

Announcements

FIRST MEETING OF THE DELEGATES TO THE GREEN SECTION OF THE U. S. GOLF ASSOCIATION.

There will be a meeting of delegates to the Green Section of the U. S. Golf Association at the Wardman Park Hotel, Washington, D. C., between July 19 and 22. The exact date of the meeting will be announced on the bulletin board of the Columbia Country Club the first day of the Open Championship. Look for the notice and don't make any dates until you see it. There are many important subjects to be discussed relative to the work of the Green Section, and every delegate to the Section should be present.

Any member of a subscribing club, even though not a delegate, who is interested in the work of the Green Section, will be welcome.

TURF BY VEGETATIVE PROPAGATION.

Recently attention has been called by the press to the vegetative method of propagating turf of the bent grasses for putting greens. The statements that have been made are for the most part inadequate and leave the reader somewhat misinformed with regard to the more important features of the method. In view of this the Green Committee wishes to announce that the July issue of the Bulletin will contain an article in which the subject of the vegetative propagation of turf will be discussed in full detail.

How We Solved the Problem of Good Fairway Turf at Pine Valley

ALAN D. WILSON

Pine Valley, to be entirely Irish, is made up of hills—big, bold, sandy hills which some freak of nature has pushed up from the level Jersey plain by which it is surrounded. Small lakes lie among them, and when George Crump, while on a shooting trip, first discovered the country, it was covered with a dense growth of pine and oak. After eight years of experiment and effort, we now have good playable fairways with plenty of fescue and bluegrass; but it is still far from perfect turf. We think we are on the right road, however, and can report very real progress.

Few people would have had the vision to see a golf course in such surroundings, and fewer still the courage to start to make one in the face of such serious obstacles. Thousands of trees had to be cut, and, worse still, the stumps had to be pulled. The sand was beautiful, clean, gray sea sand, just such as you see fifty yards back from the surf along the Jersey coast. Perfect mounds and bunkers ready made, everywhere. No mud, no dust, the best of all soil for golf, but, by that same token, little or no food for plant life and nothing to hold moisture. And so Crump faced the problem of how to make grass grow in the sands of Pine Valley.

The first eight fairways built were covered with manure, and this was

worked well into the ground with disc harrows. The ground was well cross-harrowed, raked, and then seeded with sheep and red fescue. The seed germinated quickly, grew beautifully and everything promised well, although the grass was somewhat sparse and a lot of wash took place after every heavy rainfall.

It was hoped that these were youthful troubles which maturity would cure, but when the first hot dry summer came, the dream was shattered. The grass grew brown, curled up, and large areas of it died. These were refertilized and reseeded and the whole course given a winter covering of manure. In the spring, disc or chain harrows were used, seed and top dressings put on, sometimes of humus, sometimes of mushroom soil, sometimes of bone meal. In a constant effort to enrich the soil, everything was tried.

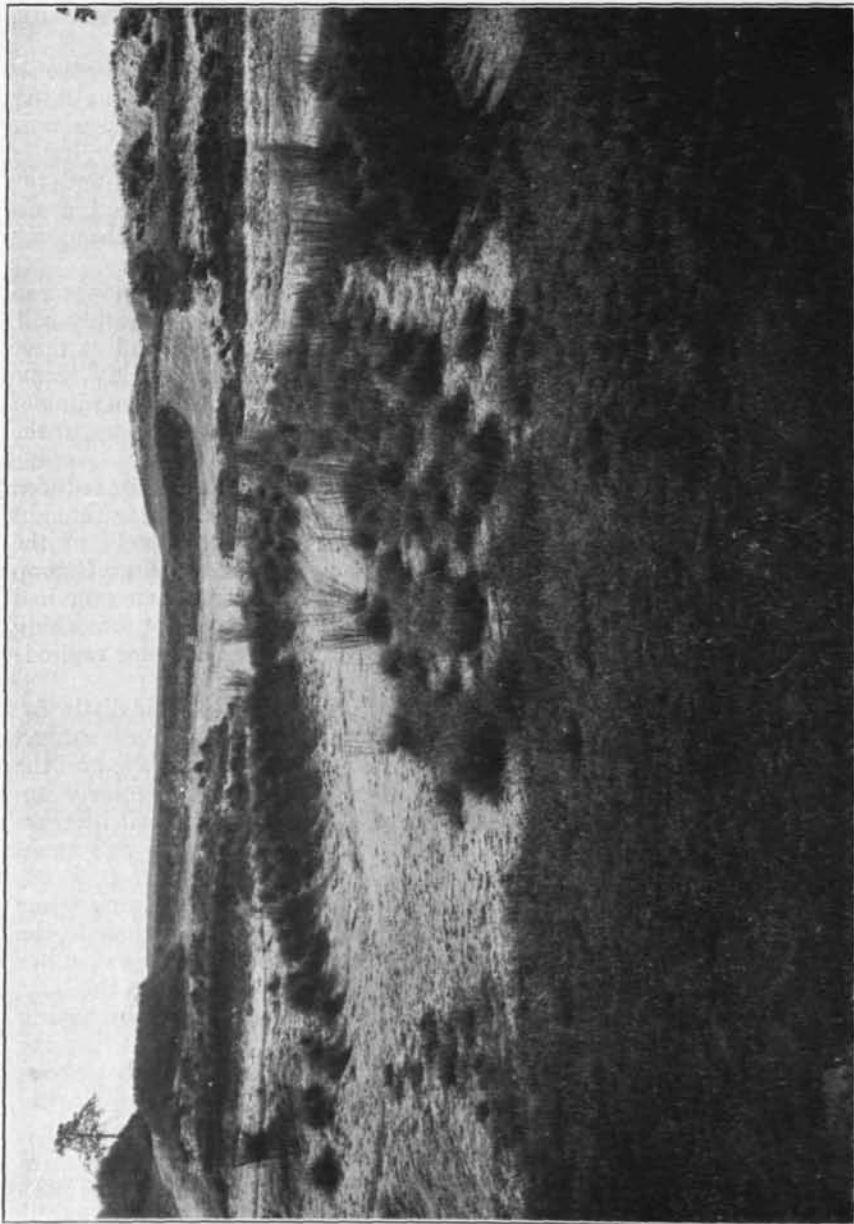
During cool, wet summers, great progress was made and hopes ran high. The fescue grasses behaved as is their natural habit in a sandy soil, and grew in tussocks, leaving bare patches of sand between; and as these had no grass roots to hold the soil, the wash of the rains quickly transformed them into little cuppy hollows. The fairways looked green; but of course the ball seldom stopped on a tussock, usually finding its way to the little hollows between.

It was essential that in some way the grass should be coerced or seduced into growing in these hollows and making a solid mat, and it was thought that this would be accomplished by just a little more enrichment of the soil. Manure was always on the course at this period, and George Crump could never get enough. Once an admiring friend—and no man ever had or deserved to have more of them—asked him if there was not something he really wanted for a Christmas present, to which George at once replied: "Why, yes; a carload of manure."

The constant fertilization helped the existing grass but did little for the bare patches; for as soon as a heavy rain came the manure washed away from them, and if we had no rain it dried up and blew away; and the same thing happened to seed and top-dressing, which were regularly applied twice a year. The net result was progress, but only a small increase in grass for the large effort spent. Again a dry summer came and again the grass simply faded away.

A water system of 120 gallons a minute had been installed, and while it saved the greens, it did not leave enough water to be of much use to the fairways. It was, of course, realized that in using the manure and other materials as a top-dressing, we were putting it where it would do the least good; that we were not only losing a large percentage of its value by having it wash or dry out and blow away, but, worse still, we were inducing the roots of the grass to seek food near the surface, when we should have been forcing them to go deep, the only place of safety in a sandy soil during our hot dry summers.

There seemed no way to accomplish this in the holes already built unless they were ploughed up; but all the remaining holes as they were constructed were covered very heavily with manure and this was ploughed under before seeding. This proved a distinct improvement in method and produced much more vigorous grass, but still the fescue behaved like fescue in the uncut natural state, and grew in tussocks; and still there were bare patches between, though not nearly so large or so numerous. This method was also used in renewing bad portions on several of the old fairways.



The sandy nature of the soil at Pine Valley is clearly indicated in this close-up view of sand bunkers in front of No. 2 green.

Clay loam brought in from Pennsylvania mixed thoroughly with our own soil, in building several new greens, had proved entirely successful; it produced a perfect putting-green turf.

This then was the situation in January, 1918, when Pine Valley suffered its only real tragedy in the untimely death of George Crump, the man who dreamed it and who had then worked and slaved and succeeded in turning his dream into a wonderful reality for the benefit of those of us who were left—we who had advised so much and helped so little. He had not only done all the work but he was the real spirit and inspiration of Pine Valley, and his sudden death left the club in a peculiarly helpless condition. Fortunately his brother-in-law, Mr. Howard D. Street, took up the burden, and has since acted as secretary of the club and chairman of the green committee.

Early in 1918 a portion of the first fairway was topdressed with a mixture of clay and manure, and in the autumn another portion which had entirely gone to pieces during the summer, was covered with clay and manure, which was ploughed in, and the ground was then seeded. The results were so promising in each case that we wished to go further, but were in doubt as to the proper road.

In the spring of 1919 representatives of the Department of Agriculture were called on for advice, and felt that it was imperative that the sandy soil be given some heavier body to prevent the loss from wash and to hold food and moisture. As it was, the rain ran down through the sand and left no moisture; the top dressing largely washed off or blew away; the grass got little good of either, and the hollows between the tussocks deepened until the roots of the grass were actually exposed.

Two remedies were suggested. First, the radical, and undoubtedly the best plan, had it been practical, of covering all the fairways with four or five inches of clay and manure compost, ploughing it in deep, reseeding, and starting afresh. This would have put the clay and manure just where they would have done the most good, *i. e.*, several inches under ground, and the roots of the grass would have been forced to grow down if they wanted food and water—the only safety for grass roots in a hot, dry climate and a sandy soil. But this meant putting the entire course out of play for at least a year. The second remedy was to seed with a quickly growing grass and topdress in spring and fall with a compost of clay and manure, in the hope that the clay would fill the hollows between the tussocks of fescue; that the quickly growing grass would root in the clay, thereby keeping it from washing away, and that the clay would work down into the sand, just as sand goes down when applied to greens on a clay soil.

We tried the first method on one entire fairway—our worst—and on hopeless spots of others. The second we employed on all the rest of the course. Both methods have been entirely successful. The first is a big undertaking, but it is, we believe, the logical answer, for it forces the grass roots to go deep, and therein lies safety. Also, you do it once and for all.

On fairways where we have used both methods, the grass with clay and manure ploughed under has a better color and a more vigorous look in dry weather than the surrounding clay-topdressed grass. Far be it from us, though, to decry the second method, for it has been our salvation and has given us better fairways in two years than we expected to get in four or five.

The hollows between the tussocks have disappeared, the ground no

longer washes unduly, there is a good solid green carpet throughout the course, the clay disappears down into the sand with amazing speed, and it has enabled us to keep the course regularly in play; but it is a constant and expensive work and the end is not yet. We will certainly have to continue spring and fall topdressings for three or four years to come, in order to get the same result which, by ploughing in, we would have gotten at once; and it is highly probable that we may have to go on with occasional top dressings of clay, say once a year, for a long time to come.

In the beginning, we were fearful that this clay top dressing would result in mud and detract from the previous joy of playing shots from the light sandy soil; and so at first we put it on only sparingly, one-third clay and two-thirds manure. We found, however, that in a few weeks, if we had some rain, the clay would entirely disappear, and so we increased the amount of clay to one-half. Now we are recommended to try seventy-five per cent clay and twenty-five per cent manure; but when we see the first sign of clay remaining on the surface, it will be the signal to stop until it disappears.

Various grasses were experimented with for use as a "filler" to the red fescue, such as bent, redtop, white and Japanese clover, Kentucky bluegrass, and even crested dog's-tail; and for some strange and to us perfectly unknown reason the blue grass proved by far the best suited to our purpose. It is supposed to like a clay soil with plenty of limestone, yet it thrives with us and acts as if its roots were following our clay topdressing down into the sand in the hope of finding limestone below, while most of the other grasses germinate, grow a while and disappear.

Now, as to methods. As soon as active work is over in the fall, we begin a compost pile on each fairway, clay which has been screened and manure in three-inch layers, about fifty cartloads to a fairway. These are turned several times during the winter. When spring comes, each fairway is given an application of about 750 pounds of fine bone meal, about 50 pounds of seed, red fescue and Kentucky blue grass mixed, and then top-dressed with 50 cartloads of clay compost, which is applied with an ordinary manure spreader. As soon as this is done, new compost piles are made and the treatment, except for the bone meal, is repeated early in September. This means in all about 750 tons of manure and 750 tons of clay a year.

For the sake of economy, we use a local clay, light in character, which contains a fairly large percentage of sand. A heavy clay could hardly be treated in the same way but would probably have to be ground fine and kept dry until application.

The success of the past two years tempts us at times to think "we have solved the problem;" but we recognize that the past two summers have been most unusual in that there has been little hot weather, plentiful rains, and no protracted dry periods—in other words, perfect weather in which to grow grass. Our method is evidently good in favorable seasons; but how will it stand adversity in the shape of a drought? We fully realize that we are still following the lines of the old mistake in putting too much on top of the ground and too little below. This has been forced on us because we did not feel justified in ploughing up the course and putting it out of play for a year; but the fact remains that we are not forcing the roots of the grass to go deep but are encouraging them to stay too near the surface.

The clay we have put on will hold moisture; but have we put on enough

and has it gone deep enough to be useful in really dry weather? This we do not know, and so we are fearful of an unusually dry summer. Certain it is that one week without rain makes our grass lose its color; two weeks turn the fairways completely brown; but where it used to die, one day's rain now makes it green again. The suddenness of the color transformation is amazing. In any event, we do not intend to take a chance on losing our grass if it can be avoided, and so we are now putting in a water system which will give us 500 gallons a minute and which is planned to water all the fairways and to give each square foot of soil a pint of water every other day if needed, and every day in a pinch. This, it is thought, will give a penetration of three inches, which will not only prevent too quick evaporation but will encourage our grass roots to stay down where they belong. With this help we hope to get through even a dry summer, not without damage, but without disaster, and if so we may then be justified in saying we have "solved the problem."

The other turf problems at Pine Valley are chickweed, crab grass, goose grass, pearlwort, brown-spot, moles, divot-making members who never replace, and the grubs of the green beetle. These problems we fight but have never yet solved.

After our struggle to secure good turf in the pure sand at Pine Valley, the sum of our experience is that three things are absolutely necessary to be added to insure success: clay or loam, manure, and a plentiful supply of water. Somewhere in his writings, Horace Hutchinson has said that the ideal soil for golf turf is a sandy soil with a "spit of clay" in it.

From our experience at Pine Valley we now are sure that one can not procure and maintain good golf turf in pure sand without adding the "spit of clay," without manure to give sustenance to the grass, and, *in our climate*, without a plentiful supply of water for both greens and fairways during the summer season. To secure sure success, both the clay and manure must be ploughed deep into the soil before any seeding is done.

After the turf is secured it is necessary to continue topdressings regularly, in order to have a well consolidated, smooth surface to the turf, and to avoid cupping.

It is a very costly undertaking to construct a golf course in a soil of pure sand. But it is wise and economical to spend your funds right in the beginning. It saves years of time; it saves labor, anxieties, and in the long run it saves money. Above all, it insures successful results.

When brought to good condition, it is truly the ideal course for golf, incomparably better in every way than any course constructed on clay soil.

Golf for All

Ex-President Taft in a recent newspaper article (copyrighted by the Public Ledger Co.) says: "Golf has been said to be the game of the rich. This is not true in Scotland, where there are many public golf courses and where working men can play in the long twilights of the summer, morning and evening. There is no reason why it should not be a game for the wage earners and those of little means in this country; and it is most gratifying to note that in many of the large cities free golf courses are being laid out and offered to the public."