Les Raisons d'Être de l'ESMA[1]

www.math-art.eu

Claude P. Bruter
bruter503@gmail.com

1. Introduction

Objects existing in nature and not created by man all seem to possess a physical stratum.

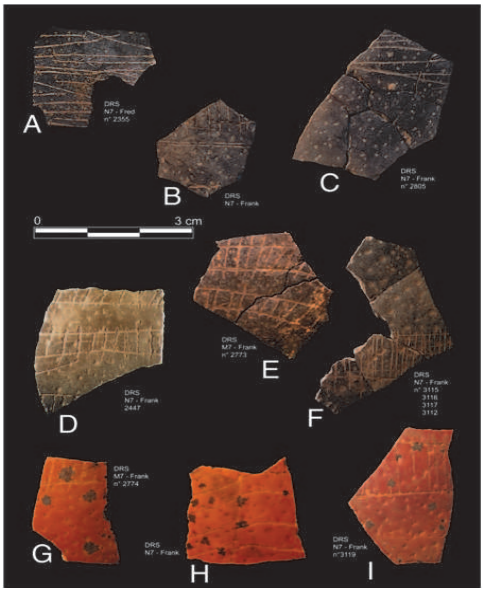
Each has a particular structure, but their functionality doesn't seem to have necessarily been studied or even recognized. Man-made objects do have a functionality, indeed a multi-faceted one.

Let us examine the existence of ESMA in the light of these preliminary remarks.

In order to better insure their stability through time and space, the animal species, including mankind, has developed representational tools and activities. These representations, at first interiorized and later exteriorized and materialized in more or less permanent forms, have served as our memory and sources of information. Memory of things observed exterior to us and memory of what we feel inside. These representations have a two-fold role, a double function, to be objects of memory and objects of information.

Engravings and paintings of all kinds, the oldest known of which dates back 60,000 years, are apparently the most ancient objects which have performed that double function.

[1] Exposé fait le 25 Mai 2012 à Bruxelles dans le cadre de «Math Art Summit» organisé par Dirk Huylebrouck



Gravures sur Oeufs d'autruches (Photos Pierre Texier [3])

Of course, the most significant events are the first to be represented. These natural phenomena might be beneficial, such as the presence of the sun, or maleficient natural catastrophes as storms or swirling movements, related to the necessities of life or to danger and the fear of dying.

These particularly significant events are also those presenting the strongest spatio-temporal stablity. They are associated with remarkable states and dynamics whose essential features have been represented. They appear with the first engravings: straight lines, curved lines, acute angles, serrated lines and undulated lines associated with repetitions and more or less periodic phenomena, like circles or spirals.

Engraving presupposes the use of a tool, probably a flint point, shaped like an arrow head and forming an exact acute angle.

These first engravings exhibit elements of local geometry. Global shapes, present in cave paintings, mainly concern the animal world.

More elaborate geometrical shapes whose nature is global, such as triangles, do not appear yet.

It seems reasonable to suppose that the use of stone as the primary material for the construction of shelters or of protective constructions, such as ramparts, tombs, temples, palaces and dwellings, promoted the development of an elementary arithmetic and geometry.

The fact that the repeated use of fundamental geometrical signs was pleasing to the eye, and later, the discovery of how to fabricate clay plaquettes and pottery, were steps leading to the development of decoration.

Here are, for instance, two pieces of pottery, symbols of femininity, created more than 2000 years before the Common Era (B.C.) :

Deux photos prises au Musée national archéologique d'Athènes

Were these the result of successive attempts of the artist, of artists at the same worksite or of artists at worksites separated in space and time? Did the works necessitate preliminary plans and calculations? To what extent does the sexual triangle play a role in the conceptualization of the triangle as a mathematical object?

By briefly evoking the past, and by asking these questions which concern the relations between mathematics and art, where natural philosophy, archeology, the history of art and the history of mathematics are involved, I wanted to call attention to one of the essential functions of ESMA, its cultural function.

It is directed in several directions. But before describing them, I would like to say a word about the conditions which allow ESMA to fulfill its function, in short, to make an inventory of fixtures and at the same time to give the potential elements of its physical stratum.

3. ESMA's Stratum

3.1 ESMA is in no way a profit-making organization. Its statute is that of an association, i.e. agroup of people who share similar judgments, convictions and wishes, and who agree to give some of their time toward the realization of common objectives.

ESMA will become stronger, more active and more influential as it benefits from the help of a greater numbrer of adherents who are competent, devoted and understanding.

Considering the material, organizational and psychological state of our societies, their evolution, present difficulties and those to come, and considering the original

nature of ESMA members' activities and their multiple competencies, we know that ESMA membership will remain numerically small.

3.2 Although ESMA's register contains nearly one hundred people, as of today only about forty are active, paying members (exactly 38 in 2011). Could this numerical weakness be balanced by financial solidity?

This is not the case now for several reasons. Dues (30 euros per member) are intentially weak. Our activities do not always correspond to projects supported by public funds. The decision-makers, still suspicious of mathematics, do not understand the cultural and social interest of these activities. The requests for support are too restricted, limited to the French part. And finally, we have no contacts within the financial circles.

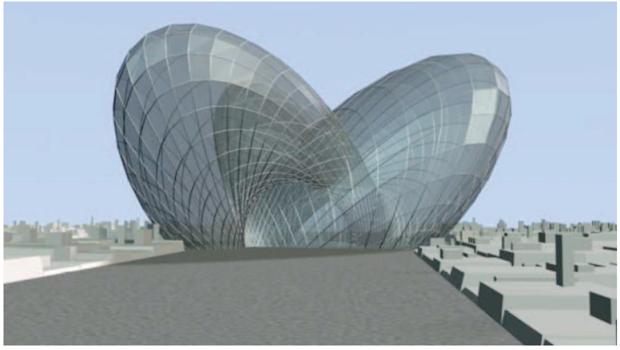
3.3 This situation could change, depending on an evolution of ESMA's reputation, an understanding of its activities, the quality of our propositions and how we publicize them.

Taking into account our ethics, our training and our occupations, the hope of progress depends almost entirely on the reputation obtained through our website, its presentation and its content. These should be commensurate with ESMA's ambitions and hopes. Everyone's help is needed to maintain this reputation.

We hope that with time, ESMA will receive more attention from various public services as well as from private foundations, and even from sponsors. The UNESCO patronage will undoubtedly aid in strengthening ESMA.

After two years of existence our balance sheet is rather encouraging. Neither the objectives exposed by ESMA, nor the content of its website has received any criticism to my knowledge. Hopefully, they have contributed to giving a good international image of ESMA. I would like, apropos, to pay tribute to our first webmaster. The curves of requests to receive the Newsletter and the visits to our website have been on a constant rise.

3.4 ESMA's existence has revived interest in the important ARPAM project [1], of which ESMA is a principal partner, giving a new dimension to it. This is being accomplished in collaboration with the Steklov Institute, the Independent University of Moscow, and the Academy of Architecture of Moscow to visualize and to materialize the project in Kaluga. In addition, the Hellenic Mathematical Society wishes to set up the project. More details about these projects can be found on the ARPAM and ESMA websites. May I add that this project not only works as a kind of museum for mathematics, but by its content has a much larger and deeper artistic and cultural interest reaching all layers of society.

Deux esquisses de folies : Septième Temple à gauche, Brioche de Boy à droite

3.5 From its history and by its very nature, ESMA has inherited an important collection of plastic works from ARPAM. These were created as much by mathematicians endowed with artistic talent as by artists remaining true to an ancestral tradition and attracted by the pure beauty of mathematical shapes.

The image of this collection of works deserved to be improved. This has been accomplished first in the form of exhibitions, which were much appreciated by the visitors. The comments in the visitors' book at the last large exhibition in the Town Hall of the fifth administrative district of Paris give evidence to this. Allow me to present a few of them:

Merci pour cette très belle exposition que
je prendrai plaisir à revoir -
Mon adresse: Jacqueline GENDRE 7 bis rue de la ROSIÈRE
75015 PARIS.
le 6 février 2012.

Pour une brochure
[illegible]_nelly@ .fr
Impressionnant !
et superbe
Victoire Mabot
mèl : victoire.mab@gmail.com
f.vermeil@yahoo.fr
Si documentation disponible P.R

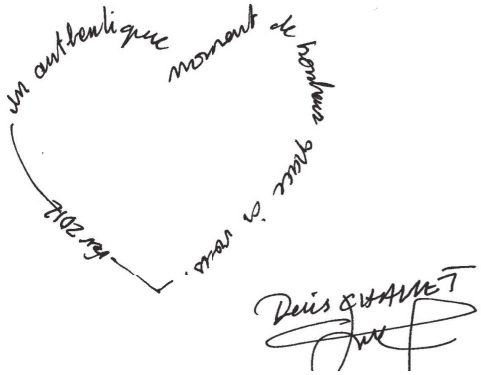
Tableau et exposition superbe ainsi que des forme ingénieuses
amusante et intéressantes. J'ai vraiment aimé continuez

Bravo, félicitations
incroyable les questions que
vous posez
aussi fascinant pour un amateur
de math et un fan des arts

Merci

Anne-Marie
et Gaspar REINHART

Merci infiniment pour cette exposition
hors du commun, où l'interactivité
entre les auteurs et les visiteurs vaut
tout l'or du monde, ce qui m'a permis
d'avoir le meilleur cours mathématique
que je n'ai jamais eu. Continuez,
votre talent n'a d'égal que votre modestie.



Denis GUEDJ

Exposition surprenante, mais très intéressante.
On apprend comment faire du beau avec des math.
Paris

Merci pour cette exposition (qui donne envie d'en savoir/voir plus ...).
Intéressant de constater que je n'ai remarqué que très peu de " mathématiques autour des œuvres (simplement des équations de-ci de-là ...). :)) Maxime
/Formateur maths
École de la 2e Chance
(Seine St Denis)

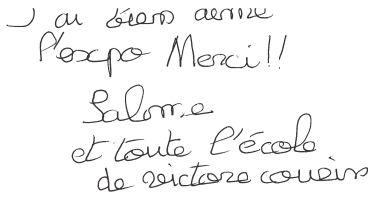
Très belle et surprenante exposition. Les couleurs sont superbes on peut aller très loin dans le rêve qui devient réalité si on sait regarder. Amitié - CHL - Paris

stephane.ervel3@gmail.com
Magnifique exposition qui me donne envie de re-découvrir les maths que j'ai appris à détester à l'école. Merci à tous les matheux Artistes.

Reading some of these comments, one can appreciate the interest of these exhibitions for the public at large, reconciled with mathematics. *From its new look at mathematics, the influence of this public of adults on the young generations can only be beneficial.*

To reach the former, whose formation of understanding and taste is still developing, oral presentations, glowing and animated, are necessary. By making *modern mathematical notions accessible to the audiences*, by showing them both beautiful and astonishing objects, *these exposés*, also based on elements of the history of art or of mathematics, *win the support of children of all ages without reservation*.

The article published in the Gazette des Mathematiciens of October 2011 [2], and our newsletters refer to this success through the enquiries[1] that were made and through more recent ones. If more convincing were needed, we could quote these two testimonials:



all the students, teachers and the principal of Nikaia's 9th high school would like to deeply thank you for your presence here. We really enjoyed your speech, and acquired many teaching experiences by your educational methods. We would be grateful to hear from you as your knowledge makes as wiser.
Sincerely yours,
Katerina Glinou, principal of Nikaia's 9th junior high school

The ARPAM project, these exhibitions and exposes without a doubt characterize the originality of ESMA compared to other similar institutions.

In a recent interview in the newspaper «Le Monde», Jean Clair, author of «Hubris. La fabrique du monstre dans l'art moderne. Humoncules, géants et acéphales» says that «What is interesting in modern and contemporary art, is that monsters, the new Titans, seem to have triumphed over gods, and that ugliness seem to have taken over beauty as the element of abstraction and fascination».

People familiar with math-art works might disagree with this point of view: as we have just seen, these works, far from being monsters, are commonly qualified as beautiful by the very few who have seen them. *ESMA exhibitions also help to*

---

[1] The standard file of our enquiries: 1) Votre première réaction après l'écoute de l'exposé est-elle:
a) Positive / b) indifférente / c) négative (Merci de justifier votre réponse en quelques lignes)

2) Ces exposés vous ont-ils permis de découvrir un nouveau visage des mathématiques ?
a) Oui / b) Non (Merci de justifier votre réponse en quelques lignes)

3) Les images et objets vus et/ou commentés ont-ils éveillé votre curiosité ?
a) oui, sur quels plans ? (contenu mathématique, aspects techniques de fabrication…)
b) non, pour quelles raisons ?

4) Considérez-vous que les œuvres présentées sont des œuvres artistiques
a) oui, pourquoi et en quoi / b) non, pourquoi et en quoi

5) Après cet exposé, percevez-vous autrement leur dimension mathématique ?
Oui / Non

6) Considérez-vous que la visite de cette exposition aura, à plus long terme, un effet sur :
a) votre manière d'envisager les mathématiques ? OUI / NON
b) l'intérêt que vous portez aux arts ? OUI/NON
c) votre rapport aux sciences et à la connaissance en général ? OUI / NON

reconcile the public with beauty. That is a supplementary argument in favor of ESMA's existence and publicity for its exhibtions.

4. **The functions of ESM**A

4.1 This glimpse on the recent ESMA activities emphasizes one of the most important reasons for which ESMA was created: to contribute to lowering the psychological barriers which separate mathematics from the public, whatever it may be, by drawing on the charm that the beauty of a successful materialization of mathematical objects can exert on everybody.

4.2 Mathematicians who practice art and artists who do mathematics for intellectual and visual pleasure, find here an image-enhancing social justification for their creative work.

Of course, the content of the exhibitions and the mathematical material accompanying them will be enhanced as the works become more numerous and varied.

It is thus justified to create an entity liable to encourage and to facilitate these creations by gathering all the participants, by striving to give them larger visibility, and when possible, by helping them not only on the mediatic level, but also technically and materially (financially) if necessary.

In this setting, contributing to the training of new participants through adapted schools is a part of the ESMA objectives.

4.3 Two other institutions display programs similar to those of ESMA. These are ISAMA and especially, BRIDGES, beautiful names indeed. They apparently came into existence after ARPAM, the parent of ESMA. It seems also that the recent evolution of BRIDGES in particular was influenced by the presence and the characteristics of ESMA.

Moreover, these institutions are American. In the past of years of plenty, some Europeans could go to the States and the Americans had no difficulty coming to Europe for academic tourism and exchange. These exchanges have become more difficult for financial reasons.

Therefore, it seemed right to give particularly to those encountering financial difficulties, new opportunities to meet and to exchange, thus bringing them a form of understanding and psychological support to their work.

In addition, there was no reason to assume that only American institutions should have the monopoly of these activities. Europe has inherited a long artistic and productive tradition close to mathematics from the Greeks, the Renaissance, and the

more recent cubist period. Europe has its own resources and its own creativity, which deserve to be more organized and supported.

4.4 We were thus in the presence of very many reasons for justifying the creation of a European institution, an institution that would have wider influence by going beyond the more limiting local activities.

And finally, it fully fits the vision, notably carried by science, mathematics and by art, of a more united world, whose internal dissensions echo all the forms of lack of intelligence and of narrow-mindedness in space and in time. Creating the European Society for Mathematics and the Arts also underlined the wish to witness the construction of a more federal architecture, a better built Europe, more efficient, outstanding on the human and cultural level.

Acknowledgment : A new thank to Sharon who translated my Franglais into English.

Bibliography

[1] Bruter C.P., *Athens Conference (The Arpam project)*, http://www.math-art.eu/documents/pdfs/THE%20ARPAM%20PROJECT.pdf .

[2] Bruter C.P., *Les beaux-arts au service des mathématiques*, Gazette des Mathématiciens, N° 130, Octobre 2011, 83-90 (http://www.math-art.eu/documents/pdfs/Gazette2011.pdf).

[3] Texier P. et alii, *A Howiesons Poort tradition of engraving ostrich eggshell containers dated to 60,000 years ago at Diepkloof Rock Shelter, South Africa*, PNAS, April 6, 2010 | vol. 107 | no. 14, 6180–6185.