

our Indian forests, except in a very modified degree, and on the larger rivers; in fact, the high specific gravity of most of our woods, and torrent-like nature of our mountain streams, preclude the idea in all but exceptional cases. Still it may not be without interest to state briefly how it is carried on here, even in quite small streams of from 15 to 20 feet in width. The streams invariably require to be prepared more or less for floating, that is, cleared of any very large rocks or boulders, and "sleepered," if I may use the expression, with pieces of wood firmly fixed in the bed of the stream every few yards; in fact, in the same way as in the riesen, except that the sleepers or rollers are much larger and placed further apart. These not only have the effect of preventing the formation of any very deep holes in the bed of the stream, but serve for the raft to slide along when it touches the bottom. Reservoirs for storing water are constructed in the same manner as I have described in the Report on Scotch Forests, as the floating cannot be carried on when the stream is in flood; in fact, the less water in it the better, so long as sufficient is stored up above to carry on the rafts. My first impression when I saw the *floss* or float, consisting of stems from 20 to 60 feet in length tied together at the ends by branches or coir from the hazel, walnut, and silver fir, of which the hazel is preferred, and lying zig-zag in the bed of a mountain stream, up and down which they extended 1,600 feet, was that it was simply impossible that they could ever be floated, still less steered down the stream, with all its windings, and over the locks and rocks which occurred pretty frequently. This raft was not quite ready, and I had an opportunity of noting how it was constructed. It contained 880 stems, eight or ten of which abreast formed as it were a "link" in the long raft of 1,600 feet. There were about 30 links or rafts in the floss. They are not fastened laterally, only at both ends to the next link. The breadth is greatest at about two-thirds from the prow, which is quite narrow, and consists of only two or three stems abreast (in front of all is a piece formed of old wood and raised out of the water like the bow of a whaleboat, so as to lead the raft), and the largest and heaviest stems are placed in the broadest part and toward the stem or hinder part, which does not taper at all. The fastenings are made very secure, but not too tight, as they must allow for play.

Preparation of the bed of the stream.

Construction of the rafts.

There are two or three *Bremsen*, or breaks, by which the speed is regulated and the float brought to a standstill if required, and the charge of the largest of those, which is the farthest back, is the most responsible post, and devolves on the float-master himself, or, in his absence, the most experienced hand. When all is ready, the water from above is let loose, and the raft or rafts which have hitherto been lying in the bed of the stream, which has probably not more than a foot of water in it, begins to float a little, but is not let go until about two-thirds of the water have passed, as it is a curious fact that when let go, if there is a steep fall in the river, it travels faster than the water, and has often to be stopped on its course to let the latter get ahead of it again. The raft is manned by eight or ten men and boys, one or two of whom stand quite in the bow to guide the prow, the others make themselves generally useful, whilst at least one or two of the best hands stand by the float-master at the break, on which the safety and good guidance of the whole depends.

When let go it is exceedingly curious to see the forward part dart off at the rate of five or six miles an hour, and the several pieces or links which have been lying zig-zag and more or less high and dry gradually uncoil themselves and follow in its wake till the whole dashes along at a great speed and apparently uncontrolled. Accidents are, I believe, rare, but this can only result from the floaters being trained to the work from their youth up (I saw little lads of six and eight going down in miniature floats); as for one not accustomed to it, it is well nigh impossible to remain on the float at all, as it literally springs sometimes out of the water on touching a rock or obstruction, dashes round a rapid turn in the stream, or jumps over a weir or anicut, with a fall of several feet.

In this manner 40 or 50 miles can be got over in a day, if the stoppages, to allow of the water getting ahead, are not too frequent, or the stream does not become swollen by mountain rains. On reaching the main stream, in this instance, the Kinzig (the small stream is called the *Wolf*), the rafts are taken to pieces, and formed anew into those large rafts with which every one is familiar who has travelled on the Rhine, the Main, the Elbe, or the Danube.

The raft which I saw was shorter and contained a greater proportion of small stems than usual, being the last of the season. They are, as a rule, at least 2,000 feet long, contain 1,000 stems, and are manned by 12 men and boys. The broad portion is always made as broad as the river or stream, failing which there is a tendency to turn round, or get side on to the stream.

Many of the Black Forest floaters have been induced of late years to migrate to Hungary, in order to introduce the floating down the mountain streams into the large pine forests there. They receive very liberal wages as an inducement to go, but as a rule, return after a year or two, and complain bitterly of the climate, and laziness and want of aptitude of the "natives."

I trust the foregoing description of floating may serve to convey some idea of it to those who have not seen it, or have seen it only on large and comparatively slow-flowing rivers; but, as I have said, it requires really to be seen to be understood and appreciated.

I do not know of any other points connected with forest management in the Rippoldsau Revier which might with advantage be detailed here; so much is noted and learned by personal inspection and study of any occupation which cannot be put down in writing, or communicated to others except in the course of practical working; and particularly is this the case with these forests, where there is little theory or scientific talk, but a thorough practical knowledge and experience of what to do and how to do it, rendering a visit particularly instructive to a forest officer.

GENERAL REMARKS.

FORESTRY in Germany is truly a science, and differs very widely from anything I have seen called by the same name either in India or England. I do not advance the theory that the German system is perfect or applicable to all States or circumstances, and still less that we in England do not grow as fine trees, or do not know how to plant and rear young trees for timber. If any have doubts

Advanced state of forestry in Germany.