

Society of Irish Foresters

1993 study tour in the

Black Forest, Germany

Monday 11th October 1993

Following breakfast we assembled at the Forestry Faculty of Freiburg University, situated in the middle of the old quarter of the city. Dr. Jürgen Huss, Professor of Silviculture and the leader for the week, welcomed the Society to Freiburg and gave an introduction to the faculty and an overview of German forestry. The faculty has 17 professors working on all aspects of forestry and is one of the oldest in the world, having been established in 1787.

Freiburg is located in the Rhine Valley, on the divide between the European maritime and continental climatic zones. The surrounding area has a wide annual range of temperature and rainfall. The western slopes of the adjacent Black Forest have a predominately maritime climate while the gently sloping eastern side is affected by continental extremes.

Germany was originally almost completely tree covered, apart from the highest mountain tops. Two thirds of the forest area comprised broadleaved species while the remainder was coniferous. Human exploitation of the forest began 3,000-5,000 years ago starting at the North Sea coast. Over time the human influence moved southwards, following the river valleys. In the intervening centuries clearance for agricul-

ture drastically reduced forest cover. By the early 1800s serious erosion was occurring on land laid bare of forest cover. The state had to take action and landowners were encouraged to plant trees on part of their holdings. This was the beginning of private forestry in Germany.

In the meantime the advent of coal mining reduced the need for charcoal, and with thousands of people emigrating to America, pressure on forests eased. In the hundred years from 1850 to 1950 large scale afforestation resulted in a forest composition of 70% conifers and 30% broadleaves. The low proportion of broadleaves can be explained by the fact that the land that became available for afforestation during the period was generally of low quality.

Today, forests cover 30% of the land area of Germany, ranging from less than 25 % in the lowlands to over 30% in the highlands. The great majority of the forest area is high forest, and of this 60% comprises two or more species. Beech is the most common broadleaf followed by oak: Norway spruce and Scots pine are the commonest conifers, followed closely by silver fir. The proportion of the different forest types and their associated standing volumes is as follows:

<i>Forest type</i>	<i>Percentage cover</i>	<i>Average Standing Volume m³/ha</i>
High Forest	92	299
Selection forest	1	334
Coppice with Standards	1	187
Coppice	1	126
Not regularly managed	2	—
Unstocked	3	—
Weighted mean		298

Over the past ten years there has been a steady increase in the broadleaf content of forests. This has been due to a number of factors such as calls for more diverse stands and the high prices paid for top quality beech, oak, walnut and cherry.

Since around 1880 there has been a history of storm damage on a large scale. The storm of early 1990 caused serious and widespread windthrow. The high volume of timber salvaged flooded the market bringing prices down and they have not recovered (October 1993).

With a high population density (around 80 million), Germans put a very high recreational value on forests. In many areas timber production is secondary to recreational use. People have a very close association with the forest. German law stipulates that every forest must be open to the public for recreation. It is seen as an important right.

There are three types of forest ownership: state (with a management structure similar to Coillte), community (generally managed by the state) and private.

After the presentation it was time to

head outdoors. Professor Huss and Dr. Schölzke led us on a bus journey to Schauinsland, south-west of Freiburg.

Tourism is a very important year-round economic activity. Many of the traditional wooden houses provide tourist accommodation. Farmers are subsidised for keeping their land open and working it in a way beneficial to tourism. It was interesting to hear that cattle are just kept for show – tourists like to see them in the fields here and there!

After a twisty route up a narrow valley (typical of those on the west of the Black Forest) we arrived close to Schauinsland, from where a short walk led to the summit tower, erected in 1980 and constructed from locally grown 80 year old Douglas fir. Schauinsland means “view into the country” and at 1,300m it offers just that. The Black Forest alone runs north-south for 200km and east-west for 60-100km. From the summit there are views over the Rhine Valley to the Vosges mountains and as far as the Swiss Alps. To the south-east, at an elevation of 1,493m, lay Feldberg, the highest summit of the Black Forest.

In recent years forest dieback has been a big talking point in German forestry. To monitor this situation, the university set up an experimental plot in 1981, a short distance down from the Schauinsland. Originally it was thought that the cause of the die-back was acid rain, then high ozone levels were implicated but the latest hypothesis is that it is caused by a nutrient imbalance in tree foliage brought about increased nitrogen levels in the soil. This increase has in turn been caused by higher nitrogen levels in rainfall due to car and other vehicle exhausts. Elevated nitrogen levels are increasing the growth rate of many forests throughout

Germany, but on nutrient poor soils these elevated levels can cause imbalances in tree nutrition. The term for the phenomenon is now "new type forest decline" and it affects both conifers and broadleaves.

With a long walk in prospect for the afternoon, lunch was thoroughly enjoyed. The walking tour, some 12km, brought us downhill through the different forest zones. Thankfully, the day remained dry and thus we were able to enjoy the magnificent colours of the forest, so striking at this time of year.

Not long after setting off, the path cut through a crop of 30 year old Norway spruce. As mentioned previously efforts have been made to increase the broadleaved content. Here naturally occurring beech and rowan have been given light and space to develop by cutting away surrounding spruce. The route continued through a fine stand of mature beech. We paused adjacent to a pile of recently extracted logs. It is customary in Germany for the forest owner to fell and extract his produce leaving it measured on the roadside for sale. Cutting had been done by contract, which emphasises the changing employment scene in these forests.

Forest workers undergo a three year apprenticeship, after which they are skilled in all operations. Nowadays however, it is proving difficult to get new workers because conditions of work and wages are more favourable in other industries. Contract work has gradually increased, much of it being done by unskilled foreign labour. It is not considered the ideal situation.

With recreational and environmental needs high, some normal forest operations prove uneconomic. Loss of revenue is made up from government subsidies. In the wider context, having forests which favour recreation

increases tourism, benefiting the whole community indirectly.

Next to storms, roe deer are the most important hazard as far as the growth of forests are concerned, and their numbers have to be controlled. Hunting is well managed and generates considerable revenue. Roe deer densities are still very high and vary from 10-50/100ha.

The final section of the walk was through high production forests of silver fir, Norway spruce and beech. It also included a stand of Douglas fir, an uncommon species in the Black Forest. Planted in 1896 it has produced stems 20m high with diameters of 80cm. It would appear to have good prospects for more extensive planting. However, as an exotic species, it has a poor public acceptance. This again emphasises the point how people have a close association with their forests and how they are managed.

Expressions of relief could be seen across many faces when we arrived at the end of the walk at the "Klosterwaldhutte" located in the middle of the forest and reserved for visits such as ours and other social functions. The unfortunate thing was that time prevented us from walking back up to Schauinsland!

Local staff had organised a very welcome meal along with local liquid refreshment. The Vice-District Forest Officer of Freiburg, Herr Giesel, joined us at the meal. He welcomed the Society to the Black Forest and he spoke about the management of his area. The role of the forest has changed from that of wood production to one of protection and recreation. To carry out these functions costs almost 6 million DM (IR£2.5 million) and revenue falls far short of this figure. This situation causes serious financial problems

which can only be bridged with state funding. Public attitude towards forests may change. The situation would be better when they see that production of timber and recreation can go together. Our President, Eugene Hendrick, thanked all those concerned for organising an interesting and enjoyable day. With that we left the candle-lit cabin and made for the bright lights of Freiburg.

Richard D. Jack

Tuesday 12th October 1993*Community Forest of
Unterkirnach, Baden-Württemberg*

On the second day of the tour we visited the community forest of Unterkirnach where we were met by the Forest Director, Herr Härle. In Germany as a whole 25% of the forests are community owned but in south-west Germany the proportion rises to almost 40%. At Unterkirnach Herr Härle manages 7,000ha, comprising 6,000ha of community forest and 1,000ha of privately owned forest. A staff of 50 is employed – 40 forest workers, 7 forest rangers and 3 clerical staff.

In 1992, the forest made a profit of IR£125,000, or IR£21/ha. This profit could have been higher – up to IR£290,000 – if the community had used the administration and management services which are available on a contract basis from the State Forest Service. However, the Town Council has decided to retain its own independent management and administrative staff in the forest. Their reasons are that they will be independent from outside, mainly political, influences in deciding the forest management objectives and in selecting staff. In this part of the Black Forest region tourism

plays a very important role in the local economy – Unterkirnach has a population of 2,000 inhabitants but last year it recorded 200,000 bed nights in its hotels and many guesthouses. Thus the Town Council wishes to retain a strong local influence in deciding the management objectives of the forest, since the development of its amenity and leisure potential will have an important impact on the local tourism industry.

The forest is situated on the eastern slopes of the Black Forest where the climate is more continental and the risk of storm damage is much higher. For this reason, the forest is managed on a shelterwood system with an average rotation length of 140 years. In practice the rotation length is determined by stem size rather than age, with trees of 1.5 to 2m³ being the objective. The species composition of the forest is Norway spruce (66%), silver fir (14%), Scots pine (14%) and broadleaves (6%).

In 1992 the forest produced 42,000m³ (7m³/ha), comprising 35,700m³ sawlog, which sells for IR£40-58/m³ (roadside), 5,000m³ pulp which sells for IR£29-30/m³ (roadside) and 13,000m³ fuelwood which is sold to the people of the town for IR£2/m³ (standing). Harvesting costs are as follows:

Large sawlog: IR£5-6.30/m³ for felling and IR£3.30/m³ for extraction

Small sawlog: IR£12.50-14.50/m³ for felling and IR£8.30/m³ for extraction

Pulpwood: costs approximately IR£29/m³ for felling and extraction – almost as much as its selling price.

Approximately 25% of the harvesting is done by the forest staff themselves, the remainder is done by contractors who are mainly local farmers or forest owners utilising their sur-

plus harvesting capacity. However, in recent months, there has been a growing influx of Polish, Romanian and Czech contractors. The contractors are paid a bonus if less than 2% of the stems in the remaining crop are damaged but they are charged a penalty if more than 5% are damaged and they get the road if more than 20% of the stems are damaged.

All sawlog is sold on roadside by competitive tender while pulpwood is sold at a contract price which is agreed each year between the forest owners association for the State of Baden-Württemberg and the major particle board mills. The community forest supplies about ten small sawmills within a 70km radius. These mills produce construction timber to order. There are also two joinery mills which buy the best quality logs of pine and silver fir. These logs must be of the highest quality and the mills are willing to pay IR£160/m³ for them – more than three times the normal price.

The main issues concerning the community forest of Unterkirnach at the moment are:

- adjusting their forest management practices to take account of the greatly increased importance of tourism in the local economy
- constraints imposed by Germany's very strong environmental lobby
- the threat of an influx of cheap timber from Eastern European countries anxious to get hard currency. Russia is currently offering sawlog to German mills at 1 DM or £0.43m³ standing.

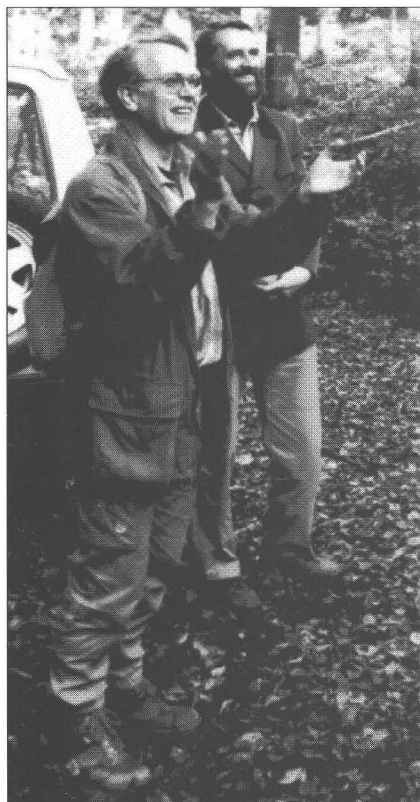
Pat O'Sullivan

Wednesday 13th October 1993

The theme for the day was the growing of high quality broadleaves. The morning was spent in the State Forest District of Ettenheim, with Forstdirektor Bischoff. The district lies in part of the Rhine Valley/Black Forest between the altitude of 160 to 800m. The average annual rainfall is between 500 and 1000mm. The soils are somewhat variable, ranging from sandy to loam, with an abundance of loess (derived from windblown sand) type soils. The mean annual increment is approximately 8 m³/ha. The objective is to grow 50% broadleaves and 50% conifers. The present composition is beech 40%, oak 5%, Norway spruce 20%, silver fir 15%, Scots pine 5%, Douglas fir 8% and others 7%.

During the morning the tour studied various aspects of the shelterwood system. The first stop was at a stand of good quality beech in which natural regeneration had started. Approximately 130 stems/ha of mature beech trees still remained. The number of seedlings varied from 50,000-100,000/ha, which would be reduced manually in the coming year. During the felling of the remaining mature trees, damaged stems were to be removed.

In general the management of the regeneration phase is as follows: between 20 to 25 years after the first regeneration felling, the last remaining trees are removed and the natural regeneration is allowed complete freedom to grow. If gaps exist, they will be planted with ash, spruce, or sycamore. Extraction lines are marked so as to minimise damage. Ground cultivation is unnecessary to achieve regeneration, as mast years are plentiful, on average every five to eight years. Planting is



*Tour leader
Professor
Jürgen Huss
with
Forstdirektor
Bischoff at
Ettenheim
Forest District*

financially prohibitive, due to the large numbers of roe deer.

The second stop was at a stand where the regeneration was from 15 to 20 years old, approximately 5m in height, needing a substantial reduction in numbers. Stocking in natural regeneration is maintained at as high a level as possible; consistent with good health and growth. Ultimately, the objective is a clean straight bole, 10 to 12m long.

The next stop was at a stand about 10m in height. The stocking is further reduced at this stage, by felling to waste, at a cost of approximately 30 hours/ha. This felling realised a revenue from firewood, about 10 DM/ha

(IR£4.15).

At the next stop in the Fernbach area, a stand of 70 year old beech had been thinned in 1991 to enlarge the crowns and increase diameter growth. The risk of epicormics resulted in a light thinning. This was achieved by marking the final stems, and thinning to favour them. Standing volume was 350 to 400m³/ha. Ultimately, the aim is to have about 100 trees/ha and standing volume 600 m³/ha. This will be achieved just before the beginning of the regeneration phase. Diameters (dbh) between 40 and 60cm are expected. Typical current annual increment for this area is about 7m³/ha. The soils are brown earths, with pHs of from 3 to 4, surprisingly low for such good growth of broadleaves.

In the afternoon the tour moved to the Müllheim State Forest District close by the Rhine valley where the leader was Oberforstrat Zeiher.

During the 19th century and again in the 1920s the Rhine was canalised to stop flooding, causing the water table to drop some 50m. Intensive horticulture and agriculture are a feature of this area, especially in the valleys. Where the soil is suitable, vines are grown on the valley slopes. The higher elevations tend to be devoted to growing oak. At the highest elevations, the oak is replaced by beech, Douglas fir, Scots pine and silver fir. Annual rainfall ranges from 700 to 1,900mm. The geology is granitic with some metamorphic gneiss. Loess, alluvial and gravelly soils predominate. The forests of the area have a multifunctional role, one of those is to purify the soil water, thereby mitigating the effects of pollution coming from the valleys. There are over 1,000ha of oak forest in the district, the soils beneath them are highly fertile and highly suitable for agriculture.

These forests have remained as they were a source of wood for the manufacture of wine casks.

The first stop of the afternoon was at an oak stand, planted between 1890 and 1910, with a current stocking of approximately 70 stems/ha. Despite having been underplanted with beech epicormic shoots were present on many of the stems. The beech were overtaking the oak, although it had been planted some time after as an under-storey. This had necessitated a decision as to how to fell and regenerate the stand. At present the oak has a mean dbh of 70cm, 90cm is the maximum desirable, trees of larger diameter tend to be subject to decay. The yield from a typical oak stem is: one third veneer quality, one third sawlog and the balance firewood. The value of the oak was estimated to be three times that of beech.

The second stop was at a site clear-felled in 1980 and planted with oak at a stocking of 5,000 stems/ha. No significant seed year occurred between 1950 and 1982 and planting was thus unavoidable. Filling-in had taken place to the extent of 3,000 plants/ha. The failures were attributed to poor provenance choice, vegetation competition and snow damage. Further expense was incurred in fencing the area against roe deer. By 1991, about IR£35,000/ha had been spent on trying to establish a crop! The use of non-selective chemicals is forbidden, and this greatly increased the cost of vegetation control.

An adjoining area was felled in 1984 and naturally regenerated. To begin with, one third of the mature trees were removed to encourage the onset of regeneration. The second third was removed after germination has successfully taken place, and the remainder were removed when the regeneration had reached knee height. Lanes 1.5m



*Quality beech
stand at
Ettenheim*



*Oak stand at
Müllheim
Forest District
with beech
under-storey*

wide had been cut through the regeneration. The cost incurred in this case was about IR£15,000/ha.

Natural regeneration at a very early stage, with no fencing and approximately 315,000 plants/ha was seen nearby. Roe deer were not a problem, and with stocking so high any losses were likely to be beneficial. The costs incurred were IR£7,500/ha, for quite successful regeneration.

The third stop of the afternoon was at a 25 year old stand of oak where a thinning was taking place. The crop had been planted, at 1.0 by 1.5 metre spacing (6,700 stems/ha). The first thinning had reduced stocking to approximately 2,400 stems/ha. Presently the crop has a top height of 12m and a mean dbh of 11cm. An under-storey is slowly developing which will be important in preventing the development of epicormic shoots on the oak. The future prescription is to open up the stand slowly, at between 10 and 15m top height, and ultimately achieve a clean bole of 10-15m long, and a top height of 20m.

Paddy O'Kelly

Thursday 14th October 1993

We departed Freiburg early, heading east for Donaueschingen. Our route took us through the colourful and spectacular "Hells Canyon", an important east-west crossing of the Black Forest. After a journey of an hour or so we arrived in Donaueschingen to start a day visit to the private estate of the Prince of Fürstenberg. Our guide for the day was Forstdirektor Sonntag.

Gathered in front of the Palace of the Prince of Fürstenberg, we were given an introduction to the town and the Fürstenberg estate. Donaueschingen is a town famous for music and

hosts a number of festivals. It is also well known for show jumping and, of course, brewing. The source of the river Danube is located adjacent to the palace amid beautiful gardens open to the public. The Prince of Fürstenberg is the second largest land owner in Germany. (By coincidence a German television crew were filming scenes for a news programme. There was great excitement among them when they saw the Society group. They wanted to shoot some footage of this happy group of Irish foresters around the source of the Danube. It went down well and Brian Monaghan's singing brought great cheers and delight from on-lookers!)

So to forestry. During the morning we visited the Fürstenberg sawmill and later a harvesting site before having lunch at a forest workers house deep in the forest. The sawmill uses pole-length logs. It is located on the edge of town, contains some of the biggest sawmilling machines in the world. Its hi-tec computer system gives very accurate and high quality end products. In addition there is a log yard where other sawmills can order different size category roundwood. This is tied in with the harvesting operation on the estate so that the whole system operates on a 'just in time' principle.

Our next stop was at a thinning of 120 year old crop of Norway spruce, with a mean annual increment of 8m³/ha. A harvester and skidder were working, felling and extracting between 4 and 8m³/hour.

During lunch we were shown the forest maps for the estate. All of these were plotted using GIS (Geographic Information System) technology. The Fürstenberg estate was the first administration in Germany to use GIS. Various maps display different information

such as compartment boundaries, stand age classes, soils, and even species selection maps.

Forest employment has reduced on the estate, as in the country generally, mainly due to increased mechanisation. Manual forest work is not regarded as attractive when compared to jobs in other industries. However, the staff that remain are highly trained and spend three years training in all aspects of forest work, resulting in safe and efficient work of top quality.

During the course of the afternoon we followed the course of natural regeneration of mixed stands of Norway spruce, Scots pine and silver fir. Felling for natural regeneration begins 60 years ahead of final felling age, which is at about 150 years. It begins at the eastern boundary of the area to be regenerated and works westwards, into the prevailing wind. This facilitates seed fall into the areas opened up by

strip felling. The canopy is opened up gradually to create gaps for seedlings to grow. Subsequent fellings require a lot of skill to avoid any damage to young plants. Management of natural regeneration is something which has gone on in the estate for generations. Each species has to be treated differently so as to maintain the mix in the end. Silver fir are particularly favoured by browsing deer. A sand and lime mix (a home-made solution) is applied to the tips of the young trees to discourage browsing. Managers aim to maximise timber revenue at the same time as having a mixed forest.

An inventory is carried out every 10 years. They use a system of permanent sample plots throughout the forest. Other plots are used to check incidence of die-back. Any pronounced occurrence is treated by the aerial application of dolomitic limestone.

We ended our afternoon on an his-

The Study Tour group at the source of the river Danube at Doneauschingen



torical note, beside a lake. Like many other lakes it was used as a water supply for specially built channels to "float" logs down to lower country, where they were used to make charcoal. Our excellent guide, Herr Sonntag, finished the visit with a traditional chorus on his hunting horn.

The day finished with a guided tour of the Fürstenberg brewery in Donaueschingen.

Richard D. Jack.

Friday 15th October 1993

We departed Freiburg for the Forest District of Bad Rippoldsau-Schapbach where Forstinspektor Kober was our guide in the teeming rain. Our first stop was the forest area Sandeckwald. The total forest area is 6,920ha; 3,400ha are state owned, 920ha are in community ownership and the remaining 2,600ha are privately owned, comprising 27 holdings between 30 and 150ha. These are larger than the average holdings in Germany and some of the landowners in this area live solely off the forest. This is not typical as most landowners in the Black Forest combine forestry with farming and tourism.

Sandeckwald is 600 to 700m above sea level and the soil is a loamy sand – generally sandstone mixed with loess on the lower slopes with granite on higher ground. Precipitation at 1,400 to 1,500mm is high – even by Irish standards – so growth conditions are good.

Beech and silver fir are the main species native to this area. However, most of the crops comprise Norway spruce/silver fir 50:50 mixture. The crop is managed under the Plenterwald or naturally regenerated selection forest system with a wide variety of age classes present in the stand. Norway

spruce was introduced in the beginning of the 13th century mainly for resin production. Beech is absent from the forest due to cattle and roe deer browsing. However it is planned to reintroduce beech to eventually form 60% of the forest cover. Areas underplanted with beech will be fenced to prevent damage from roe deer. Beech and silver fir are an ideal mixture for permanent regeneration as both are shade bearers but Norway spruce, which performs extremely well as a top storey tree, is at best a moderate shade bearer and poses problems as an understorey.

It was also interesting to see how German foresters coped with regenerating light demanders such as oak and Scots pine. Although the problems are not as great in the case of Norway spruce, openings of about 100m² are made in the canopy to ensure adequate regeneration of these species where they occur in Sandeckwald.

While it was difficult to establish actual thinning volumes removed/ha, thinnings seemed conservative by Irish standards. As few as 10 to 20 trees were removed/ha in some instances. However, the average tree size can be two m³ and more in these fellings and hence volumes as high as 50m³/ha are removed in some thinnings. Thinnings are carried out on an eight year cycle, but the grower has the option of waiting until prices are favourable. The system requires intensive silvicultural management in order to achieve the uneven age class distribution and to maintain a given species composition. Minimum standing volume is 150m³/ha and can be as high as 500m³/ha. Once this has been achieved, the system offers growers flexibility in terms of optimising tree size and date of felling in relation to market prices.

Before felling, trees are selected visually, seemingly without recourse to management tables or yield models. German foresters are confident to trust their visual judgement when making selection decisions. Given their intensive training, experience, continuity of silvicultural practice, high staffing levels and the luxury of working to a silvicultural rather than an economic agenda, this confidence, for the present at least, is well grounded. Farm foresters also share this confidence. They not only enjoy the benefits of a family forestry tradition and silvicultural continuity but forestry forms an important part of their training in agricultural college. In addition many pursue a three year intensive forestry course.

By the time the upper-storey is finally removed the under-storey has undergone a number of thinnings. This eliminates the need for conventional clearfelling. While this is Utopian silvicultural to Irish eyes, it is a system that could be practised in some forests where site conditions and rotation length would favour natural

regeneration and/or the introduction of an under-storey.

Traditionally, trees are felled and debarked on site in May when the sap is rising and wood has an attractive cream/yellow colour. There are three main advantages to spring felling: the timber has a chance to dry naturally during the summer period, it allows the felling gangs to return to farming for the summer and extract the timber in autumn and it causes the minimum damage to the under-storey.

Up to the 50s, logs were transported by a series of water channels which were built by the owners in return for land they received from the Prince of Fürstenberg in the middle of the fifteenth century. (Holdings were closed, they could not be subdivided between the farmers' children. As a result, direct links can be traced to the original owners and more importantly the continuity of silvicultural treatment has been maintained. This continues up to the present day: while owners can sell their holdings they cannot divide them.) Water transport was replaced in the 60s by truck transport when a network of



Forstinspektor Kober outlining the operation of the Plenterwald selection forest system in the Sandeckwald

forest roads was constructed. Roading density is between 50 and 100m/ha.

Today, great care is taken when felling thinnings. Highly skilled extraction teams led by master fellers, who are trained in all aspects of harvesting, ensure that as little as 1% of the under-storey is damaged. After felling, damaged and poor quality stems are removed to facilitate the regeneration of the elite trees. Natural regeneration encourages natural pruning. Nevertheless artificial pruning, up to 15m, is carried out in three stages: ground level to 2.2m, 2.2 to 6.0m and finally 6.0 to 15.0m. Pruning is still carried out manually, long handled saws are used to prune up to 6m and ladders are used up to 15m. Obviously, the main objective is to produce quality, knot-free timber, but there are two other important reasons for pruning:

- to reduce ground shade to encourage natural regeneration;
- to facilitate hunting and shooting.

Pruned stands are certified. The price differential between pruned and unpruned trees is considerable, mainly due to the demand for veneer quality logs. Pruned silver fir fetches between 160 and 240 DM/m³ (IR£67 and IR£100) compared with 40DM (IR£17) for unpruned.

Our second stop was at a small family-run sawmill at Schapbach. The owner, Herr Roth described how a mill with an annual production of only 6,000 to 10,000m³ could not only survive but provide a comfortable living for his own family and a staff of six. The mill, which the family bought in 1919, is a self contained unit. Up to 1968 it was water powered. They then introduced a diesel electricity genera-

tor. This proved to be a wise decision as today their electricity is three times cheaper than the regional grid.

Maintenance operations such as setting of saws are carried out by their own staff.

Wood is purchased from farmers, state, and community forests in lots from 20 to 1,000m³. They cut only to order, mainly for the construction market. A feature of the mill was a computerised mobile crosscutter on tracks which saws the timber into ordered lengths. These are then transferred to the saw bench where the blades in the frames are adjusted in line with the order. As a result there is no waste or stockpiling of sawn wood.

Our final stop was at the Black Forest open-air museum the Vogtsbauernhof in Gutach on the route between Offenburg and Donaueschingen. This Bunratty style development features original farmhouses and other buildings such as a distillery, bakery, granary, apiary, smithy and sawmill dating back to the 16th century. All but one of the 27 buildings were constructed on the museum site. Most of the dwellings had no outside buildings: the living quarters, stables, cattle feeding area, machines, grain and hay storage were all under the one roof. Up to 1568 these houses were built almost totally from wood and even for a long time after this date – when fire regulations were laid down – only the kitchen walling was constructed in stone.

The sawmill, which was re-erected on museum land in 1963, dates back to 1673. This created considerable interest as it is similar to mills which were in use since 1245. The millwheel is water-powered and this turns the axletree which creates an up and down motion of the saw-frame, slowly cutting

through the log: a six metre length taking three quarters of an hour to saw through. The saw, which is still working, took three years to cut all the wood for a typical dwelling.

Wood was used extensively in mining, smelting and charcoal production. It was also vital to the glass industry which used up to two m³ of wood to produce one kg of glass. The demand for wood for these industries and for domestic fuelwood was so great that by the 15th and 16th centuries some areas, such as the north-west corner of the Black Forest, were totally denuded of trees.

As well as carpenters and builders, a wide cross-section of craftsmen used wood, including coopers, vat makers, shinglers, carvers and lathe workers. A complete folklore and mystique built up around the forest and associated crafts and industries. As our guide pointed out, the people who lived in houses such as those at Gutach thought more of timber than food. The forest is still a vital aspect of the Black Forest culture, especially for its non-wood benefits such as leisure and hunting.

Donal Magner

Society Tour Participants:

President: Eugene Hendrick

Convenor: John Fennessy

John Brady, Maureen Cosgrave, Myles Cosgrave, Tony Crehan, Jim Crowley, Pat Doolan, Charles Farmer, Gerry Fleming, Brigid Flynn, Lily Furlong, Denis Gallagher, Tony Gallinagh, Michael Glennon, George Hipwell, Liam Howe, Jim Hurley, Tim Hynes, Richard Jack, John Kelly, Pat Kelly, Joe Kilbride, Jimmy Lahart, Donal Magner, Gerard Maum, Kevin McDonald, Michael McElroy, P. J. McElroy, Ann McHugh, Jim McHugh, John McLoughlin, Brian Monaghan, Michael O'Brien, Liam O'Flanagan, Paddy O'Kelly, Tim O'Regan, Pat O'Sullivan, Tom Purcell, Gerry Riordan, Martin Ruane, Joe Tansey, Charles Tottenham, Robert Tottenham, Joe Treacy.



Log handling carriage in the Roth family sawmill at Schapbach