid of Ra,” used for healing. The healing process mentioned in the “myth” (<mdw) is an ancient form of photopheresis or extracorporeal photochemotherapy. It is a method used to clean blood. Thus the statement, “Verily that which is in the mouth of Ra shall circulate” which is talking about UV light circulating in the blood (or other parts of the skin) to drive out the poison. The modern treatment involves administering a drug called 8-Methoxypsoralen (8-MOP) that sensitizes cells to light. From there some of the patient’s blood is removed and the white cells in it are exposed to ultraviolet light and returned to the body. This story of Aset and Heru is a codified way to discuss how to use the sun’s ultra violet light to cure toxins in the body.

In the book Daylight Robbery: The Importance of Sunlight to Health (1998) Dr. Damien Downing discusses how animals exposed to higher amounts of sunlight were capable of removing toxins out of their body considerably faster than animals reared away from the sun. The ancient Egyptians were imitating (biomimetically) a process found in nature.

Rc has also been used in ancient Egypt to treat vitiligo (depigmented patches of skin). The Egyptian healers would crush a plant similar to present-day parsley and rubbed the affected areas with the crushed leaves. A severe sun burn would form when these areas were exposed to the sun’s radiation. The
erythema subsided, leaving hyperpigmentation in the previously depigmented areas.23

3.2 African Continuities

Space will not allow for a comprehensive comparison of mdw ntr as a framework across Africa. This is taken up in more detail in my work *Ogun, African Fire Philosophy and the Meaning of KMT* (2011). Here I will just briefly examine the philosophy, in two African communities of memory by way of linguistics.

The essence of *Mdw Ntr (Biomimicry)* is wide-spread throughout the continent of Africa under a slight lexical variation. Instead of emphasizing the source of change (*ntr*), other areas of Africa focus on the process of change which brings phenomena into being: *hpr* “to come into being, exist, transformation, etc.” What the Egyptians called *mdw ntr*, the Yoruba of Nigeria call *Odù Ifà*. This name is commonly associated with divination, but divination is only one aspect of the practice. Like *mdw ntr* and *biomimicry*, it too studies nature with the intent on emulating its genius. However, it is not focused on technological innovations. Its primary focus is the development of *good character* in the person: developing a morally grounded human being. *Odù Ifà* can also be the springboard for some fascinating technological innovations.

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We’ve already discussed the word *odú* earlier. The word *ifù* (ọpèlè) is the Egyptian word *hpr* which has suffered from consonant erosion. The root of *hpr* is *p-r* and *h-* is a prefix. A variant in ciLuba is *cipepula, cimpulu, kapepa* “beetle”; mvunde “whirlwind,” *ciVwa* “become,” *cidiVwile* “existence,”; Basaa *hìlbì* “become, to transform.” Egyptian *mdw hpr* among the Amazulu of South Africa is called *uMthetho (mdw, odu) weMvelo (hpr)* “the law of appearing” or *ukuma njalo* “perpetual evolution.” The Egyptian concept of *hpr* is equivalent to Darwin’s *Theory of Evolution*. *Mdw Ntr* then becomes the answer to the question, "How does one thrive (*nh*) in the midst of constant flux (Eg. *isft*, Zulu *uzibuthe* "spirit of conflict") and change (*hpr*)?"

The philosophy present among the Yoruba and Amazulu is also shared among the Ancient Egyptians, and in part, in the modern field of *Biomimicry*. The difference in the Yoruba and Zulu systems is that they did not develop a complex writing script as a mnemonic device for public use. Their “script,” however, is a living script whose characters are the living objects in nature. Writing is not the only way in which African people conveyed these ideas. They used other sacred arts to convey the same message as the hieroglyphs—through divination, sculptures, sacred symbols, proverbs and myth.

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3.3 Practical Applications of the Methodology

While the theory may be good, what uses can this methodology practically provide African people in contemporary times and beyond? What kinds of things can we imagine using mdw ntr (Biomimicry) as a framework? The potential future impact of understanding and utilizing functional biomolecular materials is enormous. Imagine that one could . . .

- Engineer biological enzymes to convert organic matter to usable fuels with very high efficiency in order to substantially reduce dependence on fossil fuels. (*Alternative Energy*)
- Manipulate biomolecular recognition events to create a biosensor with no false alarms that responds with sensitivity and specificity, mitigating threats before people or other key assets are exposed. (*National Security*)
- Create new arrays of medical diagnostic assays that can predict susceptibility to and progression of disease.
- Deploy new materials that will protect people and material assets from chemical and biological contamination.
- Design and fabricate new materials that capture the superlative properties of adhesion in a gecko foot or the elegant strength in design of a diatom or mollusk shell. *(Technology)*

These seemingly futuristic benchmarks represent some of the future impact that could be realized through the understanding and exploitation of functional properties of biomolecular materials (mimicking the functions of living systems)—ideas that are being explored as we speak. For

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25 National Research Council, op. cit., p. 32.
example, current research is being conducted in the U.S. to try and mimic the process of photosynthesis in plants as a way to better harness energy from the sun: to turn light energy into chemical energy.

During photosynthesis, light-induced charge separations of photosynthetic reaction centers occur across a membrane that separates oxidizing and reducing equivalents. *Medw Ntr* would then attempt to imitate this photosynthetic process by constructing artificial photosynthetic membranes that can photoproduce oxygen and fuel molecules on opposite sides of the membrane. The goal would be the synthesis of artificial photosynthetic membranes that mimic the essential energy-conserving properties of natural photosynthesis with equal or greater energy conversion efficiency. The benefit of this would eventually be low cost energy that can be channeled to villages in Africa currently without power, while in the process there is little to no waste or harm to the environment. The methods advocated by Diop26, in terms of nuclear fission, would be too costly, wasteful and a security threat to biological systems (Chernobyl and Japan demonstrate the risks involved).

The ancient Africans already used the power of *R* in terms of health and cosmetology, now we expand the ancient practice and utilize *R* to power African cities. The possibilities are virtually endless using this methodology.

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Creative genius, resourceful intentions and artistic inventions of humans do not develop \textit{ex nihilo}. Something fundamental has to be the driving force that conceives and gives birth to these innovations. Something has to be the catalyst and this energy must permeate through the total sphere of human cognition and existence. This catalyst is \textit{culture}.$^{27}$ All technology within a social praxis is a product of culture. This is because culture is a phenomenon which encompasses all the material and non-material expressions of a people; it effects the way people interact with nature and therefore varies with the environment.$^{28}$ The question becomes how do you systematize culture (Kamitude) in a way that continually inspires innovation across the continent of Africa and the Diaspora?

This paper is essentially of the opinion that culture plays a germane role in the scientific and technological transformation of any society. If Africa is to recover from the holocaust of enslavement and its colonial aftereffects, it must first ground itself in its own traditions. From there Africa must utilize its culture(s) as a spring board to generate processes and technologies that will secure a sustainable future for its members. The framework necessary to carry out these tasks is already present in the heart and minds of African people: in their philosophies, languages and ancestral traditions. What has to be

\begin{footnotesize}
$^{27}$ For Africa and its Diaspora this culture is Kamitude.
$^{28}$ Ogungbure, A.A. op. cit., p. 87.
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done now is to systematize and adapt these traditions for the 21st century. Africa has to reconcile their traditional cultural environment with the different circumstances of the global world, which itself has largely been shaped by science and technology. I argue that to gain an edge on development, we must tap into the framework of mdw ntr (Biomimicry) as Africans are already culturally equipped to make major contributions in these areas. Africa has at least a 5000 year head start on the framework. The challenge now is to translate historical paradigms into contemporary experience.

Part of the African Scientific Renaissance involves translating scientific terms into African languages. Diop had begun this process by first translating Einstein’s Theory of Relativity into Wolof in order to demonstrate that it is not only in the language of ancient Egypt that blacks are able to master the natural and medical sciences; contemporary African languages are also capable of articulating thought across the academic disciplines. In this spirit I propose to name this emerging scientific paradigm madu-ndele (mdw ntr) after the most ancient articulation from Egypt, but using the modern Tshiluba-Bantu variation of the phrase—as it has a conceptual elasticity that articulates a wide range of meanings that is shared across African languages.

It is in the realms of science that the African (economic and political) Renaissance will translate into experience for African people. It was the sciences (mdw ntr) that allowed ancient Egypt to thrive for over 3000 years. However, they were guided by a set of principles for development which brought
about little to no waste and didn’t disturb the natural environment. The principles of ntr and mAat (balance, reciprocity, harmony, truth, justice, and the order of interrelated existence) were the foundational standards from which Pharaonic society was built. They constructed their society based on the wisdom of mdw ntr, guided by spirit of mAat and it allowed them to build for eternity.

As Obenga notes, “Whoever aspired to live forever the life of gods, in the company of the Blessed, had to make a conscious effort to live according to a set of “rules” designed for the purpose of dominating death, transcending mortality and affirming life.” Part of affirming life is not to pollute the very environment which sustains life. With the advent of global warming, industrial pollution, contaminated oceans and depleted soils, the conventional way of doing business, and the disastrous effects they have on the environment, is not in keeping with the principles of mAat (being worthy before nature). In discussing the Unity of Being among the ancient Egyptians, Maulana Karenga reminds us that, “…the ethical imperative is for humans to live in harmony with nature, respect other modalities of beings and to find in them a site and sense of the sacred.”

King Unas of the Old Kingdom states in his justification:

- \( n\ sr\ hw\ nh\ \ ir\ \ Wnis \) “No one living accuses Unas”
- \( n\ sr\ hw\ \ mt\ \ ir\ \ Wnis \) “No one dead accuses Unas”
- \( n\ sr\ hw\ \ st\ \ ir\ \ Wnis \) “No bird accuses Unas”
- \( n\ sr\ hw\ gn\ \ ir\ \ Wnis \) “No beast accuses Unas” (PT 386)

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30 Karenga, op. cit., p. 387.
The madu-ndele framework ensures we stay true to this tradition. We note here that Mdw Ntr was not only concerned with technological and medical innovations, but in character development. In order for madu-ndele to be a practical solution for Africans, it must be grounded in a philosophy that encourages the development of great leadership and the possession of high moral character (which guides sustainable development).

An objective of human development in Egypt was to become a ntr. A ntr was not only a deified ancestor, or the source from which phenomena derived, but a living member of society—a person who knows life to the highest capacity, who has proven experience in towering over life’s one thousand and one challenges. Because the word ntr derives from a root that means “water, cleanse and purity” (Eg. ntr < tur, turi, (later tui) "to be clean, to cleanse, to purify, to celebrate a ceremony of purification, purified, pure, to pray with a pure heart, clean handed’’), these qualities were associated with individuals who embodied these attributes. Because the Egyptians aspired to have the gods treat them as initiates, they asserted, insistently, their status as pure beings (I am pure, I am pure, I am pure, I am pure”).

A ntr is a person whose character is refined (Amarigna NiTer “refined” anāTāra “pure”; Kwasio nture “sacred”; Tshiluba ndolu “kindness, generosity, beautiful, beautiful part of

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31 Obenga, op. cit., p. 37.
32 Ibid., p. 220.
something, noble, handsome, distinguished, refined, generous, kind, benevolent”; Yoruba dara “good”). M37. In part, is rooted in this concept of nobility. It is reflected in Tshiluba as malelela (Eg. 3 = l): ma- is the prefix and the root lelela means “true, authentic, genuine, and veritable.” If a person acted in truth, was of high moral character, and benevolent in all their dealings, they were given the title of n-tr, which based on compared terms, also deals with rank, with underlying connotations of distance and height as can be seen in these reflected terms: Yoruba tala "high" (as in Obatala "exalted king"); Arabic tali "high, tall"; Tshiluba tadika "raise, protrude out"; ntalamu "projection" (<talama "protrude, be far distant from"). It is from this sense of distance that it is metaphorically applied to someone with extraordinary skill (some with skills high and above the average person).

This individual epitomizes “excellence” ³: Eg. ntr = ciLuba nti³ "excellence, excellent" (<talama "be smart, be attentive, be focused"; -à/-a nta³ "crafty"; CiTelu or CiTeelu = exemplary, exemplary woman, beautiful, good (do), an excellent reputation ”): Yoruba dára jùlò “super” (excellent, outstanding).

Mdwl Ntr can then be interpreted to have a secondary meaning as “the laws/principles/rules [for] excellence.” Madu or Malu-a-Ndelu ("the Science of the Origin of the Primordial Principle-(Ndela)) is by definition Madu-a-Ndolo or Ntalu "Science par Excellence.” Mdwl Ntr can be thought of as a set of skills that a leader must master to guide a family, community, or state into prosperity. This is what a leader embodies: a pure heart, great knowledge capacity, high moral character, and a

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propensity to do all things in excellence. These towering figures are known as elders, priests and kings (Eg. wr ntr/ntr wr “priest” (Ritual officiate), h⁻w ntr “the king”, hrty ntr "stonemason", hm ntr "prophet" st dr.t “the way to act, how to handle things”; Shona-Bantu Ndoro "crown, jewel (royalty)”; Java (Indonesia) Ndoro "Prince"; Tshiluba ndela “prolific person”). Even to this date when we refer to a king we say “Your Excellency!”

We bring up leadership because Africa has suffered greatly at the hands of bad leadership over the years. As a result of bad governmental policies, poor conditions of infrastructure, and state misdirection, most technological capabilities in Africa have been constrained. The issue of Africa’s brain drain is also a major factor. If Africa is to regain its agency, more local funds will have to be directed towards the development of science and scientists. As Ogungbure reminds us, there is an urgent need by governments and policy makers in Africa to heed the advice of the World Conference on Science to build or strengthen indigenous industries that can utilize agro-allied raw materials (for instance) for social change because:

“The overall economic and social development of the African nations can easily and beneficially be accelerated through the adaptation, assimilation, internalization, innovation and invention of new technologies.”33

I am not the first to suggest that Africa’s renaissance would be grounded in the sciences. The great Senegalese scholar Cheikh Anta Diop produced a magnificent work

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dedicated to this ideal in his publication *Black Africa: The Economic and Cultural Basis for a Federated State* (1987). In this work he primarily focused on energy. But even before him, the Honorable Marcus Garvey of Jamaica gave a most profound speech in the early 20th century that reinforces the convictions of Ogungbure and Diop on the importance of science (*mdw ntr*) in the liberation of Black people.

"Dive down Black Men and Dig! Reach up Black Men and Women and Pull all nature's knowledge to you. Turn ye around, and make a conquest of everything, North and South, East and West. And then when ye have wrought well, you would have inherited God's blessings, you would have become God's chosen people, naturally you'll become leaders of the world because of the superiority of your Mind and your achievements (...) The world is indebted to us for the benefits of civilization. They stole our arts and sciences from Africa, then why should we be ashamed of ourselves (...) And out of our own Creative Genius we make ourselves what we want to be, follow always that great Law. There is no Height that which you cannot climb without the active intelligence of your mind. Mind creates and as much as we desire in Nature, we can have through the creation of our own minds. But in your homes and everywhere possible you must teach the higher developments of SCIENCE to your children. And make sure...And make sure that we have a race of SCIENTISTS PAR EXCELLENCE! For in science lies our only hope to withstand the evil designs of modern materialism.

Without specifically using the terminology, Marcus Garvey personified Kamitude and was an advocate of the principles of *mdw ntr*. What Garvey calls for in this speech is not only the development of scientists, but the promotion of science on a cultural level. As Ogungbure notes, “African people
cannot make much progress in a quest for technological advancement if the dynamism of culture is not used.”\textsuperscript{34} That “dynamism” is the creative expression of one’s imagination as advocated by Garvey. The great Albert Einstein is even quoted as saying, “Imagination is more important than science because science is limited, whereas imagination embraces the world-wide.” The importance of African culture for the advancement of African people cannot be emphasized enough.\textsuperscript{35} It is now time to elevate science to the level of culture among African people worldwide.

What we mean here is that scientific knowledge cannot only be accessible to a small group of people. It must be a part of the universal education of the general population. In times past, the benefits of science were only taught to initiates in secret societies (as we can see among the Dogon as told by Griaule and Dieterlen). This has hindered Africa’s growth in the past and rendered it unable to adapt and defend itself during the colonial period. Diop reminds us of the importance of this when he noted that, “In this respect, the system of initiation whereby knowledge is transmitted in African societies is typically Egyptian. Yet this system which is generalized in African societies is not the best way to transmit or generalize scientific knowledge. This has been extremely harmful to the technological and social development of traditional black societies. The monopoly of knowledge by a restricted

\textsuperscript{34} Ogungbure, A. A. op.cit., p. 97.
A group of religious men has been detrimental to the development of African societies.”

It is the combination of science, great leadership and a stimulated creative imagination that the overall economic, political, technological and health initiatives will flourish among African people. In the October 2009 article titled “The State of South African Science,” the author reminds us that: "We know that science creates wealth and jobs. We do not want to remain consumers of science and technology from other countries. We have to invest in science for ourselves." Madu-Ndele provides that necessary thrust to manifest these ideals.

_Mdw N'tr_ [¶], as we have already stated, is the model for which progress is measured. _Madu-Ndele_ is African culture, theology and philosophy. It is the process by which Kamitude becomes a reality. It is:

- A way of translating nature’s inspirations into experience
- An inventive problem solving technique
- The laws by which phenomena comes to be
- The knowledge/history of nature’s becomings
- The knowledge of nature’s genius
- The principles for excellence
- A paradigm of moral grounding and human flourishing
- Mentor, model and measure

But most importantly, _mdw n'tr, madu-ndele(a,u), odú ifá, umthetho weMvelo, Ndel-a-Ndolo; Ndel-a-Ntalu, Malu-a-Ndele, Madu-a-Ndolo_, etc., literally is SCIENCE PAR EXCELLENCE! It

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36 Van Sertima, op. cit., p. 245.
is this author’s contention that Kamitude is rooted in the knowledge of the Law (mdw), the primordial causes which translate the Law into experience (ntr) and the transformative forces responsible for evolution (hpr). Kamitude is the catalyst, the foundation. Mdw Ntr is the method for its realization.

The next steps in this process can be done on an individual and communal level. Individually one has to look at nature differently: as a model, measure and mentor. Secondly, think of unique design or service problems where you live and look to nature to see how it solves a similar problem (like the case with the bullet train). Draw up plans in which to imitate this feat and you have a product or service worth marketing (stimulate economy). On a community level, the state must get involved to create and teach mdw ntr/Biomimicry in schools as part of the core science curriculum to aid in developing sustainable scientific minds in the 21st century. Many solutions need large financial expenditures for testing. Others do not. The nature of the scientific project will determine what steps are needed for its implementation.

Let the sky and God be our limit, and Eternity our measurement. African sovereignty depends on it.

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37 See how Biomimicry is being utilized in American schools and the curricula which guides it: http://www.biomimicry.info/Curriculum (retrieved June 1, 2011).
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PRESENTATION DE L’AUTEUR (à compléter)

Asar Imhotep is a computer programmer and Africana researcher from Houston, TX whose research focus is the cultural, linguistic and philosophical links between the Ancient Egyptian civilizations and modern BaNtu cultures of central and South Africa. He is the founder of the MOCHA-Versity Institute of Philosophy and Research and the Madu-Ndela Institute for the Advancement of Science and Culture. He is also the author of The Bakala of North America, the Living Suns of Vitality: In Search for a Meaningful Name for African-Americans, Passion of the Christ or Passion of Osiris: The Kongo Origins of the Jesus Myth and Ogun, African Fire Philosophy and the Meaning of KMT. Asar is a noted speaker and philosopher and is currently organizing efforts in a nation-wide venture titled The African-American Cultural Development Project—a national project aimed at creating a framework for an African-American culture which will help vitally stimulate the economic, political, scientific and cultural spheres of African-American life in the United States.

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