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CONTENTS

	Page
TEE SHOTS	4
SURFACE DRAINAGE— NEW TECHNIQUES G. G. Fisher	7
1974 ANNUAL TOURNAMENT	17
FRIGHT—Patrick Smartt	19
NEWS	23
TREES FOR GOLF COURSES	28
ARTIFICIAL TURF ON GOLF COURSES	30
NEWS FROM THE SECTIONS	35

Front Cover Picture

An example of the Astroturf tee. See article on page 30.

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TEE SHOTS

GOLF COURSE SUPERINTENDENTS' ASSOCIATION OF AMERICA 1974 CONFERENCE AND SHOW, ANAHEIM, CALIFORNIA

The name Anaheim has a surprising Teutonic ring in an area not far from Mexico. But surprise does not stop there. My bedroom in the Disneyland Hotel overlooked 110 acres of car park, a monorail station, three lines of electricity pylons and a banana tree.

This plantain figured frequently in the tropical landscape surrounding the hotel and tended by a Dane from the Tivoli Gardens in Copenhagen. Surprise again!

The American golf course superintendent must however either be more accustomed to these distractions or more dedicated to the job in hand. There was no lack of attendance at the six educational assemblies which

provided the meat in the GCSAA 45th International Turfgrass Conference and Show from February 10th to 15th. But this for once was no surprise.

Speakers well-known on both sides of the Atlantic punctuated the programme — Dr. Fred Gray, Bob Mitchell, Tom Mascaro, Alexander Radko—to name only a few. Frank Lamphier, after recovering from a sore throat, talked about the Ransomes' International Tournament and the B.G.G.A. Symposium at Ipswich in October with a series of slides about the trip. Excellent colour slides also illustrated a lecture by Tom Mascaro, who was so impressive at that symposium, and had lost none of his polish meanwhile.

The Exhibition seemed bigger than ever. Certainly there were more Ransomes' 5/7 Hydraulic gangs on view than last year at Boston and every other conceivable machine was to be seen.

I spoke to Dick Skogley from Rhode Island (who will be back in Europe on a sabbatical this year) Leon St. Pierre from the New England G.C.S.A., and David Gourlay, President of the Canadian Golf Course Superintendents Association. I also saw several visitors from New Zealand and Guy Catchpole, Ransomes' General Marketing Manager. Clifford Wagoner finished his presidential year of office in great style and I was grateful to him and the G.C.S.A.A. for their hospitality.



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SURFACE DRAINAGE— NEW TECHNIQUES

G. G. FISHER

Gordon Fisher is B.Sc., of the University College of Wales. Following this experience he went down to be Advisory Officer with the Sports Turf Research Institute at Bingley. He spent the next 15 years at Fisons both at home and overseas and is now a director of the Cambridge Soil Services and a professional turf consultant. He spends a good deal of his time testing materials and devising products for Government and Industry.

The Importance of Surface Drainage

Surface Drainage is basically a question of increasing drainage in regard to both the speed and quantity of water draining from the surface to the sub soil, that area which has tended so much in the past to be a missing link. Excellent drainage from tile system down below, plenty of water on the top, but no effective link between. Now it is largely speed of drainage, speed of surface drainage, which is so important to Golf. You cannot play properly on a wet surface and this is obvious to all; a wet surface whether it is mud or in fact standing water, will not provide the right playing conditions.

Of course, it goes a lot further than that and there is the question of producing the right sort of grass surface both in quality and quantity. In quantity you want to maintain 100% cover; you don't want bare ground, and you don't want 50% cover, but this is what the wet surface can so often produce. Perhaps even more we should think about the quality of the turf which can arise from putting up with a wet surface. As you know, you are trying to maintain grasses of a certain type mostly on fairways or greens. You are trying to maintain the Bents and Fescues, you are trying to put up with, or if you can, eliminate the *Poa Annua*s and you don't want perennial rye grasses in most situations. But the wet surface is the one which will encourage an annual meadow grass, perennial rye grass type of sward as opposed to the one which you want, which is more usually Fescues or even *Poa pretensis*. Smooth stalked meadow grass is a rather more favourable grass and here again, it is very much more at home on a dry surface than the wet one.

A further reason for the importance of surface drainage on the golf course is to produce uniformity. A considerable part of the battle of maintaining turf is producing uniform penetration,

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and a uniform result across the surface of a green or across a fairway. This applies to penetration of water, nutrients, fertilisers, etc. It applies to the production of thatch or heavy surface mats, which as you know, tend to occur in isolated places, and alongside. You may get areas without any surface fibre full of worms, full of coarse grasses, full of weeds, and it is this lack of uniformity which will often cause a low quality in many turfs.

Finally, surface drainage is important in countering increased precipitation and increased wear. I say precipitation advisedly rather than rainfall, because these days, apart from our rain and snow, we put so much water on artificially, so that whereas you may have a natural rainfall in the area of 20 to 35 inches, yet with constant watering these days, you are perhaps doubling these figures and this has to be borne in mind as a need for much better drainage through the surface, to get rid of these increased quantities of water. Also there is the question of countering the increased wear. I think we can safely assume that the vast majority of clubs have had a vast increase in the number of members over the last 10 years. This means increased traffic, increased wear, increased compaction, and you need a better surface drainage to counter that.

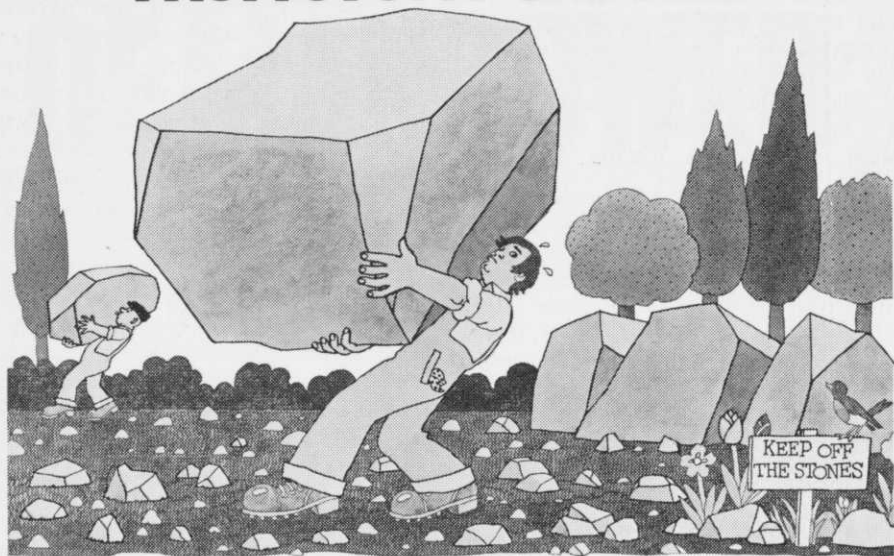
Before we go to the question of how to achieve this surface drainage we should mention that the drainage from the sub-soil is of course fundamental. It is no use going into measures for improving the surface drainage until you have effective drainage from the sub-soil. This may be a natural permeable material below, more often it means an adequate clay tile or plastic tube system. The point is, of course, that it is no use putting surface measures in such as sand slits and having them fill up with water with nowhere to go.

As to the actual techniques of achieving surface drainage, the ideal method of course, is to treat the soil profile in depth. Most of the early links were put on sand dunes and there you have a free natural drainage, which generally speaking, is satisfactory at all times of the year. That is natural permeability. These days if you are building golf courses in other situations you will nearly always build up a soil profile with a permeable layer at the base of coarse sand, and on the surface, usually a mixture of sand, peat and a certain amount of soil according to the permeabilities which are desired and can be achieved. One can say in such cases that you have one big sand slit and there is no need to go to extra measures to improve it, because you have got a built-in permeability right from the start. More and more golf greens are being built in this way but the cost is considerable. £10—£15,000 per acre is necessary to build up a profile in this way. A typical profile to be used on a football field will have more sand and blinding under the soil layer which is mostly sand and peat to ensure a quick draining profile. An even more permeable profile is possible with 24" sand, then a layer of sand and peat only, with no soil. This was done in Sweden but one must remember that this profile takes longer to establish a grass sward in these very permeable conditions.

Sand Slitting

Most of you have to deal with the existing conditions and apart from the expense of improvement, there is the interruption to play which cannot easily be tolerated. Therefore the question of sand slits as a means of improving surface drainage has been

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