WOOD

A HISTORY

JOACHIM RADKAU

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Translated by Patrick Camiller

polity

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CONTENTS

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INTRODUCTION: PRAISING WOOD, CARING FOR WOOD, SPLITTING WOOD – AND A HISTORICAL SYNTHESIS

> I marvel how our God has given so many uses to wood for all men in the whole wide world: building timber, firewood, joiner's, cartwright's and shipbuilder's wood, wood for rooms, wood for wheelbarrows, paddles, gutters, barrels, etc. Who can tell of every use that wood has? In short, wood is one of the greatest and most necessary things in the world, which people need and cannot do without.

This praise of wood as an indispensable, multi-purpose material, here taken from Martin Luther's *Table Talk* of 30 August 1532, became a leitmotif of early modern literature as people gave serious attention to supply problems instead of relying on the Good Lord to provide for them, even when they sinned against the forest. Later, Luther was said to have predicted that the world would one day 'lack three things: good coins, wood and good friends'. The sense of crisis sharpened this view of wood as the foundation of human existence, which had previously been given little thought. In fact, wood is a natural material that has marked human culture – not only in the 'Wood Age' of the past but right down to the present day. Recently we have been experiencing a renaissance of wood, as both fuel and construction material, that scarcely anyone would have considered possible a generation ago.

The more one goes into the significance of forest and wood in history, the more one can succumb to wood mania and start to feel that, in a way previously unsuspected by historians, it is a secret key to essential features of various cultures, and even to the rise and fall of great powers. Over the years and decades, my frequent travels inspired me to collect whole bookcases of literature on wood and the forest, until inevitably my colleagues gave me the nickname 'Woodworm'. But I was aware that in the wood scene this counts as

an honorific title. I was often overcome by the wealth of my discoveries, yet I found few books that even half satisfied my curiosity about the whole matter. Realizing that I would have to write my longed-for book myself, I was also seized with an ambition to show my disbelieving fellow historians that wood is one of the most important issues in the history of the world.

Or is wood so banal that it is not worth thinking about? In 1948 Sigfried Giedion published his magnificent work *Mechanization Takes Command* under the watchword 'For the historian there are no banal things' (Giedion 1948: 3). No one else has given such a fascinating description of the ways in which mentalities are embedded in furniture: the history of chairs, for example, which begins in the late Middle Ages, mirrors the history of bodily posture, and 'posture reflects the inner nature of a period' or 'the essence of the age' (ibid.: 262, 310f., 396ff.). Giedion's central question 'What happens when mechanization encounters organic substance?' (ibid.: 6) is a fateful one for human civilization, and also a central question in the present book. For Giedion it ultimately remains open: the history of man's dealings with wood brings forth a whole series of answers. Another vital question that history has lined up for us concerns the way in which societies manage on limited resources. It was already noted in the Middle Ages that the forests are finite, and more recently we have begun to grasp that the oceans and the atmosphere are finite too.

The history of wood and forest is all too often presented as a jumble of disconnected facts. Yet it provides much food for thought as soon as we broaden our horizons and look more deeply into the matter. Solid history here coincides with world history theory. In the 'modern world system' described by Immanuel Wallerstein, does the timber trade further widen the gulf between core and periphery, or do the forests actually give the periphery a special opportunity? Is Garrett Hardin's 'tragedy of the commons' decisively confirmed in the history of the forest, or are forest communities the best example of the model of local commons organization for which Elinor Ostrom received the Nobel Prize in 2009? Does rational choice theory provide the key to the technical history of wood, or does the power of tradition and emotion make itself felt everywhere in that history?

These are big issues of world history – and yet the literature is as split on them as a shattered wooden log. This is already visible in the concepts: the leader writer of the journal *Holzforschung und Holzverwertung* once complained of the 'massive, Babel-like, linguistic and conceptual confusion of the lumber industry' (Alfred Teischinger, in Heinzinger 1988: 236). And then there is the wider

forest economy! Forest and timber are inseparable from each other, but the literature treats the history of the forest and the history of wood processing as if they belonged to two different worlds. Forest historians are reluctant to look beyond their chosen subject, yet the history of the forest cannot be understood if one looks only at the forest. 'Sustainable forestry', harmony between economy and forest, is a question not only of technology but even more of cooperation within a typically global field of tension between forest dwellers and tillers of open land, mountain and plain dwellers, herdsmen and farmers – a source of conflict present throughout human history.

The literature on wood processing is thoroughly opaque. Most of it refers only to discrete activities, from charcoal-burning to the art of wood-carving, and usually has a limited regional focus. Indeed, it is strange that regions closely related in terms of wood and forest know so little about one another. The bulk of published works offer a hotchpotch of facts that allows us to distinguish neither historical processes nor a coherent train of thought. The common idea seems to be that wood is mute, that it is not at all easy to make it speak.

Although in my heart of hearts I am a forest romantic, I have learned most of what I know about wood and the forest from thoroughly unromantic books. It was with surprise and enthusiasm that I discovered an American work virtually unknown in Europe: Stanley F. Horn's *This Fascinating Lumber Business*, published in 1943, whose author – a 'hardwood man', as he describes himself – founded in 1908 the *Southern Lumberman*, the 'oldest lumber trade paper' in the world. He vividly depicts how the striving for sustainable forestry can originate in practical problems and not necessarily, as many German historians believe, in academic research or the world of state administration. 'Hardwood people', we learn, are of a special mould. In an interview given in 1978, the 89-year-old Horn provided special insider's insights into how the timber sector in the American South organizes itself within the Order of the Hoo-Hoo, where conflicts similar to those of the old German student fraternities are worked off in a theatrical show of force. The European reader is astonished to discover that an old tradition of lamenting wood shortages survives in the forest-rich United States: 'Every time an old house is torn down there is somebody to shake his head in woe and say: "You can't get lumber like that any more." But the truth is that just as good lumber is being manufactured today as ever.' I had already delved quite deeply into the historical German fear that the supply of wood would run out. But Horn left me in no doubt that people elsewhere have had to take active measures to ensure that their supply holds up in the future.

Unsurpassed to this day is Bryan Latham's *Timber: Its Development and Distribution: A Historical Survey*, first published in 1957. Its author, founder president of the Institute of Wood Science, comes from a woodland dynasty stretching from James Latham I and James Latham II to James Latham V, whose trade in exotic hardwood began in Liverpool in 1757, exactly two centuries before the publication of the book. It is a unique work, in which one can sense this unbroken continuity of first-hand knowledge; the author tells us that 'timber is in my blood, as it has been in the blood of my ancestors for two hundred years'. The book's title is *Timber*, but its entire contents show that timber and wood cannot be separated from each other, in either nature or history. This is especially confusing for German readers, who have got used to the distinction between the two terms (for which there is no precise equivalent in German) only to learn that lumberjacks in the West shouted out 'Timber!', or rather 'Timber-r-r-r', when a tree fell.

Again and again we are confronted with the fact that wood is a special material which cannot be replaced with any other, and which, on closer inspection, decays in a range of quite different ways. Horn and Latham tell us that, both in the forest and in commerce, hardwood and softwood belong to different worlds, each with its own customs and histories. We would look in vain in their work for any trace of the common complaint about deforestation and wood shortages, since, in fact, a failing supply means a boom time for the business. Latham's book is full of stories, yet we see how wood – even when, as he does, we leave the vast realm of firewood – breaks up the historical narrative, and how difficult it is to divide up the history of wood satisfactorily.

Master narratives exist only for the forest as such. But, as the British historian Oliver Rackham mocked decades ago, they often amount to 'pseudo-history', copied down from others and resting on an uncritical attitude to the sources. Suspiciously, we find the same story in books about completely different forest regions, from Western Europe to Japan: first, a long bad period of unregulated plunder, then the great age of salvation, of sustainable forestry, under the supervision of a forestry administration. The darkness of the terrain encourages the development of myths and legends. And throughout history we find a constant vacillation between the idea that forests are endless and the fear of deforestation and shortage. My own debut in the matter was in 1981, at an international conference in Essen on 'Energy in History', where I questioned the thesis of a catastrophic shortage of wood in the eighteenth century. This

triggered a controversy that rumbles on even today, thirty years later. For it has been the central myth of the proud German forestry that, ever since Germany began to revive in the 1800s, it has saved more and more other countries from the threat of a supply disaster. I was therefore called 'the German Rackham' and considered for a time as the foresters' enemy.

Fortunately, and for good reason, my relations with the forestry people have since become more amicable. For the critique of the traditional view of forest history opens up new perspectives for wood. If the lesson of history is that the 'Wood Age' did not end through ecological suicide, then the road to another wood age is not necessarily suicidal either. The Wood Age did not break down because of a shortage of wood, any more than the Stone Age broke down because of a shortage of stone. A broad overview demonstrates this better than a plethora of special studies can ever do. Environmental history as a critical discipline must also take pseudo-ecological statements apart.

Anglo-American naval history has long had a wood shortage controversy that is unknown in continental Europe. In the critical wake of Admiral Alfred T. Mahan and his famous work *The Influence of Sea Power upon History, 1660–1783*, Robert G. Albion published in 1926 the classic *Forests and Sea Power: The Timber Problem of the Royal Navy, 1652–1862*. Since it was ultimately timber resources, not the energy and courage of sailors, that ensured a country's supremacy at sea, the rise of the Royal Navy had gone hand in hand with constant supply fears – fears which, according to Albion, were well founded because of England's destruction of its forests. The inner contradiction of Albion's book, however, was that in the end he still attributed the naval victory over Napoleon at Trafalgar to Britain's superior timber resources. Later research showed that he had greatly exaggerated the country's deforestation during the period in question. The core of the problem – already in Albion's book – was not any real shortage but the power of the 'Timber Trust': while the British fleet was routing Napoleon, the Admiralty was allowing itself to be blackmailed by a gang of big timber dealers (Albion 1926: 58f.). As a naval official later mordantly noted: 'The real timber problem of the Royal Navy was the trouble with the wooden heads that guided its policies, and England did not have to import that kind of timber' (Horn 1943: 19f.).

But is the history of wood simply a matter of demonstrating particular causal relationships? Does wood not supply the material for 'big history'? Does the attempt to achieve a synoptic overview amount to

no more than ghost-hunting? Is there a reason after all for the unsatisfying character of the existing literature? Is 'wood' as such too general a theme for a written history? Should we not stick to the usual narrower subjects: the timber business, reforestation, woodcutting, charcoal-burning, wood distribution systems, woodcrafts, wood-carving, house-building, the energy business, pitch, tar and potash production, and in modern times the wood pulp and cellulose industry?

In my view, a general history of wood does make sense, because a connection exists among all these themes – not only logically and in nature, but also in history itself. Until the industrial age many users of wood had a direct relationship with the forest, and all had to deal in one way or another with the natural properties of wood. Craftsmen in Lippe (in what is now North Rhine-Westphalia) defied the warden in 1757 by searching in the forest for the tree of their choice instead of having one allocated to them; otherwise 'they preferred not to have any wood'. Typically, the scion of an old family of woodcrafters once told me how his ancestors used to go into the forest to find the right tree for a newly commissioned item. When I asked him when this practice had ceased, he thought for a moment and said it had been when the first woodworking machinery arrived. The whole pace of work then speeded up, and people no longer had time to search the forest for trees.

The American wood lover and technologist Bruce Hoadley is of much the same view: 'Trees are a source of wood only for those willing to expend much time and physical effort, because extracting workable wood from the tree is no casual pastime' (Hoadley 1980: 203). Modern working speeds, together with modern transport and distribution systems, have broken the direct link between the forest and processing activity, and the grading of high-quality woods for the market has become a centralized procedure. For many industrial timber products, the natural qualities of a particular wood are no longer of interest.

The whole forest and timber industry often strikes the outsider as a world unto itself – an opaque, hermetically sealed black box. But conflicts of interest that divide commercial forestry, sawmills, the furniture business, the chipboard industry and the wholesale trade find expression not only in lobbying activity but also in the specialist literature. One might even say that different mentalities take shape in all these sectors. In relation to the present and future, not only the historical past, it is important to make ourselves aware of the overarching connection among these particular sectors. The first link is the resource itself, wood; its finite character is today clearly apparent

on a world scale, as age-old fears of supply exhaustion, forgotten for some time, resurface alongside ambitious and varied plans for the exploitation of timber. At the same time, technological advances have given rise to what we might call programmatic connections. Modern technologies for the processing of timber waste yield new kinds of combined use: wood as raw material, wood as fuel, wood as input for cellulose production. Attempts were already made in the early modern period to exploit waste within such an interlocking system. Today, once again, these have a promising future ahead of them.

The various ways of using forest and wood have continually cut across one another. Today too, and into the future, there is a real danger that the different purposes will conflict: maximum use of wood as a resource capable of regenerating itself; optimum use of the natural properties of wood; and a return to an ecologically stable forestry. This too underlines the need to consider the 'forest and wood' sector more holistically than most analysts have done until now. Only then will it be possible to identify and overcome a conflict in aims before it is too late. As one 'woodworm' from Austria put it: 'If all parties interested in wood – from forest people through the timber industry to academic researchers – could be brought around a table, wood would be an unbeatable material' (Franz Solar, in Teischinger and Lex 2005: 117). But he knew that, for the time being, a Broad Green Alliance remains a pipe dream.

'America's Wooden Age was a wonderful era, specifically because of the nature of the prevailing technology which depended so heavily upon wood': so begins the collection *America's Wooden Age*, originally published by the National Museum of History and Technology (Hindle 1975: 12). Well, we might ask, if the Wood Age was really so wonderful, why didn't America stick with wood? A collection of American graphics and drawings from the nineteenth century, published around the same time by the Bettmann Archive in New York, bears the title *The Good Old Days – They Were Terrible!*, and the log cabin of legend appears in it as a stench-filled breeding ground for vermin (Bettmann 1974: 47). If one writes a history of wood filled with enthusiasm for the material, one finds oneself asking why it does not rule the world, instead of often being driven out by other materials. A critical approach is needed to avoid falling into illusions; if wood is to win back some ground, an explanation is needed as to how it lost that ground in the first place. Not infrequently, the advantages of wood have become evident only in retrospect. And the narrow horizons of the timber industry have prevented many an opportunity from being seized.

Here lies the attraction, but also the difficulty, of writing a history of wood: we are faced with a major context that has previously remained beneath the surface, little considered by historians. Our knowledge of how the forest has marked human existence down the ages, and of how it responded to human demands on it, is still full of gaps. There has been no lack of research, to be sure, but for olden times it is based mostly on the mass of forest ordinance. This by itself does not tell us what actually went on in the forest. As Oliver Rackham has repeatedly stressed, the real history of the forest should not be confused with the history of legal regulations.

Forest history also tends to judge earlier conditions from the point of view of the modern timber industry, for which the forest is productive of wood and little else. In the case of Italy, Gabriella Bonacchi has characterized the rise of the modern timber industry as the *vittoria del legno sulle foglie*, the 'victory of wood over foliage'. For farmers all over the world, the forest has been seen mainly as a grazing ground and a source of fodder for their animals, with fruit trees as the most valuable element in it; the Tree of Life in the final chapter of the Book of Revelation is a fruit tree. Thus, what for modern foresters is at best a 'marginal use', and at worst 'poaching', was for most of human history the main utility of the forest. What features stereotypically in many books as the bad age of the forest's ruin was the very time when the farmer's interests prevailed there, rather than an interest in maximizing timber production for the market. In certain periods, the production of pitch, resin, rubber and tannins also played an enormous role.

Since forest historians have focused only on their pet subject, they have shed little light on its connection with general history and economic-technological development. We know of the massive use of wood in many earlier trades but all too little about the wood policies of various cities or the strategies they adopted to ensure adequate provision in the future. General statements are made more difficult by the fact that local and regional differences are especially great in the timber industry.

Even the modern economic history of wood and the forest is less well known than one would like to think. Although wood continues to be the most versatile material, and a very important factor in the world economy, it has received relatively little attention from economists and technologists. Wood technology is not a 'cutting-edge technology', nor is the timber industry a headline-grabbing sector of large-scale industry – at least not in Central Europe. Wood is not (or is not yet) a material that holds out the prospect of a Nobel Prize. As

in the past, wood is used in little-known ways in a whole number of sectors of the economy. Only a synoptic overview can reveal its full significance.

Although I am always susceptible to the romance of the forest, my main interest as a historian of wood and the forest has long been in the anti-romantic aspect of *rationalization*. For the fact is that, in modern times, human dealings with wood and the forest may be described as a series of rationalization drives. In this respect, I have unwittingly stood in the tradition of Max Weber – or, to be more precise, of the rationalization obsessive who has traditionally been the authority for rational choice theorists. In my own biography of Weber (Radkau 2009) I uncovered quite a different thinker: one who was aware of the ambivalence of rationalization and the force of passion in history – and who has left his mark on the present edition of this work. In reality, man's dealings with the forest cannot be rationalized through and through. As a Swiss expert noted, even 'cost unit accounting is virtually unknown' in the timber business (Höchli 1957: 35), and no one who plants trees can tell in advance what they will be worth by the time they are ready to be felled. To quote Hindle again, in order to write about the Wood Age, 'the first need is to develop a sensitivity to the ways of wood. This sensitivity cannot be fully conveyed in a written paper because the three-dimensional world of wood has important nonverbal aspects which can be apprehended only by seeing, or even by touching, the objects involved' (Hindle 1975: 4).

Such is the dilemma of all books about wood. The records are bare; you usually have to hunt for the emotions between the lines. The best way to get a feel for them is by talking with 'woodworms' – with people in the wood and forestry sector. But we should not forget that emotions also stir on the opposite side. Architects for whom 'modern' is a magic word drool over concrete as the pinnacle of design freedom and regard timber as a 'reactionary' material, even if they concede that it provides a pleasant indoor climate and that the freedom offered by concrete usually results in monotony.

Not surprisingly, emotions also permeate the literature on wood and the forest. Too often, though, they do not reveal themselves as such but are smuggled into the text, or else the author remains unaware of his subjective judgement. A forester and historian who loves mixed deciduous woodland once assured me that he would like to grab a colleague who is promoting conifer monoculture and string him up from the nearest tree! The forest is not the place of peaceful harmony that romantics like to imagine. Lovers of old-growth forest have no language in common with people for whom the giant trees are

'lazy journeymen' because of their slow rate of growth. The literary type who is fixated on ancestral woodland looks with indifference, or even disdain, on the reforestation projects that are the forester's pride. American forest rangers who take pride in the heroic struggle against fires hate pyromaniac lovers of the wilderness, for whom fire is part of the forest ecosystem. Wilderness fans see the timber industry as only one disturbing factor in the history of the forest, and consider those who see the forest mainly as a timber resource to be simply narrow-minded. And wood lovers who are fond of log cabins and lavish wooden furniture are the laughing stock of technologically minded moderns, who demonstrate the robustness of wood by making the most economical use of it. What a challenge to wood and forest historians! Max Weber's insistence on value-free science raises no more than a yawn among many of today's social scientists – but it is little short of revolutionary for the history of wood.

To knit together rational and emotional approaches would seem to be the most difficult challenge for historians of wood and the forest. It has not yet been convincingly explained how German forest romanticism links up with the simultaneous reforestation movement; there is evidently not a direct causal relationship. Today a coffee-table book entitled *Wood* promotes itself with the blurb: 'Access to the essence of wood opens up only when we give up counting, measuring and thinking' (Spring and Glas 2005). Even thinking we have to give up! When a wood-carver explained much the same thing to me, I countered by asking whether he didn't have to have a lot of intelligence in his hands when he was carving. Our intelligence is not present only in our brains. Only in combination with the intellect do our emotions become a productive force.

Theodor Heuss, who in the 1920s ran the Deutscher Werkbund (in many ways an offspring of the British Arts and Crafts movement) and in 1949 became the first president of the Federal Republic of Germany, looked back in 1951 at the 'cohabitation of romanticism and rationalism' in the Werkbund – 'a relationship that spawned very many children' (Heuss 1951: 13f.). Even the old half-timbered houses, which used prefabricated wooden components, required far more precise planning than brick buildings. Wood is conducive to identification and intuitive approaches, but these are capable of leading one astray. People think they know wood from long experience, but this very certainty can make them blind to new knowledge. In his book *Understanding Wood*, Bruce Hoadley attacked 'the mountains of misinformation available and commonly accepted by woodworkers' – for example, the idea that 'wood has to breathe'.

No, wood does not breathe in the sense in which animals do. 'Wood doesn't eat either, and it doesn't require feeding with furniture polish' (Hoadley 1980: 10).

In the existing ecological literature, two genres stand more or less side by side, unconnected with each other. One of these bewails the loss of forest all over the world; the other raves about wood as a natural material. But trees have to be felled for wood to be used. So how can the two attitudes be married? There is a lot of confusion on this score among nature lovers: many are shy of facing up to the contradiction. Georg Sperber, a leading forestry official in Germany, declared with a mixture of triumph and alarm: 'A new wood age has begun that threatens to sell off our natural heritage' (Knapp and Spangenberg 2007: 177). One resolution, at least symbolic, is the tree house – that is, a wooden construction built into a treetop. But the tree house is not exactly an optimal solution for mass housing. Are other syntheses possible? Or is it true that timber use inevitably leads to destruction of the forests? This book will also try to give answers to these questions; there is no single general answer.

For some time, the demand for a 'big history' has been in the air – one that links together human history and natural history. In view of the alarm bells about the environment and the global climate, the task is to understand both the historical past and the future in terms of a co-evolution of man and nature – a co-evolution which, in the absence of level-headed foresight, will eventually be marked by catastrophes. But historians have long had problems with writing such a new history in an empirically solid manner. Attempts at 'big history' are often banal or superficial, in line with the schema of 'modernization + globalization', and lack both the attraction of a hunt for sources and the surprise of unexpected discoveries.

If it is not to be completely colourless, a global history of the co-evolution of man and nature needs tangible material to work on. Wood might be one such material – a leitmotif for a history of the world with endless picturesque variants. For some centuries, a sizeable part of history may be seen as a constant to and fro movement between forest autonomy and timber industry dynamics – with agriculture as a powerful additional player. A new and dramatic culmination now seems to be shaping up. 'Sustainable development', set as the goal for the whole world economy at the 1992 environmental conference in Rio, was first applied – though this is now largely forgotten – to the forest, and especially the montane and saline forest of Central Europe. Forest policy, then, is the historical origin of modern environmental policy; and the historical, as well as contemporary, association

between forest policy and power politics also reveals something about certain pitfalls of environmental policy. The structure of wood points to new paths for technology. 'So, the way in which a branch is joined to a tree trunk is such that no engineer can improve on it, in terms of tension and solidity' (Fellner and Teischinger 2001: 131).

Thirty years ago, when I began my researches, the history of wood was a *Holzweg*, in the sense meant by Heidegger, the philosopher from Todtnauberg in the Black Forest: that is, a path ending in thick undergrowth, where the walker turns back in disappointment and only the forestry worker can do any more. Because of the new timber boom, however, the story is now approaching a dramatic finale: the circle seems to be closing as many phenomena of the old Wood Age reappear, together with the fear of wood shortages and wood theft (a widespread crime typical of the eighteenth and nineteenth centuries). But we need to be careful. We are not at the end of history, even if storytellers are all too fond of creating that impression. A new wood age had only just been proclaimed when the crash of autumn 2008 arrived, and forest-owners were again complaining of falling timber prices. This is another oscillation that has been taking place for two centuries or more. The business press turns somersaults as it adjusts its words of wisdom from boom to depression, but one of the useful things about history is that it surveys longer time periods. This fits in well with the *longue durée* of the growth of trees. 'Learn from history' all too often means no more than finding contemporary analogies for certain fixed points in the past: 'death of the forest then, death of the forest now'. A more important lesson, however, is that history goes on.

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PATHS INTO THE THICKET OF HISTORY

1 The 'Wood Age'

Do materials make history?

Wood is a special kind of material. From time immemorial, the skill of the human hand has developed by working wood, so much so that we might say the relationship with it is part of human nature. The handling of wood is a basic element in the history of the human body, and in the history of craftsmanship.

In a brown coal mine at Schöningen in Lower Saxony, eight wooden spears have been discovered since 1994 that date back 400,000 years – by far the oldest known wooden implements anywhere in the world (figure 1.1). This highly improbable find is in its way more spectacular than all those at Troy put together. It testifies to an amazing skill in woodworking, greater than anyone previously attributed to people in the Palaeolithic Age, and it shows just how early man developed a high level of competence in dealing with wood. An earlier prehistoric object – a yew spear unearthed at Clacton-on-Sea in 1911 – had already caused a sensation, but after the Schöningen find that was seen to be not just an isolated case but a representative example of Palaeolithic woodcraft.

The know-how associated with wood belongs, as it were, to 'human nature' – to a primal anthropological state. Hartmut Thieme writes of the Schöningen spears: 'The technical perfection of these ballistically balanced weapons points to a long tradition of using such implements.' The exciting conclusion is that humans were capable of big-game hunting hundreds of thousands of years earlier than we previously thought (Thieme 2007: 85). Since 1973 there has been considerable discussion of Paul S. Martin's thesis of 'Pleistocene overkill', according to which North American big game, with the exception of certain kinds of bison, were wiped out by human invaders within the space of a few centuries, some 10,000 years ago. Archaeological finds have indeed revealed a striking overlap between the appearance of humans and the disappearance of big game. The problem with the theory seemed to be that it was hard to imagine how these early humans could have technically mastered big-game hunting on such a scale. But, if we think of the art of perfect woodcraft stretching back into the mists of time, and applied precisely to hunting weapons, then the problem vanishes; the missing link is found.

The glacier mummy of 'Ötzi' from 5,300 years ago, which caused such a sensation when it was discovered in 1991 in the Ötztal in the Austrian Alps, had no fewer than seventeen different kinds of wood

Figure 1.1: Eight wooden throwing-spears were found in and after 1995 in an opencast brown coal mine at Schöningen, in the foothills of the Harz mountains. Dating back 400,000 years, they are the oldest hunting weapons to have survived intact. They were lying in a hunters' camp amid the bones of at least fifteen horses, which had presumably been hunted with these weapons on the shores of a lake. They prove conclusively that primitive man (and, later, Neolithic man) was not only a scavenger but a skilled hunter. But they also prove that people had developed technical skills in woodworking.

on it, each used for a particular purpose (Spindler 1994: 232–8). Archaeologists have also refuted Tacitus' claim that the ancient Germans built their houses from unhewn tree trunks; it appears again and again that the 'savages' were not as savage as we used to think. Ötzi has distracted public attention from oak-lined wells dug up in opencast mining areas in Saxony and near Erkelenz in the Rhineland, which dendrochronological datings have shown to be more than 7,000 years old. These completely unexpected finds have revolutionized our picture of prehistoric settlements in Central Europe, but most spectacular of all have been the wooden nails that make expert eyes as big as saucers. The archaeologist Susanne Friedrich commented: 'After these, anything is possible!' One is curious whether the 'Stone Age' will one day prove to have been a highly developed 'Wood Age'!

Since wooden implements have survived much more rarely than stone or metal objects, we long underestimated the extent to which human history rests upon wooden foundations. A whole culture of work depends on wood – from the Palaeolithic right down to the modern age. There has always been interaction between people and wood: the material made its mark on the hand, the muscular system and man's creative powers, and wooden implements bore traces of the hand that fashioned them.

The wooden machines of the early industrial age, however standardized in their production, sooner or later acquired an individual character from the people who worked on them – which is why these were less interchangeable than workers on iron machinery. Adjustments often needed to be made to wooden machines, and the workers themselves had to take charge of repairs. Wood was easy to work with, but wooden machinery wore out quickly and encouraged a lot of small improvements to be made all the time: 'Wood has been par excellence the material of innovation.' Two historians of the Japanese textile industry noted: 'Technological progress, therefore, penetrated more rapidly into factories equipped with wooden iron-reeling machines than it did with those of iron-machines only' (Clancey 2007: 130, 131).

Where the machines were made of iron, workers were sometimes expressly forbidden to make repairs themselves. Previously, wood had preserved a degree of autonomy for labour and also set limits to the increase in the pace of work. The natural fibrous structure of the various kinds of wood influenced the history of technology. Indeed, the effects of wood extended into social history and the consciousness that workers had of themselves.

Woodworkers played a pioneering role in the formation of the

German labour movement, providing a number of key leaders such as August Bebel, Carl Legien and Theodor Leipart. All three were turners – an occupation which, though low in the craft hierarchy, called for special skills of its own (Flade 1979: 231). Both Walter Ulbricht and Wilhelm Pieck, respectively the first party boss and first president of the German Democratic Republic, had originally been joiners. And, in the case of England, Edward Thompson has shown in his great biography that William Morris (1834–96) – who sparked new enthusiasm internationally for the crafts, especially carpentry – was not only a Romantic admirer of the Gothic style but also a passionate socialist.

The political consciousness of workers derived not only – as Marxist theory would have it – from the experience of capitalist exploitation but also from pride in craft skills. Carpenters may have stood out numerically, but when the various trades fused into an industrial union it called itself (after initial hesitations) the Deutscher Holzarbeiterverband, the German Woodworkers' Union (Gottfried Christmann, in Grebing 1993: 17ff.). And in 1966, when the German Wood Union (Gewerkschaft Holz) followed the technological realities and the practice of employers' associations by renaming itself the Wood and Plastics Union, this move triggered considerable disgruntlement: 'It's a new emblem that leaves our members cold'; 'even if we rechristen ourselves, we shall always remain the Gewerkschaft Holz' (Hans-Otto Hemmer, ibid.: 255). Wood shapes identity!

In commerce, too, wood created a world of its own. Buying wood is a matter of trust, since many defects are not visible from the external aspect of a tree. 'Lumber-grading requires considerable exercise of personal judgment', remarked Stanley Horn (1943: 219), at a time when wood was the object of intensive scientific research. And he knew what he was talking about. For this reason, long-lasting personal relations tend to develop between sellers and purchasers.

The Company of Woodmongyres, founded in London in 1376, lost its charter in 1667 when a number of cases of deception came to light; Samuel Pepys's diary contains details of this (Latham 1957: 31). Since the felling and transportation of timber was often subject to government regulation, large dealers often needed to have contacts in officialdom – and so it was that a network took shape, based on either trust or corruption, according to the situation and the way it was seen. 'Conservatism and corruption marked the system by which the navy received and used its timber', Albion tersely opens his chapter on naval timber procurement. 'Patron–client links . . . are central to the allocation and management of timber concessions', is how

Dauvergne describes the timber business in South-East Asia today (Dauvergne 1997: 8). And much the same can be observed in Europe too, throughout the history of the commercialization of timber.

We continually come across a special kind of human milieu in the world of wood – one sealed off on the outside but full of tensions inside. Today, when an ecologically aware public has become alert to illegal tree-felling and forest plunder, many timber firms claim not to know where their product comes from (see, for example, 'Gegen illegales Holz', *WWF-Magazin*, July 2009). Perhaps many really do not know: it would be further evidence of what Jürgen Habermas called 'the new obscurity'.

Wood, wood, everywhere!

Werner Sombart (1863–1941), one of the founders of modern sociology, never forgot – unlike many of his successors – that nature is the foundation of life on earth and that human culture is deeply marked by its handling of natural resources. In his view, the entire culture of pre-industrial times had an inner unity that was only apparent in retrospect but had never been taken into consideration by historians. This unity had a 'decidedly wooden character' (Sombart 1928: 1138).

Following Sombart, the concept of a Wood Age culture stretching over thousands of years from the Stone Age to the eighteenth century became central to the colourful panorama of the pre-modern world. Wood, wood, everywhere! The Stone Age was itself mainly an age of wood: this is too easily forgotten, because wooden remnants have survived from olden times only in exceptional cases. The Greeks also carved images of their gods out of wood: it is only an optical illusion that all their statues are marble.

For millennia, wood was the most important, often the only, substance used for fuel, building and craftsmanship; it was also central to the forerunners of the chemicals industry. A whole world may be seen under a wooden aegis – from woodcutters, rafters, charcoal-burners, potash-makers and glass-blowers, through salters, forgers and blacksmiths, carpenters, cartwrights, coopers and veneer sawyers, to the high art of woodcarvers and shipbuilders. In the early modern period, a eulogy of wood's many and varied uses became a rhetorical figure all the more forceful because of supply worries.

Wolf Helmhard von Hohberg, author of one of the leading works on agriculture in his time, wrote in 1682: 'If we had no wood, we would also have no fire – and then we would have to eat all our food raw and freeze in winter. We would have no houses, and also no

brick, glass or metal. We would have neither tables nor doors, neither chairs nor other household equipment' (Hauser 1966: 38). Wood as fuel ranked quantitatively far higher than wood as craft material: it is estimated that, up to the nineteenth century, nine-tenths of wood was used for burning; the word 'coal', in Germany at least, nearly always referred to charcoal. In 1768 the Venetian naturalist Francesco Griselini called wood 'the most precious and most necessary good for the needs of humanity' (Vecchio 1974: 58). As to the forest, it was necessary to human life not only because of its wood but – even more important in some cases – as a grazing ground. It was the only pasture before a special technique was developed for the creation of irrigated meadows.

Someone who looks for wood and forest in history easily becomes obsessed with the subject, finding countless riches in Europe and other parts of the world. Wood as the foundation of human life, economy and culture is present everywhere: all one has to do is dig a little and learn how to read between the lines of the sources.

There is a transhistorical core to the relationship between human beings and wood. However, wood use and woodworking have been subject to (sometimes huge) historical change. The natural properties of the various kinds of wood have always been noted, but they represented *potentials* that were variously used and appreciated in different cultures and epochs. Wood inspires culture; it does not determine it. If there had been only a single 'Wood Age' culture from the Palaeolithic to the 1800s, world history would be truly monotonous. Historians would have to group Neanderthals and people from the age of Goethe in the same category, with the result that the Wood Age would become a night in which all cats were grey. But that is not how things are. Looked at more closely, history presents a *multiplicity* of 'wood ages' and 'wooden cultures', beginning already in prehistoric and ancient historical times. The following section will demonstrate this with the help of some striking examples.

Prehistory: in the beginning was fire

'Anyone who believes that in prehistoric times humans lived in harmony with nature has not the faintest idea of what really happened', Eberhard Zangger, an unconventional archaeologist, tells us. 'Whichever region one examines, the first phase of human-induced environmental instability was the most destructive, because it was at the very beginning that the most soil was lost' (Zangger 2001: 141). Zangger bases himself on the results of digs in Greece, but it

is not only there that the evidence points to environmental crises of which no written testimony has come down to us. In the sandy soil of Lusatia, in eastern Germany, extensive forest clearances as early as the fourth century AD led to wind erosion on a scale that proved disastrous for agriculture. Around AD 400, the inhabitants of a village on the Teufelsberg near Briesnig 'gave up the struggle and abandoned a settlement on which sand deposits up to four metres thick had been laid down over the course of a century' (Spuren 2002: 278).

It was not natural instinct but hardship and a sedentary existence that led people to adopt a rather more sustainable way of handling natural resources. The early economy was based on plunder, and until modern times the threat of falling back into this repeatedly posed itself. In agriculture and livestock-raising – the two main kinds of farming – the effects of poor husbandry soon make themselves felt. But it takes longer in the forest, and it is there that the temptation of pillage is especially great. It can then take generations for the forest to recover.

But should the forest regenerate itself at all? As agriculture spread, the impetus to clear land was at first much stronger than concern for preservation of the forest. A turn to protection required a change in the form of economy. It may therefore be assumed that man's relation to the forest had some features of a drama – but when, where and how?

It was long thought that people in early times lived in quite straightforward harmony with the forest, since they would not have been able to clear large areas with their primitive axes. But, as experiments with stone tools have shown, this was to underestimate the capacities of prehistoric man. A Finnish pioneer of experimental archaeology demonstrated in 1953 that a Neolithic stone axe could fell a medium-sized oak tree in a mere half-hour (Radkau 2008c: 42).

The fact that humans soon learned how to make use of fire was also left out of account for a long time. Only since the 1960s has a combination of palaeobotanical and ethnological research made it clear to what extent human civilization had its origins in fire-assisted hunting and slash-and-burn cultivation, which left areas of cleared forest highly fertile for a few years before they became exhausted and had to be given up.

In the conditions of Central Europe, the forest managed to regenerate itself once humans moved on from these fire clearances. But things were not so easy in areas affected by drought. Much of Australia's savannah land came about as a result of burning by Aborigines, and tree cover returned only gradually when these practices were