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TEE SHOTS

by the Editor

Minchinhampton Golf Club in the Cotswolds is proposing to purchase 130 acres for a second 18 holes. But the scheme envisages maintaining the present golf course, which is on common land and crossed by several roads. This would be kept open for those wanting an occasional round or to learn how to play the game. If the scheme goes through, Minchinhampton will be the first golf club in Gloucestershire to have 36 holes.

Wigtown and Bladnock Golf Club in Scotland have decided to buy their golf course, which is now owned by the Town Council. The Council is asking £3,750, so it looks a good bargain.

Teignmouth Golf Club's professional, Leslie Dymond, received a little-known trophy last month. He is now the Plymouth Gin Professional of the Year. Mr Dymond has served the club for more than 40 years.

Berwick Town Council has accepted in principle a scheme to develop the present Magdalene Fields Golf Course into 18 holes.

A West of Scotland golfer who has an artificial leg bought himself an electric buggy and got his club's permission to use it on the golf course. Unfortunately, a public road crosses the course and the buggy had to be licensed for the road at a cost of £10.

John Reece, writing in the Western Daily Press, described how one well-known Bristol golfer, Bob Williams of Knowle, recently surprised fellow members by announcing that he was going to clean his clubs. George Gunston did his best to dissaude him. " They'll fall apart, Bob," he said. Bob took all his iron clubs and disappeared in search of a bucket of water. When he returned he was excited. His clubs gleamed. " Look at this," he said, " the thing I have been using as a two-iron is really a five ! Oh, watch me shake these chaps from now on."

Troon Old Golf Course has brought a new green into service as the first of a series of improvements in readiness for the 1973 Open Championship.

DRAINAGE AND THE USE OF CLAY TILES

by A. L. TURNER

Land drainage is a very expensive business—it is worth while being particular about the details because the work is buried and out of sight and things that go wrong cause much additional expense and trouble. So I make no apology for commenting upon some matters which may appear trivial, viz. the gap between pipes and the "porosity" of land drains.

The gap between 12 in. lengths of agricultural land-tile-drain-pipes when laid as lateral drains. This has been the subject of a number of scientific studies and some of these are:—

"The Hydraulic Comparison of Land Drains and the Determination of Effective Diameters" by A. N. Ede in the Journal of Agricultural Engineering Research Vol. 3. No. 1—1958. Among other things this examined the "relative discharge data for variously gapped, spaced and perforated drains".

As to the effectiveness of drains laid with varying gaps he says "The gap width is only of material significance below widths of 1/20 in.; a tenfold increase to a gap of $\frac{1}{2}$ in. leads only to a 10% increase in discharge," and he concludes "the size of the gaps between drains of normal length or longer has very little influence on performance and any gap of 1/20 in. is relatively good. For drains of ordinary roughness this infers, in effect, a butt joint." You will note the qualification "of ordinary roughness"—there may be tiles on the market which have been burnt so well and are so accurately manufactured as to produce almost a watertight butt joint, but these, I suspect, are unusual and conditions for getting a "perfect" joint in the ground would also be uncommon.

"Potential Flow into Circumferential Openings in Drain Tubes" by Don Kirkham. Journal of Applied Physics No. 21, 1950.

This paper gives a theoretical analysis of the effect of the spaces between drain tube units as used in artificial drainage of soils. The basic problem solved is that for axially symmetric flow from an external cylindrical boundary at constant potential to a series of equal, equally spaced openings at a lower potential, all located axially on, and comprising a part of, the otherwise impermeable drain tube. The analysis shows, for example, in the case of 6 in. diameter drain tubes having 1 ft. long impermeable sections and buried 4 ft. deep in uniformally permeable soil, that increasing the openings from 1/32 in. width to $\frac{1}{4}$ in. will increase the flow 36%, while embedding the tubes in gravel to make the 1/32 in. openings of effectively infinite width will increase the flow 180%. The discussion in this paper further considers the effect of differences between widths of 1/64 in. to as much as $\frac{1}{4}$ in. and concludes that if the tubes are embedded in gravel the open spaces become effectively infinite—this is a consequence of the negligible loss of lead which results when water seeps through gravel as compared with water seeping through soil.

"Drainage of Agricultural Lands" in the Section on Subsurface Drains by G.O. Schwabe, 1957.

Mr Schwabe concludes that for practical purposes data shows that doubling the crack width will increase the flow of approximately 10% and that for a $\frac{1}{8}$ in. crack width 50% of the total lead is dissipated within 1 in. of the crack opening; this effect indicates that permeability of the soil and shape of the soil near the crack will greatly influence the flow. Tests on crack width of $\frac{3}{8}$ in.-$\frac{1}{8}$ in. and close (1/32 in.) and $\frac{1}{8}$ in. with gravel envelope indicated that $\frac{3}{8}$ in. gap was too wide, resulting

(*Continued on page 6*)

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in a considerable inflow of soil. Drains with gravel envelopes were more effective in keeping out soil. He recommends $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in stable soils and as close as possible in unstable soils. I would interpret these soils as heavy clay in the former and silts and sands in the latter.

It should be noted that tile drains laid automatically by machinery are invariably laid with close butt joints—the pipes touch each other; vast improvements of water intake occur when gravel surrounds the gaps in the drain, in heavy (clay) land tight butting is less critical than in silt on sandy land.

This is summed up in "Soil and Water Conservation Engineering", page 313: "It is important in laying tile to leave as large a crack width as is permissible as limited by the stability of the soil material." In case of doubt, butt tight.

Generally for average pipes butt joints will in effect leave an opening of about 1/20 in. which is adequate.

Questions have been raised, and in my opinion incorrectly answered, in connection with the "permeability" of tiles. The following comments may be of use. The qualities required of a tile are: (a) high strength (tested as in BSS.1196); (b) low absorption (of water); (c) high resistance to the action of frost; (d) accuracy as to length, cross section, shape, etc.—(these are tested as in BSS.1196).

The burning process by which clay tiles are made approximates to that of brick making. When very high temperatures are reached and when dense clays are used the result is towards complete vitrification—or fusing of the materials. Such tiles are virtually impermeable—that is no water in measurable quantities passes through the sides of the pipe at all. Pipes made of sandy clays, and if imperfectly burnt, will have high absorption and some permeability —and may well be much less frost resistant.

Tiles can be tested for absorption by standing them in a container of water having first placed some plastic or clay waterproof material in the base of the container—a dry tile is then stood on end on this and made watertight at the base. After filling the container and leaving for 48 hours or so, if there is any uptake of water over about 12-15% of the weight of the tile the absorption is high and if water freely passes through the tile is likely to have low strength and be defective. Frost resistance often follows inversely the water absorption trend.

It is essential to distinguish between land drains made of porous concrete and those made of clay (tiles). The former are indeed intended to permit water to pass through the wall of the pipe—tests for this are prescribed in BSS.1194. This is achieved by making them of an aggregate which is not dense and from which most of the fines have been eliminated. (Readers may know of course that tarmacadam tennis courts are designed on the same principles.) Pipes of this sort are called "permeable wall" pipes.

In the literature on design of tile drain systems, nowhere can I find any suggestion that clay tiles *should* be porous—and therefore the comment by the consultant editor on page 36 of No. 6, Vol. 23 of "The Groundsman" must be regarded in my opinion as completely misleading. In good, sound, well-burnt clay tiles water will not penetrate through the "pores of the pipe" in any significant quantities. Pipes salvaged and covered in soil can be reused with every confidence—they should be cleaned off internally and externally and can be as good as new.

It is worthwhile to note as a summary of the discussion above the role of the new plastic drain tubes; both factors are involved—perviousness and gap. These tubes are made of completely impervious material with slots 1.19 mm. wide (about 1/20 of an inch).

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THE GOLFING SUPERINTENDENT

by GEORGE J. CHARLESON
Superintendent, Park Country Club, Buffalo, New York

It has often been said, and rightly so, "It isn't necessary to be a big league ball player to be a major league manager." Does this same axiom hold true regarding a golf course superintendent? e.g.: "One doesn't have to be a golfer in order to be a golf course superintendent." It may be to a certain degree. However, I feel it could be a great asset to be a "golfing superintendent". Now, before everyone retorts with one chorus of—"There are hundreds of turfmen all over the country who grow fine turf and have never hit a golf ball in their lives"—allow me to present my case for a "golfing superintendent".

It must be remembered that golf is a game and is governed by a set of rules. These particular rules are promulgated by the United States Golf Association and the Royal and Ancient Golf Club of St. Andrews, Scotland. Each superintendent should be aware of them, but the golfing superintendent is bound to become more familiar with them and the reasons behind them.

Of the many rules which come to mind, one often overlooked by a non-golfer is the teeing ground. This is defined as a rectangular area two club lengths in depth, the front and sides of which are defined by two markers. In other words, when placing the tee markers, prior to the start of a day's play, it is necessary to remember that a player has the right to use the area two club lengths behind the markers. Thus, it is important to remember that when placing the markers near the rear of the tee, enough room must be left for these two club lengths.

Another rule not familiar to many non-playing superintendents is, "In placing a cup, the liner should be set at least one inch below the putting green surface". The reason is fairly obvious. It allows a well-hit putt to drop into the hole, rather than strike the liner and bounce away. As a golfer, the superintendent becomes very conscious of this rule and is ready to correct any infractions on his own course. Having played shots to various parts of the greens, he becomes more aware of the most desirable pin locations. This awareness helps provide for a fairer, more interesting and enjoyable test of golf for his club members. It also can serve as a means of more evenly directing the flow of traffic over the green.

A golfing superintendent has one more distinct advantage and this is strictly defensive. On countless occasions he must listen to the various complaints of the golfing fraternity—"The greens are so fast,—so slow,—so hard, —so soft,—so long,—or so short." He may hear, "The ball sits on the green too low" or, "The fairways are cut too short and I can't hit a wood off such a tight lie". Undoubtedly these all sound too familiar to superintendents. (Remember, golfers are human beings and, as such, are quick to blame most anything, including the superintendent, for a poor game.) However, *through personal experience as a golfer*, the superintendent is able to evaluate the legitimacy of these complaints.

Perhaps the greens are slowing down, or a grain is beginning to creep in, or they are a bit too firm. As a golfer, he looks at the situation with the maintenance view of the superintendent and the "player" view of the golfer as well. Thus, a touchy situation can be remedied before the general membership starts to complain and he is able to stay one step ahead of another headache.

Golf is good business

It is a generally accepted fact that most large and successful companies place their executives and salesmen in country clubs throughout the States. One may ask why this is done. There

(*Continued on page* 10)

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are many answers to this question. However, it is felt that the golf course is regarded as an ideal place to entertain prospective clients, thus helping to promote good public relations. It is also felt that business may soar while relaxing in the pleasant surroundings of a golf course.

If big business thinks so highly of golf for promoting business and relations, shouldn't the golf course superintendent? He has the greatest access to the "place of business". The golfing superintendent can make the golf course his meeting place for his green chairman and/or committee. He is able, during the course of a relaxing round of golf, to point out first-hand his needs in the maintenance of their golf course. It is amazing how much more understanding a committee can be when viewing problems "at the scene", as opposed to discussing them in the board room of the clubhouse. In addition, golf provides an opportunity for the superintendent to meet the committee on an equal basis, rather than the usual employer-employee basis.

"He just cuts grass . . ."

The golfing superintendent will become better known to the membership and a little more respected because of a common interest in the game. This may help to eliminate the feeling among many that anyone connected with golf course maintenance "just cuts grass". Another point to consider is the changing of the Green Committee Chairman. Every superintendent who has experienced this change realizes that each one may well be a frustrated golf course architect. Many have their own pet projects, such as redesigning a certain hole or trap or—perhaps—the entire golf course! A superintendent can explain the varied problems of maintenance connected with his proposals. However, as a golfer, he can view them from both angles and speak and act more intelligently regarding them. As a golfing superintendent, he shall approach any question with an open mind. This enables him to work at his vocation and be looked upon by his chairman as a professional turf specialist.

This is not meant to imply good golf course superintendents now and in years gone by have not, or will not, play the game. However, it may be well to remember . . . "Maybe you are standing too close to the forest to see the trees". Golf can help develop a more versatile and well-rounded superintendent and it may promote more respect for his profession. This, in the long run, may help him to attain a higher professional and economic level.

Let me attest to the fact that golf most assuredly has aided me in my profession and also let me point out one more fact. You may possibly be the recipient of the Championship Trophy at a future GC AA Tournament—all because you made the game part of your job!

With acknowledgements to the "Golf Superintendent"