A concrete tale

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Since the first appearance in 2006 of the "greatest archaeological site of the century", the Bosnian "pyramids", Mr. Osmanagic, their finder (or founder ?...), has always maintained that the huge slabs of conglomerate (see the article on the geology of the Visoko region) covering the hill of Visocica are the result of human intervention. In the earliest days of the 2006 excavations, a Foundation press release (bs) stated : "*There can be no doubt that these blocks of stone were worked by man in early Bosnian quarries, transported to the site, and used to build the pyramid.*" In May 2006, in an open letter to Professor Enver Imamovic (bs), the word "quarries" was once again mentioned by Mr. Osmanagic : the blocks were *"hewn long ago from early Bosnian quarries, transported here, and used for the walls of the pyramid*."

Concrete Blocks

However, faced with the difficulty of visualizing how the transport of such enormous quantities of huge slabs could have been undertaken, and, in particular, the impossibility of identifying the famous "early Bosnian quarries" from which they were removed, Mr. Osmanagic did not waste any time in coming up with another hypothesis. From July 2006, he took to saying that the Visocica blocks - and perhaps also the Pljesevica sandstone slabs - were made of concrete cast on site. An article in ***Science Daily*** (en) in December 2006 confirmed the direction he was taking. Entitled : "*The Riddle of the Great Pyramid of Giza : professor discovers that some blocks are concrete*," the article, although dumbed down to within an inch of its life, referred to a well known scientific paper (en) by Michel Barsoum, of Drexel University, Philadelphia, and published in the ***Journal of the American Ceramic Society*** . In this paper, the author sought to show that some of the blocks of the Great Pyramid were man-made (a public presentation of Mr. Barsoum's theory on the construction of the pyramid of Giza is to be found here (en)). As far as Mr. Osmanagic was

concerned, there could no longer be any doubt that the Visocica conglomerates were also concrete. In fact, the text on the Foundation website (bs) which refers to the ***Science Daily*** article bears the title : "*The Great Pyramid of Egypt and the Bosnian Pyramid of the Sun built of concrete blocks !"* It then launches into the refrain of : "*Bosnian Pyramid of the Sun is built out of the concrete conglomerate blocks poured at the site. Bosnian Pyramid of the Moon mostly consists of the sandstone cement plates poured at the site ...* "

Analysis

But the existence of this "concrete" and "cement" had to be based on something more than Mr. Osmanagic's intuition alone. An announcement was made to the effect that five different laboratories had analysed (en) the Visocica blocks, and confirmed that they were artificial. Four of the laboratories are listed here (bs) :

- the Institute of Civil Engineering of Tuzla (bs) in 2006 headed by Ahmet Imamovic ;
- the Institute "Kemal Kapetanovic" of Zenica (bs) in 2007 and 2008 headed by Muhamed Pasic ;
- the Institute for Construction and Materials, University of Sarajevo (bs) in 2008 (Azra Kurtovic)
- and finally the Polytechnic Institute of Turin (it) in 2009.

There are also some pages (en) that cite an analysis carried out by a private company, Geoprojekt of Tuzla (Geoprojekt is the company that, in 2008, conducted the geological survey on the Vratnica mound). Other pages cite the latest survey carried out by Professor Davidovits (en), proponent of a controversial theory according to which the pyramids of Egypt were built of geopolymer (en), reconstituted stone.

However, anyone searching the sites of these various institutions for the **results** of these tests will not find any pertinent information. Nor is there much beyond a few details to be found on the Foundation website, despite the fact that this page (bs) states that "*all reports are available on www.icbp.ba* [1] *and www.piramidasunca.ba* [2]". As far as these reports are concerned, none has ever been published by the Geoprojekt company, or by the University of Sarajevo. The Foundation website contains four references to "reports", none of which, as will be seen below, meets the criteria required of a reasonably serious scientific work ...

Institute of Civil Engineering of Tuzla

A "preliminary report" (bs) issued by the Institute was published by the Foundation in July 2006 ; I have already discussed this report here.

Rapport du GIT
GIT Report

The reader might recall that what this "report" does is provide a series of compression strength values taken from various samples, information which, however, casts **absolutely no light at all** on the question of the origin (natural or artificial) of the materials tested. The chemical composition of two samples of "cement" is given, with widely differing results ; but, again, these results say nothing about the origin of the material. This preliminary report, according to the Foundation geologist (bs), should have been supplemented by other tests (particle size distribution, radiocarbon dating ...). I

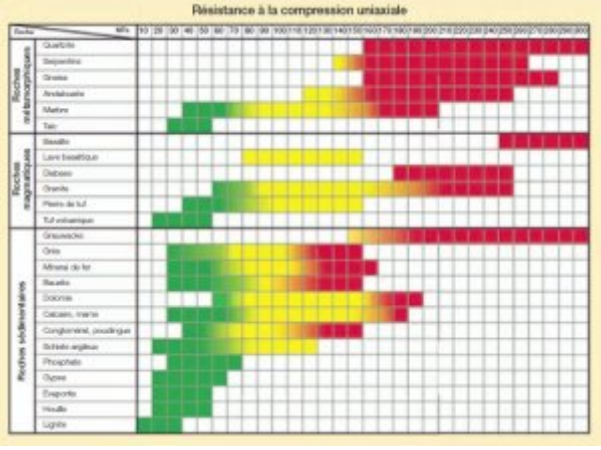
do not know if further tests were carried out ; what can be said, though, is that, if there ever was a definitive official report from GIT, it has never been posted on the Foundation website, and nor is it mentioned anywhere in the Foundation documents. The fact that the report is nowhere to be found does not prevent the Foundation from citing it as “confirmation" of the artificial origin of sandstone and conglomerates from the "pyramids".

Report of Professor Muhamed Pasic

The report by Professor Muhamed Pasic (bs) from the University of Zenica was published in January 2009 (since the links on the Foundation are not working at the moment, I attach a copy of this report below) :

Rapport du Prof. Pasic
Report by Professor Pasic

This document is **not** a scientific report. It appears beneath the header of Mr. Osmanagic’s Foundation, and is presented as an interpretation of test results, although these results are not presented in the accepted manner (number and origin of samples, protocols, tables of results ...). The first thing to note is that, as in the GIT analysis, the analytical methods used by Mr. Pasic are those employed in **civil engineering**. Such methods are relevant in assessing the quality of a concrete, but they are not capable of determining the age and **origin** of a material. Let us take one example : the first part of the report (pages 1-3) is devoted to a study of the mechanical resistance to compression of the various samples, and it is only by relying on the argument that the "pyramid” samples exhibit a greater amount of “solidity”, compared to those from the Ravne tunnel, that the author claims to confirm, from page 3 onwards, that these materials were created artificially. Had he consulted a geologist [3], the author would have discovered that the natural resistance to compression displayed by sandstones and conglomerates varies hugely, and can easily exceed 100 MPa, as shown in the document below :



Résistance à la compression des roches
Compression strength of rocks -
Source (fichier pdf)

The other "arguments" in favor of the theory of artificial concrete submitted by the author (low porosity, sample rupture modalities, presence of CaCO3 and MgCO3 - hardly surprising in

sandstones and conglomerates with a more or less dolomitic calcite matrix), are little more convincing : **none of these elements contains anything to indicate a non-natural origin** for the conglomerates and sandstones at Visocica and Pljesevica. Just because a conglomerate looks like concrete, and behaves like concrete when subjected to fracture and pressure, it doesn't necessarily mean that it actually is concrete ... unless, as seems to have happened with Professor Pasic, the researcher has already decided that this is the case before even beginning work !

Confirmation (?) from the Polytechnic Institute of Turin

Ever since "confirmation" from Turin Polytechnic of the "artificial concrete" thesis first saw the light of day in late 2009, it has been duly proclaimed and trumpeted on each and every forum and site concerned with "pyramids". Nevertheless, no report has as yet been published on the Foundation website (nor, indeed, on the Politecnico website). Informations about the Polytechnic analysis can be found on only two pages of the Osmanagic site. The first (en) is on the English section of the site, and contains copies of four pages from "SHAN", an Italian magazine carrying an article about the Bosnian "pyramids" that repeats all of Mr. Osmanagic's theories. The article is **illustrated** with copies of some document that could conceivably be the Turin Polytechnic report, except that it is completely illegible. The report is also mentioned in this text (bs) on the Bosnian section of the Foundation website, but, again, there is no copy of the actual report itself : just an email summary, written in English, sent to Mr. Osmanagic by one Giancarlo Barbadoro. This email from Mr. Barbadoro is the one that we find cited on websites and forums, surrounded by palisades of exclamation marks, as sole source of the "confirmation" - see here (en), for example.

Who is Giancarlo Barbadoro, and how did he come to be the one who informed the Foundation of the Italian report ? Mr. Barbadoro is a Celtic-influenced musician (it), an author (it), and director (it). He is also founder of the "Ecospirituality" Foundation which happens to be the publisher of "SHAN" magazine, concerned equally with the rights of "natural peoples" (en) and with "the freedom of the megaliths" (en). He hosts various gatherings (it) and websites (it) devoted to the esoteric, UFOs and archeological "mysteries". Small wonder, then, that he went to Visoko to see Mr. Osmanagic's "pyramids". He it was who took the samples, had them analyzed by the Turin Polytechnic Institute, and then sent the results on to the Foundation.

But why has he not made available the full Turin Polytechnic Institute report, rather than merely the basic summary sent to Mr. Osmanagic ? Or, if he did make it available, why is the report not posted on the Foundation website, where there is quite a plethora of rather uninspired reports (bs), on such subjects, for example, as tunnel ventilation, or the measurements of wood used in tunnel "reconstruction" ? Could it be because the report falls some way short of saying what Messrs. Osmanagic and Barbadoro were hoping it would ? Even if the report actually exists, and assuming that its contents are as summarized by Mr. Barbadoro, there are still many unanswered questions : where exactly were the samples taken ? under what conditions ? precisely what information was given to the Polytechnic ? exactly what analyses were carried out ? ... In short, we are still **a long way off** from being able to talk about scientific confirmation !

Analysis (?) by Professor Davidovits

Mr. Osmanagic and Mr. Davidovits met in Edinburgh (en) in November 2008 at the "Histories & Mysteries" (en) conference (where other familiar faces such as Harry Oldfield were also to be seen). It was on this occasion that Mr. Osmanagic gave Mr Davidovits a sample from the Vratnica "mound". Once again, it has proved impossible to obtain a proper analytical report on this sample. It seems that all Mr Davidovits did was to send the Foundation an electron microscope photograph (bs and en), accompanied by a rather terse email in which he mentions "geopolymer cement" without

any scientific discussion ; and in which he requests some further information about the geology of the region. The article on the Foundation website citing this email indicates that "*more information can be found*" on the official Professor Davidovits website ; unfortunately, the official page in question (fr) provides little more - indeed, if anything, somewhat less - information. In December 2008, Mr. Davidovits placed a statement on the page to the effect that what he was dealing with was : "*antique concrete (not modern) worth of being analyzed*". So, before even beginning any analytical tests, he had already announced that the material was concrete ... An update in February 2009 repeats this "first impression" ... but still treads very warily : "*pockets of what **seemed** to be calcined clay*". After that, nothing further. Professor Davidovits merely confines himself to commenting on the analysis by Professor Pasic mentioned above, an analysis of which he clearly knows no more than the shortened version (en), translated into English on the Foundation website, which at no point explains how Mr. Pasic reached his conclusions, although Professor Davidovits endorses them without any reservations : ("*I am enthousiatic in reading that it could have been used by those who built the Bosnian Pyramid of the Sun, Visoko*").

> **Update, november 2013** : t seems that Prof. Davidovits has finally become aware of just how much advantage has been taken by Semir Osmanagic of Davidovits' analysis ; despite the fragmentary nature of the report, Osmanagic implies that it says much more than it actually does. A recent update of Davidovits' page now gives some details :
> **–** The kind of concrete that Davidovits identified was in use during the Middle Ages, and was also used by the Romans and Egyptians ; but there isn't "any data that may suggest anything older".
> **–** The sample of concrete that he studied bears no resemblance to the natural conglomerate (or pudding stone) covering the "pyramids".
>
> So Prof. Davidovits, while confirming his analysis of the Vratnica sample as Roman concrete (which he supposes could have come from a cistern or water tank constructed on the site where the drilling took place), is making it clear that he wants no part in Osmanagic's wishful thinking about "pyramid concrete" : "Consequently, the information published on the Bosnian Pyramids websites are inaccurate."

A PhD from Drexel University

What can we conclude from all this ? That the gospel according to which "artificial concrete" is a component of the Bosnian "pyramids", far from being confirmed and reconfirmed as Osmanagic would have it, **is not supported by any serious scientific report**. And yet there is a real scientific work on the "concrete" of the pyramids, and we could be forgiven for wondering why it does not appear on the Foundation website. This work is a doctoral thesis, submitted by Mr. Aaron Sakulich in September 2009 to Drexel University in Philadelphia. The thesis, not yet published, is to be found on the University website (en) (note 9 MB pdf file).

In his thesis, Mr. Sakulich, a geopolymer and cement specialist, analyses a number of blocks from archaeological sites where there was a possibility of artificial origin. Amongst these blocks were samples from several Egyptian pyramids, which he compared with samples of natural limestone and granite, samples from a "prehistoric pavement" in Colorado (it was in fact a natural pavement), and a total of seventeen samples from various sites around Visoko (Visocica, Pljesevica, Ravne tunnel, Vratnica ...). These samples were sent to the Drexel University Materials Science laboratory by the Osmanagic Foundation. The Foundation actually announced here (bs) that it intended to send a total of twenty-five additional samples to three top international materials science laboratories. The

Foundation made it perfectly clear that the selected institutions would not know who any of the others were, thus avoiding any risk of "collusion" between them.

Analysis of these samples (at least those of them that were usable, since it appears that, in with the "concrete" samples, the Foundation also managed to include various organic soil samples - "*foul-smelling soils*" – together with a piece of stalagmite) is described on page 130 and onwards of the thesis (p. 151 of the PDF file). The composition of the various samples revealed nothing in particular to the author ("*None of the phases detected were particularly exotic and were limited to quartz, calcite, dolomite*"). Only two samples - number 17, which came closest to a modern concrete, and number 8, possibly a natural conglomerate, but which could also be interpreted as displaying the characteristics of concrete - were considered to warrant the expense of carbon-14 dating.

This technique is indeed the one best calculated to distinguish a natural concrete from an artificial one. As the author explains on page 148 (169 of the PDF), to produce lime mortar, lime is first heated in a lime kiln, which converts it into quicklime (CaO). Next, the addition of water converts it into slaked lime Ca(OH)2 (calcium hydroxide, or Portlandite). Then, during the setting of the mortar, the slaked lime absorbs atmospheric CO2 and becomes CaCO3 once again. It is the absorption of atmospheric carbon dioxide that makes dating by carbon isotope 14 possible. Such dating is, of course, impossible in the case of a natural limestone dating back several hundreds of thousands, or millions, of years. In the case of cements or man-made mortars, applying this dating technique is quite difficult, since they usually contain a mixture of varying proportions of "old limestone" (which contains no trace of C14) and "young limestone" formed by atmospheric carbonation during the formation of mortar. As far as archaeological cements are concerned, the results might be in question (especially since there is always the risk of recent contamination ; see the case of the fossilized wood from the Ravne tunnel). If, on the other hand, the dating returns an “infinite” age, this means that there is no trace of carbon 14, and that there is therefore no chance of this being anything other than an old natural limestone that had developed during natural cementation of sandstone granules or blocks of conglomerate by the deposition of calcite. Yet the results of the dating carried out by Mr. Sakulich on two samples, one from the "Pyramid of the Sun", and the other from the Vratnica "mound", are **beyond question** : both show an "infinite" age. This allows Mr. Sakulich to conclude that : *“It is therefore likely that at least these two samples are natural ; if nothing else, it is definite that **they are not made of a recarbonated lime-based material**“*.

Finally, we understand why this study is not, and probably never will be, mentioned on the Osmanagic Foundation website ! The blow will be all the more keenly felt by the Bosnian "pyramid" believers given that, besides anything else, the author, Mr. Sakulich, is in fact a supporter of Dr. Michel Barsoum, mentioned above for his thesis on the artificial origin of at least some of the stones of the pyramid of Giza. Despite its highly controversial nature (for a systematic refutation, see, for example, here (en)), Mr. Sakulich himself seems all in favour of this theory. The adherents of a theory according to which the Egyptian pyramids are made of concrete can hardly be accused of being part of the scientific "establishment," since they themselves are "victims" of the rejection of their theories by "orthodox science". If even they refute the concept of a "concrete" Visocica, whose word are we to trust ?! The difference is that the theories of Messrs. Barsoum and Sakulich, controversial though they might be, are nevertheless proper scientific theories, accompanied by appropriate arguments and documentation, which cannot really be said of Mr. Osmanagic’s theories …

The last word must be left to Mr. Sakulich, who is certainly not without humour :

"*It is noted here that investigation of the Bosnian ‘pyramid’ samples provided no evidence supporting the theory that the structures will “break a cloud of negative energy, allowing the Earth to receive cosmic energy from the centre of the galaxy”, or that they will “adjust the Earthly*

frequency and bring it into accordance with the vibrations of our Sun" at the behest of the Maya, the Cosmic Watchmakers. Should either of these events come to pass it will surely be due to reasons other than the geological makeup of the 'pyramids.'" [4]

P.-S.

See also, in the site gallery, All that nature can never do, part V : conglomerate or concrete ?

Notes

[1] the site of the "international conference" of 2008

[2] the Foundation website

[3] He would also have avoided stating that the tunnel Ravne conglomerates were deposited in the sea... see here.

[4] See Wikipedia (en) and this text for the original quotes.