Transhumance in Germany

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Abstract

Three main types of mobile livestock systems may be distinguished: nomadism, transhumance and the alp-system. Focussing on transhumance there is only one region where a genuine system has ever developed in Germany. This is the Swabian-Franconian transhumance, which involved sheep in the federal states of Baden-Württemberg and Bavaria. In contrast to Mediterranean types of transhumances with their long history, the Southern German transhumance is a result of late medieval developments and had its most important economic significance in the first half of the 19th century. It is estimated that by the mid-19th century about 3 million sheep took part in transhumance. Today, the number of shepherds who are still practicing transhumance in these regions is minor. From the total of approximately remaining 230 full time shepherds there are only 100 to 120 shepherds practicing transhumance involving 70.000 to 90.000 sheep. This is about 20 to 30 % of the total number of sheep in the area. The paper will present the historical background of transhumance and discuss the reasons for the structural changes and the present standing of the transhumant sheep regime in Southern Germany.

1. General remarks on mobile livestock systems from a German anthropologic perspective

Until the second half of the 19th century **sedentary livestock systems** in Europe had been very much restricted to areas with sufficient year-round feeding. This was the case either in areas with the climatic possibility of grazing for the entire year or in areas where the growth conditions allowed the production and storage of winter fodder. In areas where year-round grazing was not possible, or where technology and traditions did not allow for the production of winter keep, mobile livestock systems had to develop. In the first decades of the 20th century especially French anthropologists, geographers and ethnologists intensively investigated the history, types, and (particularly) the sociological aspects of **mobile livestock systems** (ARBOS 1922, BLACHE 1933, BLADÉ 1892, CAVAILLÈS 1931, GRENIER 1905, LEFEBRE 1928, MARTONNE, de 1904). Since then three main types of spatial dislocations of livestock systems are distinguished (meaning the seasonal division of the land used for production into two or more separate areas): nomadism, transhumance and the alp-system. Fig. 1 displays how these systems function (according to BOESCH 1951, HORNBERGER 1959, JACOBEIT 1961).

Nomadism means that whole tribes, along with all their livestock, families and belongings move steadily or are driven by environmental constraints from one grazing area to the next. Nomadism has not existed in most of Europe for many years. The seasonal migrations of the Sami people in Northern Scandinavia are the closest analogue in modern times.

The term **transhumance** (another expressions also used is long distance transhumance) is correctly applied to livestock systems exhibiting a loose dependence between sedentary arable cultivation and full-year mobile livestock keeping - with sheep in most European cases. According to the scientific typology, this link existed during the 'classical' periods of all the various forms of transhumances which developed (in Europe and elsewhere in the world). In surviving transhumance systems, however, the arable sector has often disappeared and the movements between summer and winter grazing areas are often made with lorries. Another characteristic feature are regular seasonal movements between mountain areas and distant lowlands. In contrast to nomadism, the movements of the livestock in transhumance was accompanied by herders only - the owners of the livestock and the families of the herdsmen usually stayed at their residential places where they were ('classically' , at least) occupied with subsistence arable farming.

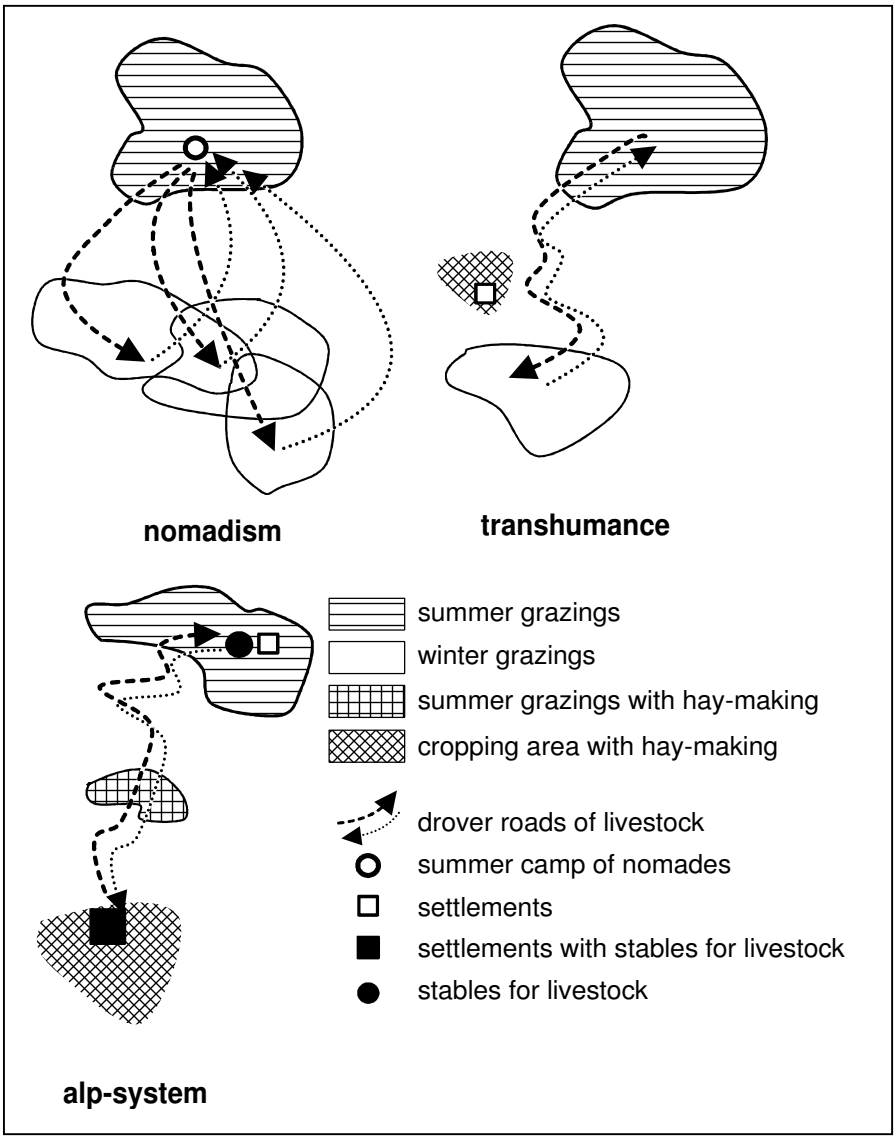

Fig. 1: Functional differences between nomadism, transhumance and the alpine system (according to BOESCH 1951, HORNBERGER 1959, JACOBEIT 1961).

The third type, the **alp-system** (other expressions also used are vertical transhumance or pseudo-transhumance), involves the movement of some of the livestock (usually heifers and dairy cows) up to mountain areas, the so called alps, for a short summer period. The cultivated land in the valleys is used in the meantime for raising crops and as hay meadows to produce winter fodder. During the alpine grazing season, hired personnel or family members live in permanent solitary cabins on the alps; when various partners share a larger alp area even small settlements may have developed. The main duties on the alps comprised (historically) the management of the livestock and maintenance of pastures and settlements, the procurement of fire wood and cheese making. The alpine pastures often stretch over a vast altitudinal zonation starting with grassland which originates in previous wooded areas and extending to high altitude natural alpine meadows above the timber line. In some areas high alps and intermediate alps with additional hay-meadows exist to exploit a greater altitudinal range.

2. The Swabian-Franconian transhumance

In this paper the French-German definition of transhumance is followed, ignoring the Alpine movements which still flourish in Bavaria ('alp-system'). In Germany there is only one region where a transhumance system ever properly developed. This is the Swabian-Franconian transhumance with sheep in the Southwest of Germany in the federal states of Baden-Württemberg and Bavaria.

Today, the **number of shepherds** who are still practicing transhumance in these regions is rather small. Taking into account the proper meaning of transhumance (dislocated summer and winter grazings) it must be stated that in Bavaria transhumance has virtually disappeared and only exists anymore in the state of Baden-Württemberg. The total number of sheep keepers in Baden-Württemberg is about 4.500 with ca. 320.000 sheep (status 2002, official statistics). From the total of approximately 230 full time shepherds only 100 to 120 shepherds are still carrying out transhumance with their 70,000 to 90,000 sheep (according to personal inquiries). This is about 20 to 30 % of the total number of sheep in the area (see also Tab. 1). Considering a realistic flock size with an average of 700 ewes this means that the summer grazings still comprise an area of 17.000 to 23.000 hectares (calculated on the basis of 4 to 5 sheep per ha) and the winter grazings may have an area of approximately 35.000 to 45.000 hectares (on the basis of 2 to 3 sheep per ha).

Tab. 1: Development of sheep numbers in the present-day territory of the state of Baden-Württemberg (various statistical data sources).

year	number of sheep	year	number of sheep
1800	ca. 650.000	1966	116.000
1830	ca. 880.000	1972	142.000
1873	577.000	1978	185.000
1926	128.000	1984	224.000
1936	139.000	1986	232.000
1938	153.000	1992	256.000
1943	181.000	1999	294.000
1960	152.000	2002	319.000

In Bavaria the total number of sheep keepers is about 12.000 of which 300 to 330 are full-time farmers. The number of sheep is estimated with ca. 480.000 (status 2002). It is assumed that about 130 full-time shepherds with about 100.000 to 115.000 sheep are practicing a regional movement with their flocks (with a perimeter of 10 to 50 kilometer) - at least during the summer grazing period. During the winter period the sheep are in general kept in sheds and feeded (personal inquiries).

This situation was different just 50 years ago. The scale of transhumance in Southern Germany had at this time becomes obvious when one considers the equivalent numbers in the **early 1950s**: At this time between 500.000 and 600.000 sheep (about 60 to 70 % of the total number) were kept by transhumant shepherds between all the Southern German states (HORNBERGER 1959). Note that this data represents a time when transhumance was already in historic decline. The number is even more significant when compared with the much better known transhumance in Southern France. The "transhumance provencale" of the 1920s involved between roughly 250.000 and 300.000 sheep (ARBOS 1923) and the movement between the Languedoc and the Massif Central in the 1910s involved only about 60.000 head (SORRE 1912).

In contrast to Mediterranean types of transhumance found in Spain, France, Italy or the systems in Southeastern European countries, which can often be traced back as long as to Neolithic times, the **Southern German transhumance is a result of late medieval developments** (PISTORIUS 1838, HORNBERGER 1959, JACOBEIT 1961).

The story of the Swabian-Franconian transhumance started with the monastic economy of the **12th century**, which in this area meant specifically Cistercian order (RIBBE 1989). More than other monastic brotherhoods, the Cistercians widely influenced the activities of cultivation and settlements in Central Europe and with it agriculture and livestock keeping. (Interestingly, a similar effect emanated from their large estates in the British Isles). The Cistercian monasteries were economically successful and their richness depended to a large extent on the production and merchandising of woven products. This meant therefore a flourishing sheep farming system. As far as we know today, the medieval sheep system was not mobile. Small flocks based on farms which belonged to a nearby monastery were moved in a close perimeter across the area of these dependent farms. This happened as long as possible throughout the year and as long as feeding sources of any kind were available. It can be assumed however that some winter fodder was stored on the monastic leasehold farms.

In the **14th century** the extension of the Cistercians' sheep systems reached their peak (RIBBE 1989). Both economic and social factors contributed to this development: As the monasteries lost their attraction for the lay brothers who were necessary to operate the extended agricultural enterprises, the Cistercians were forced to extensify the agriculture sector. And this extensification was easily achieved through an increase in sheep keeping. This system ensured a similar or even a higher economic revenue from a smaller labour input. What developed, which in later centuries was taken over by "normal" secular farmers or urban entrepreneurs, was known as "das Landgefährt". This term can be translated as something like "moving around in the countryside" (a very similar derivation to 'transhumance') and the system existed with ups and downs until the second half of the 18th century.

Parallel to the monastic system a **primitive sheep system** (and similar cattle, pig, horse and goat systems) existed in the rural communities. These relied entirely on the year-round grazing of the local commons. With the heavy depletion of the population in the 14th century (as the result of climatically-induced famines and successive epidemics of plague), extensive sheep grazing was able to expand into newly-vacant rural areas. This was doubtly rewarding for the rural populations because of at the same time the manufacturing of woolen cloths in the fast growing cities had developed, creating an enormous demand for wool.

In the second half of the **18th century** economic interest encouraged the leading social and political classes in the dukedom of Württemberg to further expand and develop the weaving industry as a source of government revenue. There was only one major problem that had to be overcome: Although various local breeds of sheep were common in Central Europe (the most widespread were local races based on the "Zaupelschaf"-species), they all had the disadvantage that they had poor quality wool and were not hardy enough for long transhumance journeys. While it was known that the **Spanish Merino sheep** had both these qualities, Spain maintained a strict prohibition on the export of these sheep until 1760. Merino requests from countries such as France, Sweden and Saxony to import Merino sheep had been denied. Only with the enthronement of Phillip V. were the first exceptions made and in 1785 the Duke of Württemberg finally succeeded in getting permission to purchase 30 rams and 10 ewes Merino. It is reported that the king of Spain was rewarded with a present of a group of albino deer for his generosity (HORNBERGER 1959).

An interesting historical document tells of the journey of two Württemberg shepherds who were sent to Spain to buy the sheep (VOLZ 1845): In 1785 they first traveled to Southern France to get first-hand experience of Southern French Merino breeds and in Spring 1786 they continued to Spain to the markets of the Segovia area. They started back from Segovia on the 15th of May, 1786. The description of their travels documents their struggles with thieves and wild animals and their sheep losses. On July 2nd they arrived just three rams short in the Southwestern French town of Perpignan where they completed their mission with the purchase of 49 rams and 20 ewes of the Roussillon breed. By September 9th, and with total losses of only six animals, the two celebrated shepherds were back in the city of Münsingen on the Swabian Jura. It can fairly be said that the modern Southern German transhumance had its origin with these few sheep.

The precious Merino rams were kept at royal sheep farms. By crossing with the local breeds a new breed, the **Southern German Merino landrace** (= Deutsches Merinolandschaf), had evolved within a few decades. With ca. 70 % of the total flock this sheep is the dominant breed in the Southern German states even today (Tab. 6).

Within a very few years (before the end of the century, in fact), the first real transhumant shepherds, accompanied by this **new sheep**, with its **much-improved wool and physiognomy**, took off on long journeys between now dislocated summer and winter grazing areas. The demand for wool was such as to make systems involving widely-separated pasture areas viable.

This new system was made politically possible because at the same time power struggles between the numerous and so far independent countries were resulting in a geopolitical reshaping of the Central European landscape. The shepherds could now cross what had

previously been tight borders more easily and the new sheep system was also endowed by the state with rights to travel from the summer to the winter grazings and (especially importantly) to have the right to winter grazings in suitable regions.

Finally an important social point has to be mentioned in the context of the success of transhumance: The small farm holdings on the Swabian Jura, the poor growth conditions due to climate and soils and the large families had led to a dramatic **impoverishment of rural communities**. This was especially the case for those sons who were excluded from the takeover of farms due to the law of succession or those who could not find a job in the crafts sector. For these the expanding sheep system opened up new job opportunities.

Tab. 2 shows the tremendous growth of the sheep numbers in the various territories of present-day Germany in the first half of the **19th century** as a result of the enormous **demand for wool**. An interesting aspect is that large quantities of the now high quality German wool was being exported to Great Britain (MAYER 1999). But only in the Southwest of Germany did the fast developing sheep sector work in a transhumant way. In the kingdoms of Bavaria and Württemberg and in the dukedom of Baden the number of sheep grew from about 1,8 million at the beginning of the 19th century to about 3 million sheep by around 1860 and 90 % of these sheep were kept in transhumance (HORNBERGER 1959). Considering a carrying capacity of probably not more than 4 sheep per hectare this means that the summer grazings on the Jura uplands may have comprised 600.000 to 800.000 hectares.

Tab. 2: Number of sheep in the present-day territory of the German state over time (HORNBERGER 1959, DBV 2003).

year	number of sheep	year	number of sheep
1810	ca. 15 million	1930	3 million
1850	ca. 25 million	1950	2,7 million
1860	ca. 30 million	1970	2,4 million
1880	ca. 15 million	1990	3,2 million
1900	ca. 10 million	2000	2,7 million

Traditionally, the **Swabian-Franconian system** worked in the following way: From late spring until late summer the shepherds grazed the extensive upland areas in the Swabian and Franconian Jura mountains. Then, depending on weather and growth conditions of the vegetation they started their journey to lowland winterings, sometimes several hundred kilometers away. It can be assumed that the **daily walking distances** ranged between 10 and 20 kilometers, so for many shepherds the journey may have lasted several weeks. Important days in the calendar of the shepherds were the 23rd of April (St. George's Day), when they usually arrived in their summer grazing areas and the 24th of August (The Feast of St. Bartholemew) when they again left. An intermediate grazing period, the autumn grazing, lasted until 6th of December (The Feast of St. Nicholas). In the heyday of transhumance the system occupied an area which extended around 400 kilometers from West to East and around 300 kilometers from South to North.

Fig. 2 depicts the main **transhumance routes** and **wintering grounds**. The latter included the valleys of the Rhine, Danube and Main and the Lake Constance Basin.

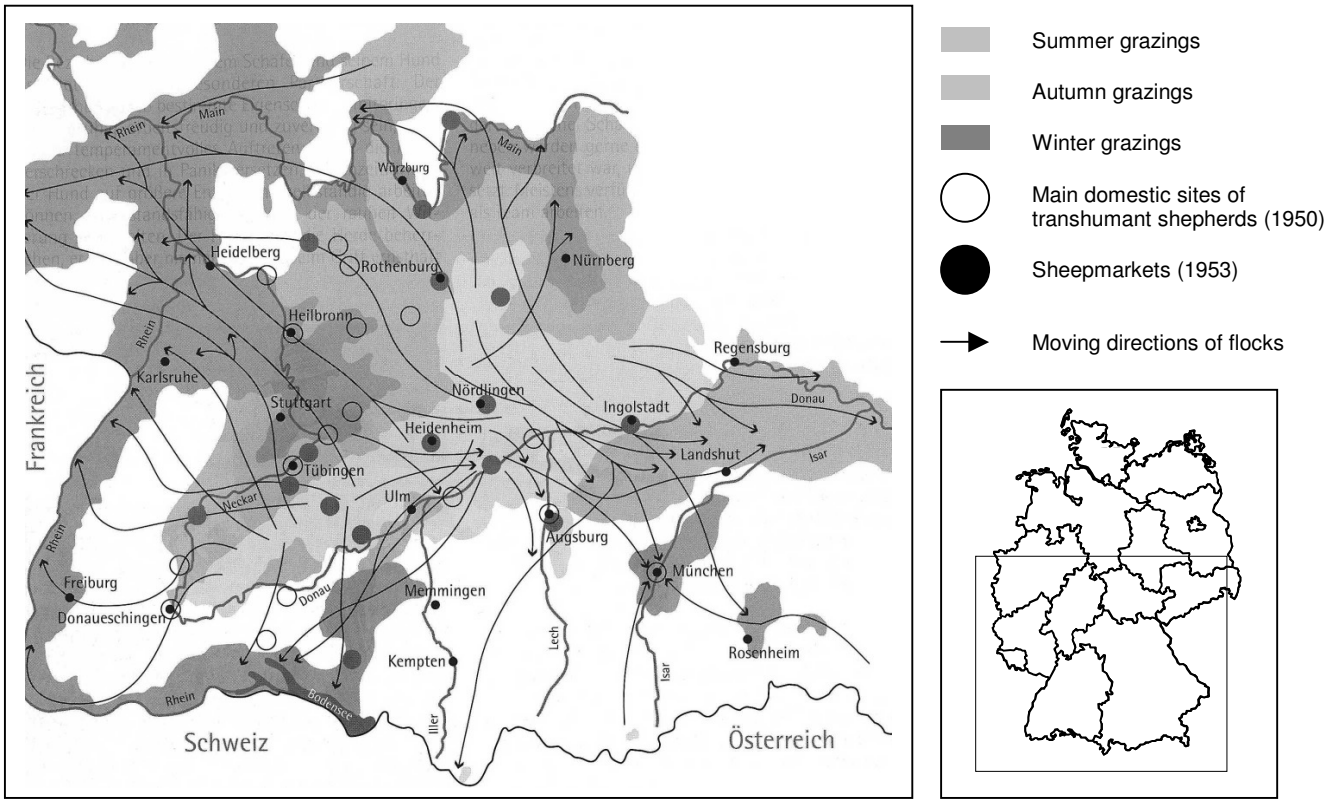

Fig. 2: In the second half of the 18th century a unique form of transhumance with sheep developed in the Southwest of Germany (today in the federal states of Baden-Württemberg and Bavaria). Typically, the flocks spent the summer on the uplands of Swabian-Fraconian Mountain Range and then in autumn they moved to winterings in the valleys of Rhine, Main and Danube, or in the Lake Constance Basin (illustration taken from MAYER 1999, after HORNBERGER 1959 & RIEGER 1966).

Tab. 1 and 2 also reveal that this transhumance system flourished for less than a hundred years and had its peak in the **middle of the 19th century**. After 1860 the demand for wool declined rapidly. Cotton and cheaper imported wool was being substituted for European wool. An interesting historical analysis is that the clearances of the Highlands and Islands of Scotland, which resulted in millions of impoverished people leaving for overseas countries, influenced the establishment of large sheep industries in North and South America, South Africa, Australia and New Zealand. Whatever the exact mechanism, these New World flocks posed a significant challenge to the established European industries, and had the severest impacts on the German sheep economy. From a peak of almost 3 million the number of sheep in Southern Germany collapsed to about 800.000 by the **end of the 19th century**. In Germany as a whole the number decreased from about 30 million to about 10 million over the same period. Moreover, the agricultural progress which had been imposed with ever greater vigour on the rural societies of Southern Germany in the second half of the 19th century eventually started to impact on the transhumance system. The **new techniques** included the housing of livestock and a move to dairy systems, the production of winter fodder (hay) on what had previously been grazings, the growing of new crops such as potatoes or lucerne where there had once been fallows and commons and the inclosure of common land.

3. The situation of sheep rearing and of transhumance in particular in Southern Germany today

Today sheep farming in the core regions of the historic Swabian-Franconian transhumance faces many obstacles (many of which are shared by other more 'modern' systems). The following overview briefly outlines the most important:

Until the **second half of the 20th century** the most important product of all sheep-farming systems in Germany was wool. This was the case irrespective of the region or which breed was kept. Today, wool has no economic importance at all and in general the shearing costs are higher than the revenues obtained by selling the wool. The prices in 2002 for high quality wool ranged between €0,30 and €0,90 per kg (depending on colour and fineness) with a yield of 4 to 5 kg per sheep and shearing costs of €3 to 3.50 per sheep. For many sheep farmers therefore, wool is a problem of disposal. At the same time Germany is estimated to be 5 % self-sufficient in wool - 95 % of all wool is imported.

Today, for the first time in recorded history, the sheep economy relies on the **production of lambs** for meat. This has necessitated a complete change in the production regime. In the past the feeding for the flocks had to be sufficient only for them to survive and to raise the lambs. This was possible on the uplands of the Jura mountains although the growth rate of the lambs was, of course, due to the poor diet, very limited. In contrast, a modern and profitable working shepherd cannot make a living by depending only on upland pastures, since the production of marketable lambs requires grazing of better quality and additional high energy feeding at finishing. This leads to a "bottleneck" in modern sheep farming - the difficulty of finding the necessary good grazing at low cost. Where good ground is theoretically available sheep farmers are often in **competition with other interest groups**, such as suckler cow farmers. Because Suckler Cow Premium is higher than Sheep Annual Premium (on a Livestock Unit basis) and suckler beef achieves better prices on the market than lamb, extensive beef farming is much more rewarding than sheep farming. A second challenging group in the Jura mountains are hay producing part-time and hobby farmers. Due to the high level of support for extensive hay meadows (which are of course also of high ecological value, often Natura 2000 sites) hay meadows are more profitable than the renting of grazings to sheep farmers. A third competitor is the very attractive payment for afforestation.

At present, **income from sheep farming** is derived from subsidies and countryside management services (e.g. Sheep Annual Premium, MEKA II-payment scheme, Countryside Management Scheme) and selling lamb makes only a minor contribution. Calculations show that the net income that can be achieved by full-time sheep farming (which is just half of the average net income of a full-time farmer) is no higher than the subsidies the farmer receives, i.e. he gains no income directly from his production. Or in other words, the income from the meat is just enough to compensate for the production costs. Current prices for lambs range from €1,80 to €2,10 per kg live weight. Therefore, the survival of sheep farming in Germany at the moment is only possible by optimising the following income sources: service partnerships for the management of high nature value areas, agricultural subsidies and the production of high quality and high priced lamb. Historically a flock of 100 to 200 ewes was

enough to make a reasonable living. Today, a shepherd has to have at least 800 to 1.000 ewes, which even then are just enough to make a poor living.

It is documented that large numbers of sheep (Tab. 1) grazed the hundreds of thousands of hectares of extensive grasslands (mainly chalk grassland on the Jura mountains) in the first half the 19th century. This led, of course, to overuse and resulted in ecologically depleted areas with severe environmental problems (GAUKLER 1938). Today, on the other hand, there is evidence that extensive grazing with sheep occurs only on about 7.400 hectares of high nature value chalk grassland in the Swabian Jura (BEINLICH 1995). These changes have caused great concern and have given rise to the almost philosophical debate concerning **grazing models** and **appropriate conservation** techniques for Juniperus-heaths and chalk grassland sites. In the 1970s and 1980s, nature conservation interests highlighted the ecological richness of heathland and associated chalk grassland formations. However, it has not been easy to match the interests of conservationists with the needs of the shepherds. There is, for instance, the problem that for many botanists the occurrence of orchids is not compatible with grazing even at a very extensive level. Thus, in western parts of the Swabian Jura up to 90 % of sites with conservation interests are not grazed by sheep any more, but rather are artificially managed by mowing and (often) the subsequent disposal of the biomass (Tab. 3).

Tab. 3: Grazed chalk grassland in the early 1990s (various data sources compiled in BEINLICH & PLACHTER 1995).

County	grazed	excellent	deficient
Freiburg	< 5 %	no data	no data
Karlsruhe	> 50 %	no data	no data
Stuttgart	81 %	74 %	7 %
Tübingen	44 %	24 %	20 %

Furthermore, the remaining upland grazing, designated as nature reserves, are very scattered and are usually fairly small. A survey of 1.000 chalk grassland sites in the 1980s showed that most of them are isolated and separated by long distances (Fig. 3, MELUF 1982). This is a crucial point when new grazing models are considered.

The Southwest German transhumance relied upon **rules and privileges** for the wandering shepherds. Unlike in Provence or in Spain there never existed a special or coherent system of legally-established drove roads. The paths the transhumances took on their journey from the summer pastures to the various winter grazing areas can more be described as a system of spatial corridors. Whereas the actual passage of the flocks is generally allowed, the daily grazings have to be individually sanctioned by the particular community and in most cases shepherds are charged a rent depending on the size of the flock and/or the length of time on the communal territory. Over time a tradition evolved as shepherds used the same trans-humance corridors and had contracts with the same municipalities every year. In the past shepherds could even gain a small revenue if they kept their sheep overnight in folds on arable fields.

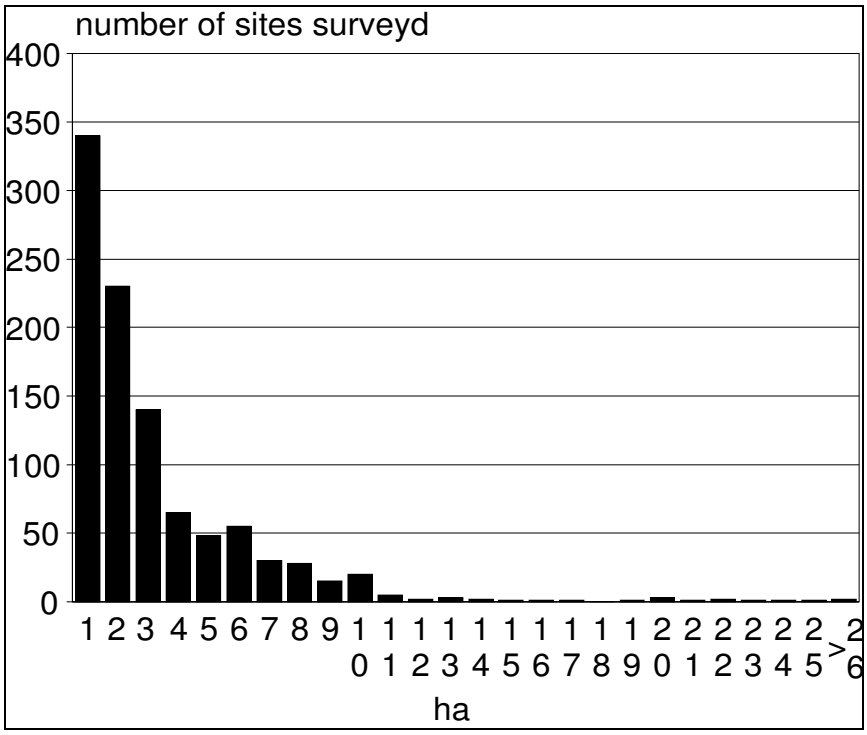

Fig. 3: Survey of a sample of 1.000 chalk grassland sites on the Swabian Jura. Only a very small number of sites are larger than 10 hectares (MELUF 1982). Since the 1980s the situation has not changed significantly.

Today, the **fragmentation of the landscapes** by all sorts of transport networks make transhumance almost impossible. Modern highways and railways do not mix well with sheep flocks. In addition, a shepherd making his journey form the Swabian Jura to the valleys of the Rhine or Danube, has to cope with the fact that his traditional winter grazing lands have been given over completely to maize and/or cereal fields. Even cereal stubbles - very much appreciated by the shepherds as a source of forage - have also disappeared, since they are now immediately ploughed in and reseeded after harvest.

The development of the **sheep sector** for Baden-Württemberg from 1830 until now (Tab. 1) shows that the lowest level with almost only 100.000 sheep was recorded in the mid 1960s. Since then, numbers have risen steadily to about 320.000 head, which is the highest number since the beginning of the 20th century. This positive development can be attributed to the following reasons. First, due to the interest and assistance of nature conservation initiatives which highlighted the fact that the existence of high nature value heaths and grassland depends on extensive sheep grazing (FISCHER 1929, MATTERN et al. 1980, FISCHER & MATTERN 1987, BEINLICH & MANDERBACH 1995). And second, growing numbers of sheep are also kept by **hobby farmers** with a maximum of 50 head as a cheap management tool for small private properties. But as already pointed out modern sheep systems are no longer performed in a transhumant manner. There has been a complete switch to stationary systems, using fenced off grazings from spring to autumn and given additional feeding in sheds during winter.

4. The vegetation of extensive (transhumant) sheep grazings

The vegetation of grassland related to transhumant sheep pastoralism is not easy to describe. The following points must be elucidated:

- Only few records exist of the **historic scale** and of the floristic and structural characteristics of the traditional sheep grazings of old. What we know, due to the large numbers of sheep kept on the Jura mountains, is that they must have covered vast areas and that the grazings were widely overused and exploited. Most probably they were not of comparable quality to "modern" ecologically-valued grazings. However, what is widely forgotten by ecologists is the fact that the ecological value and the biodiversity of the grazings are the results of strong selection by grazing sheep as well as the extreme (calcareous and Karstic) site conditions and the lack of fertilization.
- Site conditions, the selection of feeding plants, overuse and erosion processes are driving forces that once resulted in **mosaic-like vegetation patterns**, which might change from season to season in a stochastic way. This is very much in contrast to the homogeneous conditions found in meadows or in well managed modern grazings.
- Most of today's sheep grazing areas originate of course in historic pastoral use. But grazing was only recently reinstated in many of these after decades of **abandonment**. Furthermore, many sites had been managed for quite a long time in an artificial way by means of mowing. It has to be assumed that these factors influenced the composition of the vegetation both by depleting the seedbank and by introducing new plants which were favored due to new site conditions.
- Recent research about conservation strategies for grazed chalk grassland pointed out that the distribution of the seeds and fruits of many plant species is very much related to **transport vectors** such as the sheep. Since the number of transhumant sheep is permanently declining it is to assume that in the long run this may cause negative effects on the recolonization of sites and the necessary refreshment of seedbanks (BEINLICH & PLACHTER 1995, FISCHER et al.1995, AMLER et al. 1999).

The following list describes **main vegetation formations** of extensive grassland which can be assumed to be a result of long-standing traditional sheep grazing with special emphasis on summer grazings in transhumant systems, using the standard European phytosociological nomenclature.

- Carlino-Caricetum sempervirentis Lutz 47 (calcareous grassland with *Carlina acaulis* and *Carex sempervirens*).
- Polygalo-Nardetum Oberd. 57 (silicieous grassland with *Nardus stricta*).
- Festuco-Genistetum sagittalis Issl. 27 (grazing formation with *Genista sagittalis*).
- Calluno-Sarothamnetum Malc. 29 (heathland formation with *Sarothamnus scoparius* and *Calluna vulgaris*).
- Gentiano-Koelerietum pyramidatae Knapp 42 ex. Bornk. 60 (grazing formation with *Genista* sp. and *Koeleria pyramidata*).
- Gentiano vernae-Brometum Kuhn 37 (grassland formation / meadows with occasional grazing with *Gentiana verna*).
- Genisto-Callunetum typicum Tx. 37 (dry heathland formation).
- Genisto-Callunetum molinietosum Tx. 37 (moist heathland formation).
- Adonido vernalis-Brachypodietum pinnati Krausch 59 (grazing formation with *Adonis vernalis* and *Brachypodium pinnatum*).

Fig. 4 shows the geographical distribution of the Gentiano-Koelerietum pyramidatae formation, which is the main type of **grazed chalk grassland**. In addition, Tab. 4 shows the approximate area of chalk grassland in Germany. It is obvious that Baden-Württemberg is an important area. Only two other states, Bavaria and Thüringen also have significant numbers of sites. This distribution is, of course, a result of the geological and climatic conditions, but also very much related to the historical existence of large scale summer grazings related to the Swabian-Franconian transhumance. Tab. 5 depicts a typology of grasslands according to the Natura 2000 nomenclature, showing how it correlates with extensive (transhumant) sheep grazing.

Tab. 4: Distribution and scope of chalk grassland in Germany (various data sources compiled in BEINLICH & PLACHTER 1995).

Bundesland (federal state)		Area (ha)	Historic landuse
Baden-Württemberg	A	25.456	Grazing/extensive meadows
Bayern	B	13.426	Grazing/extensive meadows
Hessen	C	2.530	Grazing
Niedersachsen	D	375	Grazing
Nordrhein-Westfalen	E	2.200	Grazing
Rheinland-Pfalz	F	752	Extensive meadows/Grazing
Saarland	G	754	Extensive meadows
Sachsen-Anhalt	H	3.837	Grazing
Thüringen	I	9.550	Grazing/extensive meadows

Tab. 5: Typology of grasslands that are particularly correlated to extensive (transhumant) sheep grazing, using the Natura 2000 nomenclature.

Natura-Code	Grassland-type	Related agricultural system
4030	Dry heathland	Extensive livestock with sheep (grazing)
5130	Formations with Juniperus communis on calcareous heaths or grassland	Extensive livestock with sheep/cattle (grazing)
6110	Karstic calcareous grasslands	Extensive livestock with sheep (grazing)
6120	Xeric sand calcareous grasslands	Extensive livestock with sheep (grazing)
6210	Formations on calcareous substrates	Extensive livestock with sheep (grazing and hay-making)
6230	Formation with Nardus stricta on silicious substrates in mountain areas	Extensive livestock with cattle/dairy (grazing and hay-making), suckler cow systems and sheep
6510	Lowland hay-meadows	Traditional livestock with cattle/dairy, suckler cow systems, winter grazing for sheep in still operating transhumant sheep systems
6520	Mountain hay meadows	Traditional livestock with cattle/dairy, suckler cow systems, seasonal grazed by sheep in modern stationary fenced off systems

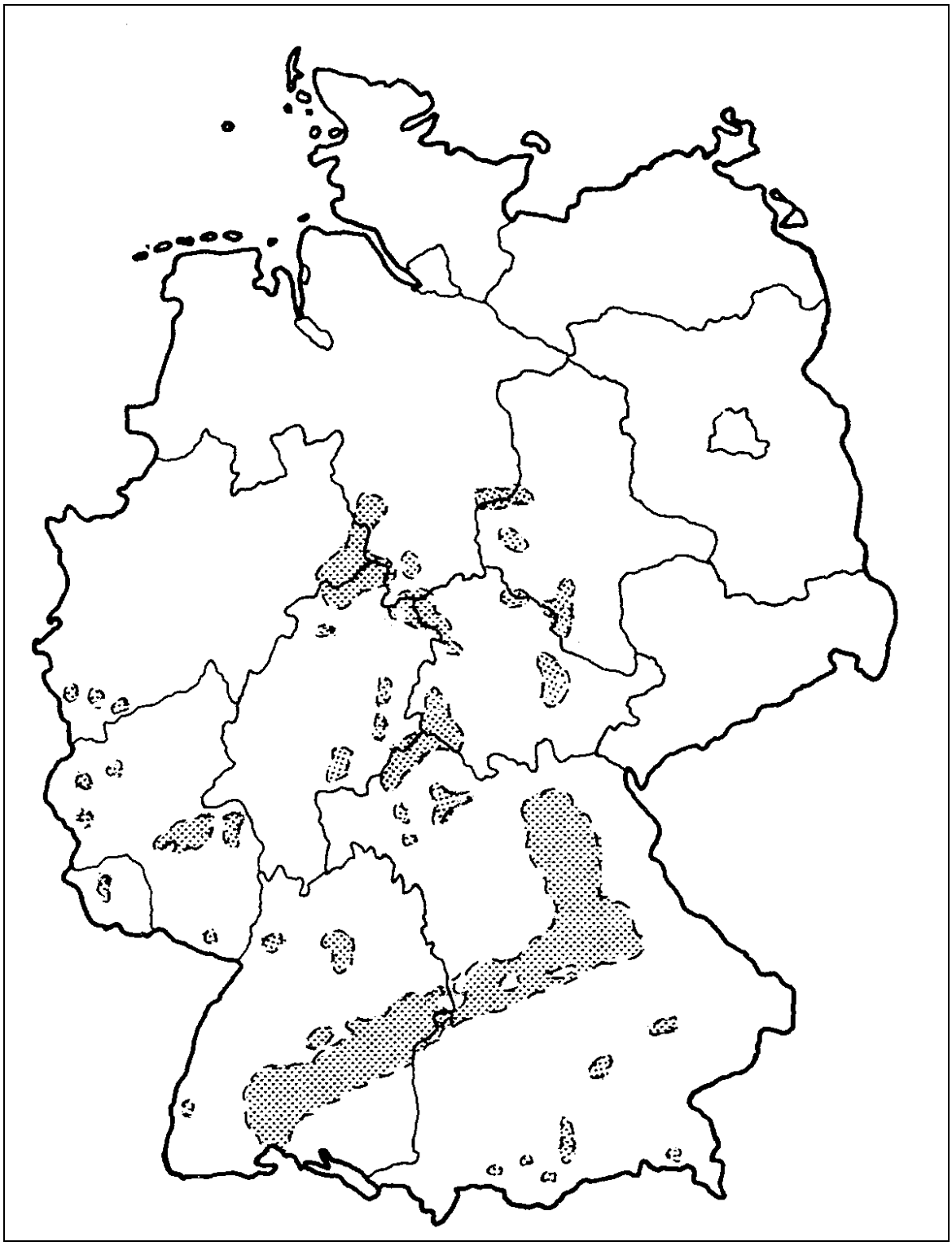

Fig. 4: Germany (federal states) and distribution of chalk grassland (according to BEINLICH & PLACHTER 1995): A= Baden-Württemberg, B= Bayern, C= Hessen, D= Niedersachsen, E= Nordrhein-Westfalen, F= Rheinland-Pfalz, G= Saarland, H= Sachsen-Anhalt, I= Thüringen.

5. Final Remarks

An aspect that has to be addressed and which is often badly neglected in nature conservation strategies (and indeed in the whole rural development concept) is that of the **'missing' value** for low-intensity livestock systems and their products. A scenic landscape produced by High Nature Value farming systems is highly esteemed by visitors as well as by the tourist industry. But the value that visitors ascribe to this service provided by agricultural systems is not reflected in their **consumption habits**. RÖSSLER (2001) demonstrated the interactions of tourism and the transhumant sheep systems in the central part of the Swabian Jura: In 44 restaurants in the Lauter-valley (the Lauter-valley and the surrounding area is one of the regions in the Swabian Jura with the richest chalk grassland sites) the consumption rate of lamb is only about 1,2 % of the total meat (= 1.505 kg) per year. Furthermore, significant parts of this small amount (because it can be bought cheaper from catering services) comes from abroad. What is lacking in the first place is an awareness of the interdependence between the performance of landscape, ecological richness, low intensity farming and consumption behaviours.

RÖSSLER (2001) calculated that, if the consumption of lamb in the Lauter-valley restaurants increased from 1 to 25 %, this would mean that about 1.500 more ewes could be kept and thereby ca. 650 hectares of upland could be managed/preserved in a natural way. The case study from the Lauter-valley can be transferred to many other regions. To **solve the problems** of the sheep sector it is not enough to only call for more and higher subsidies. To improve the situation for extensive sheep farming (especially for the remaining transhumance shepherds), a change in the consciousness of the people and a change in the mentality of both meat and tourism marketing must take place. To remedy this situation creative cooks, shepherds with marketing competence, and probably most important of all, intelligent moderators and programmes will be needed to bring together these various interests.

Tab. 6: Sheep breeds in the states of Baden-Württemberg and Bavaria (status 2002, according to personal inquiries).

Extensive breeds	% of total sheep number
Skudden	< 1,0
Weiße Hornlose Schnucke	< 1,0
Weiße Gehörnte Schnucke	< 1,0
Graue Gehörnte Schnucke	1,1
Bentheimer Landschaf	< 1,0
Rauhwolliges Pommer. Landschaf	< 1,0
Rhönschaf	< 1,0
Coburger Fuchsschaf	< 1,0
Bergschaf	< 1,0
Semi-intensive breeds	
Merinolandschaf	20,2
Merinofleischschaf	19,1
Merinolangwollschaf	20,0
Schwarzköpfiges Fleischschaf	13,7
Intensive breeds	
Texel	6,6
Suffolk	< 1,0
Blauköpf./Weißköpf. Fleischschaf	3,2
Leineschaf	< 1,0
Ostfriesisches Milchschaf	5,2

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