

Tomas Herben

## Understanding Grasslands in Grunewald



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I came to the Wissenschaftskolleg to gain understanding of how ecological processes in time and structures in space may be related. This rather obvious issue has been studied surprisingly little; so the choice of the model object was rather arbitrary. The object of the particular study I was involved in at the Wissenschaftskolleg was grasslands (something one does not find in Grunewald, so the data collected before had to suffice). Grasslands are a peculiar type of ecosystem. They deserve more attention, since they exemplify the relationships between humans and nature and the intertwining of human history and the history of the landscape.

Grasslands seem to have come to existence (just as their principal species, grasses) as a result of continuous co-evolution with grazing animals. In many parts of the world, the association of these animals and grasslands is more or less self-sustaining; in Europe, however, most grasslands are due to humans keeping cattle and sheep, and continue to occur here only because of continuous management of whatever sort. They have been used for hay-making or grazing and are thus intimately linked to the ways in which humans have changed their environments.

In contrast to arable fields, however, human interference in grasslands is much more subtle (no tilling, no planting of anything). Mankind does not affect species by uprooting them; it only weakens them by mowing or grazing. By weakening the bigger (and hence stronger) species, it leaves space for the weaker species, thus creating the enormous species diversity found in grasslands. Flowery meadows (to a great

extent gone, but still to be seen in areas with very poor agriculture or very advanced nature conservation) are due just to this simple process; some of them may harbour as many as 50-60 species per square meter. This "equalizing" human interference has another effect: it imposes scale on the plants that grow there. They are flat (because anything bigger-than-the-average gets removed by mowing) and homogeneous and nothing is taller than a plant can achieve between early spring and the time of hay-making. Whereas forests or scrub are built by plants much bigger than the human body, may look "uncouth" and may be quite impenetrable, this is never the case for grasslands. The only risk an occasional walker faces is getting his or her shoes wet.

Human interference, by being subtle, is also much less obvious to a poorly informed observer. Its effects show up over longer time intervals than in fields. In the end, it may take ten years before the abandonment of a grassland shows up as a disappearance of the nice flowers; and it may take several decades before the grassland changes by natural succession into a scrub or forest. To outside observers, grasslands simply seem natural (an occasional walker, however, may have a quite different experience facing an angry owner when stepping onto a grassland when the grass is tall). There is another matter contributing to the perception of grasslands as natural: their size and their position in the landscape. Whereas an arable field is bound to be of certain size (so that the ploughman can make turns), grasslands can be almost infinitesimally small: they fill otherwise unusable spaces of the old agricultural landscape: balks, road verges, forest margins, stream banks and orchards. They were maintained there by well-targeted human activities acting on a fine scale, such as youngsters taking a cow or a goat to these tiny pastures, or old ladies cutting fodder with sickles to feed rabbits. An easy task when human labour is cheap.

The combination of botanical beauty and no 'obvious' human interference has shaped the image of grasslands as the natural part of a lovely rural landscape divided between fields, small forest tracts and grasslands. Nothing could have been more wrong. The mental picture many of us have of a nice "natural" piece of mountain landscape with a mixture of grasslands and forests is of the same category as thinking of big cities arising without any human presence. One can never think of grasslands separately from the cultural history of the landscape. This is shown by the recent changes in the landscape. The second half of the twentieth century has seen the traditional grasslands largely disappear, since the traditional ways of maintaining landscape changed. The fine-grained human activity of the past vanished as the cost of human labour increased and techniques for large-scale agricultural production were

devised. This spurred a great deal of interest in conserving and studying them. The dependence of grasslands on management, however, makes the true 'natural' object of study rather elusive (the same matter burdens their conservation as well) and one may be interested to look backwards in time to try to trace their development through centuries and millennia. But grasslands leave few clues to their past. Unlike forests, there are no tree rings there; unlike fields, there are much fewer written records about them. This bears a great risk that our concept of them will be based to a large extent on our own experience and (short-term) memories, which are, to a great extent, the above combination of botanical and natural-landscape beauty. These memories should be regarded with great caution, since there is a great deal of difference between early Mediaeval, late Mediaeval, pre-industrial and 19th century ways of landscape management. Grasslands are simply an object changing just as human living patterns do. An ecologist studying them has to be aware that his or her object is but a particular realization in time, and a conservationist (and there is a strong urge to conserve grasslands, given their species-richness) has to make the painful decision which moment is the 'right' one .

When at the Wissenschaftskolleg, I used a sort of an ecological microscope to look at one particular grassland and at its changes, which are hidden in the seeming uniformity imposed by management. The microscope consisted in deliberately not taking the perspective of a casual observer, but in trying to see how the grassland appears to individual plants instead (more on this in the project report later in the *Jahrbuch*) and how their spatial positions affect the dynamical process in the community. Perhaps it was only an accident that the study of spatio-temporal processes took place at a singular moment in Berlin, when two spatially separated parts of the city with different histories interact, and in the German-speaking world, as the grasslands that we were studying were founded and cultivated for centuries by German-speaking people (one really cannot separate the grasslands from the history of the region). When doing so, I was fortunate enough to be able to learn by two different types of interactions. There were many people around whose perspectives I was trying to understand during their colloquia, common lunches and that sort of thing. This is the "usual" environment the Wissenschaftskolleg provides, and which most Fellows acknowledge in their *Jahrbuch* recollections. But I was particularly lucky in being able to join a focused group of three people who shared interests but came from rather different backgrounds and brought with them their perspectives. These were systematic Ulf, who never sees obstacles but only challenges, and critical Richard, with whom we can be sure that whatever

passes his test of scientific rigour will pass anybody's. We endeavored to see the grasses as delta functions (quite a horrifying thing at the beginning, but it helped us a lot) and I felt myself forced to write this short treatment of grasslands as an excuse for a perspective so far-removed from that of a casual observer.