

Conclusion (or text recycling)

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Could we say that summaries and resumes, being the main component of every professional or scientific paper, are also a kind of recycling? By which I mean the recycling of the ideas and reflexions already outlined in the paper. And it is also a real recycling if we think of today's possibilities of writing on a computer by using a *copy&paste* option. Let's admit that we often do it with our own papers! And some of us even with someone else's...So, in the final review of the papers presented, by recycling the results of their authors on the issue of recycling the past, I will try to highlight some main, common points.

„Zagreb still without a waste management plan. The city is under the threat of 300 000 kn fine if the waste removal and sorting system is not completely changed within three months. The Decree on the management of municipal waste came into force on November 1.“ These were the headlines in the daily press while the exhibition „*Recycle, Ideas From the Past*“ was underway. It proves that the exhibition has an excellent timing – it fits perfectly into the present when every single one discusses recycling as the important factor of sustainable development and is also an expert on the topic. However, the majority think that recycling is the invention of modern times, of our being aware of the need to have a rational attitude to the nature and the environment, that is, to the planet we live on, to the unavoidable consequences of our consumer society ruled by the slogan „use and throw away“.

When talking about recycling in the past, it is understood in its widest sense, meaning the collection of used, damaged and/or rejected items with the aim of their processing, transforming, adjusting for new either identical, similar or completely different uses. In short, it is about the secondary use of items or raw materials. Thus seen, we can talk about recycling from the moment we defined humans as humans because they are the only living beings producing items with their own hands, from their own ideas, in order to facilitate or make possible their own survival. In the beginning, humans probably recycled because they lacked or did not have access to raw materials, or they economized, but with time the motivation was extended beyond the economic field of life, into social, spiritual, cultural spheres. Stone tools are the first evidence of recycling that have been preserved to our day. In her paper „*Stone tool recycling throughout history*“ Rajna Šošić Klindžić points out the fact that recycling and transformation of

items are the inseparable part of the first technological processes, namely they are one of the phases in the so-called operation chain (*chaîne opératoire*). Although it is difficult to conclude with certainty whether a stone artefact that has been discovered is in its original shape or it is a reworked or processed item, the paper presents clear evidence about stone tools being already recycled in Paleolithic, and the oldest confirmation to this is the possible case of recycling more than million years old from the Fuente Nueva site in Spain. The author particularly emphasizes the fact that some prehistoric tools were reused in later prehistoric, but also in historic periods, almost until recently, but their purpose has changed considerably and often has changed from the sphere of everyday use into symbolic, apotropaic, magical sphere. This is confirmed by the so-called thunderstone (*cerauniae, thunderstones, pietra del fulmine*), present in the beliefs and myths of numerous human communities all over the globe.

Along with stone and wood, bone must have been one of the first raw materials used by man for making various items, but also one of the earliest secondary raw materials. That is, as Selena Vitezović describes in her paper, bones alone, as food leftovers, are a secondary raw material and their transformation into useful items is a form of recycling. The category of bone raw materials, in its wider sense, covers all hard raw materials of animal origin, besides bones, there are cervidae and bovid horns, including ivory and other tusks, shells of molluscs, eggshells, turtle shells. Although the majority of the above-mentioned materials are kitchen waste from animals used for human consumption, some of them can be collected in nature without killing animals. Simple and easy acquisition and physical and chemical properties of bone raw materials have rendered them suitable for making various utilitarian, decorative and even artistic objects. They were also used for other purposes, for instance, as building material (structures of mammoth bones for the dwellings of Upper Paleolithic hunters), as fuel, as color pigment, crumbled, ground into powder they were added into clay mixtures or used for incrustations, they were used as fertilizer, compost, glue etc. But, items once made from bones or shells, particularly from the expensive ones, were often recycled after they had been broken or damaged. Thus, broken bracelets or combs could be used to make pendants, amulets, necklace beads or game tokens.

The most numerous and significant witnesses from the Neolithic are various ceramic artefacts, primarily vessels of various shapes and ornaments. Jasna Vuković explains how and why it is possible to reuse a broken ceramic vessel. From the simplest use of crushed ceramic fragments for preparing clay mixture (so-called grog) for new pottery production, through using ceramic fragments and figurines for making various tools and equipment (spindle whorls, polishers, spatulas etc.) and for tiling fireplaces or parts of houses, to repairing broken vessels by drilling holes and tying individual parts with organic strings.

Textile, that is, products from various types of fabric is rarely preserved, particularly from ancient times, which does not mean that it did not exist or was not recycled. Karina Grömer's paper deals with the above topic and unveils all the possibilities of secondary use of fabric which does not include simple remaking it, but it will be found, creased and torn, in Hallstatt salt mines being used as temporary cords for tying tools or as sanitary materials, as a means for sealing wooden medieval boats, as the necessary base in the process of making pottery or metal casting, as insulation in medieval castles etc., etc.

A particularly interesting example of recycling canvas, that is, its secondary use can be found in Igor Uranić's paper *Liber linteus and the Zagreb mummy*. It is about linen which, after its original purpose as an Etruscan ritual calendar, at some later time, was again used for somewhat similar, but still different purpose. Namely, someone has, not understanding the writing on the canvas, used it for wrapping the mummified deceased and thus unintentionally extended its ritual function, but with a different meaning.

With the advent of metal, recycling gets its true and full meaning. The very possibility of repeatedly recasting metal items and casting them into the new ones was one of the huge advantages of metal over stone. Uneven distribution of metal deposits contributed to metal recycling, since the shortage of metal ore in the vicinity, it's being remote or its resource scarcity triggered metal recycling. Snježana Karavanić analyzes the possibilities and procedures applied in the process by using the examples from the Bronze Age when metallurgy became an important factor of economic and social development. All metal objects were recycled, the worn and unusable ones, the ones damaged when cast or not to the liking of the master, but also the ones that had been perfectly made. Bronze items could be repeatedly recycled over time, so it is possible, according to the author, that some objects from the Late Bronze Age contain bronze from the Early Bronze Age. In terms of metallurgy, recycling of bronze items demanded specific know-how which was probably passed from generation to generation. From the archaeological point of view, the best evidence of possible recycling is a large number of workshop-hoards from the Late Bronze Age, which, along with the prepared raw material, contain foundry equipment like moulds, pouring ladles and the like.

Although glass from the times of the Late Iron Age is found at archaeological sites, its production was significantly improved at the time of the Romans. This fact helped Ana Franjić and Ian Freestone to discuss recycling in its narrow sense, as understood today. So it is not just about reusing objects, but about reversing them to their basic ingredients, namely, it is about their complete physical and chemical change.

The idea of recycling is not only related to objects. We can talk about recycling buildings, structures, and through them, about a kind of recycling of space and landscape which is discussed in the paper *Tumuli in Dalmatia – last 2000 years* by Jure Šučer and the paper *Space Recycling in the History of Dalmatia* by Ivan Alduk, through the eyes of a conservator, a person who is dedicated to the preservation of space as it used to be. The author has listed numerous examples, from the most well-known, the metamorphosis of Diocletian's Palace into the town of Split, to the interference into sacral and secular buildings and the change of their purpose. If the latter is the case, a lot of sacral buildings retain their „holiness“, but within different beliefs or religions. Diocletian's mausoleum, as the emperor's tomb, must have been a sacred place highly respected, and it has kept the same meaning as the cathedral of St. Domnius, although within a different religion. In Dalmatian hinterland, Christian churches have been transformed into mosques and vice versa. Although graveyards and graves have always been holy places since time immemorial, they still get destroyed and the tombstones used for secondary purposes, less „holy“ but more practical. There is a number of examples of their use in building river crossings or bridges. Ancient Roman stelae and altars, just like medieval Bosnian tombs, were often „victims“ of oblivion and the change of religious systems and on a large scale, they were used as building material for construction and decoration of Christian churches, houses, barns, wells, grindstones, roads. Sometimes the whole systems of prehistoric and ancient Greek or Roman structures were later redesigned into new spaces, as shown by the contemporary museum at Škrip on the island of Brač. The exceptional evidence of the space recycling is a well-known Greek cadastre, i.e., the division of land in the Stari Grad field on the island of Hvar, an administrative measure that has been kept in its almost original form to date, despite the changes in cultivated crops and in the manner of farming. Unfortunately, the latter could in our time lead to the devastation and disappearance of this intangible cultural heritage.

Prehistoric earthen and/or stone barrows (tumuli) are a striking part of the landscape, particularly on the Adriatic coast and hinterland, but as such, since the old times, they have been susceptible to various types of recycling which has been helped by numerous legends and traditions related to them. The research into them started with the development of archaeology in the 19th century. Since barrows were primarily burial mounds, soon after they had been

built subsequent burial of new graves followed in their outer part. This custom has prevailed since prehistoric times, through ancient Greek and Roman era until the Middle Ages, but is most prominent during the late Middle Ages. Keeping the continuity of the holy space, which barrows as burial mounds obviously were, they often became the places to build churches. As prominent markers in space, they will also become orientation points, watchtowers, space delimitation tags, or administrative space units. Unfortunately, in war times they get degraded either physically or symbolically, by trench digging, by building bunkers and machine-gun nests.

The ancient Romans were the masters of re-exploiting everything possible. It is especially visible in construction because the price of labor and material was always relatively high, so the total costs were reduced by recycling building material. What is particularly interesting is the fact that recycling was not only often done by the Romans but it was a practice planned by the state policy and economy. Witness to this are the laws and regulations enforced since the 1st century BC. Although previously processed and shaped stone architectural and construction elements were usually recycled by being built into new structures, unfortunately, they were often used for the production of lime which completely physically changed them. As today, a special problem was the disposal of construction waste, but it was solved by it being used for filling up swamps, ditches, for ground levelling etc. Dora Kušan Špalj in her paper on the site *Aquae Iassae* shows how it was done in ancient Roman provinces. She analyzes the reconstruction of the spa in the 4th century when the architectural elements from the earlier spa temple, richly ornamented, were recklessly used as ordinary building material. It was a completely rational act because it reduced the acquisition, processing and transport costs of stone, which, at those turbulent times, was not without significance.

The epigraphic monuments all over the Empire met the same fate, which is discussed by Dino Demicheli on the example of numerous inscriptions from Salona. It is common knowledge that the majority of today well-known inscriptions from the region of ancient Salona have not reached us from their original position, but they have been found as spolia found in piles of stones, in olive groves, vinyards and various later sacral or secular buildings or as parts of long ago collected collections. Demicheli emphasises the dichotomy of the significance of spolia, which, on the one hand, are the evidence of the aggressive activities caused by man himself or by natural processes, but on the other, they testify about the development of cities and other settlements, about the economic and social changes over time. The ancient epigraphic monuments usually meet the fate of other spolia and finish as ordinary building material. Luckily, thanks to the interest in antiques at the time of Humanism and Renaissance, part of them got a new role as museum exhibits in numerous collections of stone monuments established as early as the end of the 15th century. However, the interest in antiques and the fashion of collecting them will also bring about fake monuments and their inscriptions.

In her paper, Ivana Ožanić Roguljić proves that nothing was garbage for the ancient Romans, especially not food, and she shows their intelligent and effective way of reusing every means and the idea they came across. This is especially evident in food preparation, particularly meat. For the Romans, animals were not only the source of food but also of other raw materials (bones, animal skin) or fuel (lard). The first book of the famous *Apicius cookbook* is dedicated to the preservation, salvage, reuse of a food, and sometimes to some sort of food and drink counterfeiting. The advice for the latter is how to turn white into red wine! Apicius gives advice on how to „improve“ a honey or *garum* which was no longer good and how to increase the quantity of olive oil. Food is also associated with its packaging in which it was transported and stored where a kind of recycling can be noticed, that is, a repeated use of amphoras or other vessels, not always for the same foodstuff. However, when doing it, they were careful that amphoras which previously contained foods or liquids of strong flavour, were not used for foods which would be ruined in them.

Ana Pavlović demonstrates in her paper that money is subject to secondary and repeated use. Coins go through the same phases as any other item: production, use, disposal and reuse. It naturally changes its function in the process, from the original commercial to the religious, decorative or symbolic use. And this secondary use appeared simultaneously with the advent of coins in the 6th century BC, thanks to the fact that coins were primarily metal objects. How varied this „second life“ of coins, that is, money, could be, the author clearly shows in numerous examples from the ancient Roman times and the Middle Ages, whether it is fibulas, pendants, amulets, game tokens, jewellery, ornamental details on ceramic or metal pots or offering for the other world.

All the above-mentioned types of archaeological sources and monuments find their place in museums and their collections or, if they remain in the original place, in archaeological parks. The concluding paper by Ana Solter about the Archaeological Museum building in Zagreb gives a nice example of how the place of storage, keeping and presentation can be witness to recycling, that is, the transformation of the building which was erected as a palace. It has gone through a lot of transformations, from a luxurious residential building, had various business and commercial uses, used to be an automobile and officers' club, army headquarters and finally was turned into an archaeological museum. Not to mention that all the changes following its new purposes also transformed the building's exterior and interior. But who knows whether it is its last transformation? Since not designed specifically for a museum, despite all the changes, it today does not meet the requirements of the contemporary museological profession.

Rajna Sošić Klindžić's opinion is interesting, that „the research of stone tools can be defined as recycling because today they are used as a medium for learning about prehistoric societies and their life and as a didactic tool in teaching archaeology“. In this sense, the idea of reuse could be extended to all archaeological finds analyzed at the exhibition „*Recycle, Ideas from the Past*“. In all cases, we can and have to distinguish the reuse from recycling in its right sense. To repeat, reuse is what we usually call a secondary use of something that has, as a result of various circumstances, lost its original role, while recycling means the reuse of the material, or its reduction to the raw material in the production process leading to something completely new, a new identity. Archaeologically it is not always possible to distinguish between the two, but various scientific analyses can help.

Let us conclude: the idea of recycling originated in the ancient past and is still alive today, having changed its scope and shape. But, as the analyzed examples clearly show, not even then the need to recycle arose only from the shortage of raw materials or the need to economize, but it was both determined by economic and ecological and by numerous social, religious and cultural factors.