

continent without a sufficient previous knowledge of the language, then my advice would be, in the first instance, to settle down at a quiet place to learn the language; and after having made some progress, to seek the acquaintance of any forest officers who may reside in the vicinity, so as to become acquainted with the technical terms and expressions used in the profession. For the purpose of learning the language there are numerous places to choose from; should any one desire a hint in this respect, I may state that in France, Nancy for the north, or Aix en Provence for the south, would probably be found to answer; and that in Germany, Hanover, Göttingen, Eisenach, Bumberg, and Stuttgart may be named, but that there are many other places equally suitable.

To those who have time to study both in this country and on the Continent, my advice is, first to go abroad, and then to take up forestry in England and Scotland. This I am inclined to think will be found a good arrangement. As, however, in most cases circumstances may not permit a course of studies abroad, I will in the first instance endeavour briefly to indicate the subjects to which attention should be directed in this country. In the reports which precede these remarks, the Crown forests and some of the largest and most instructive private wooded estates are mentioned, but there are many others besides, and forest officers on furlough will find ample opportunities in most counties to acquire an abundance of useful information regarding arboriculture. A general book on forestry is the well known work "The Forester," by James Brown, 4th edition, 1871. "John Grigor's Arboriculture" will also be found useful. Instructive papers on special subjects will be found in the "Transactions of the Highland and Agricultural Society of Scotland," and of the "Scottish Arboricultural Society." The "Gardeners' Chronicle and Agricultural Gazette" also has occasional articles on the subject of forestry. But the best school is constant personal intercourse in their forests and woodlands with the forest officer of the Crown forests, and with experienced wood managers and foresters on private estates.

Professional studies in Great Britain.

I will commence by a few remarks on coppice woods, the management of which is more simple than that of high timber forests. I would draw special attention to the laying down and treatment of osier beds, which may be seen in great perfection along the Thames and elsewhere. Such coppice of willows, which is cut over annually, or every second or third year, yields a high rent on good soil, the material being used by the basket-maker and cooper. In India we have nothing exactly like it at present, but I am inclined to think that similar short rotation coppice woods of willows or other fast-growing trees might be made to yield a good return. Oak coppice for bark, the stripping and drying of bark for tanning, mixed coppice of hazel, lime, and other trees, coppice with standards of oak, may be studied in most counties, and it is not necessary to mention particular localities. The main points to which attention should be directed are, the length of rotation, which will be found to vary within wide limits, according to climate, soil, kinds of trees and the requirements of the market, the quantity and value per acre of the crop at the fall, the intermediate thinnings, the number of standards, if any, per acre, and their share in increasing the value of the crop. In some places the yield of the coppice is considerably increased by planting larch and other coniferous trees with it. The coppice woods without standards for the growth of hop poles in Surrey, Sussex, and particularly in Kent, merit special and careful study. In 1866 I had the privilege of visiting the woods of Sir Edward C. Dering, of Surrenden, near Ashford, and I must say I have seen nothing anywhere in Europe to be compared to them. The ground is carefully trenched; ash and Spanish chestnut are planted close together, often mixed with larch, and the results, both as regards rapidity of growth, length of poles, and the money returns realized, are very remarkable. It is instructive to compare these carefully tended and highly productive woods with the old natural coppice, which often yields a very small return. Sir Edward has been good enough to state that any of the forest officers from India who may wish to inspect his plantations are at liberty to do so, if furnished with the needful introductions from the India Office.

Coppice woods.

Oak and mixed coppice, with a large number of oak standards, is a form of forest not uncommon in the south of England, similar in many respects to the "*Taillis sous futaie*" generally found on private estates in the north and centre of France. The coppice keeps the ground under cover, draws up the younger standards, and yields an additional return. The part which is here performed by the coppice will remind Indian foresters of the beneficial effects of bamboo underwood under teak, or of tamarisk wood under the babul and euphrates poplar in Sindh. In one of the preceding reports a sketch of the self-sown oak woods of Sussex is given. The timber is here the main crop, but it is raised with the aid of the underwood.

Coppice with standards.

Considerable extents of natural high forest, mainly maintained by self-sown seedlings, are to be found in various parts of the country. The natural forests of Scotch fir in the Highlands have been described by Captain Walker, and the beech of Buckinghamshire is mentioned in Mr. Webber's report. The management of these beech woods is exceedingly interesting. They are uniformly dense woods, the trees not full grown; where I have seen them they appeared to be between 60 and 80 years old, but sufficiently mature to shed seed. There is a sprinkling of ash, whose light green foliage overtops the more yellowish green heads of the beeches. The cuttings, which go through the forest in regular rotation, merely consist in thinning out a small proportion of the larger trees. Small blanks are thus formed, which are filled up readily by self-sown seedlings. The system is exceedingly conservative, the soil improving steadily by the mass of vegetable mould formed by the decaying beech leaves, and it is probable that if there were a sufficient demand for this description of wood, some of these forests might be made to yield a larger annual crop than they are said to yield at present. Excellent Scotch fir woods of considerable extent, originally planted but now maintained mainly by natural reproduction, may be seen in Windsor Forest, near Swinley and Sandhurst; and generally it may be said that the maintenance of timber forests by self-sown seedlings of oak, birch, beech, Scotch fir, and even of larch and spruce, is understood and utilized in many places, so that there is no lack of opportunities in acquiring useful information on this branch of forestry, which is particularly important for Indian foresters.

Timber forests with natural reproduction.

Plantations, however, are, *par excellence*, the strong point of arboriculture in Great Britain. As far as my experience goes, there is no country in Europe where plantations on a large scale are made at a less cost per acre (considering the rate of labour) or with more uniform success. The continuously moist climate, without any long-continued droughts, is a great help in this respect, but the skill of nurserymen and foresters is, I believe, the principal element of success. In order to understand

Plantations.