

# OPEN

## Invitation

Tom O'Brien was instantly impressed with Royal Birkdale when he walked the course for the first time 13 years ago. At the age of 48, he accepted the Head Greenkeeper's post in what could have been his last opportunity to handle an Open Championship, as well as his first. JOHN NELSON met the man who is again preparing his course for a world-class test of golf

**T**om O'Brien, B.E.M., is the name. On his shoulders rests the reputation of Royal Birkdale for providing a world-class test of golf at The 120th Open in July. It could not be in better hands.

Tom's the head greenkeeper and this will be his second Open preparation. He had his baptism in 1983 and although it was an experience not without its traumas, his course was universally acclaimed. Now, once again, he's in the hot seat, under the spotlight. What kind of man is he? How has he gone about preparing the course? Was it a benefit having done it before? How can other head greenkeepers gain from such experience?

Golf and greenkeeping have been his whole life. Indeed, he grew up as part of the Scottish tradition whereby golf was the natural thing to do. Everyone played and virtually every village had its own course. He comes from Muirhead, Glasgow originally and on leaving school immediately started a career as a greenkeeper. He joined his local club – Mount Ellen – as the junior member of its green staff.

Mount Ellen is a downland course and Tom joined a team of four. He stayed 17 years and there he learnt his craft – as well as marrying a local girl and raising two sons. In those days – as always I guess – it was the head greenkeeper who determined whether or not you made the grade. Tom was lucky. The Mount Ellen head insisted on the highest standards, taught Tom all he knew, and made sure he got a thorough training. It was all practical training and know-how, of course. Tom didn't have the opportunity for studying college theory, but this didn't turn him against academic learning or against those who were college trained. He accepts the academic view – except when it goes against common-sense! He was taught always to listen to other views – and then make up his own mind.

Anyway it paid off. He was able to join the ranks of head greenkeeper and get his own course. It was not initially →



**UNDER  
SCRUTINY:  
CHAMPIONSHIP  
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→ in Scotland, but France, where he became 'superintendent' at a USAF Base course near Paris. He liked it there, but eventually felt the urge to return to Scotland. He successfully applied for the head greenkeeper post at Gullane, with its three courses. This was his first exposure to links courses and he was, and remains, full of praise for the Gullane links.

He also got to know Muirfield and its head greenkeeper. Muirfield was a current venue for The Open and the Gullane links were used for qualifying. It was at Gullane that he first began to have ambitions to handle an Open Championship. He realised, however, that this would mean leaving Gullane and although he speculated about Muirfield he decided it would be foolish to wait for the vacancy of head greenkeeper to occur since there was no guarantee of his getting it. He would have to look elsewhere.

Then as now, there were just seven Open Championship venues, four in Scotland and three in England, so the choice was limited. He accepted the need for patience and resigned himself to possibly a long wait.

The first to become vacant was Royal Birkdale in 1978. Tom discussed it with his wife, applied – and the rest, as they say, is history. He was 48, and felt this could well be his last opportunity – as well as his first!

Arriving early, he walked the course and was instantly impressed. Notwithstanding the splendour of Gullane, he'd never seen a more inviting course and it instantly appealed. 'You can tell immediately' he said, 'if a course is for you', and Royal Birkdale was. He felt at home with its sense of feel, of visual appeal and scale, and it all felt right.

Tom hadn't rated his chances over highly. He lacked academic qualifications, but had 33 years experience of greenkeeping, caring for top class links courses as well as downland and parkland courses and, of course, he was a successful head greenkeeper.

He got the job and he's never looked back. He's enjoyed every minute and the family immediately took to Southport where they've settled. When the day comes to retire, he'll stay there.

He was all set to realise every greenkeeper's ambition – to handle an Open Championship. This was to be in 1983, so he had ample opportunity to get to know his course and its idiosyncrasies – and to worry about it, of course. In the event – apart from one hiccup – it all turned out alright. But he found it a humbling experience. 'The realisation comes' he said, 'that you've been entrusted with ensuring that your course stand up to scrutiny – that it provides the best test for the world's best golfers'.

The R&A help beforehand by inviting head greenkeepers from all Open venues to be its guests at prior Opens, and in Tom's case he was to visit four other venues before his own ordeal.

He now thinks he was perhaps a bit too cautious with his cutting of the greens in 1983 and also revealed that it was during this, his first Open, that he suffered his greatest



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upset. A 'phone call in the early hours told that the 6th green had been sabotaged. Could he come at once? He was collected by police car.

Vandals had dug it up in six places to a depth and width of over a foot and slogans had been spray painted all over the green. A protest group claimed responsibility. Tom inspected the damage by torchlight and made plans for a 4am start to patch things up. But by daylight it was obvious that it would take months to restore the green to its former glory. It must have come close to breaking Tom's heart. He said he'd never felt so low.

In the event, start of play was delayed by just 20 minutes – to allow the repair work to be completed. The tee was brought forward 30-40 yards to make it possible to carry the cross bunkers and then play a short iron to the green. Damaged areas were designated G.U.R. and two undamaged avenues allowed players to replace their ball to hole out. Part of the fringe was cut to make it part of the putting surface. Five white slogans were repainted green to make them less legible and the BBC agreed not to give any TV exposure, thus minimising the publicity sought by the vandals.

The R&A subsequently stated that it would meet any cost involved and give any assistance required in restoring the green to the very fine standard of the other 17 greens.

Tom explained his preparation for this year's Open – especially the greens – and his thinking behind it. He was somewhat sceptical about media talk that there was a special programme. 'Royal Birkdale', he said, 'is a members' course and they expect to be able to play on it every day.'

So his programme is special every day. The course must be maintained in first class condition 365 days a year – including Christmas Day! Unlike Augusta, the course is not closed for work to be carried out without interruption. Nor is there the luxury of a few days grace once The Open is over. People queue to be first to play the course the very next day.

It's all very well for tournament players to say that the greens will be great for members when they leave. He appreciates the need for greens to be at their peak from the beginning of the tournament, but they don't have to maintain them afterwards – day in, day out – or carry the can if he loses them afterwards. The same applies to tees, for although some are created just for The Open, many are not. Many are members tees of limited size, and used continually up to, during and immediately after by members and visitors. Some holes would lose their character if played from new tees, the 9th being a good example, for they would have to remove the legendary marker post landmark for the drive!

Having said this, Tom readily admitted that he took his preparation for The Open very seriously. His approach is systematic and includes aeration, feeding, minimum watering and measured grass cutting.

Commenting on the quality of Birkdale sand, he said it was very fine, didn't retain water and therefore must be kept



### Royal Birkdale's working calendar

**AERATION:** Throughout the year Tom O'Brien aerates the greens weekly, stepped up at the back end of the year to 2/3 times a week.

**TOP DRESSING:** He dresses the greens once a month before The Open with a Buxton sand of a consistent grade and particle size, specified by the STRI.

**VERTICUTS:** Every two weeks until two weeks before the tournament.

**TURF GROOMING:** He uses Turf Groomers all the time. The height is adjusted according to grass growth.

**GRASS GROWTH:** Greens are cut every day. In January, February and March there isn't much growth because the turf is links grass and east winds retard development. It's more a case of trimming than cutting – he calls it 'topping'.

**GRASS CUTS:** He cuts in two directions at 90 degrees. During The Open week he cuts the greens three times a day – once early morning, twice at night.

**LENGTH OF CUT:** Before The Open – three-sixteenths, during The Open – one-eighth of an inch.

**WATERING:** Yes, he uses water, but only if absolutely necessary.

damp but not swamped. This, he emphasised, is where local knowledge was so important – as it was with the weather – and why he would stick with his hard-won knowledge about his own course and not be overawed by those who, whilst undisputably expert in their own fields, lacked detailed local knowledge.

The variable and unpredictable local weather proved that a rigid programme wouldn't work. To plan to carry out the same jobs every Monday morning would result in complete frustration. Thus he'd learnt to adapt to what each day brought with it.

Asked if the snow in February, which stayed around, had affected his schedule, he opined that it had been a blessing in disguise. It allowed the ground to rest and there had been no ill-effects, the often magnifying action of sun on snow causing no burn-up.

Happy with his preparation up to the start of the golf season, he'd been very gratified when the R&A at their first Open preview for the media, held in March, declared themselves very satisfied with the course.

But then he'd had to cope with a prolonged drought. Throughout May there'd been the least rainfall for 100 years. The Weather Centre reported a record low of 8.4mm for the month and there was no sign of rain to come!

Nonetheless conscious that he would be judged by his greens, he drew a contrast between Birkdale and Augusta, where the one topic of player conversation would be the greens and their speed compared with previous years, by saying that his test of golf started with each tee and the winner would be the one who played the best golf from tee to green as well as putting the best.

His greens, he promised, would have enough pace to pose a real challenge although they would not be as fast as Augusta. Nor did they have Augusta's severe undulations – in fact they appear on TV as seemingly bland and flat. But they do have their own subtleties – ask any member!

It's his policy to make all the greens the same speed, but he must work with the natural conditions and these vary for different greens. 'The 6th is probably the fastest' he said, 'but take, for example, the 2nd and 8th and compare them.' The 2nd is sheltered from the sun and protected from wind by trees, whereas the 8th is exposed and unprotected. He confessed he didn't use a stimpmeter or pentrometer but had his own ways to measure speed and firmness.

He smiled with gentle irony as he told of the extra staff drafted in for The Open. 'If they're necessary now, they're surely necessary all the time, aren't they?' he asked.

A golfer himself, he thought it helped him as a greenkeeper. He plays much less now and his handicap has risen from nine to nearer 18. He doesn't play at Royal Birkdale although he started off that way, finding he didn't enjoy his golf as he was always seeing little things that demanded attention. Now he plays at Southport Old Links and by playing away from home any perceived problems are not his, and he enjoys his golf.

He is looking forward to his second Open Championship, not least because he meets greenkeepers from other Open venues and BIGGA members who come to help him keep the course in good order during the event. For their part I am sure they also will be looking forward to meeting Tom. I doubt if any other greenkeeper is held in higher esteem than Tom O'Brien, Head Greenkeeper, Royal Birkdale Golf Club.

● The author, John Nelson, is a member at Hillside, one of the four Open qualifying courses.

## JON ALLBUTT on the disposal of chemical containers and tank washings

As NPTC examiners we listen as the Foundation Module Test candidates recite the litany of options available for disposing of old chemicals, used containers and tank washings. It sounds impressive enough until you look closely at those options and try to see how they might work on a golf course.

Take for example the disposing of used containers. The problems of finding a suitable site for burying are so great as to make this option unworkable on a golf course, similarly the option of burning certain types of container is also a non-starter. Most containers find their way into a skip or on a rubbish tip... try explaining that to the Inspector when he or she visits and starts asking those awkward questions! So what is the best way of dealing with the problem?

All containers must be rinsed and the rinsings put into the spray tank. The empty containers must then be rendered unusable again, with puncturing in several places being the best way of ensuring that they are not re-used for carrying petrol, or worse! The containers should then be kept in a safe place until there are enough to justify a trip to the council tip, enquiring of your local authority first to be sure you take them to the right place. An alternative strategy is to use the disposal services offered by the manufacturer or distributor – both Chipman and Envirogreen (Maxwell Hart) offer such a service.

There are no options available for disposing of unwanted concentrate. An authorised waste disposal contractor is the only route available for this job. Remember, it is a breach of the Pesticides Regulations to store non-approved pesticides and this includes old wood preservatives.

The options for disposing of tank washings also become a problem when looked at in the context of the golf course. The options of constructing a soakaway or using a 'designated area' fall down when you approach your local office of the National Rivers Authority. In general you can expect your local official to be less than enthusiastic! There are units available that will filter the pesticides out of the washings, though these are more suitable to those who use much more pesticide than we do and are also quite expensive to buy.

It is possible to have a specially constructed wash down and rinsing area that drains into a tank which is periodically pumped out and disposed of by a licensed contractor. You will need to take care that rain does not fill the tank by fitting a cover over the drain when not in use. The best method is to spray out the washings on an area compatible with the product label approval, for example if greens have been sprayed with a selective weed-killer, the rinsings and tank washings can then be sprayed on the fairway. In certain circumstances the tank washings can be re-used for another spraying job providing the same product is to be used again. If the washings are to be re-used they must be kept in a sealed container properly labelled to avoid misuse.

The new edition of the Amenity Code of Practice for the use of Approved Pesticides is in the process of being revised and reprinted. It will contain advice on how the job of using

# How to create your own policy on handling chemical waste

some pesticides is now subject to risk assessments under the COSHH Regulations and having a copy of this Code of Practice is an essential first step in forming a policy on the handling of chemical waste. Copies will be available from the NTC in the autumn, with details appearing in this magazine.

There is a lot of concern about the pollution of water and the NRA is responsible for enforcing the new Regulations under the Water Act and the Pesticides Regulations. The very new Environment Protection Act will also have an impact for users of potential pollutants of any kind.

To avoid the risk of prosecution under one or all of the Regulations now in force, make sure you have a clearly written policy on how you will tackle the problem of disposals. Before you establish your policy make a draft and consult those listed in the Code of Practice. After their comments have been taken into account, introduce the policy to your staff and make sure they follow it. It will be necessary to carry out periodic checks to make sure the policy is being carried out correctly – don't assume that staff will follow it to the letter!

● Jon Allbutt will be presenting his highly informative lectures on COSHH and the Food and Environment Protection Act at BIGGA Management Courses in November.

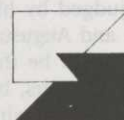
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58

■ Your informative reply to Barry Moggridge's letter (March issue) regarding employment in the USA prompts me to pose a similar question regarding employment in Canada.

My work and qualifications are near identical to those of Barry and, like him, I'm travelling abroad in the autumn for a holiday. My destination is Toronto, where I have aspirations of obtaining work in the near future.

After reading your reply I became concerned about the 'green card' issue and whether such restrictions apply to Canada.

Please advise me and if possible give information on jobs available or organisations I may contact.

**PAUL McGRILL** Ashton-in-Makerfield Golf Club

*Discussing Paul's request with the Canadian High Commission, I learned that similar restrictions to those in the USA also apply. A Canadian Country Club employer seeking to recruit emigrant staff must first satisfy the Canadian Employment Centre that stringent efforts have been made to fill a specific post with a native born Canadian and that such efforts have failed. Only when this is proved beyond doubt will the Canadian High Commission in Britain entertain an application, which must then be accompanied by an "Employer Validation Certificate", in effect a form of employer sponsorship. Exceptions are made for the recruitment of specialists in world-wide short supply and include such as nurses, midwives and some doctors. Having a blood relative resident in Canada does also help, though is by no means a guarantee. With the Canadian turfgrass industry applying similar management techniques to those employed in the USA, it seems the odds are stacked against an emigrant applicant.*

■ I feel I must respond to 'Mr Scargill's' letter in the April issue. First, I do not think the committee set-up at Mr Carr's Club has anything to do with attending lectures. Until this year all Northern Section lectures were held in the evening, but this year we tried afternoon lectures and they were poorly attended. Of course we greenkeepers work strange hours, but surely no work is pressing enough to keep a greenkeeper out on his course at 8pm on a January evening!

Second, does anyone, or should anyone, get expenses for attending lectures? I certainly do not and would not expect payment for what is partly a social outing anyway.

Third, concerning travel from remote areas: we've had members travelling from as far afield as Hull and Lincoln, which is a credit to them for making the effort.

As for waiting 13 years for a toilet to be installed, where does the fault lie? It is the responsibility of every employer BY LAW to provide washing and toilet facilities for staff members. If Mr Scargill's toilet flushes I assume mains water is available, so the solution to proper washing – a hot water geyser costing about £50 – is there. Where, I wonder, does Mr Scargill wash after spraying? What would happen if there was a spillage? It is not only the fault of the Club, but also the responsibility of the head greenkeeper to ensure these facilities are provided for his staff. Committees are sometimes blamed for things of which they are unaware and it is incumbent upon head greenkeepers to present in a proper and professional manner the details of their employers obligations.

Mr Scargill, has your Club got a written Safety Policy document, a visible copy of the Factories Act, Contracts of Employment, copies of Insurance Liability, protective clothing, first aid kits, fire extinguishers, an accident book, a spraying log book, COSHH assessments, chemical inventory, safety signs and proper chemical storage? All these MUST be provided, to be seen and used, AT EVERY PLACE OF WORK. If yours is not the case, I suggest a written report to committee may help, or a telephone call to your local Health and Safety Officer.

**BOB LUPTON** Secretary Northern Section

■ The advent of imported bark fumigated with the pesticide methyl bromide

# Letters

is causing increased anxiety amongst both purchasers and suppliers of naturally processed home produced barks. As a major handler of solely British bark from sustainable resource forests which is naturally processed, I feel it is important to draw attention to this controversial issue.

Imports of bark are banned under Britain's plant health organisations. However, it appears that if it is proved to the Forestry Commission's satisfaction that the product does not present a plant health risk to British forests, the Commission has the power to grant licences to import normally prohibited material. So, to ensure there is no such risk, the imported bark is fumigated, before being landed, with methyl bromide gas to kill any insect or fungal infestation.

As I see it, this is an act of environmental vandalism. It is contaminating an otherwise sound natural product with a poison, a halogenated hydrocarbon – the same family in fact as CFCs. Methyl bromide is toxic and leaves residues on organic materials and bark thus treated cannot be accepted as wholly natural. Certainly the Soil Association will not endorse it as such.

In the current climate of environmental awareness untreated British bark must be the preferred product, but how can the buyer know which is treated with pesticides and which is not?

We feel strongly that products should pass an environmental audit to prove them ecologically sound in terms of origin, process and use and guarantee that our bark is free of any chemical additives. It is hoped that those professional companies with sound environmental ethics will make similar statements. Buyers should ask for written guarantees to state that the bark has not been treated or mixed with methyl bromide or any other harmful chemicals.

Imported bark may make economic sense but environmentally, while it is chemically treated, it is simply unacceptable.

**JOHN LATTER** Melcourt Industries, Gloucester

■ The article appearing in your April issue (Keith McKee on 'Nitrogen versus other nutrients') gives rise to a point on which I must take issue. Because fertiliser rates are the subject of argument, and if printed articles, by Keith or others in the fertiliser industry, are not crystal-clear and accurate, how can the poor greenkeeper, struggling with a flood of information, be expected to discount mis-information?

Okay, Keith would say 'Yes, everyone knows I meant P<sub>2</sub>O<sub>5</sub>'. But he and your excellent magazine (as a source of reliable information) should be as near perfect as possible. The expression of phosphorus and potassium content needs care in the use of the elemental symbols P and K. They can be used by themselves in text as abbreviations for phosphorus and potassium respectively. But when used with numerals, as in '5 kg/ha P' or '6 oz/yd 2 K' they relate (or should relate!) to the quantity of the pure element, as opposed to the oxides P<sub>2</sub>O<sub>5</sub> (phosphate) and K<sub>2</sub>O (potash) which are the usual forms for expressing fertiliser content. The factors for converting units P to units P<sub>2</sub>O<sub>5</sub>, etc., are:

$$P \times 2.29 = P_2O_5 : P_2O_5 \times 0.44 = P$$

$$K \times 1.21 = K_2O : K_2O \times 0.83 = K$$

If your magazine was not so good I'd not bother. It's only because of the trust it generates that I want to see reliability on this point!

**JOHN SHILDRICK**

*John Shildrick is Chief Executive of The National Turfgrass Council.*

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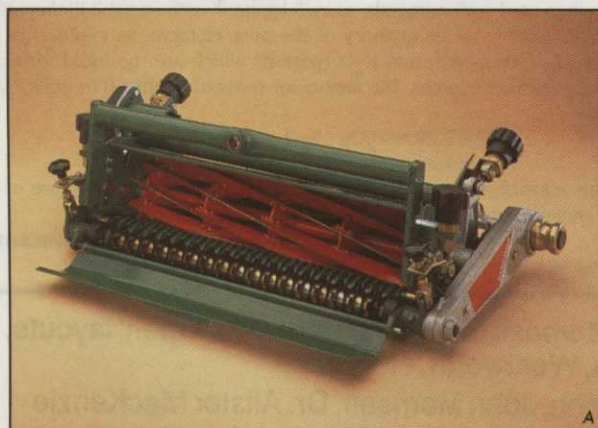
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the air oxygen can no longer keep the soil sweet. Locking oxygen out of the soil, making it too dense for roots to grow. Water can no longer drain through the soil, which adds to the problem as it becomes stagnant.

Water can't be drawn up through the soil by capillary action to supply the plant's requirements. The grass roots are now in a hostile environment and start to retreat towards the surface. The plant can no longer draw and will begin to lose its healthy green colour. The technical term for this is chlorotic.

If nothing is done to correct the basic problem it becomes tempting for clubs to treat the symptoms. More water is required to keep shallow roots alive. Since shallow roots find it difficult to obtain food, fertiliser is applied. This will give a temporary boost but does not solve the problem.

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46

# A VERY

How to win the battle against compaction:  
a Greenkeeper International special report

One of the major battles every greenkeeper must win if he is to gain the respect of his employers and Club members is the battle against compaction. We hear so much these days about compaction and its associated problems that it is important for our members to understand precisely what is meant by compaction, how it affects our courses, and what can be done to alleviate it.

First, let us identify the problem. Plants have basic requirements if they are to thrive: food, water, warmth and light are all obvious and readily spring to mind. In addition to this they require the right growing medium. This usually means soil. Soil should be open and contain a high proportion of air as healthy plants require oxygen within the root zones. These air gaps and pockets provide the passageways through which water can easily move and be stored. This aids both drainage and irrigation. It is also through these gaps that the plant pushes its root systems.

Compaction exists within the soil when it has been pressed together, causing these air gaps and pockets to close. As soon as compaction starts, the micro-environment within the soil moves in a downward spiral. Having closed the air gaps, oxygen can no longer keep the soil sweet. Decaying organic matter gives off methane, which will now remain locked in the soil, making it sour. Water can no longer drain through the soil, which adds to this problem as it becomes stagnant.

Neither can the water be drawn up through the soil by capillary action to supply the plants' requirements. The grass roots are now in a hostile environment and start to retreat towards the surface. The plant can no longer thrive and will begin to lose its healthy green colour. The technical term for this is chlorotic.

If nothing is done to correct the basic problem it becomes tempting for Clubs to treat the symptoms. More water is required to keep shallow rooted grasses alive. Since shallow roots find it difficult to obtain food, fertiliser is also applied, and as every greenkeeper will tell you, we now have the classic situation for a build-up of thatch. If allowed to continue, the thatch will cause the soil to dry out even more.

The root zones will become even more shallow until they almost only exist within their own layer of thatch. This causes a root break, where the turf on the greens is often not attached to the soil layer at all. More water and more fertiliser is required to keep the grass alive, and so the spiral continues.

By now the ideal environment has been created for the build up of various bugs and diseases which tend to survive in the sour damp micro-climate of thatch. The most obvious of these is fusarium, although there are several others which can be just as devastating. At this point many a strong man has been known to go weak at the knees, but let us not despair. Rather let us ask ourselves a few questions which may help us to avoid getting to this point, or if we are already there, help us to reverse the cycle.

The first question is: 'What causes compaction?' The answer is traffic. Traffic through construction, traffic through maintenance and traffic through play. While there is little that may be done about traffic in construction, there is a great deal which can be done by greenkeepers and the Club to reduce unnecessary maintenance and play traffic. It seems obvious to us that players and maintenance vehicles should be kept to the proper paths and walk-ways. However, greenkeepers often complain that golfers ignore barriers and signs, but I wonder how often they are set a bad example by green staff sometimes riding unneces-

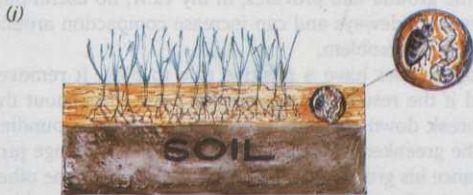




# PRESSING PROBLEM



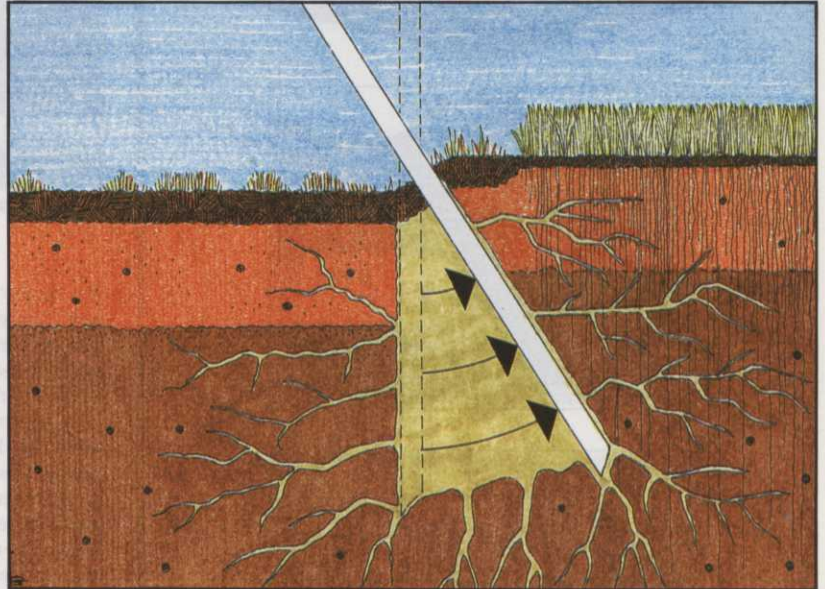
Air channels are closed; the air is forced out and water can no longer move freely in the soil



A micro climate is created within the thatch layer where pests and diseases thrive

sarily over the grass on tractors and turf maintenance vehicles? Good communications are important, and it may be that greenkeepers need to explain just how much damage can be done if selfish players do not obey the course rules.

Having said all this, it has to be acknowledged that most



The action of a Verti-Drain

courses are being subjected to an amount of play which is far in excess of anything imagined even ten years ago, let alone when many courses were built, possibly over a hundred years ago.

Having identified compaction and its causes, what can be done to alleviate the problem? The answer is a great deal.

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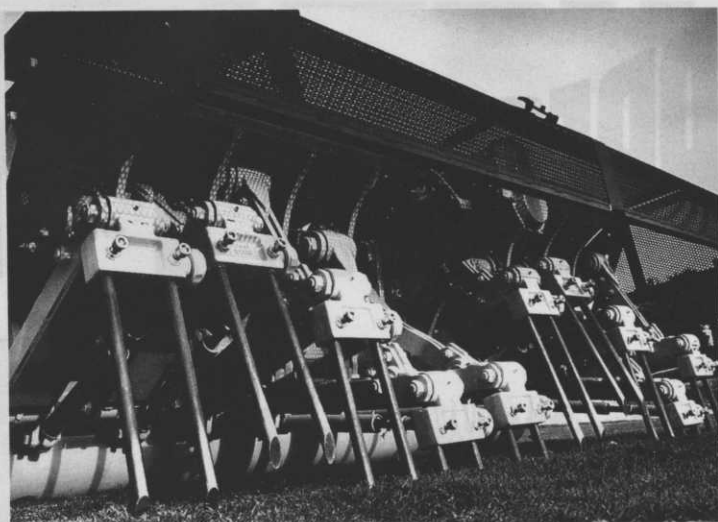
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The Verti-Drain – a powerful tool

In the past many different systems of cultivation have been devised and used. These include solid, hollow, and slit tining. Solid tining is simply driving a spiked shape tine into the ground and provides, in my view, no useful purpose whatsoever. It forces soil sideways and can increase compaction around the hole rather than alleviate the problem.

By contrast, hollow coring does have a positive role to play. It removes some thatch and soil and if the resultant holes are left open throughout the winter, frost again can break down the hole sides, helping the surrounding soil to open up. Should the greenkeeper wish to conduct a soil exchange programme, because for instance his greens have been built on clay or some other unsuitable matter, he can simply remove the cones and replace them with a suitable top dressing. The depth of hollow tining is of paramount importance when carrying out such an operation, and a machine capable of penetrating the soil up to eight inches or more should be used.

Slit tining also has its benefits. Deep slitting in the autumn connects the surface of the soil to the drainage layers. This helps to take away any heavy winter rain and, in the same way, fine slitting in the spring and summer ensures that rain and irrigation soaks through the turf rather than being shed sideways by the thatch. Slitting is also a useful means of root pruning rhizomes and stolons.

In recent years the appearance of the Verti-Drain has transformed compaction relief by using its unique shatter tining action. This machine penetrates the ground up to 16 inches deep, piercing any pan which may exist. The tines then heave the soil, cracking up the compaction before they are withdrawn. This heaving action lifts the soil in a uniform manner, the lift representing the amount of air that has been incorporated into the ground. Like most machines, the Verti-Drain has to be used conscientiously, and soil conditions need to be taken into account. The operation should be undertaken at an intensity of hole spacings and to a depth which is consistent with the greenkeeper's maintenance programme. It may be that the greenkeeper would wish to start at, say, four inch centres going down to a six inch depth and progressively increase the depth as well as decrease the distance between centres. Such a programme may well be necessary if the greens have a root break. In such circumstances the surface of the soil needs to be opened up so that the grass carpet can anchor itself to the soil before a more vigorous treatment is attempted.

Whichever method of compaction relief is used, it is important for greenkeepers and Clubs alike to realise that the benefit is not indefinite, and that it will be necessary for them to continue with their compaction relief programme as long as their courses are extensively played.

Finally, let us consider our objective, which is to have a healthy grass cover despite the excessive wear and possible drought conditions which we are experiencing. Open friable soil should enable the right grasses to put down deep rooting systems which can obtain moisture in all but the worst drought conditions. These deep rooting grasses should be able to sustain heavy wear and regenerate growth after intensive play. Using the right machinery at the right time can assist every greenkeeper in achieving this objective.

**'Whichever method of compaction relief is used, it is important for greenkeepers and Clubs alike to realise that the benefit is not indefinite, and that it will be necessary to continue with their compaction relief programme as long as their courses are extensively played'**