every hole. In the past, we resorted to rubber mats, which were never popular. When we used the main tees during the dormant period, they generally took a lot of stick and were never really in a good shape for the start of the busy playing season. Good tees for winter play are a real bonus - they keep the golfers happy and allow us to present better conditions all year round.

"Not long ago, we had a serious thatch problem on the greens, due mainly to lack of aeration and infrequency of topdressing. It took about three years to get rid of the thatch accumulation by a concentrated programme of slitting and hollow-tining, combined with four to five annual topdressing applications.

"We cut back severely on irrigation and drastically reduced the amount of fertiliser, all of which made a marvellous transformation to the eventual quality of the putting surface. Last year, the greens only had one very light fertiliser application in the spring and they remained in pretty good shape for the rest of the year.

"Greenkeepers now are more aware of the treatment required to produce vigorous healthy turf capable of withstanding regular heavy punishment. Gone are the days when unlimited fertiliser was binned on to satisfy the whims of some influential club official without consideration for the long-term consequences.

"Automatic irrigation systems are regarded more as management tools now, to be used with great discretion. Many have learned their lessons the hard way and come to realise the quickest way to ruin turf can be brought about by the excessive use of water and fertiliser high in phosphates and potash.

"As I said, everybody seems to think they can do the job better than those officially appointed by the club. When you are in the business of catering for the sporting ambitions of all kinds of golfer, you can expect to be criticised occasionally. Golfers are very fickle at times. If they have a good game, they will sing the course's praises, but those who play badly may seek to justify their poor performance by finding something to complain about.

"I suppose it is the nature of the way golf is played that the greens attract the most comment, favourable or otherwise. We often hear golfers say: 'the greens are too hard, put more water on them!' They equate hard surfaces with dry greens and soft surfaces with wet greens.

"If they play their shot improperly with low trajectory and it fails to pull up on the putting surface, they immediately assume the green is too dry! Golfers don't appreciate that the maintenance of greens is not so much to make it a good landing area as a true putting surface and to do this we have to gear our efforts to keeping turf firm and the surface fast and true.

"Therefore, a good putting surface does not necessarily display the characteristics of a receptive landing area for a dropping golf ball. Regular aeration and topdressing does help to produce a good surface with the kind of resilience in the turf that will absorb the bounce and take the spin of a properly played golf ball.

"I have a deputy and three assistant greenkeepers, who are all good reliable workers with an enthusiastic interest in the operation and running of the course. We are fairly well-equipped, with a Cushman turf management system that includes a spiker,
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Eddie heads a jovial greenstaff at the Brocton Hall club.

railway timbers were used on the bank of a ditch cutting across the 12th hole.

hollow-tineer and topdresser; two Ransomes Triplex greens mowers; a Ransomes 180 with two sets of cutting units; three tractors, all fairly old; a set of Ransomes hydraulic five-gang mowers for the fairways and a set of trailed gangs for the semi-rough.

"We have a Sisis outfield spiker for the fairways, a Litamisa for leaf sweeping and collection, as well as an assortment of small machines, such as Flymos and strimmers. We recently purchased a Lawn Genie.

"We have spent some time this winter tidying up the banks of ditches intersecting the fairways. Traffic on these slopes has led to some deterioration in the turf’s condition – there are ruts and other unplayable lies to frustrate golfers. We are in the process of building permanent retaining walls with railway timbers to present a neater appearance and reduce the amount of hand work required to maintain these drainage channels. We are also clearly defining the edge of the water hazard in compliance with the rules of golf, which will please all our golfers.

"A couple of alterations to our par-three 17th have also been carried out. The tee has been resited, bringing a lovely old stone tower dovecote building partly into play. An approach bunker guarding the entrance to the green now has to be carefully negotiated. We have also altered the course of a winding stream and drained an old pond area to improve the aesthetic appearance of this area.

"Most greenkeepers would agree that the autumn and winter months are often the busiest period for the outdoor staff at every golf club. This is the only time we usually get to carry out important construction work and other necessary tasks to improve the course and facilitate more economical upkeep. Golfers who think we spend most of our time in the sheds through the winter months are mistaken!"

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Trees can add a great deal to the attractiveness of a landscape.

IN this series, I'm going to explain how to select, buy, plant and maintain trees for golf courses. Some of my ideas you might find novel or controversial, but I make no apologies for this. If, by the end of the series, your awareness of the potential of trees on golf courses has been increased, then I'll have achieved my primary objective.

**By Tony Gentil**

Let me start by explaining what I see as the major benefits of planting trees on golf courses. On large areas of open space, trees can add a great deal to the attractiveness of the landscape. They provide scale, colour and interest. They are also useful for screening off eyesores and forming windbreaks to improve the micro-climate.

Trees will, to some degree, act as a barrier to noise and atmospheric pollution, important considerations where you have a course alongside a busy road.

Conservation of wildlife is uppermost in many people's minds and trees can offer a diversity of habitats that encourage and sustain many species of animal and plant under the threat of extinction.

Obviously, to the golfer, trees can feature as major elements to test skill. What isn't perhaps so obvious is that well-grown timber can find an eager market and trees could be considered as a potential source of income to the club.

So, having outlined the reasons for planting trees, let me tell you how to decide what to plant.

I must confess I envy the golf clubhouse, I would use the potential source of income to the trees could be considered as a test skill. What isn't perhaps so obvious is that well-grown timber can find an eager market and trees could be considered as a major elements to test skill. What isn't perhaps so obvious is that well-grown timber can find an eager market and trees could be considered as a potential source of income to the club.

So, having outlined the reasons for planting trees, let me tell you how to decide what to plant.

I must confess I envy the golf course manager faced with the task of choosing trees. He hasn't got the problems of the town planter trying to grow trees in confined spaces. Complaints from town dwellers that trees are blocking light through windows, filling gutters with leaves, interfering with television reception and pushing buildings over all make you sometimes wonder if town planting is worth the effort.

When it comes to selecting trees for golf courses, I would say that you could choose any of the trees that are hardy in your area. Basically, if the land will grow grass, it will also grow trees. This means that you have a choice from several hundred different species and cultivars.

Conservationists argue that, if you wish to encourage wild life, then you should only plant native trees. I feel that this approach is a bit too restrictive. There are no more than a handful of tree species native to Britain and using them exclusively cuts down your choice drastically.

Furthermore, conservation is only one beneficial aspect of tree planting and there are other equally valid considerations. Even the most 'natural' looking golf course owes much to the hand of man and I see no reason why you shouldn't include foreign tree species in your planting scheme.

As a general rule, I would plant large growing forest trees, such as lime, beech, oak, horse chestnut and some conifers where there is ample room for them to spread unhindered. In formal areas, say near the clubhouse, I would use the smaller growing 'manmade' trees, such as cultivars of mountain ash and Japanese cherries.

On most courses, I would plant both conifers and deciduous trees. Conifers come into their own in winter, screening eyesores and acting as windbreaks. They also provide a superb backcloth to deciduous plantations, particularly when the latter are coming into leaf in the spring or having a final fling of colour in the autumn.

Tree planting costs a lot of money and, under certain circumstances, it is possible to obtain financial grants from bodies such as the Forestry Commission. If you are considering large-scale planting, it is certainly worthwhile finding out if your scheme is eligible for grant aid beforehand. Amenity societies and conservation groups might be prepared to help with financial or physical assistance.

The best method of obtaining trees for planting, without a shadow of doubt, is to visit several nurseries and see the trees growing on their own in winter, screening eyesores and acting as windbreaks. They also provide a superb backcloth to deciduous plantations, particularly when the latter are coming into leaf in the spring or having a final fling of colour in the autumn.

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ment and then go along and keep your eyes open.

You’ll find out most of what you need to know about the quality of his nursery stock even before you get out of the car. If the place looks a tip, with rusty machinery lying all over the place and debris thrown in corners, then you’ve a good idea of his attitude of mind. Have a look at his trees by all means, but I’ll bet you find they are fighting for life among a tangle of weed.

By the same token, an immaculate nursery should be a guarantee of good-quality trees.

The nursery trade, like any other profession, has its own jargon and there are three main types of tree you could buy. First, there are ‘forest transplants.’ These are very small trees, usually grown from seed and two to three years old – each will be 4in-6in tall. These are the cheapest and used in their millions for mass planting.

The second group are called ‘whips.’ These are small trees with a single whip-like stem hence their name. Whips vary in height from about 2ft 6in to 6ft. These cost about 50p each and are, for most situations, the best trees to buy. They are easy to plant, don’t need staking, establish well and need the least maintenance of all the three groups.

Finally, there are ‘standards.’ These are the type of tree traditionally used for planting in streets. They have a trunk clear of branches up to a height of 6ft and, from there, the head develops, rather like a lollipop.

Standards are the dearest of all, costing between £10 and £20 each. They need staking for the first two to three years after planting. Although still popular, they never look as natural as whips and for large-scale planting can be horrendously expensive.

My next article will explain how to plant your trees.

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MORE BOOKS ON SCIENCE

BY EDDIE PARK

"Praised be, my Lord, for our sister, Mother Earth, which doth sustain and keep us, and bringeth forth divers fruits, and flowers of many colours, and grass ." So said St. Francis of Assisi. In the more recent times men seem to have forgotten this simple fact — that the chief figure in all this is still Mother Earth, admittedly with increasing help from the human race. Unhappily, we seem to have rushed up the blind alley of thinking that Man is now the Master and that he has the ability with all his discoveries to dictate what he wants.

So, in our attempts to maintain (and in many cases recover) our golf courses, now is the time to relearn the laws that Nature imposes on US.

It is necessary with Soil Science to curb the very natural enthusiasm that is engendered by a fascinating subject. A useful start is to look in the Public Library for a copy of the "Soil Survey Bulletin" for your own particular area. The Soil Survey has, until recently, been financed by MAFF and has produced detailed surveys for most non-urban areas. A brief outline of local Geology, Relief, Climate and Soil Formation is followed by detailed descriptions of soil profiles which are linked with maps identifying specific areas. Even more useful is the section on the suitability of each parcel of land for different purposes (including golf).

In my last article on old books I mentioned the splendid 'New Naturalist' series which I said could now be found in bookshops at very reasonable prices. Imagine my horror when the following week I visited a bookshop in York and found plenty of choice but all at about £25! Dark thoughts came to me that the BIGGA meetings were being held in York and someone had ruined the market — probably that new chap at Wentworth (another book collecting nut)! Fortunately, the following week I was in Holyhead and found one at 1½ which all goes to show you just have to go far enough. This one was "The World of the Soil" by Sir E. John Russell (1957) still one of the best introductions to the subject. Russell followed Sir Dan Hall as Director of Rothamsted Research Institute and also wrote the classic "Soil Conditions and Plant Growth" (1961) and, less useful, "Soils and Manures" (1945). Hall originally produced "The Soil" as long ago as 1902.

It is a matter of golfing history that in 1926 the R & A set up an expert panel to consider the dire state of British golf courses; this eventually became the Scientific Advisory Committee for the Board of Greenkeeping Research. Both Sir Dan Hall and Sir John Russell were members of it. Perhaps the authorities took things more seriously in those days?

Another prolific writer in this field was G. W. Robinson of Bangor. He wrote "Soils their Origin, Constitution and Classification" (1932) and "Mother Earth" (1937), this latter being a series of letters on soil addressed to Sir George Stapledon (yet another member of the Scientific Advisory Panel). In the Teach Yourself series there was some useful information in "Good Soil" (1944) by S. G. Brade-Birks of Wye College in Kent. Coming up to date a word of warning would be in order. Some of these subjects in the hands of the academics have become very detailed and full of theories and counter-theories — confusing for the student who simply wants to learn the basic principals. Two books available in paperback form which are established favourites are "An Introduction to Soil Science" (1974 reprinted 1980) by E. A. Fitzpatrick and "An Introduction to the Scientific Study of the Soil" (1927 reprinted 1980). Both these books enable the everyday processes in the soil to be studied in as much detail as the individual wishes. A really simple book is to be found in the Science for Everman series. "Your Guide to the Soil" (1965) is probably aimed at the gardener or student farmer, but it is easy to read and fairly instructive.

It may seem a bit superfluous to talk about books on the use of chemicals on golf courses. Everyone who goes to the I.O.G. Trade Show at Windsor staggers home with carrier-bags stuffed with enough reading matter for a year. Perhaps the main thing is to get chemicals into perspective. Modern research confirms that we cannot afford to disturb the balance in Nature with the unnecessary over-use of chemicals.

Equally we cannot afford to return to the state of affairs on golf courses prewar. I don't suggest you buy it, but an out-of-date book called "Suppression of Weeds by Fertilizers and Chemicals" (1946) by Long and Brenchley plus old Bingley Journals, bring home the great advantages today of a few, well chosen chemicals. Good handbooks are available and are frequently updated. S.T.R.I. and the B.A.A. produce a "Directory of Sports & Amenity Turf Chemicals" and H.M.S.O. give us "Approved Products for Farmers and Growers" (the latter is useful for those who realise that some of the chemicals we need for large areas can be bought much more cheaply from farm suppliers). Herbicides are especially necessary to the greenkeeper and it is important to use the right chemicals for the target. Sutton's "Turf Weeds", the Weed Research Organisation's "Garden Weeds" by R. J. Chancellor and "Chemical Weed Control in Your Garden" by J. E. Y. Hardcastle are all most useful.

Now for a bit more history. R. B. Dawson, the first Director of the Board of Greenkeeping Research, had been trained at Rothamsted under Hall and Russell and one of his earliest tasks at Bingley was to write the leading article in the new journal. As his subject he chose Plant Ecology and he went on to write a simple outline of the principals of that subject which, in spite of all subsequent discoveries, still makes good reading today. A very close look at that subject is essential next time.