

“There Is Hope for a Tree”: Pollarding in Hungary

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“For there is hope for a tree,
if it be cut down,
that it will sprout again,
and that the tender branch thereof will not cease.”

Job 14:7

“It often so happens that beauty or need encourages the farmer to pollard the oakwood. Here experience has it that moisture always serves the wounds better than other places: in the place of one branch that is cut, in a year there will spring twelve other . . .

The oaks must be thick, at least as big as a man’s thigh,
if we want to pollard them for firewood or some other household duty.”

János Nagyváthy, *Hungarian Practical Cultivator* (1821)¹

Introduction

A tree may be of two types, as far as its origin and shape are concerned: a maiden or a coppice stool with shoots. Maiden trees grow from seed (thus they are also called seedlings when young) and are tall with a clearly discernible trunk that divides into branches only at a considerable height. As opposed to this, coppice shoots grow from a stool (either above or underground), and never appear alone. The stool itself is what remains in the ground when a tree is cut, and it produces new shoots every time the old ones are removed, or in other words when the shoots are coppiced.² These two types of trees are used for different purposes: shoots would hardly make a good lamp post, and a twenty-metre-tall maiden can only be turned into firewood by wasting much energy, which, ironically enough, is exactly what happens nowadays. It may appear that

¹ János Nagyváthy, *Magyar Practicus Termesztő* (Hungarian Practical Cultivator) (Pest: Trattner János Tamás, 1821; reprint, Szeged: Állami Könyvterjesztő Vállalat, 1884), 285–286* [henceforth, the asterisk (*) indicates that the translation is mine].

² This only holds true for broad-leaved trees. Conifers do not coppice. The word “coppice” comes from French “couper” meaning “to cut.”

seedlings are a “natural” way of reproduction, whereas stools are merely “artificial,” but the matter is not that simple. There are, for example, elm trees that do not use seeds but clone themselves with the help of their root system.³ A well-known example is hazel, which, when overshadowed by taller trees, does not flower, but sends up young shoots. Or moving away from trees: perennial flowers also keep their bulbs underground, from which they grow every year. Coppice stools and shoots are, however, essentially the results of human activity based on the simple fact that *when a tree is cut, it does not die but grows again from the stool*. This is a principle of the highest importance, practically forgotten now when it is widely believed that every tree has to be replaced by planting another one in its place. Foresters, naturally, are aware of coppicing, however, they consider it a primitive form of forestry, and also think that the stools “wear out” after a few cycles of coppicing, in other words they will not grow new shoots any more. This is untrue: the oldest – and still living – stool, with a diameter of six metres, is approximately one thousand years old.⁴ If we suppose a twenty-year coppice cycle, which is rather long, then this stool has produced new shoots some fifty times.

This is all of significance, because it helps in understanding that modern forestry is only one, and not necessarily the best, method to deal with trees. Woods today are rather monotonous: many even-aged, preferably maiden trees, often of the same species,⁵ not to mention tree-plantations that foresters mistakenly call woods. Prior to the birth of modern forestry, that is approximately the eighteenth century, woods and single trees used to display much more variety in their appearance and composition. Without the help of heavy machinery, it was very difficult to cut and transport trees, thus people aimed at producing optimum size trees for every purpose.

Today firewood is cheap, at least in comparison with the trunks of maiden trees.⁶ Earlier, when energy did not come through wires and a switch but had to be produced by every household, firewood was the more important of the two types. Firewood, then, is far easier and more economical to make with the help of stools than from maidens. I have seen it argued several times that stools lower

³ This is not called coppicing but *suckering*. It produces individual trees of the same genetic make-up.

⁴ Oliver Rackham, *Trees and Woodland in the British Landscape* (London: Phoenix, 1996), 15: Bradfield Woods, Suffolk.

⁵ A few straightforward words about the Visegrádi mountains (Co. Komárom-Esztergom and Co. Pest) by a botanist: “In the cutting areas of turkey oak – sessile oak it is not the mixed woods of the above species that grow, but mostly sessile oak monocultures, while the shrub layer is also subject to heavy ‘unnatural selection.’ In practice this means that from time to time groups of foresters visit the given territory and cut down every shrub and tree other than the sessile oak.” Péter Csontos, “Az aljnövényzet változásai cseres-tölgyes erdők regenerációs szukcessziójában” (Regeneration succession of sessile oak – turkey oak woods: Processes in the shrub layer), *Synbiologia Hungarica*, 2, no. 2 (1996), 11-12.*

⁶ Aladár Halász, *A magyar erdészet 70 éve számokban* (Seventy years of Hungarian forestry in numbers) (Budapest: FM Erdőrendezési Szolgálat, 1994).

“biodiversity” and thus, the resistance of a wood to disease.⁷ However, I have yet to see a wood that perished because it was not sufficiently biodiverse due to the amount of stools. Seeds are not necessarily a better solution either, because it is customary not to use local seed but rather that from a carefully cultivated “Überbaum”: as a rule, foresters aim towards homogeneity.

Pollarding

This essay concerns a special form of coppicing, which has been almost completely forgotten by now. There is a case when coppice stools cannot be used to produce shoots, because the territory where the trees are located is accessible to grazing animals: young shoots are the finest possible part in the diet of cows or goats. Stools are resistant, but they do not live forever. If the shoots are eaten in July, they will reappear next spring, however, after three or four times the stool will give up and rot away. The solution, then, is to cut the tree not close to the ground, but at a height of about two or three metres, so that animals cannot reach the new growth. As far as the shoots are concerned – for the tree, if you like – the height at which shoots grow is of no significance. This is quite the contrary for the person who has to work them, since it is not easy to use a saw or an axe while balancing on top of a ladder. After all, we are facing a method born out of an uncomfortable need. It combines the height of maidens with the firewood production of stools: all this is called *pollarding*. It also follows from the nature of the subject that most pollard trees are not found in woods but in wood-pastures and around settlements.

The history of pollards has been most carefully studied in England, notably in the works of Oliver Rackham.⁸ These trees grab our attention mostly by their appearance. An ancient pollard, of which there are tens of thousands in England, usually has a fantastic, grotesque shape. Pollarding became unfashionable in England about two hundred years ago; surviving ancient pollards, uncut for a long time, have a huge *bolting* (the permanent trunk), two to three metres

⁷ Rezső Solymos, ed., *Természetközeli erdő- és vadgazdaság, környezetbarát fagazdaság* (Nature-friendly economy of woodland and game) (Budapest: MTA Erdészeti Bizottság, 1998), 32. * “Is it necessary to differentiate ... between seedlings and stools, or can the woods be considered equally natural in both instances? Usually there is no differentiation ... In a genetic sense, however, a wood coppiced four or five times is certainly not natural.”

⁸ Oliver Rackham, *Hayley Wood: Its History and Ecology* (Cambridge: Cambs & Isle of Ely Naturalists’ Trust, 1975); idem, *Trees and Woodland in the British Landscape* (London: Dent, 1976); idem, *Ancient Woodland: Its History, Vegetation and Uses in England* (London: Edward Arnold, 1980); idem, *The History of the Countryside* (London: Dent, 1986); idem, *The Last Forest: The Story of Hatfield Forest* (London: Dent, 1989); idem, *Trees and Woodland in the British Landscape* (London: Phoenix, 1996) (The second and last entries are not the same. The first version of the book was, in theory, revised in 1990, but actually it was almost entirely rewritten, and thus can be considered a separate piece. I work from the first, 1996 paperback edition of this new text.) These few thousand pages are compulsory readings for all woodland historians.

tall and frequently six to eight metres around, the top of which is full of humps and bumps due to the numerous times the branches were cut and the wounds properly overgrown. Nowadays the branches themselves are many and huge, and often touch the ground whereby they root and start new trees. This new growth is spontaneous, and when people do the same to trees that otherwise would not grow this way, it is called *layering*. In sum, if one has a little practice and pays due attention, an ancient pollard is rather difficult to miss. The word *ancient* is not used here by accident. Pollarding prolongs the life of a tree on the one hand, and the fact that it is at a place where pollarding seems to pay back the effort ensures its survival on the other. Its life is prolonged by pollarding because every time the shoots are cut, growth is slowed down. The tree reaches old age, when the energy coming from the leaves is no longer sufficient to provide for the amount needed to grow a new ring over the whole surface of the trunk, much later.⁹ Pollards are not usually found in woods, unless the wood itself used to be a wood-pasture or a field previously. Woodland trees rarely survive long: when they are considered to be “mature” (in other words when foresters think they do not grow fast enough and straight enough to be marketable, which is around one hundred years nowadays), they are cut. Consequently, a high proportion of ancient trees are pollards. Pollarding, similarly to coppicing, is not entirely artificial. The best-known examples to demonstrate this are the so-called stag-headed oaks. The topmost branches of these trees start to dry, which is usually taken as the first sign of ultimate decay. The oaks then, more often than not, in fact die, because they are considered dangerous and are cut down. It was the above-mentioned Oliver Rackham who discovered that stag-headed trees are actually not dying. There are specimens which have been in that condition for more than fifty years and the lower part of their foliage is still in excellent health.¹⁰ (This also means that the human lifespan is a serious limiting factor in this research. These oaks will certainly look the same when the landscape historian investigating their history is remembered only by a tombstone in a nearby cemetery.) Stag-headed trees thus “pollard themselves”: they get rid of a number of branches, so that the amount of wood they have to produce in the form of annual rings is reduced and the leaves may still provide enough energy, thus prolonging the life of the tree.

Trees can be pollarded for a number of reasons. Firewood, mentioned above, is only one of these, though certainly the most important. In northern countries, where winter is severely cold, their main purpose is the production of leaf-fodder, but this does not hold true in the British Isles, where winters are much milder. In Hungary, as in most of Europe, many riverside willows are pollarded in order to grow withes for basket making. These trees are treated in such a way not because animals would eat the shoots – although that is also

⁹ Rackham, *Trees and Woodland*, 11-12. (Henceforth this reference is to the 1996 edition.)

¹⁰ *Ibid.*, 12.

possible – but because the head of the bolling has to be above water even when floods occur, so that the tree does not “drown”.

A later tradition is the pollarding of mulberries, especially the white mulberry (*Morus alba*). The leaves of this tree were the most important fodder for silkworms from the seventeenth century onwards in Hungary.¹¹ It is in the primary interest of the farmer to have as many branches as possible with pollarding again presenting the best solution. Mulberries do not live particularly long, nonetheless, one can find considerable specimens. Close to Veresegyháza (Co. Pest), on the bank of Sződligeti stream there stands a pollard mulberry with a girth of 300 cm, it is hollow inside but the foliage is in fine condition.

Finally, it is worth mentioning “beauty”, as understood by Nagyváthy in the paragraph quoted above. It is very often aesthetic reasons that dominate pollarding, especially in the case of alleys. The only Hungarian deer-park that survives intact (Gyarmatpuszta, Co. Komárom) has a row of pollard horsechestnuts along its redbrick wall. One of the largest of these trees is 430 cm around, also hollow inside where a grown-up person can easily hide.

Pollard trees can be found all over the world. In Norway, several techniques are used to gain winter fodder with the trees sometimes shredded – an alternative version of pollarding with a longer trunk and shoots growing all along – up to a height of fifteen metres. In Sweden, wood pasture with pollards is called *lövängar*, in the eastern Alps *Lärchenwiesen*, in Crete *phrygana*.¹²

The Hungarian Case

In England, the tradition of pollarding goes back at least to the Middle Ages. Hungary also has many pollards, yet the initial question I had to pose was how ancient the practice of pollarding actually was. This question was ultimately answered by the trees themselves. In the catalogue of ancient trees there are a number of pollards,¹³ among which probably the most spectacular is the lime at Szabolcsbáka (Co. Szabolcs-Szatmár-Bereg), which is approximately 500 years old. Then, in the Seclar – that is entirely Hungarian – area of

¹¹ See for example: Endre Kunoss, *A selymészet kézikönyve vagyis népszerű útmutatás a szederfák ültetése, ápolása és selyemhernyók tenyésztése ügyében* (A handbook of silk production, or popular guide to the planting and management of mulberries, and the breeding of silkworms) (Pest: n.p., 1853).

¹² Ingvid Austad, “Tree Pollarding in Western Norway,” in *The Cultural Landscape. Past, Present and Future*, eds. Hilary H. Birks, H.J.B. Birks, Peter Emil Kaland, and Dagfinn Moe (Cambridge: Cambridge University Press, 1988), 11-29. Oliver Rackham, “Trees and Woodland in a Crowded Landscape – The Cultural Landscape of the British Isles,” in *ibid.*, 72.

¹³ A list of several thousand ancient trees is found in Dénes Bartha, *Magyarország faóriásai és famatuzsálemei* (Large and ancient trees in Hungary), Erdészettörténeti közlemények, 15 (Budapest and Sopron: Országos Erdészeti Egyesület, Erdészettörténeti Szakosztály, 1994). Pollarding, alas, is not recorded. Pictures of ancient trees are accessible in Ernő Vajda, *Öregfák* (Ancient trees) (Budapest: Natura, 1969).

Transylvania (today Romania), near Farkaslaka (Lupeni), I have found a wood-pasture that has dozens of very ancient pollard beeches, a landscape of outstanding beauty, rarely paralleled in continental Europe.

Thus, it seemed reasonable to argue, based on living trees alone, that the tradition of pollarding can be traced back to the Middle Ages in the Carpathian Basin. Geographical names also preserved a memory of the pollards that once stood in the area: the Hungarian name for a pollard: *csonkafa*, and the adjective derived from it: *csonkás*, are to be found by the hundreds all over the country. To strengthen the argument, the same words appear in written sources from the fourteenth century onwards.

Hungarian research has thus far neglected the subject almost completely. The only writer to dedicate a few pages to pollarding was the ethnographer Lajos Takács. What historians and archaeologists know about pollards is taken from his books.¹⁴ Sadly enough, he misinterpreted the phenomenon and took it to be a form of grubbing out of woodland. He was right in the sense that some eighteenth-century sources call pollarding (*csonkolás*) when the branches of trees to be destroyed later by other methods are cut down. He did not point out, nonetheless, that if the branches of a living tree are cut, that, *in itself*, will very rarely result in the destruction of the tree. János Nagyváthy, quoted at the beginning of this essay, described the events with much more accuracy. In fact, all sources cited by Takács speak about pollarding and not the grubbing out of woods,¹⁵ and they are all from the eighteenth century. As we have already seen, both living trees and written sources prove that the tradition is actually much older, dating at least to medieval times. Here I shall trace the remains of pollarding in several Hungarian source types, trying to signify directions of further research rather than attempting an analysis of all available data, which would be too soon at this point.

The history of trees can be studied using three major source types. Firstly, there is written evidence, which in this essay means medieval (pre-1526) charter material. This is a rather arbitrary choice governed by the assumption that early modern sources would be too numerous to deal with in such a short essay. Secondly, pictorial sources are also relevant. One has to look for paintings, engravings, miniatures, etc. that depict pollard trees or the process of pollarding. Thirdly, archaeological data should be considered. Archaeology here is inter-

¹⁴ Lajos Takács, *Irtásgazdálkodásunk emlékei* (Remnants of our clearance-based economy) (Budapest: Akadémiai Kiadó, 1980), 160-166; idem, *Egy irtásfalu földművelése* (Agriculture in a cleared village) (Budapest: Akadémiai Kiadó, 1976), 46; idem, *Határjelek, határjárás a feudális kor végén Magyarországon* (Boundary marks, perambulations at the end of the feudal period in Hungary) (Budapest: Akadémiai Kiadó, 1987), 46-47.

¹⁵ He admits at one point, although with reluctance, that "Trunks without branches, thus, may not have been only the result of clearances, but may also have been created to produce the once so important winter fodder, and are in general the result of the woodland management techniques available before the introduction of modern forestry." Takács, *Irtásgazdálkodásunk emlékei*, 165.*

preted very broadly, including everything that was preserved in the landscape or in toponyms. Standing trees also belong here, since they are of interest not only as botanical units but also as the results of human activity. It should already be noted at this early stage, however, that there is no straightforward relation between place-names and surviving pollards. Next to Veresegyháza (Co. Pest) there is a Csonkás-dűlő, yet one does not find pollard trees there but rather south of this place, in Mogyoródi-csücskö.

Written Sources

Vocabulary

“{The boundary} starts at the big public road, thence it goes towards the meadow of the priest, then passing by under Sumug mountain it is at the meadow of Luthardus. Thence it goes to the spring of a river, which is commonly called Egrug, and here is a willow tree. After this it goes through the big road to the land of Bocon, thence through Egrug stream to the oak with a sign. Then it turns back towards the east through a *rubetum* until a ditch, where there is a pollard oak (*detroncata quercus*). From this, descending through a valley it proceeds to the big road, and at the edge of this road there is a great ditch, whence it returns to the said place.” [The perambulation of Ganna (Co. Veszprém), dated to 1171, but most probably written around 1234.¹⁶] A *rubetum* is a common wood-pasture with thorns.

Of all medieval written sources, perambulations are the most important for the historian of the Hungarian landscape. As shown by the above quotation, a perambulation entailed walking along the boundary of a settlement in a literary sense, during which process the most conspicuous landscape features were recorded. Until the eighteenth century, these perambulations replaced maps, and similarly, they contain much information about the landscape. Trees, for example, are recorded in their thousands – most often by genus (oak, lime, etc.) but sometimes down to the species level (beech, hornbeam etc). How to interpret these data is a more complicated question,¹⁷ nonetheless we are not concerned

¹⁶ *A pannonhalmi Szent-Benedek-rend története* (History of the Pannonhalma order of St. Benedict), vol. 8, *A bakonybéli apátság története: Az önállóság kora 1023-1548* (The history of the abbey of Bakonybél: The age of independence 1023 – 1548), by Pongrác Sörös (Budapest: Pannonhalmi Szent Benedek rend, 1903), 256-260.

¹⁷ Rackham, *History of the Countryside*, 209-211. Rackham found 787 trees in the Anglo-Saxon (pre-1066) perambulations. Almost forty percent of these are thorns. In Pilis (Co. Komárom-Esztergom and Co. Pest,) I collected 17 medieval perambulations; the most frequently mentioned trees in these – however surprisingly – were walnut and pear. Péter Szabó, “Pilis: A Hungarian Forest in the Middle Ages” (MA thesis, Central European University, Budapest, 1998), 8. Flóris Rómer argued that in the *Codex Diplomaticus* (a mid-nineteenth-century multivolume work, copying thousands of medieval charters without editing) oak was mentioned most frequently, but he did not provide any statistical data to

with statistics here, but with the individual trees. In other words, supposing that pollarding existed in the Middle Ages, pollard trees should appear in perambulations as well. I do not claim that all pollards were recorded as such in charter bounds, since sometimes the compiler does not even specify what type of tree he is writing about. However, a pollard, especially if the bolling is old and the shoots are young, looks so characteristically different from a maiden that this feature may have easily made it to the charter itself. Perambulations are usually rather schematic, but sometimes we read about young or old trees, trees with a double or a broken trunk, or even a certain branch leaning in one direction or another.¹⁸

Csonkafa

Csonka, as already mentioned, is modern Hungarian for a pollard. This term appears in very low numbers in the sources, always in the form *csonkafa* (*fa* means tree) or *csonka* + type of tree. The Dictionary of Hungarian Charters lists nine cases, I have found only one further example.¹⁹ Out of these ten trees three are willows, three pears, two poplars, one oak, and one is not specified. Pear may seem surprising: why would a fruit tree be pollarded? I do not know the answer, but a standing tree once again demonstrates that the practice of pollarding pears once existed. On Nagy-Villám mountain, right next to the royal castle of Visegrád, there is a bigish wild pear, pollarded and surrounded by stones. Because of the pollarding the canopy is so dense that the trunk is practically invisible even in winter. This tree is what a medieval perambulation would describe as “meta pervenit ad arborem Chuncakerthwel lapidibus circumdatam.”

prove this. Flóris Rómer, “Magyarország földirati és terményi állapotáról a középkorban” (On the geographical and agricultural status of Hungary in the Middle Ages), *Magyar Akadémiai Értesítő*, 1860, 226-385.

¹⁸ For example: *Zsigmondkori Oklevéltár* (Charters of the age of Sigismund) (henceforth *ZsigOkl*), eds. Elemér Mályusz and Iván Borsa, vol. 5 (Budapest: Akadémiai Kiadó, 1997), 82. 1415: “ad quendam arborem *zyl* curvatam”; *Magyar oklevélszótár* (A dictionary of Hungarian charters) (henceforth *OklSz*), eds. István Szamota and Gyula Zolnai (Budapest: Hornyánszky Viktor, 1902-1906), 245. 1302: “venit ad arborem *tul* *fyotol* dictam” (“*tul*” means “oak”, “*fyotol*” is “young”); *Codex Diplomaticus Patrius* (henceforth *HO*), eds. Imre Nagy, Iván Paur, Károly Ráth, and Dezső Véghely (Budapest and Győr: n. p., 1865-1891), vol. 8, 411. 1300: “tres arbores *nucum*, ubi quarta per ventum percussa fracta esse dicitur.”

¹⁹ *A nagykárolyi gróf Károlyi-család oklevéltára* (The charters of the Károlyi family of Nagykároly) (henceforth *Károlyi*), ed. Kálmán Géresi (Budapest: n.p., 1882-11897), vol. 2, 135. 1431: “pervenit ad quendam arborem *chunkafa* dictam” There must be more examples, however, a statistical analysis of the several thousand Hungarian medieval perambulations is yet to be conducted.

If this were all there was, one could argue that pollards might have been a characteristic feature of the medieval landscape, but they rarely held the attention of the compilers of charters to such a degree that they recorded them. There is, however, another word that appears far more frequently in perambulations and seemingly denotes something comparable: *troncus* (and its spelling variant *truncus*).²⁰ It is only logical, by the way, to look for a Latin word, since perambulations were written in Latin, with the vernacular version of landscape features only occasionally included. Nevertheless, the case here is not merely that *troncus* would be Latin for *csonkafa*. These two words are never connected. Furthermore, *troncus* had a different Hungarian equivalent. We shall see later on that in the Middle Ages two, by now forgotten words used to exist to denote pollards.

Troncus is a formulaic part of many perambulations; if a tree is mentioned, basically three types are differentiated: *dumus* (shrub), *arbor* (tree), and *troncus*.²¹ Undoubtedly, the most general of these is *arbor*, but a shrub is not necessarily what one would imagine today. What sense does “oak-shrub,” often mentioned in documents, make, for example? In modern languages a ligneous plant is either a tree (one trunk) or a shrub (multiple trunk). At the moment, nonetheless, we have to find the medieval meaning of *troncus*. The first question is whether or not it was simply the remaining dead part of a dead tree, which appeared too difficult to remove and thus was left standing to decay. Several things contradict this. Firstly, the Middle Ages were an age when, for example, in the purchase of a plot the seller had it included in the contract that the newly planted willows were not for sale²² (planting a willow is the easiest thing in the world: one cuts a fresh shoot, sticks it in the ground, and that is it, providing there is enough water), or when the Forest-guards of Bakony (Co. Veszprém) would not come to an agreement with the people of the abbot of Pannonhalma until they promised not to touch any living tree in the said forest.²³ In 1464, the villagers of Ráckeve (Co. Pest) obtained the right to gather dead-wood on the island of Csepel from no lesser personage than king Matthias.²⁴ The list could go on endlessly, and every item indicates that medieval people did not waste wood,

²⁰ In this essay, my database comprises approximately thirty-five charters. Enlarging it is simple, but time-consuming.

²¹ See for example *Zsigmond*, vol. 5, 247. 1415: “prope unum rubetum vulgariter thelbokor vocatum ... ad duas arbores vulgariter thulfa et nyrfa”; *Oklsz.* 1343: “ad alium dumum transeundo qui vulgariter dicitur egerbokur”;

²² *A kolozsmonostori konvent jegyzőkönyvei* (Protocols of the convent of Kolozsmonostor), ed., Zsigmond Jakó, vol. I (Budapest: Akadémiai Kiadó, 1990), 201.

²³ *Codex Diplomaticus Arpadianus continuatus* (henceforth *ÁUO*), ed. Gusztáv Wenzel (Pest, Budapest: n.p., 1860-1874), vol. 2, 314-315 (1258).

²⁴ Iván Magdics, *Diplomatarium Ráczeviense* (Székesfehérvár: n.p. 1888), 21.

or at least that there were areas where firewood (or the access to it) was by far not abundant enough to let a whole trunk rot away standing instead of chopping and burning it. *Troncus*, on the other hand, appears as a *terminus technicus* all over the kingdom. Secondly, in almost all cases, we also learn what type of tree the *troncus* was.²⁵ With a dying, leafless trunk this would hardly have been possible. Let me illustrate this with an example: Not far from the village of Szada (Co. Pest) there stands a dead trunk, the branches of which were cut down. Its circumference is 240 cm, which puts it to the fifth place in size among the wild-cherries (*Cerasus avium*) known to me in present-day Hungary.²⁶ When I saw it in the summer of 1999, parts of the bark were clearly visible. Thus the characteristic circles all around made identification easy. In a few years, however, the remaining bark will disappear and then it will be rather difficult to identify what type of tree it was. A botanist or a carpenter will have no problems, but it is hard to believe that among medieval perambulators there was always someone capable of such identification. If a *troncus* had been a dead tree, it would have been much more efficient to record it as such, instead of bothering with identifying it – after all the aim of recording landscape features in a perambulation was to make it easy to recognise them later. Thirdly, I know several cases where charters mention the dry trunks of dead trees, yet the word *troncus* never appears in connection with these.²⁷ In 1337, the boundary of a settlement in Co. Ung touches upon “some dry trees, which were still standing in their roots.”²⁸ This description could have easily been substituted by *troncus*, had that meant anything like this.

In sum, *troncus* denoted a living tree.²⁹ Thus, as a restriction of the meaning of *arbor*, it must have had something to do with shape or management. In the charters, unfortunately, there is no explanation of what a *troncus* might have looked like or how it was created. Furthermore, no agricultural treatises survive from the Middle Ages in Hungary, while different ways of cutting trees

²⁵ For example *Károlyi*, vol. 1, 304 (1368): “ad verticem cuiusdam montis, in cuius latere pervenissent ad unum truncum arboris vulgo nyar vocate meta terrea circumfusum” (“nyar” is “poplar”); *ZsigmOkl*, vol. 3, 641 (1412): “penes quendam silvam glandinosam iuxta truncum arboris ilicis”

²⁶ By counting the rings of the largest branch cut, I estimate it was around one hundred years old when it died. The biggest living wild-cherry I know of stands in Faizási wood, near Nagykovácsi (Co. Pest) with a girth of 380 cm. In third place, there is a recently broken tree on Jelenc mountain, near Hont (Co. Nógrád) with a girth of 330 cm. For the rest, see Bartha, *Magyarország faóriásai*, 173.

²⁷ For example in Uzsa (Co. Zala): *Zala vármegye története. Oklevéltár* (A history of Co. Zala. Charters), eds. Imre Nagy, Dezső Véghely, and Gyula Nagy (Budapest: Franklin, 1886-1890), vol. 1, 473-475.

²⁸ *A nagymihályi és sztárai gróf Sztáray család oklevéltára* (Charters of the Sztáray family of Nagymihály and Sztára), ed. Gyula Nagy (Budapest: n. p., 1887-1889), vol. 1, 126* (1337): “venit ad quasdam arbores exsiccatas, tamen in radice stantes.”

²⁹ This is sometimes emphasized: *ZsigmOkl*, vol. 3, 217-218 (1411): “sub quodam tronco vivo magno.”

certainly did not interest those few who knew how to write. The only way to find out more is through the medieval Hungarian equivalent of the word. Glossaries and dictionaries from the fourteenth-sixteenth centuries translate *troncus* as either *tőke* or *törzsök*.³⁰ I also managed to find both words as vernacular forms in charters, the former once, the latter twice.³¹ *Törzsök* has by now almost disappeared from the Hungarian language. The only living, though outdated usage is *törzsökös nemes*, which means a nobleman from an ancient family. *Tőke*, on the other hand, is very much alive today, and has three basic meanings:

- 1) what remains of a tree above ground when it is cut, and the same when taken out and used for example for chopping wood;
- 2) vine-stock;
- 3) capital, as described by Karl Marx.³²

We are in a lucky position, because the 1533 *Lexicon* of Murmellius also defines *tőke*: “Die lenge ader stam des boms von der wurtzel bis an die este”, that is “The length or trunk of the tree from the roots until the branches.”³³ This is a perfect definition: if a charter speaks about a *tőke*, then the perambulators saw a standing tree with a big trunk but small or no branches, which is exactly what a pollard tree looks like when in use.³⁴ This, by the way, also explains why *csenkafa* and *troncus* are never considered equivalent to each other. Namely, these are two different approaches towards the same subject: *csenkafa* (English

³⁰ *Régi magyar glosszárúum* (Old Hungarian Glossary), eds. Jolán Berrár and Sándor Károly (Budapest: Akadémiai Kiadó, 1984). “*Törzsök*” appears in the form “*ultra silvam Tursoc*” in the *Gesta Hungarorum* Hungarian chronicle writer commonly known as *Anonymus* (c. 1200) [*Scriptores Rerum Hungaricarum*, ed. Imre Szentpétery, vol. 1 (Budapest: MTA, 1937), 76, 80].

³¹ *Károlyi*, vol. 1, 272. 1366: “*postmodum venissent ad unum truncum in latere unius silve ad usum ulmi (!) vulgariter zyltursuk*” (“*zyl*” means “elm”) I have not seen the original, but “*usum*” makes absolutely no sense here, thus we certainly read a mistake in the transcription and/or edition. The meaning of the sentence, nonetheless, is clear without “*usum*.” *Documenta Res Hungaricas Tempore Regum Andegavensium Illustrantia*, ed. Gyula Kristó, vol. 1, 183 (1302): “*in quodam loco ubi est quidam truncus Byktuke vocatus*.” (“*byk*” is “*beech*”). *HO*, vol. 7, 233 (1293): “*iungit quendam truncum qui Egunthuke vocatur*” (“*egur*” means “*alder*”).

³² *Magyar értelmező kéziszótár* (A dictionary of the Hungarian language) (Budapest: Akadémiai Kiadó, 1982). It should be noted that the first meaning is annotated as “*folkish*.”

³³ *Régi magyar glosszárúum*, 710. Murmellius was a German humanist, whose Latin-German dictionary was published with Hungarian glosses in 1533, in Cracow.

³⁴ We should not forget that every word of a perambulation was translated from the vernacular into Latin. There was no artificial terminology, especially in the beginning, for the actual landscape to be described. Latin, or the Latin of those who had this task, was very often reluctant to perform what was expected. Early perambulations, such as the 1055 charter from Tihany (historically Co. Zala, today Co. Veszprém), demonstrate the kind of difficulties scribes had to face. As time passed, “*vulgo dicitur*” appears less and less frequently, and later perambulations are much more formulaic. *Troncus*, thus, is by no means a Latin word whose vernacular meaning has to be found, but rather a translation which may reveal or hide a meaningful original.

pollard) refers to the specific management form, whereas *tőke* (English bolling) to the plant itself. Perambulations, primarily intended as depictions of whatever there was to notice in the landscape, tended to record the appearance not the management.³⁵

The only connection between the words *troncus* and *csonka* is the verb-form. According to the 1595 dictionary of Verancsics, “truncare: chonketanni”, *csonkít* is the verb derived from the adjective *csonka*, and *-ni* the suffix that forms the infinitive.³⁶ At the beginning of this chapter I quoted a perambulation, where a certain “pollard oak” was mentioned. In the Latin original this was “*detruncata quercus*”. Somewhat more is revealed in a 1364 perambulation from Co. Zala, where the boundary is in “an oak pollarded from above” (“in arbore ilicis desuper truncata”).³⁷ All in all, the activity was called *csonkítás* or *csonkolás* (English pollarding), whereas the result was a *tőke* or *törzsök*. When translating the latter two, the scribes started out from the Hungarian verb, and used its Latin nominal form. This difficulty was not faced by Hungarian clerics alone: in England, for example, the Latin name of pollards was “*robur*,” which in modern botanical language refers to the pedunculate oak (*Quercus robur*).³⁸

The second meaning of *tőke*, vine-stock, is also worthy of attention. This is also at least medieval in origin, although I do not know whether this was the first term or that connected to bollings. The obvious connection between the two is that a grapevine works very similarly to coppice stools or pollards. Every year it is cut back – lower or higher depending on the method – and the grapes themselves appear on the young shoots. We do not plant grapevines every spring, and we do not have to plant trees either. In just the same way that stools and bollings produce young shoots for firewood, vine-stocks grow branches for us to have wine next year. The third meaning of *tőke*, capital, is undoubtedly a semantic continuation of this image. Capital in a bank produces interest in the same way as vine-stocks produce grapes. Turning back to trees, with coppice stools or pollards it is not the fruit, but the shoots themselves that are valuable. According to Murmellius: “*Ramus, quod de ipso trunco arboris: tőke aga*” (“A branch from that *truncus*: a shoot”). This is another proof that *troncus* does not refer to a dead stump but to a living tree.

Tőke and *törzsök*: their Latin translation was the same, but the Hungarian originals may have differed. One solution may be that *tőke* meant a stool, while *törzsök* was a bolling, but, unfortunately there is no evidence to support this

³⁵ It is also possible that *csonka* has only recently acquired its present meaning. In medieval sources it may simply mean a broken or otherwise damaged tree, *arbor fracta*.

³⁶ *Régi magyar glosszárú*, 151. Verancsics was Dalmatian by origin, and published a five-language dictionary very much in the form of modern dictionaries: words in alphabetical order with short translations.

³⁷ *A pannonhalmi Szent-Benedek-rend története* (History of the Pannonhalma order of St. Benedict), vol. 7, *A zalavári apátság története* (A history of the abbey of Zalavár), by Tamás Füssy (Budapest: Pannonhalmi Szent Benedek rend, 1908), 530–531.

³⁸ Rackham, *Ancient Woodland*, 182.

otherwise appealing idea. It is to be noted that although the two words sound similar, it is most probably by accident. The stem of *tőke* is *tő* (meaning stem itself), which is of Finno-Ugric origin. In the case of *törzsök*, however, linguists do not even know if it is a derivative of the modern word *törzs* (trunk) or the other way round. In either case, the origin is unknown. In theory, then, we face two absolutely separate words.³⁹ The main problem, nonetheless, is that the sources almost always write *troncus*, therefore there is not enough material to differentiate between the Hungarian originals. This difference had either disappeared by the Middle Ages, or never made it to the Latin of the period. Fieldwork in places with the names *törzsökös* or *tőkés* (both adjectives form the nouns) may cast light on the problem, but I fear by themselves will not suffice. From another point of view, I cannot tell whether a particular *troncus* in a perambulation referred to a stool or to a pollard. Examples suggest that both were possible. In Felsőhalász (Co. Zemplén) a *troncus* was mentioned in the middle of a coppice wood, and here this could only refer to a stool unless the territory had been a wood-pasture before.⁴⁰ Most *tronci*, nonetheless, appear as individual trees (such as the one in the Ganna perambulation), which makes it most probable that they were pollards. If we accept that *troncus* was the translation of both *tőke* and *törzsök* because there was no difference in the meaning of the two words, which is the best we can do at present, then we can assume that the medieval Hungarian peasant was not much interested in the height at which he cut trees. He rather concentrated on the similarities, so that *tőke* or *törzsök* both meant a tree whose branches were cut off in order to maintain a steady supply of firewood.

Pollard trees in pictures

Pictorial sources are usually rather disappointing for the woodland historian. Pollard trees present one of the few exceptions, most probably because their appearance is so characteristic. The most famous picture with pollards – although certainly not because of them – is the one from the *Very Rich Book of Hours* of Duke Berry (fifteenth century) with six pollard willows on the bank of a river in front of a magnificent white castle.⁴¹ The best known Hungarian examples – again not because of the trees – are the early modern engravings of Wilhelm Dilich depicting towns and castles. Pollard willows are visible for example on Szentendre island in sight of Vác (Co. Pest) from 1600. Little does it matter whether Dilich actually saw these trees or not, what is important is that the whole scene was “realistic”. The most magnificent pollard ever depicted by Dilich is the one standing in the foreground of the view of Fehérvár (Co. Fejér).

³⁹ *A magyar nyelv történeti-etimológiai szótára* (An historical-etymological dictionary of the Hungarian Language), vol. 3 (Budapest: Akadémiai Kiadó, 1976).

⁴⁰ *Zsigmondi*, vol. 3, 217-218.

⁴¹ Jean Longnon and Raymond Cazelles, *The Très Riches Heures of Jean, Duke of Berry* (New York: Braziller, 1989).

To the best of my knowledge, the earliest depiction of a pollard is to be found, rather surprisingly, on a Hungarian wall painting. This fresco was made around the mid-fourteenth century in Vitfalva (today Vítkovce, Slovakia) and represents scenes from the legend of St. Ladislaus.⁴² (fig. 1) The trees in question are very unusual. Wall paintings – together with codex illuminations – in most cases depict *the* tree, the *par excellence* plant with no individual features. Species occasionally might be guessed at, but “it is curious how few artists ever portray a recognisable oak or ash tree.”⁴³ In sharp contrast to all this, the Vitfalva wall-paintings contain three trees that were cut at around two metres, as may be judged in comparison to the people, and some young shoots have already appeared on top of the bollings. The trees themselves are not very elaborate, partly because of the simplicity of the style. However, because of the clearness of expression, it may not entirely be unjustifiable to assert that the trees were indeed intended to represent pollards.⁴⁴

Far less ambiguous is the 1579 calendar from Nagyszombat (today Trnava, Slovakia), where February is represented by two activities: sowing and pollarding. (fig. 2) The type of tree, once again, is unrecognisable, but the scene itself is rich in authentic detail. The man is holding a typical medieval axe; the tree stands where pollards very often appear, in the middle of a field. These territories, when cultivated in a two or three-field system, were from time to time available to grazing animals, thus firewood could only be obtained through pollarding.

Archaeology

Toponyms

There are hundreds of place names all over the Carpathian Basin that preserve the memory of pollarding. These include *csonkás*, *törzsökös*, or *tuskós*. Naturally, not each toponym is equally ancient, nor do they all refer to similar landscapes. The minimum age of the place name has to be established in each case, and fieldwork is needed to discover extant pollards, if any, identifying their role in the given environment. This is a rather exhausting occupation and, more often than not, yields no results, since in the vast majority of the cases nothing but the place name remains to remind the researcher of what trees once grew there. Here I shall present one example of the methodology put into practice.

⁴² Gyula László, *A Szent László-legenda középkori faliképei* (Wall-paintings of the medieval St Ladislaus legend) (Budapest: Tájak, korok, múzeumok egyesület, 1993), 121-126. The picture reproduced here is a tint-drawing based on copies by József Hanula. (The original wall-paintings are in very poor condition.)

⁴³ Rackham, *Ancient Woodland*, 15.

⁴⁴ I should like to thank Dóra Sallay for drawing my attention to this picture.

Pusztaszentistván lies thirty kilometres east of Budapest, next to a larger village called Mende, both located along the Tápió stream. It is not an independent settlement, since administratively it belongs to the above-mentioned Mende. The neighbourhood is rich in medieval – and earlier – archaeological sites. Mende itself is most probably late medieval (fourteenth-fifteenth centuries), but to the west there used to exist the village of Bille, and to the east those of Oszlár, Sáp, and Süly, all established in the Árpád period (eleventh-thirteenth centuries).⁴⁵ Szentistván is somewhat more problematic. The archaeological finds suggest an Árpád period settlement that was deserted in the fourteenth century. Even an earthwork castle was located on a nearby hill, which, so the archaeologists argue, disappeared together with the settlement. The problem, then, is the total lack of written evidence. This, in itself, would not be entirely unusual in this part of the country, however, it is at least suspicious that all bigger and smaller settlements in the immediate surroundings are recorded, except for Szentistván.⁴⁶ The name (St. Stephen in English), as the only non-material source, tells us that the *terminus post quem* for the foundation of the settlement is 1083, the date for the canonisation of King Stephen.⁴⁷ Then, finally, the name appears in Turkish sources of the sixteenth century. In 1559, it is reported as deserted and used by the villagers of Csaba as meadow land.⁴⁸ Szentistván must have been its medieval name, to which was added the word *puszt*, the common late medieval and early modern denominator for deserted villages. All in all, we can argue that Szentistván was an early medieval settlement, inhabited until the thirteenth century. By 1600, after the Ottoman conquest in the middle of the sixteenth century, all villages in the neighbourhood were deserted. Süly was resettled in 1653, and its new inhabitants rented the lands of Mende, Szentistván, and Bille.⁴⁹ People did not return to Mende until as late as 1727. Szentistván remained deserted until

⁴⁵ Zsuzsa Miklós, “Árpád-kori földvár Mende-Leányváron” (An Árpád period earthwork castle in Mende-Leányvár), *Archaeológiai Értesítő*, 108 (1981), 233-250.

⁴⁶ Zsuzsa Miklós did not find anything, and neither did István Tringli, who elaborated the fourteenth-fifteenth-century history of the whole of Co. Pest, although the other deserted settlements close to Szentistván are often mentioned. István Tringli, “Pest megye története. 1301-1526” (A history of Co. Pest. 1301-1526) (Ph. D. diss., ELTE, Budapest, 1999).

⁴⁷ It has recently been suggested that St. Stephen in the dedication of churches may refer to the first-century protomartyr Stephen as well, although this would probably not be true in the case of settlement names. András Mező, *A templomcím a magyar helységnevekben* (The dedication of churches in Hungarian place names) (Budapest: METEM, 1996), 92-93.

⁴⁸ Gyula Káldy-Nagy, *A budai szandzsák 1546-1590. évi összeírásai* (The 1546-1590 conscriptions of the sandsak of Buda) (Budapest: Pest Megyei Levéltár, 1985), 168, 564. Csaba is today Rákócscsaba, part of Budapest.

⁴⁹ Gyula Kocsis, “A Tápió mente fálvainak népe, gazdálkodása, települése a XVI-XVII. században” (The people, economy, and settlement of the villages around the Tápió stream in the sixteenth-seventeenth centuries), *Ethnographia*, 90 (1979), 15-41.

around 1800. This can be deduced from the Ordinance Survey maps, where the first series (1782-84) show the territory without houses, while in the second series (1860-61), Pusztaszentistván is already visible,⁵⁰ though it is to be noted that it has changed considerably during its two-hundred-years' modern history. Presently it is restricted in location to the northern side of Tápió stream, but earlier maps testify⁵¹ that it used to lie on the southern banks as well. People returned, but not independence. Szentistván was never again a separate village.⁵²

North-west of the settlement, there is a place with the name *Csonkás*, obviously a reference to pollards. Here, on a long terrace along a stream that flows into Tápió, there stand several pollard ash-trees (Hungarian ash, *Fraxinus angustifolia* ssp. *pannonica*). The girth of the largest is 360 cm, and there are several of around 280 cm in circumference, altogether at least seven trees.⁵³ They are conspicuously evenly spaced, therefore it is possible that they were planted. However, this being their natural environment, they may well be remains of the original vegetation. More important than this is their age, but that question is rather difficult to answer. There is no simple X cm in girth = X years formula, not even within the same species. A tree standing in a favourable position may grow twice as fast as another in less a favourable place, not to mention that favourable and non-favourable are not necessarily meaningful categories here.⁵⁴ These ashes are free-standing, close to water, thus they should be growing quicker than others. Pollarding, on the other hand, slows down the speed of growth, since after every pollarding it takes several years for the tree to "recover" and reach its original growth rate. I would estimate that the oldest trees are around 120-130 years old. The Ordinance Survey maps seem to support this estimate. The first one shows a treeless territory near the stream, the second has some trees but certainly not a whole row, whereas the third one again depicts a treeless landscape. This signifies that the ashes began to grow some time after the third Survey. The trouble is, however, that no one has ever ventured to test how reliable the Ordinance Survey maps are in depicting ancient trees.⁵⁵ Perhaps also, the ashes, especially when young, may not have been noted on the maps. It is worthwhile mentioning that the trees, although quite sizeable

⁵⁰ *Second Ordinance Survey Map XXXIV – 51.*

⁵¹ *Third Ordinance Survey Map 5063/1.*

⁵² *Pest-Pilis-Solt-Kiskun vármegye általános ismertetője és címtára* (The general description of Co. Pest-Pilis-Solt-Kiskun), vol. 5, ed. Géza Szabó (Budapest: Várnegyei Tisztviselők Országos Egyesülete, 1931), 19-20.

⁵³ I should like to thank Péter Banyó for helping me with the measurements, which, since the ashes were surrounded by thorns, was not at all an easy task.

⁵⁴ After all, why should fast growth be favourable for a tree? This is a typical anthropomorphic prejudice based on the notion that if a child develops quickly, we take it is a positive sign that he or she may live long. On the contrary, if a tree grows quickly, it is most likely to die early. Bristlecone pines (*Pinus aristata*), the oldest standing trees, live in the worst possible conditions in the western USA, and produce microscopic annual rings.

⁵⁵ Hungary has a sufficient number of trees which are at least three hundred years old, on which this test could be carried out.

nowadays, do not appear on the modern tourist maps, either. Anything more certain about their age could only be established by a ring-count.

Most of the ashes are pollarded, but not in the usual way. Seen from the direction of the stream (from ahead) and especially from the sides, signs of pollarding are clearly visible. From the back, though (from the direction of what was once the village of Oszlár, then Oszlárpusztá), not much meets the eye. This may certainly be an accident if this had not been the case with at least four of the ashes. The method of pollarding seems to be as follows: one branch was left to grow on the side of Oszlárpusztá, but the branches facing the stream were cut in the usual manner. The result is a series of rather strange half maidens – half pollards.

I have described above the many possible reasons to pollard a tree. Here, it was obviously the appearance of the trees that mattered the aim being to grab the attention of whoever saw the ashes. English parallels help with finding an explanation for this. All over the British Isles, many pollards signify the boundaries of different settlements and estates. An eighteenth century division map demonstrates that in the case of Szentistván we witness something similar.⁵⁶ (fig. 3)

Although it is difficult to say for certain, it seems that the pollard ashes stand on the former boundary of Pusztaszentistván and Pusztaoszlár. Whether this follows the medieval boundary we cannot say, as no medieval perambulation of the area survives. Experience shows, nonetheless, that the boundaries of settlements, precisely because people are constantly occupied with them, are some of the most stable elements in any landscape. The ashes in Csonkás most probably preserve a boundary that was set up 800-900 years ago, and although Szentistván was deserted for half a millennium, these trees present a living link with the people that once inhabited the place.

Conclusion

In this essay I tried to demonstrate that in Hungary the tradition of pollarding goes back at least to the Middle Ages. The set of problems was interpreted from three independent perspectives: written sources, pictorial evidence, and archaeological material including living trees. Signs of pollarding were discovered in all of these, so that one may safely argue that pollard trees were indeed parts of the medieval and post-medieval landscape. Research can, thus, proceed in the direction of field-work, an example of which was also presented above. I hope that one day all ancient pollards will be understood and appreciated for what they are: remnants of the once harmonious relationship between people and nature.

⁵⁶ *Magyar Országos Levéltár* (Hungarian National Archives), S 87/30.



Fig. 1: Copies of the mid-fourteenth wall-paintings of the St. Ladislaus legend
In Vitfalva

Böjt elő hava.



Fig. 2: The calendar of Nagyszombat, 1579. "Böjt elő hava" is February.

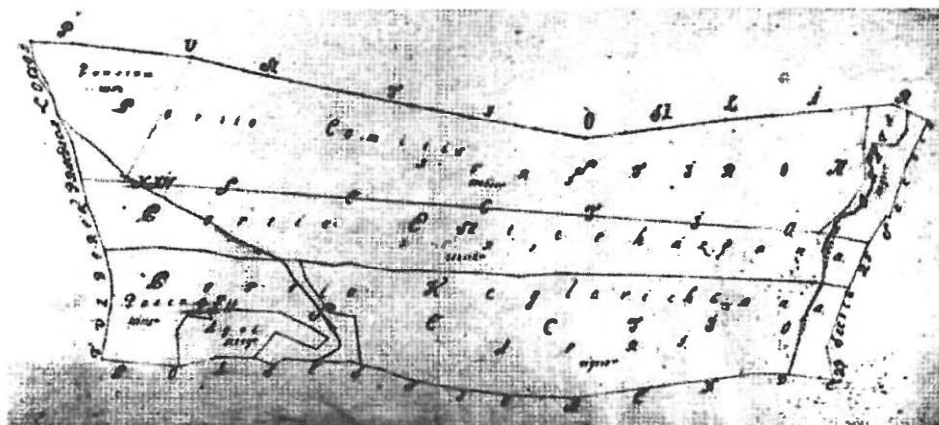


Fig. 3: An eighteenth-century estate division map of Pusztaszentistván. The pollard ashes stand on the northern edge (note the meanders of river Tápió, now vanished).

MEDIUM AEVUM
QUOTIDIANUM

44

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HERAUSGEGEBEN
VON GERHARD JARITZ

GEDRUCKT MIT UNTERSTÜTZUNG DER KULTURABTEILUNG
DES AMTES DER NIEDERÖSTERREICHISCHEN LANDESREGIERUNG

niederösterreichkultur

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*From the Latrine, through the Woods, and into the Lake:
Ecological Samples from Medieval East-Central Europe*

An Introduction

Recycling is nowadays a decisive issue in ecology. This holds true for historical ecology in East-Central Europe as well, albeit in a very different sense. Whereas reusing old material is doubtlessly valuable in environmental protection, the same is rather questionable, if the old material comprises historical sources. The reason to put together and present the following four essays was to help, as far as the authors could, recycling be back where it truly belongs.

Historical ecology is a well-established discipline in Western Europe. In East-Central Europe, much progress has been made recently, and now many scholarly publications appear on the subject. In other words, the *methodology* is understood and applied. However, it is only in exceptional cases, such as the climatology research in Brno, Czech Republic, or the excavations of the medieval royal garden at Visegrád, Hungary that the methods are applied on sources, be them written or archaeological that are freshly gathered for the topic. Historical ecology is an essentially *quantitative* field of research. Before the writing process commences, a large amount of data must be collected. Furthermore, the type of data we use is atypical for former research. A chance mention of heavy rains in a charter, or pieces of seeds in a latrine did not use to be considered significant. This may well be true if they stand alone; but *all* occurrences of heavy rains for a hundred years, or *all* plant remains in a latrine carry otherwise unreachable information. The task, then, is twofold: we have to collect as much data as we can, and we have to look for the type of data that has not yet been searched for.

Many learned articles on the historical ecology of East-Central Europe fail to perform this task. They take what was published before and examine it from a different angle, which, although an inevitable step, does not suffice alone.

The connection between the otherwise rather diverse essays presented here is that they all try to analyse sources hitherto unexplored. We hope that we live up to the requirement of introducing essentially new data to the common knowledge. Whether our analyses may also stand the test of time is for the reader to decide.

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