Memoranda Soc. Fauna Flora Fennica 88: 27–36. 2012

Hazel (*Corylus avellana*) pollards

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Hazel (*Corylus avellana* L.) always forms more or less ring shaped multistemmed shrubs in naturally grown or coppiced stands. Examples are given of large hazel shrubs in the Åland Islands, SW Finland. If only one above ground stem is allowed to develop, the hazel developes into a tree. Hazel trees are rather rare; a few examples are mentioned from Finland, Sweden and Norway. Hazels are rarely pollarded. A few have occurred in the Åland Islands and in Sweden. Two stands with hazel pollards in Scotland are described and the former use of these hazels is discussed. The reason for pollarding hazel was perhaps the use of the cut branches for fertilising meadows and cereal fields, or as fodder for goats. Another reason could be that the hazels were pollarded for producing nuts.

Introduction

According to my experience, and also to information in the botanical literature (e.g. Blomqvist 1911, Lindman 1914), the hazel (*Corylus avellana* L.) always forms ring shaped multistemmed shrubs in natural, more or less undisturbed stands (Figs. 1–2). A hazel shrub starts from a seed. As long as the shrub is young, it is shaped as a bouquet of a few aerial branches (shoots or stems) from its underground stool. The stool grows slowly at its periphery and begins with age to decay in the centre. The aerial stems rejuvenate from the peripheral parts of the stool. Thus the hazel shrub becomes more or less ringlike with a hollow centre. Such a ringlike hazel shrub is called by a Swedish vernacular term *runna* (Palmgren 1915–17). If coppiced, hazels behave in the same way as in natural stands; the stools form ringlike shrubs with a varying number of aerial stems. The largest number of stems found by me growing on one stool in the island of Nåtö, Åland Islands, SW Finland, was about 170 (Hæggström 2000), whereas Palmgren (1915–17) reports a stool with about 300 shoots on Nåtö.

According to Rackham (1980), hazel stools often reach 6 ft (= 183 cm) in diameter, which corresponds to about 575 cm in basal girth. Several of the stools on Nåtö studied by me (Hæggström 2000) were considerably larger (Figs. 1–2); the largest was 861 cm with a calculated age of 990 years. Palmgren (1915–17) mentions still much larger hazels from the Åland Islands. One stool on Nåtö had a basal girth of 15 m and the largest stool, which grew on the island of Granholm about one kilometre north of Nåtö island, was 18 m in basal girth. The age of these two large stools reported by Palmgren were at the beginning of the 20th century, according to the calculation methods used by me (Hæggström 2000), 1 724 and 2 069 years, respectively.

The hazel was formerly mostly used as a coppice shrub. The oldest traces of coppicing hazel date back to the Neolithic Age. Parallel hazel stems were laid as a track across a wetland in the Somerset Levels in southwestern England (Coles

Fig 1. Two more or less ring shaped multistemmed shrubs at Nåtö Biological Station, Nåtö-Jungfruskär Nature Reserve, Åland Islands, Finland. They were coppiced before 1960. The hazel stool to the left was about 7 m high and comprised of approx. 120 stems in 1997. The basal girth of the stool was 719 cm and its calculated age 826 years (Hæggström 2000). The stool to the right: height 7 m, approx. number of stems 170, basal girth 831 cm, calculated age 955 years. Photo: C.-A. Hæggström, 10 April, 1998.

& Orme 1977). The age of this track is, according to ^{14}C datings, between 4 460 and 4 160 radiocarbon years. Rackham (1977) puts forward an idea that the hazel stands in the Somerset Levels were used chiefly for their leaves, and coppicing was a kind of dimension cutting; only those hazel stems were cut that had reached a suitable size.

Hazel stems could be cut for different purposes, *e.g.* for pottery crates, woven hurdles and hoops in England during the 18th and 19th centuries (Collins 1988). In the Nordic countries hazel wood was used for barrel hoops, baskets, carpentry, charcoal, creels, furniture, plaited fences, rake pegs and roof sticks (cf. Hæggström 1992). In the Åland Islands, SW Finland, hazel stems were chiefly used for herring barrel hoops (Hæggström 1992, 2000, Hæggström & Hæggström 2003). Further, hazel nuts were collected, not only in the Åland Islands, but also in the mainland of Finland (Norrlin 1871, Hjelt 1902). Nuts from Åland were sent to the Swedish court in the 16th century (Palmgren 1915–17). There are also reports of the proceedings of crown courts where landowners made complaints about their hazel stands being destroyed, or nuts being collected without the landowner's permission (Palmgren 1915–17). Nuts were also sold on the markets (Hjelt 1902). The fishermen of Åland have hazel nuts for sale on the autumn herring market in Helsinki still today.

In some areas hazels were, however, not desirable. Thus Peterken (1981) reports that hazel was cut as a "weed" in oak coppices in Cornwall, southwestern England.

Hazel trees

A stand with hazel trees was described by Bergroth (1893, 1894; cf. Hjelt 1902). It grew in the island of Hamnö belonging to the village of Björkö in Kumlinge, eastern Åland Islands. This stand

Fig. 2. A typical multistemmed hazel shrub with a height of 8 m, approx. 95 stems and a basal girth of 813 cm. The calculated age was 934 years in 1997 (Hæggström 2000). A person stands in the empty space inside the ring shaped shrub. Finland, Åland Islands, Nåtö-Jungfruskär Nature Reserve, Nåtö Island, Skarpbacka. Photo: C.-A. Hæggström, 3 October, 1981.

comprised several hazel trees with short (maximum 3 m) trunks; the circumference of the thickest tree was 103 cm.

A hazel tree stand was described by Eklund (1927). It grew in the small island of Lövskär in the archipelago of Korpo, SW Finland. This island was heavily grazed by sheep. There was a rather dense stand of about 30 hazel trees on an area of half a hectare. The hazels were 5–6 m high. The thickest stem was 195 cm in circumference at 1 m height.

Reports on hazel trees from different parts of Sweden were given at the beginning of the 20th century (Teiling 1920, Almquist 1929, Lindquist 1929). The photograph in Teiling's (1920) paper clearly depicts a hazel pollard of about 5 m height and approx. 15 cm diameter of the bole near its base; several short and dense young shoots surrounds the base. A thick hazel was reported from Näsum in Scania, S Sweden; its circumference was 219 cm at about 0.5 m (Lagerberg 1947).

The thickest hazel tree that has come to my knowledge is reported from Norway (Lagerberg *et al.* 1952). This tree grew in Yddal in Fusa, Hordaland. Its girth was 446 cm at about 0.5 m height in 1937. It divided at about 1 m into two main branches which were 295 cm and 252 cm in circumference; this hazel may have been a pollard, although Prof. Ingvild Austad (Sogndal, Norway, personal communication) does not have any knowledge of hazel pollards in Norway.

A large stand with hazel trees was discovered in Mölndal close to Gothenburg in SW Sweden (Nilsson 1924). It comprised nearly one hundred hazel trees and several multistemmed shrubs. The largest hazels were about 7 m high and the circumference of 52 trees varied between 21 and 96 cm (average 62 cm; measurement at about 1.3 m height). The circumference of the base of one large hazel trunk was 132 cm. The crowns of the trees were amply branched indicating pollarding. The trees had developed rather many ba-

sal shoots. This hazel pollard stand was protected, because of its curious hazel trees. As all management, including grazing ceased, the hazels of the area developed into ordinary multistemmed hazel shrubs by the 1990s (Carlsson 1994).

Unfortunately, no information is available on the use of the hazels in the above mentioned hazel tree stands.

The reason for the hazel to develop into a single stemmed tree was discussed in detail by Palmgren (1915–17). He is of the opinion that hazels are single stemmed only if all stems but one were cut and the development of new shoots was prevented by grazing. He observed that new shoots developed abundantly around the base of hazel trees every spring, but they were destroyed later in the summer by grazing animals. Both Nilsson (1924) and Eklund (1927) were of the same opinion regarding the origin of hazel trees with a single trunk.

According to my experience from the Åland Islands, hazels with a single trunk are nowadays rare. I have seen two such trees on the wooded meadow island of Senskär which belongs to the Nåtö-Jungfruskär Nature Reserve (Fig. 3). Slotte (2002) reports on hazel pollards in Transsylvania in Roumania. He also saw a horse-cart loaded with some birch and hazel twigs which were to be used as fodder for cattle kept indoors. Hazels were, however, chiefly used as coppice shrubs and the stems were used for fences and as sticks for peas. Of course, hazel is also used as firewood.

Fig. 3. A hazel with a thick trunk on Nåtö Senskär. The circumference at 130 cm height was 88 cm in 1977. The age of this hazel tree could not be determined, because of heartwood rot. The hazel was probably pollarded decades earlier. One 12 cm thick and one 6 cm thick stem and about 25 young shoots had developed from the base. The hazel was cut back in the 1990s. Finland, Åland Islands, Lemland, Nåtö-Jungfruskär Nature Reserve, Senskär. Photo: C.-A. Hæggström, 9 June, 1969.

Hazel pollards in Scotland

During the Tour of Selected Scottish Wood Pastures and Cultural Heritage Woodlands on 16–20 March 2003, organised by Mr. Peter Quelch (Forestry Commission Scotland) and others of Scottish Natural Heritage, I visited two areas in the Highlands with hazel pollards, namely the wood pastures of Glen Finglas and the Rassal Ashwood National Nature Reserve (Sanderson 1998, Quelch 2001). In both areas, veteran hazel pollards were abundant. However, the development of the pollards had taken different ways, depending on the management of these areas during the 20th century.

Otherwise, hazel pollards seem to very rare in Scotland. Sanderson (1998) reports on a single massive hazel pollard on the south side of Loch Katrine about 45 km N of Glasgow. Mr. Peter Quelch sent me two pictures of this very nice pollard by e-mail on October 31, 2007.

Glen Finglas

The site in Glen Finglas wood pasture is located approx. 45 km N of Glasgow and approx 11 km WNW of Callander. The wood pasture represents without any doubt an ancient man-made landscape. The remnant of a possible shieling and a small enclosure next to the wood pasture show

Fig. 4. Hazel pollards in Glen Finglas, Scotland. All these pollards were cut at about 1.5 m height. One special feature of these hazels are the short and bent thin branches of the crowns. Photo: C.-A. Hæggström, 17 March 2003.

that more intensive activity by man than just hillside grazing has occurred in the area. The details in the report of Sanderson (1998) support this.

In Glen Finglas, almost every black alder (*Alnus glutinosa* L.) and hazel was cut at about 1.5 m height (Figs. 4–6). This indicates a very special type of pollarding. Some hazel pollards grew like fruit trees in an orchard. One prominent feature of these hazels is their short and bent thin branches of the crowns, compared to the long and slender branches of naturally grown hazel shrubs elsewhere in Europe.

The hazel pollards of Glen Finglas were probably in use during the latter part of the 19th century. According to Sanderson (1998: Target Note 7), one branch of a hazel pollard was recut. The girth of this branch was 60 cm and it comprised about 120 rings indicating that the hazel was last cut in the 1870s. The age of the bole was thus estimated at about 220 years and for the largest boles at 300 years. One hazel was recently cut and cleft and its age was only 52 years; the diameter of the stem was 21.5 cm (girth approx. 67.5 cm on a circular stem). The growth of regularly pollarded trees is, however, much slower than of trees left unpollarded long ago.

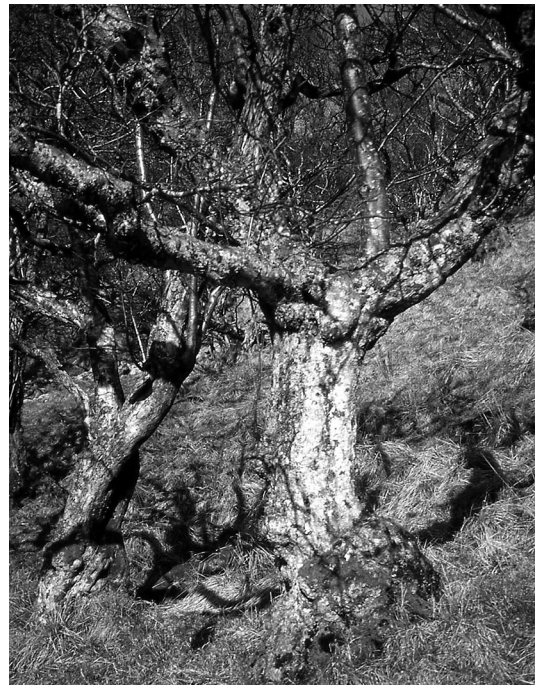

Fig.5. A hazel pollard. This specimen shows the typical form of an old pollard: a broad base, a slender waist and a swollen pollard head from which the branches grow. Scotland, Glen Finglas. Photo: C.-A. Hæggström, 17 March 2003.

Fig. 6. Mr. Peter Quelch is studying the lichen growth of a hazel pollard. Note the bitten off stumps of numerous young hazel shoots around the base of the bole. Scotland, Glen Finglas. Photo: C.-A. Hæggström, 17 March, 2003.

Due to grazing by sheep and red deer in Glen Finglas, the hazels and alders are not able to reproduce with basal shoots, because those growing have been browsed every year (Fig. 6).

Rassal Ashwood NNR

The Rassal Ashwood National Nature Reserve is located on the west coast of the Mid Highlands 7 km W of Lochcarron and about 75 km SSE of Fort William. The area studied was fenced in 1957 against red deer and other grazing animals and thereafter partly planted with ash, birch, black alder and perhaps hazel. The idea was to regenerate a previous ash wood with some other deciduous species. However, as far as I could see, the land use of the area has previously been much more diversified and intense than just grazing of a lax wood. There were several signs of that land use: 1) hazel pollards of the same kind as in Glen Finglas; 2) many ash and birch pollards; 3) pollards growing on or at the rock outcrops and stony banks with plain terraces between; 4) very few woodland plants; 5) an old stone wall at one of the fences. The terraces may have been used as cereal fields or meadows. The area has a resemblance of the terraced slopes of, *e.g.* the Pyrenees in Spain, with ash pollards along the terrace edges and banks (Hæggström 1998a, 1998b).

Several old hazel pollards grew in the fenced area. Every one of them had developed shoots from the base of its bole. A complete series of hazel pollards could be seen, from still well preserved via collapsed with only one living branch to totally dead and decaying (Figs. 7–10). They showed that removing of the basal shoots is absolutely necessary if hazel pollards shall be preserved. All younger hazels in the fenced area were multistemmed shrubs of the ordinary ring shape.

Discussion

Hazels are rarely pollarded. No single information has come to my knowledge about the definite purpose of the pollarding. Therefore, only suggestions about the use of the hazel pollards can be put forward.

No natural agent is known to create pollards otherwise than by accident. Trees may develop into natural pollards if struck by lightning or broken by a gale or another falling tree, but such trees are very few and they are scattered among trees of normal growth. Further, the height at which natural pollards are injured (broken) varies. Browsing animals may bite off the top of a young tree and later a few branches may grow in the top of the stem. Thus a pollard is formed. However, such young trees will not develop into veteran pollards with thick boles and prominent pollard heads, because the animals do not browse off the new twigs at regular intervals, but haphazardly. If the grazing pressure is weak, such young

Fig. 7. A healthy hazel pollard with several young shoots developing from the base of the trunk. Scotland. Rassal Ashwood NNR. Photo: C.-A. Hæggström, 20 March, 2003.

animal pollards will not develop into veteran pollards. If the grazing is heavy, the young trees will be browsed to death quite soon.

As the hazels and other pollards in Glen Finglas were cut at only 1.5 m height, a very convenient height, one can judge that they were protected from browsing animals in some way. Although Glen Finglas had many goats during the 18th century and even later, goats had no access to these pollards. If so, they would have climbed the boles and destroyed the trees.

Pollards were commonly used througout Europe for leaf fodder, firewood or wood for producing charcoal, or rods for thatching, hurdles, creels, baskets and barrel hoops, etc. (Hæggström 1992). However, the reason for pollarding the hazels in Glen Finglas and Rassal Ashwood NNR can only be guessed as long as no information on their use is available. The estate papers of the Earls of Moray may perhaps shed light on this problem in Glen Finglas. However, most of these papers are not available.

A possible reason for pollarding trees, mainly black alders (in Glen Finglas) and hazels, was to use the leafy twigs as fertiliser in meadows and cereal fields. Pennant (1774: 377) describes such a use of black alder when he visited Dundonnel on the west coast about 50 km NNE of Rassal Ashwood NNR, on July 30, 1772: ”Here we were rejoiced with the sight of enclosures long strangers to us: the hay was good, the bear and oats excellent; but the manner of manuring, called in these parts *tathing*, was very singular: many of the fields were covered with the boughs of alders,

Fig.8. Mr. Peter Quelch inspects a hazel pollard with deteriorating branches on the bole and vigorous regrowth of new stems from the stool. Scotland. Rassal Ashwood NNR. Photo: C.-A. Hæggström, 20 March, 2003.

Fig. 9. A collapsed hazel pollard is replaced by an ordinary hazel shrub that has developed from the stool. Scotland. Rassal Ashwood NNR. Photo: C.-A. Hæggström, 20 March, 2003.

lately cut: these are left during the whole Winter to rot; in *March* the ground is cleared of the undecayed parts, and then ploughed." Muir (2004) quotes under *tathe faud*: "In Scotland, a field in which livestock are folded in order to enrich the ground with their droppings". If twigs of black alder were used as fertiliser as they are rich in nitrogen, then hazel could also be used, because its leaves are fairly rich in nutrients and fast decaying.

The twigs could also have been fed to livestock. The twigs were perhaps strewn in field at their most nutritious condition in the summer and then fed to the livestock. The animals ate the leaves and thin twigs and then in turn fertilised the field by their droppings. As goats were kept in the Glen Finglas area during the 18th century and even later, hazel could have been used as fodder for them. Already Linnæus (1749) observed that different animal livestock ate different plant species. Hazel which is useually despised by cattle, is eaten to some extent by sheep (Hoflund 1970, Olsson 1976, Hæggström 1990). Goats are known to eat such fodder that sheep and cattle despise, e.g. fresh oak and hazel. No information is, however, available on the use of hazel as fodder for livestock in Glen Finglas.

Another suggestion is that the hazel pollards were used for their nuts. There are several reasons for this: 1) the hazels, especially in Glen Finglas, grew as if in an orchard; 2) rather young naturally grown hazels often bear much more nuts than older ones; 3) nuts are easier to pick from low growth pollards with small crowns; 4) the areas in western Scotland, like Glen Finglas and especially the Rassal Ashwood NNR, are prone to gales.

Fig. 10. A decaying stump is the only remnant of the original single trunk hazel pollard. Several thick trunks have grown from the stool forming a typical hazel bush. Scotland. Rassal Ashwood NNR. Photo: C.-A. Hæggström, 20 March, 2003.

Then the still unripe hazel nuts are at the risk of being beaten off the branches, especially if they are long and slender, as they tend to be on naturally grown hazels.

Acknowledgements. My sincere thanks are due to all the nice people I met during the Tour of Selected Scottish Wood Pastures and Cultural Heritage Woodlands on 16–20 March 2003. We had fruitful discussions about pollards, wood pastures and coppices in various parts of Scotland in an unusually nice weather. I am especially grateful to Peter Quelch for valuable discussions and suggestions, both during the tour in Scotland in 2003 and earlier excursions in the Åland Islands and i the Lake District of England and later, too. Futher, his corrections of my English text is acknowledged.

References

Almquist, E. 1929: Träd och buskar i Upplands vegetation. — Lustgården 10: 105–140.

Bergroth, O. 1893: Finska trädjättar. — Geografiska Föreningens Tidskrift 5: 194–196.

Bergroth, O. 1894: Anteckningar om vegetationen i gränstrakterna mellan Åland och Åbo-området. — Acta Soc. Fauna Flora Fennica 11(3): 1–78, 1 map.

Blomqvist, S. G. 1911: Till högbuskformationens ekologi. (Zur Ökologie der Hochgebüschformation.) — Svensk Bot. Tidskr. 5: 1–81.

Carlsson, Å. 1994: Bondens träd – och botanistens. — Svensk Bot. Tidskrift 88: 159–166.

Coles, J. M. & Orme, B. J. 1977: Neolithic hurdles from Walton Heath, Somerset. — Somerset Levels Papers 3: 6–29.

Collins, E. J. T. 1988: Changing markets for coppice products and coppice management in England 1750–1914. — In: Salbitano, F. (ed.), Human influence on forest ecosystems development in Europe. Proceedings of a workshop in Trento, Italy 26–29 september 1988. Pitagora Editrice, Bologna, pp. 331–334.

Eklund, O. 1927: Baumförmige Hasel (Corylus avellana L.). — Memoranda Soc. Fauna Flora Fennica 1: 16–20.

Hoflund, S. 1970: Kunskap om fårens beteendemönster har betydelse för praktisk fårskötsel. — Foderjournalen 9: 27–43.

Hæggström, C.-A. 1990: The influence of sheep and cattle grazing on wooded meadows in Åland, SW Finland. — Acta Bot. Fennica 141: 1–28.

Hæggström, C.-A. 1992: Wooded meadows and the use of deciduous trees for fodder, fuel, carpentry and building purposes. — Protoindustries et histoire des forêts. GDR ISARD-CNRS. Les Cahiers de l'ISARD 3: 151–162. Toulouse.

Hæggström, C.-A. 1998a: Pollard meadows: multiple use of human-made nature. — In: Kirby, K. & Watkins, C. (eds.), The Ecological History of European Forests: 33–41. CAB International.

Hæggström, C.-A. 1998b: Hamlingsängar i Europas bergstrakter. — Nordenskiöld-samfundets tidskrift 58: 15–40.

Hæggström, C.-A. 2000: The age and size of hazel (Corylus avellana L.) stools of Nåtö island, Åland Islands, SW Finland. — In: Agnoletti, M. & Anderson, S. (eds.), Methods and Approaches in Forest History: 47–57. CAB International.

Hæggström, C.-A. & Hæggström, E. 2003: Can natural habitats be utilised in a sustainable way? — In: Tonkov, S. (ed.), Aspects of Palynology and Palaeoecology. Festschrift in honour of Elissaveta Bozilova, pp. 81–111. Pensoft Publ., Sofia & Moscow.

Hjelt, H. 1902: Conspectus florae fennicae. Vol. II. Dicotyledonae I. Amentaceae – Polygonaceae. — Acta Soc. Fauna Flora Fennica 21(1): 1–261.

Lagerberg, T. 1947: Vilda växter i Norden II. Corylaceae – Rosaceae. Ed. 2. — Bokförlaget Natur och Kultur, Stockholm. Pp. 449–860, Plates VIII–XX, 233–464.

Lagerberg, T., Holmboe, J. & Nordhagen, R. 1952: Våre ville planter II. Revidert og forøkt utgave. — Johan Grundt Tanum, Oslo. 371 pp., Plates I–XII & 161–368.

Lindman, C. A. M. 1914: Några bidrag till frågan: buske eller träd? — K. Vetenskapsakad. årsbok 12: 231–287.

Lindquist, B. 1929: Några intressanta skånska träd. — Lustgården 10: 199–200.

Linnæus, C. 1749: Pan Svecicus. — [3] + 38 pp. Upsaliæ. (Diss. N. L. Hesselgren.) (Also published as Pan Svecus in Amoenitates Acad. 2 in 1751 and 1762.)

Muir, R. 2004: Landscape Encyclopedia. A reference guide to the historic landscape. — 297 pp. Windgather Press.

Nilsson, G. 1924: Ett bestånd av trädformig hassel i Göteborgstrakten. — Sveriges Natur 15: 150–151.

Norrlin, J. P. 1871: Bidrag till sydöstra Tavastlands flora. — Not. Sällsk. Fauna Fl. Fenn. Förh. 11(N.S. 8): 73–196.

Olsson, G. 1976: Inverkan av betning och annan skötsel på hagmarkers vegetation. — Svensk Bot. Tidskr. 69: 393–404.

Palmgren, A. 1915–17: Studier öfver löfängsområdena på Åland. Ett bidrag till kännedomen om vegetationen och floran på torr och på frisk kalkhaltig grund. I–III. — Acta Soc. Fauna Flora Fennica 42(1): 1–633, 16 tables, 2 plates, 2 maps.

Pennant, T. 1774: A Tour in Scotland and a Voyage to the Hebrides 1772. — VI + 439 pp., 44 plates. J. Monk, Chester.

Peterken, G. F. 1981: Woodland conservation and management. — 328 pp. Chapman and Hall, London, New York.

Quelch, P. R. [2001]: Ancient Wood Pasture in Scotland. An Illustrated Guide to Ancient Wood Pasture in Scotland. — http://www.forestry.gov.uk/pdf/ancient.pdf/$FILE/ancient.pdf (31 January, 2008).

Rackham, O. 1977: Neolithic woodland management in the Somerset Levels: Garvin's Walton Heath, and Rowland's tracks. — Somerset Levels Papers 3: 65–71.

Rackham, O. 1980: Ancient woodland, its history, vegetation and uses in England. — Edward Arnold.

Sanderson, N. 1998: Glen Finglass historic landscape survey, final report 1998. — Neil Sanderson Botanical Survey and Assessment, Hampshire.

Slotte, H. 2002: Glimtar av gamla svenska odlingslandskap i Transsylvanien. (Abstract: Glimpses of the historical Swedish agricultural landscape in Transylvania.) — Svensk Bot. Tidskr. 96: 8–17.

Teiling, E. 1920: Om trädformig hassel. — Sveriges Natur 11: 153–154.