

## General Aspects Regarding Trephination

*“Our knowledge of prehistoric surgery is limited to operations that affected the bony tissue. One of the best known and most remarkable operations performed ...is without question that of trepanation, the evidence of their skill and success in the use of rude instruments being nothing short of marvelous”.*

**George Grant Maccurdy,  
Prehistoric surgery – A Neolithic Survival**

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The curiosity concerning the human being and its evolution in time has represented a major topic of interest, both for commoners and scientists.

Even beginning with antiquity, the sources of that time have mentioned all kinds of interpretations and considerations concerning the human body and its way of functioning and, consequently, of reacting to the stimuli of the environment. Of course, the provided interpretations were consistent with the information and conceptions of their time.

As soon as knowledge had developed, medicine detached itself from other sciences, bringing new perspectives and study modes upon the mentioned aspects.

Much later, at the end of the 19<sup>th</sup> century, the basis of anthropological science had been also established, and later on, this field achieved a self standing status.

With regard to the anthropology of the old populations, it closely followed the evolution of archaeological studies. In Romania of the 19<sup>th</sup> century there was no special interest either for archaeology or anthropology. The remarkable finds made during the first decades of the 20<sup>th</sup> century initiated a significant stage in the development of both mentioned sciences. The intensive archaeological research provided an even larger quantity of human osteological materials available for an anthropological study. The more complete the skeletons were, the more significant information could be obtained. Therefore, besides the usual anthropological data, some pathological or cultic elements could be reconstructed. In this sense, trephination represents a surgery, carried out in a purely curative purpose, but also as a ritual practice which resulted in the cutting off of a roundel from the skull of a living or deceased person. In the latter case, the subject could have been an enemy or an individual with special skills or capacities. In addition, in the case of some ailments with psychic consequences, the archaic people considered that individual to have been possessed by evil spirits, which should have been expelled by the practice of trephination. Such beliefs persisted until today, as we will find in one of the following chapters.

Yet, before starting to develop the topic, we should firstly establish, for certain, what is the meaning of the trephination term. In fact, it consists of a series of maneuvers, surgically performed on the skull, with various purposes and utensils, aiming to cut away a portion of bone

(in most of the cases including all its three layers), either to use it as a roundel (with special powers), or to alleviate an illness, or just symptoms<sup>1</sup>.

Of course, in time, a lot of other similar finds have been done all across Europe. Depending upon the country, the discoveries were chronologically assigned to various epochs.

The South American trephinations were situated in time about 2000 years B.C. and lasted up to the time of Columbus.

Considering the purpose of the trephination, we could distinguish the following categories:

- the strictly medical purpose (for battle wounds or accidental ones);
- the magical-religious purpose (trophy skulls, mummification etc.).

At the beginning of the research concerning the trephination, some trends have appeared among the outstanding scholars of that time.

G. de Mortillet, Nadaillac, Lecène, Baudoin considered the trepanning process as being exclusively connected with the cultic life.

Others, like Hansen, Lucas Championnière, Wölfel, admitted that, initially, the trephination had a unique therapeutic destination, in the case of cranial trauma, when bone splinters had to be removed<sup>2</sup>. In many situations, the difference between the injury determined by warfare and the one made by an accident could hardly be distinguished<sup>3</sup>. In order to have an idea about the incidence of trauma upon the skull treated with trephination, we could mention here two good examples, namely the Yamnaia and Catacombaia Cultures which covered large regions of Europe, beginning with the Eneolithic and during the Bronze Age. Therefore, the trauma resulting in trephinations for the Catacombaia Culture reached 10%, while those for the Yamnaia Culture reached no more than 3%. The anthropologist who referred to these cases had pointed out that, in most of the interventions, the cause was made by trauma, in some cases, by a blunt object. Of course, the solution of removing the bone splinters from the wound had been chosen, a fact which would have certainly alleviated the consequences of the blow upon the patient's skull<sup>4</sup>.

For the ancient populations on the territory of Romania, the spirit of the dead was frequently located in the head and achieving a bony fragment of the cranial vault represented, as *pars pro toto*, a concentration of powers or other qualities which could be easily taken over by another person when creating and wearing such an amulet. It is not accidental that in many corners of the world, bony fragments of skulls were found worn suspended at the neck as a single amulet or grouped in necklaces (Fig. 1, Fig. 2). Sometimes those who wore them had a high rank in the society, being either shamans, chieftains, or their descendants. As shown in a paper regarding the Ukrainian and Moldavian territories, which referred to some social aspects, as rendered in the necropolises belonging to the bearers of the tumulus ochre burials (Pit-Grave Culture), children used to inherit the social status of their parents. And this is not an isolated case, restricted to that region. It is interesting to observe the children burials containing ritual objects considered to have generally belonged to the shamans<sup>5</sup>.

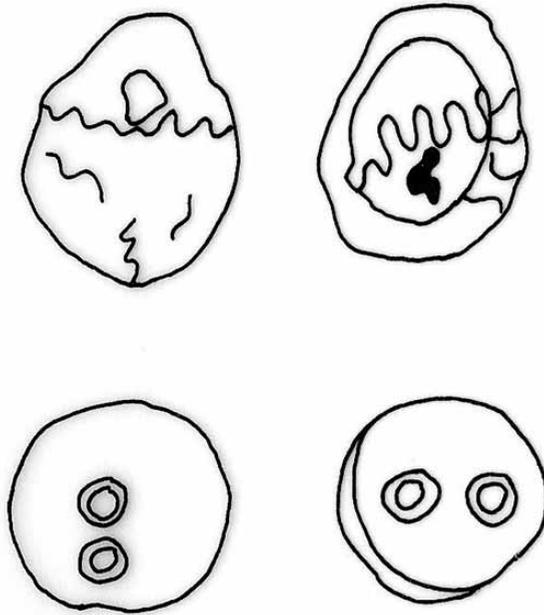
<sup>1</sup> In this volume, we have used trephination and trepanation as synonyms.

<sup>2</sup> Olga Necrasov, *Asupra unor cranii vechi trepanate, găsite pe teritoriul R.P.R.*, Probleme de antropologie, vol. I, 1954, p. 124-125.

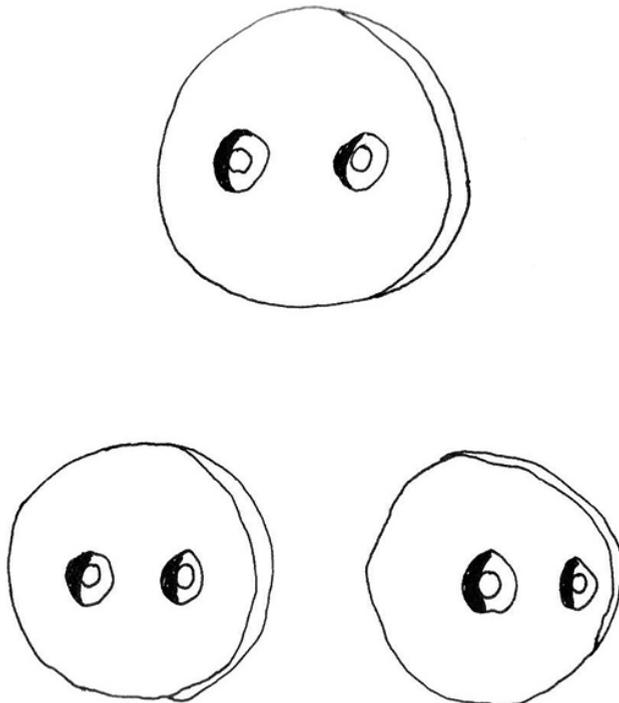
<sup>3</sup> T. Anda, *op. cit.*, p. 251.

<sup>4</sup> S. I. Krutz, *Paleoantropologiceskie issledovanija stepnogo pridneprovija*, Kiev, 1984, p. 78-80.

<sup>5</sup> Svetlana Ivanova, *The Social Differentiation in the Pit Grave Society: A Reconstruction Based on Burial Data*, In Lolita Nikolova (ed.) *Early Symbolic Systems for Communication in Southeast Europe*, vol. I, BAR International Series 1139, 2003, p. 160.



**Fig. 1 - Skull fragments from Petit-Morin (Marne) in France used for pendants or strings (apud Al. Lenghel, 1926, p. 408)**



**Fig. 2 - Skull roundels used as pendants of strings - Musee de Saint-Germain (apud. T. Anda, 1951, p. 254, Fig. 3).**

The detected trephination cases number into the thousands all over the world, or continents and are not restricted to a certain area. Yet, it seems that probably due to a more intense and lasting archaeological investigation and also due to the anthropological studies performed earlier upon skeletons, Europe has most of these identified situations<sup>1</sup>.

In other parts of the world, like in the Eurasian steppes of Kazakhstan, for instance, in the Botai Culture, the archaeologists made finds which showed the use of the trepanned skulls, or cut away skull pieces, as cultic objects. They were found in the dwellings of the mentioned culture<sup>2</sup>.

### **Trephination in the Times before the Warfare Periods**

We consider that period to be the one during the Paleolithic and Neolithic periods, when the communities had a rather small number of individuals and they were situated at larger distances one from another. Of course, conflicts could not be excluded even then, but they were less extended than later.

The archaic people had well processed all kinds of stones or wood and, therefore, their weapons were restricted mainly to such categories of raw materials. For their level of development, the weapons had satisfied their demands<sup>3</sup>.

Such a surgical operation was meant to save the life of the patient affected, in some situations, by blows on the head. This trauma could be also induced by accidents. Under these circumstances, in most cases, no differentiation could be done between those two certain causes.

After the widespread use of copper and later, of bronze and iron, the weapons became more and more sophisticated and intense warfare resulted in their permanent development and improvement.

### **Trephination in the Warfare Periods**

Of course, the appearance of a blow by a club is significantly different from, for instance, the cutting of a sword. In the second case, the piece of bone is partly or totally cut away from the skull. In the latter situation, the hole might mislead and be interpreted as a trephination hole.

People knew from experience that in the case of a severe wound the intervention should be done as quickly as possible and during battles, the medicine men accompanied the warriors. For Romania, we have such information about the time of the wars between the Getae-Dacians and the Romans. Both armies were accompanied by such people. We know that also, in that part of Europe, the Greeks had medics that followed their troops<sup>4</sup>.

In any event, given the complications which could have appeared when several severe wounds were inflicted upon a single patient, we could also presume that the archaic medicine people, in most situations, possessed the abilities to cure their patients. When stating that, we rely upon

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<sup>1</sup> Charlotte Roberts, K. Manchester, *The Archaeology of Disease*, Ithaca, New York, p. 91.

<sup>2</sup> Marsha Levine, Y. Rassamakin, A. Kisleko, Nataliya Tatarintseva, *Late prehistoric exploitation of the Eurasian steppe*, McDonald Institute monographs, 1999, p. 202 and figs. 4.21. and 4.22.

<sup>3</sup> An interesting study about the evolution of weapons in the Late Bronze Age could be found in the book of Robert Drews, *The end of the Bronze Age. Changes in Warfare and the Catastrophe ca. 1200 B.C.*, New Jersey, 1995, p. 180-208.

<sup>4</sup> V. Crișan, *Cîteva date și informații cu privire la neurochirurgia antică*, Istoria medicinei. Studii și cercetări, București, 1957, p. 319.

the high percentage of healing identified upon trepanned individuals, some bearing even two or more such interventions.

Of great interest we have found some studies carried out upon trepanned skulls from the Southern Seas. In those territories, it seems that the mentioned technique was practiced since immemorial times<sup>5</sup> and it ceased at the moment when white people reached those regions. The reason for such a situation was due to the use of fire arms. Such a weapon inflicted very severe and extended wounds, damaging on a large scale, both the skull and the brain. The local communities until then, used cutting or percussion objects as weapons, as did other populations on archaic levels of civilization. Such items inflicted wounds which did not affect too much the cerebral matter. Under such conditions, trephinations were practiced on a large scale, being a common procedure. In most of the cases, just the cranial bones were affected and the most important operation was to remove the so-called “impressed” splinters, which, otherwise, induced a pressure upon the brain. After the operation, the patient felt an almost instant relief.

Of course, after the conquest of the Whites upon the mentioned territories, trephination was useless as it did not help to cure the wounds made by fired guns<sup>6</sup>.

### Theories Regarding the Origin of Trephination

According to some theories, trephination was initiated during the Mesolithic time, or even, earlier, during the Upper Paleolithic period<sup>7</sup>.

What can be maintained as certain is that it became a general practice in the Neolithic period. We should mention here that the old trepanned skulls, for instance, number few thousands. The fact that many of them were found in Europe we consider to be just an insignificant fact, being the result of more intense investigation of that continent.

Bennike and Piggott had considered that Central and Northern Europe might have been the original place of trephination<sup>8</sup>.

Such scholars consider trephination as having a “monocentered” origin, respectively Central and Northern Europe<sup>9</sup>.

D.R. Brothwell mentioned trephination cases from Europe, the Pacific area, South and North America, Africa and Asia and more recent examples from Melanesia, Serbia and Polynesia<sup>10</sup>.

Besides the above mentioned places, the practice of trepanning is also mentioned in Australia, Africa, and Asia<sup>11</sup>.

We consider worth mentioning here the opinion of the Romanian anthropologist Olga Necrasov, who had considered that trephination was brought, at least to South-Eastern Europe, by the bearers of the tumulus ochre burials<sup>12</sup> (Pit Grave Culture). We share her opinion.

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<sup>5</sup> See above.

<sup>6</sup> T. Anda, *op. cit.*, p. 261.

<sup>7</sup> T. Anda, *op. cit.*, p. 252; Em. Moldovan, *Trepanația craniă la culturi preistorice din Transilvania*, Buletinul cercurilor științifice studențești, arheologie-istorie-muzeologie, 9, Alba Iulia, 2003, p. 5.

<sup>8</sup> Charlotte Roberts, K. Manchester, *op. cit.*, p. 91.

<sup>9</sup> Em. Moldovan, *op. cit.*, p. 5.

<sup>10</sup> D.R. Brothwell, *Digging up bones*, Cornell University press, Ithaca, New York, 1981, p. 121.

<sup>11</sup> Charlotte Roberts, K. Manchester, *op. cit.*, p. 91

<sup>12</sup> H. Ullrich, *Das Motivproblem der Trepanationsforschung im lichte neuer Funde*, Actes du VII-e Congrès International des Sciences Préhistoriques, Prague 21-27 août 1966, Prague, 1971, vol. II. p. 1283.

If the origin of trephination was considered by some German scholars to be in Germany and by some French to be in France, we could easily extend this idea to the territory of Romania as being the land where trephination originated. Yet, the Romanian scientists have considered that the mentioned surgical practice was initially taken over from the bearers of the tumulus ochre burials who came from the north-pontic steppe zones. The discovery of the skull from Girov I, a site belonging to the Cucuteni Culture, has also been considered to have documented the existence of trephination performed by the local Neolithic communities from today Romania. But the studied site is dated back to a time when the bearers of the ochre burials had started to intrude into the territory of Romania. This is why, in our opinion, we should rather consider that the above-mentioned practice was brought here as initially hypothesized, by the latter communities, and was borrowed by the local communities. In fact, this hypothesis can also be sustained by the finds from Decea Mureşului and Holboca which belong to the Stredyi Stog II, respectively to the Yamnaia Cultures known as “sequences” of the larger complex of the bearers of the tumulus ochre burials. So is the case in Bulgaria, where trepanned skulls were found in the necropolis of Russe at the chronological level of the Gumelniţa Culture from Romania, being also dated in the Eneolithic time, when the mentioned communities intruded into the territories west of the Black Sea. Yet, it is interesting to note that on the territory of the former Yugoslavia there were skeleton finds with trepanned skulls which were dated back to the Early Neolithic times<sup>13</sup>. In fact, it is possible that the trephination cases from Yugoslavia could have originated, at least in part, in western Europe.

If we observe that the practice of trephination was brought in prehistoric times by the bearers of the tumulus ochre burials, we could also notice that the symbolic one was brought in South-East Europe much later, by the Turk-like populations, during the period of migrations. This would be an explanation for the presence of such interventions in today Bulgaria and Hungary. It should not be surprising to have future finds of similar cases on the territory of Romania.

In our opinion, considering the existing data, trephination might have had a multilocal, instead of west European<sup>14</sup> origin, being developed in different corners of the world and afterwards dispersed, together with population growth which finally resulted in the current situation when, in remote rural communities, the mentioned surgery is still preserved and used.

### **Trephination Distribution**

According to the idea of Loughborough, “the geographic areas where trephination could be encountered are widely dispersed”.

In Europe, almost every country has discovered its own cases of trephined skulls. This seems to have been flourishing among certain groups. Anyway, we have good examples especially from the Neolithic sites of France.

In northern Africa this practice is used by the Kabyles and Berbers in the northern part of the continent, by the Kisii from Kenya, Tende from Tanganika and by the Masai. In Egypt there are also known few trepanned skulls.

In Asia, the use of trepanation was also widely distributed, in the Middle East, India, Pakistan, Afghanistan, China, southern Siberia, Japan.

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<sup>20</sup> Ž. Mikić, *op. cit.* p. 146.

<sup>14</sup> Ž. Mikić, *op. cit.*, p. 146.

In Oceania, the inhabitants of the Polynesian Islands, as well as others, from Bismark, New Britain, New Ireland, Tahiti and others, have also used trephination.

In Melanesia, this kind of surgery was also very frequently used.

On the American continent, few cases of such interventions have been found on its northern part. Probably the largest number of cases is to be found in South America, in the region of the Andean Mountains, especially in the Peru and Bolivia, with the datation between the 5th and the 6th centuries A.D.

This expansion of the mentioned medical practice was viewed by some scholars as a cultural diffusion, while others considered it as a multilocal invention<sup>15</sup>.

In our opinion, there were, indeed, several places where trephination could have occurred, but its distribution must have been surely done also by cultural means. We should not forget that this was a surgery and, in most of the situations it was meant to rescue lives. Therefore, the medicine practitioners must have been very receptive to any improvement of the mentioned technique. This was a significant path towards its fast acceptance and assimilation from one community to another.

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<sup>15</sup> A.C. Auderheide, C. Rodriguez-Martin, *The Cambridge Encyclopedia of Human Pathology*, Cambridge University Press, 1998, p. 31.