TURF AND GOLFING TURF

By REGINALD BEALE, F.L.S.

MY only excuse for writing on this subject is that I have been asked to do so by my good friend the Editor of this magazine, but before getting under way I must present my credentials.

In the first place, I claim to be the pioneer of rapid turf production and the art of greenkeeping as it is now practiced. In support of this I bring forward Sunningdale, which was the first golf course produced from seed and which was sown in September, 1900, and in full play in twelve months' time—a feat then considered more or less miraculous, as at that time it was generally conceded that it took a minimum of three years to form turf of any sort and at least a generation to produce a fine, close-knitted, thick-soled turf, but now commonplace, as I have since produced twenty-five courses from plough to play in less than a year, with a record of five months made at Sandy Lodge.

I have inspected at least 250 established golf courses and prescribed mixtures for not less than 100 new ones standing on all classes of soil, from pure sand to hard clay, in all countries of Europe.

But what has all this to do with turf in the United States of America and the Dominion of Canada? Admittedly very little, excepting that the same thing is required there, *i.e.,* good turf, for the same purpose, the Royal and Ancient Game, but under different geological and climatic conditions.

Until the year 1908, I knew nothing of golf or turf in America and certainly cared less, but that year I had an interesting proposition put before me by the Chairman of the Greens Committee of The Country Club, Brookline, Mass. This Club was extending its course by taking in some thirty acres of new ground; samples of soil were sent to me together with a very accurate description of the climate and instructions to prepare sufficient seed for the greens and fairways. I carried out the instructions to the best of my ability, hoped for the best and awaited results, which were so satisfactory that in 1911 I decided to tour the Eastern States, myself, so that I could thoroughly investigate conditions on the spot.

My tour embraced the golf courses connected with the following clubs—The Country Club (Brookline), Arcola, Baltusrol, Brae-Burn, Chevy Chase, Chicago Golf, Columbia (Washington, D. C.), Detroit, Garden City, Glen Echo (St. Louis), Hackensack, Huntingdon Valley (Philadelphia), Kanawaki (Montreal), Mayfield (Cleveland), Merion, Myopia, Onwentsia, Philadelphia Cricket, Royal Montreal, Shinnecock Hills, Tedesco, the National Golf Links of America, Toronto, Whitemarsh Valley, and many others.

On my second tour, from which I have just returned, I visited Piping Rock, Garden City, Sleepy Hollow, Pine Valley, the New Merion, Atlantic City, Westmoreland (Pittsburgh), Oakwood, Indianapolis, Chicago Golf, Onwentsia, Skokie, Winnetka, Old Elm, Westmoreland (Chicago), Detroit, Mayfield, Wanakah, Rochester, Scarboro' (Toronto), Toronto, Kanawaki, Outremont, and Essex County, and so revisited many old friends, which enabled me to note results and at the same time extend my territory and experience.

By visiting the country, I got an absorbed knowledge of its geological, and more important, the climatic conditions under which one has to grow turf in the Eastern and Central States of America and Canada, and I can now sit in my study chair with closed eyes and picture in my brain the existing normal conditions in those sections any time of the year.

In order to discuss the question of turf intelligently, it is necessary to divide it into two sections, viz., Turf for the Putting Greens, and Turf for the Fair Green.

TURF FOR PUTTING GREENS

It is well to remember at the very start that a modern putting green is artificial both in its make-up and upkeep, consequently it may not be necessary or desirable to choose grasses that are natural to, or thrive best in, a certain district under natural conditions, but rather to choose those that are best suited to the purpose for which they are to be used; this, no doubt, sounds unscientific and all the rest of it, but when all is said and done, science is a good servant but a very bad master, and the man with a good fund of common sense and knowledge of applying same usually gets the better results.

It has always been my opinion and I state it here right boldly, that turf of the best English quality can be developed on putting greens anywhere in the sections of the country covered by my tours, provided that the greens are properly prepared, fertilized, and top-soiled if necessary, so as to form a seed bed of rich, friable soil of a minimum depth of four inches with all undulations fashioned with runaway surface outlets for storm water or melting snow in order to prevent, as far as it is humanly possible, any such accumulations when freezing and thawing conditions alternate and when the natural or artificial drainage, as the case may be, is put out of commission by the frozen subsoil. The so-called winterkill is bound to occur if such methods are not adopted and valuable time and money will be wasted.

A green made on these lines and sown with a mix-

ture of seeds, say for the sake of argument, the Coombe Hill Mixture, should produce turf similar in all respects to that at Coombe Hill in any section of the United States and Canada that I have seen.

In support of my contention that the best English, or perhaps I ought to say British turf, as there is some wonderful stuff in Scotland and Ireland, can be produced in North America, more or less to order, I bring forward the Country Club at Brookline, where they sowed the greens with our Mid Surrey Mixture and have obtained greens equal to those at the Mid Surrey Golf Club, Richmond, England, which means a lot to anyone who has seen Peter Lee's famous productions at the latter club.

The greens at Brookline, especially the 9th, 10th, and 11th, taking them year in and year out, are in my opinion the best in North America, and while I may claim some of the credit of obtaining such results for myself it is only fair to say I should not get it all—I explained how the greens should be made and sown, but if that Club had not seen that my instructions were faithfully carried out, nothing would have been accomplished.

Before leaving the question of greens, I may as well give a few hints on the making and upkeep in tabloid form, so that they can be easily digested.

Always, if possible, arrange for early fall sowing and regard the period between mid-August and mid-September as the selected moment. When the first rains come in the fall the soil is so warm that the seeds germinate very quickly and if sown thickly get well established and self-protecting before the winter sets in.

In the spring the soil is cold and in consequence the seed not only germinates slowly but it also grows slowly and the young grass plants have to face the heat and more especially the drought of the summer when in a very young, weak state, very often with evil results. Also in spring weeds and other obnoxious growths are much more prevalent than in the fall.

When making or contouring a green, remove the top soil, work with the subsoil and finish off by replacing the top soil in an even layer over the green. The separation of the soil and the replacement of the same cannot be done properly by scoops, so it is always advisable that this section of the work should be done by hand with spades and barrows.

All drains should be laid before the top soil is replaced.

In making up greens, each scoop or barrowful as it is shot down, should be carefully trodden; otherwise, the surface will sink later.

Always, if possible, make surface runaways from undulations, otherwise water will accumulate with disastrous results to the turf.

Water freely during droughts and in the evenings, if possible, as best results are then obtained. The water applied at that time does most good and does not evaporate as quickly as it does if applied in the heat of the day. In any case, water freely, and remember that one good soaking is worth a dozen light sprinklings.

It is hardly necessary to state that pond or stream water of a natural temperature gives the best results, but where this cannot be obtained and the water is pumped from a depth, or city water is used, some means, if possible, should be taken to get it up to the natural normal heat by exposing it to the sun and air in a shallow pond or reservoir tank or if it is pumped direct by laying the pipes close to the surface where they will feel the influence of the sun.

If the latter system is adopted, draining cocks should be put in all low places so that the pipes can be emptied in the winter; otherwise they will freeze and burst.

To avoid the tired, sickly appearance that turf gets after a long period of artificial watering, give it a monthly or bi-monthly dose of Complete Grass Manure, at a rate not exceeding 20 pounds per 400 super yards, mixed before use with at least 100 pounds of dry, fine soil or sand. A light fertilizing as above will keep the grass growing and in good heart, whereas, if artificial watering is relied upon alone it just keeps it alive, especially if the water is hard, low in temperature, or contains any impurities.

Eradicate and destroy all weeds as soon as they appear, do not let them multiply, and remember that wire, witch, crab and September grasses get hold best in weak or exhausted greens. If you cannot exterminate the latter, keep them, like clover, in check by lifting the creeping or prostrate stems and branches with a close-toothed iron rake and mow closely; repeat this as often as necessary and use our Anti-clover manure for the drought dressings when the trefoil is prevalent.

Topdress freely with a finely sifted compost of a light, friable, porous nature, rich in organic or fertilizing matter, so as to reduce the plasticity of the soil if it is too heavy and to add body if it is too light, and when doing so remember that a cubic yard of compost will cover 144 superficial yards to the depth of a quarter of an inch, and that sixteen dressings at the above rate spread over, say, three years, will reduce the natural top spit soil of the dressed area to the secondary position of the subsoil, so there is hope for all greens, no matter whether they stand on sand or clay. The contouring and general preparation of a green is costly and its upkeep is more so, consequently it is the worst economy to be parsimonious when seeding. In England, with our warm genial climate, we sow one ounce to a superficial yard and expect to get a close turf in a year or less, and when we are in a hurry we sow at the rate of two ounces per super yard.

In America and Canada, where the climatic

conditions are, to say the least of them, extremely severe and difficult, the minimum rate should be two ounces per square yard and the maximum, four ounces.

TURF FOR THE FAIR GREEN

A true golfing turf is composed of dwarf creeping grasses, which form a close-soled, springy sod, which is both a delight to walk over and play on, as it holds the ball from the ground so that it sits up and looks at the player and when a divot is taken the club cuts through the matted fibrous roots of the grass without hardly touching the soil.

Turf which does not answer the above description is not golfing turf at all; it may cover the ground and make it look nice and green and so mislead the casual observer, but it is worthless from a golfer's point of view, and that's all there is to it.

This sort of turf will pass with those who have not played on or seen anything better, but those who have can tell it at once by the way it feels to the foot and club.

As I have already explained, a true golfing turf is springy to the foot and when a divot is taken the club slides through the mat of grass without hardly disturbing the soil.

Turf of the non-golfing quality, on the other hand, is uncomfortable to walk over, there being very little fibre under the foot and it is difficult and unfair on the player because the ball falls through it and rests on the hard baked ground, which the club has to cut through to take a divot, a difficult and unpleasant stroke which oftentimes jars the wrists.

Of all the clubs I visited in 1911 and this year, only a small proportion could show even a reasonably good turf on the fairways and as far as I know there are not many clubs in North America that can at present boast of a true golfing turf.

This is a very bold statement, but if a golfer who knows what a true golfing turf is will make a tour of inspection in the same section as I did he cannot but bear me out. That the results required can, however, be obtained, I stand convinced and as proof of this would point among others to the Country Club of Detroit, Toronto and Mayfield (Cleveland) where there is a young but true golfing turf—all having been sown in accordance with my system and with my mixtures.

To avoid any hair-splitting, I must say here that I have taken the courses as a whole and have avoided all mention of those that I have not seen or those that have some good or reasonably good turf and some bad.

I will now attempt to explain the reason for the lack of really good turf in America. In the first place, the best natural turf in the British Islands is found in locations that have been nibbled close by sheep or rabbits for years, and the best artificial turf where mixtures of grasses have been sown and where the turf has been closely mown, from the very start.

These conditions suit the finer grasses which tiller out, mat and increase, while the coarser grasses die out to a very large extent. In some instances I have seen just the reverse happen; that is to say, a fine rabbit or sheep fed turf has been saved for hay, which allowed the coarse grasses to gain the mastery.

Probably many of my readers have seen exactly the same thing happen on an abandoned green, which I think in conjunction with the above conclusively proves that to get a fine turf, close grazing or mowing is absolutely necessary.

Secondly, the great majority of the artificial or sown courses in America have been sown with venerable prescriptions propounded years and years ago for agricultural purposes before golf was known out of Scotland.

I might state here that eighteen years ago not only was it considered impossible to produce fine turf from seed, but there was absolutely no demand for it, but when the game of golf took hold of the civilized world I saw that the ordinary commercial mixtures of lawn grass seeds and the old methods of turf production must go by the board and new methods and new mixtures take their place.

The third reason is the antiquated idea that the indigenous or native grasses are best in their own sections or zones, because they are indigenous or native, an argument which absolutely bolts and bars the door to any sort of improvement and is as worthless as it is futile.

The fourth and last reason is the improper ratio in which the various varieties are used (even when the mixture is made up of correct varieties) and also the thin sowing.

It takes years of patient observation and costly experiment before one is fitted to propound mixtures of grass seeds for a neighbor's lawn by propounding mixtures of which they really know nothing; yet quite a few persons are prepared to gamble with the prosperity of a golf club, when it is well understood that a club is, or rather should be, judged by the quality of its turf rather than by the comfort of its club-house.

I met one man who intended to base the prescription of grasses for sowing a course situated on raw sand from about half a dozen quaint little handwatered trial plots, each about one yard square. He pointed out the grasses to me and asked me to note how well they stood on the sand without any fertilizer at all; the plots were barely a month old and the expert evidently did not know that any grass seed will germinate freely and keep alive for months on a piece of cloth or an old sack, or anything, so long as it is kept moist.

Another showed me with pride a course on which he had used almost every named grass procurable; he certainly had got a turf, but it was far better suited for dairy farming than golf and the cost of it must have been simply cruel.

A third sent me out on a hot dusty trip to see an "eye opener" in the rapid production of fine turf by sowing fescues and bents, and when I arrived the perfect turf had absolutely no bottom and looked like a stubble field, as it well might, considering that the seed was sown in equal quantity of each description at the rate of 120 pounds per acre. The significance of this will be better understood when it is known that the number of seeds that go to one ounce varies roughly in the different varieties from 14,000 to 500,000.

There are a few other little pitfalls which are quite easy to fall into, such as the different rates of growth; that is to say, some grasses take twice as long to reach maturity as others. The area covered by one grass plant may be two to ten times as large as the area covered by a single plant of another variety of the same age, and some grasses amalgamate and go well with other grasses and some will grow only in isolation.

By just pointing out a few little difficulties such as the above, one can easily understand why there is not much good golfing turf on fair greens in America.

The rate the seed is sown per acre is another very important question and no matter from what point of view the subject is tackled, financial, common sense, or golfing, heavy sowing is undoubtedly the best and cheapest.

For a start, let us assume that the course in question is a first-class venture with sixty acres to sow, calling all told for a capital of, say, $250,000 and an annual upkeep of, say, $10,000, the latter of which is very reasonable. If money is worth six per cent, which I understand it is in America, the club has to face a steady outgo of six per cent on its capital which in this case would be $15,000 plus the cost of the upkeep, $10,000 or $25,000 per annum in all, or say $2,000 per month. Now, if the greens and fairway are sown at the minimum standard rates of one ounce per square yard on the greens and 200 pounds per acre on the fairway, the approximate cost of the sowing would be for eighteen greens of, say, 900 super yards, $330 and sixty acres of fair green, $3,360, or $3,690 in all.

The above rates per acre are the minimum standard rates as used in England, which admittedly possesses the best grass growing climate in the world, and are calculated to produce a turf fit for play in from nine to twelve months from the date the seed is sown, so if I allow a full year to produce a playable turf in America where the climate is difficult to say the least of it, I am being under rather than over sanguine.

I will now bring the figures into collision; the upkeep bill all told is $2,000 per month and the sowing cost $3,690.

If the seed is sown at the double rate of two ounces per square yard on the green and 400 lbs. on the fairway, the sowing cost would be $7,380, which should bring the course into play, give normal seasons, sometimes between six and nine months from the date it is sown, but assuming that a saving of only two months is made it will pay for itself. These are hard figures which no doubt will be carefully scrutinized, and whilst not being a financier I do not think I have made a mistake.

A friend, after reading a rough proof of my notes, tackled me on the upkeep question by saying the sooner a course is got into play the sooner will one have to start paying for its upkeep, a truth so palpably true that it is untrue.

The upkeep of a course does not start from the time it is fit to play, but from the time it is sown, and between these two dates the course is not earning a red cent.

There is another very valuable point for the consideration of the financial committee which is usually not given proper thought, and that is the speed of growth or quantity of herbage produced in a season by various varieties of grass.

Grass, from the standpoint of the farmer, who is of course the greatest producer, is valued solely by its feeding value and weight of herbage produced per acre, whilst the golfer, who constitutes a small part of the small minority, values the same family wholly by its texture, the lie it affords the ball and the cost of mowing. Generally speaking, the most valuable grasses from the farmer's point of view are of the broad-bladed, fast, tall-growing, non-creeping class, which give the heaviest cut, and conversely from the golfer's point of view they are of the fine, dwarf, creeping varieties, which give the smallest cut.

It follows, therefore, that a valuable farmer's turf is uneconomical to the golfer and that a good golfing turf is uneconomical to the farmer.

Now, as the farmer is in such a great majority, it is safe to assume that his requirements keep the Boards of Agriculture and Seed Merchant experts busy and that the golfer is badly served unless the latter fully understand his requirements and has sufficient knowledge, which cannot be acquired in a day or a year, to meet his case.

The above will be more readily understood when I explain the well-known fact that a good farmer's turf will grow to a height of about thirty inches on an average soil, in an average season, whilst a good golfing turf will grow only about ten inches in the same period.

I do not, however, wish my readers to think that the mowing bill of these two classes of turf is exactly in the ratio of 3-1, as this would be wholly inaccurate; it is more like 4-1.

Speaking generally, the growth of the coarser grasses is stimulated by repeated mowing, as there is no other outlet for the energy of the plant, whilst the surplus energy of the finer grasses is absorbed by their spreading, creeping nature.

If it were possible for me to produce a turf which

after reaching perfection would cease growing, it would easily be worth $1,000 per acre, and as I can produce one the upkeep of which is at least one-third of that of an ordinary meadow turf, I feel that my reputation stands on a sound base.

Judged from the common-sense point of view the advantages of heavy sowing are just as striking, especially if one remembers that a close turf is either composed of relatively a few large grass plants which may take a year or more to mature, or a multitude of small ones which can be produced in a few months and which improve with age. Furthermore, if a club decides to sow lightly and wait for the turf to mature, not only does it face a long, tiresome costly wait, but worse still, the chances of a partial or total loss through adverse weather are increased about threefold.

If the seed is sown heavily at the right season the little grass plants are crowded together and so afford each other shade and protection from wind or sun almost from the start, whereas, if light sowing is resorted to the little grass plants have got to stand alone and a poor chance they get if adverse weather sets in either in the shape of a cold dry wind or a hot scorching sun. It is wonderful what a little shelter will do; I have frequently noticed that the seed in the hoof-marks made by horses harrowing and rolling in the seed gets quite a start on its exposed neighbors and where the seed has been gathered together by a wash-out it comes up like hairs on a cat's back and is self-protecting from the very start.

When a golfer joins a club, he wants to play on the course as soon as possible and not wait for a year for the turf if it can be produced in a shorter time.

Most of the golf courses I have seen in America possess interesting natural features, which, if properly handled, are of sufficient importance to earn reputations for their clubs in exactly the same way as they do at home; as a matter of fact a goodly few have already done so and have been copied, such as the tenth at Brookline.

To my mind, however, to copy the work of another is a sure sign of weakness and any attempt to reproduce nature, futile and ridiculous; a genius accepts hints from both and produces original masterpieces.

Before writing Finis, I will discuss in a few words one or two points in regard to keeping the course "through the green" which are peculiar to the North American Continent.

Although water and fertilizers are freely used on the greens, the fair greens get none, and yet the play of the long shots is or should be just as important as the short shots and if it is necessary to have good, true putting greens, surely it is equally necessary to get a good lie on the fairway, yet, as a rule, little or no attempt is made to improve matters.

If the above is admitted as it must be, I ask, why is the turf on the fair green allowed to peter out from sheer starvation when it could not only be kept alive but improved year by year by an annual dressing of fertilizer at a cost of about $15.00 per acre and an occasional sprinkling of water? The answer to the question is always the same, the area is too big for any club to handle; but is this true?

A course 6,000 yards long by 50 yards wide occupies approximately 60 acres; from this deduct say 15 acres for the rough in front of the tee and short holes where good fair green is unnecessary, which leaves 45 acres to deal with.

The fertilizer for 45 acres would cost about $675, but that of the water I cannot even guess at, but surely it would not be prohibitive to put in hydrants, say, 100 yards apart and devise some method of semi-automatic watering by means of demountable perforated tubes, after the style of the Skinner system, anyhow for clubs which own their own water plant.

An occasional watering would not only be a great help to the grass but it would also improve the play of the whole course by reducing the hardness of the soil and the abnormal summer run of ball.

The next question is the use of heavy automobile mowers, weighing 2,000 pounds or more. These heavy tools may be economical so far as the wage sheet is concerned, but I am quite sure that there are few soils and less turf that can stand their regular use without injury.

If they are used on medium to heavy soils when they are wet, they cap or seal the surface and so arrest the natural flow of air and water and generally get it into a state inimical to the growth of grass and they crush and bruise the grass if they are used when the ground is dry. On light soils they do not do so much damage, assuming that the turf is thick and well-rooted, but where it is not, the back thrust of the driving roller actually moves the surface soil, especially when starting or grunting up a gradient.

If one with a knowledge of mathematical engineering was to calculate the hammerstroke imparted to the turf by the driving roller in terms of pounds per square inch, the result would be simply staggering.

The ideal automobile mower does not weigh more than 1,200 pounds, it cuts thirty inches wide and is operated and steered by a man who walks behind it.

Those who own a heavy automobile mower and do not wish to scrap it can use it with advantage in the early spring as a roller when the frost is out of the ground, provided that care is taken to see that the soil is neither too wet nor too dry, or in other words is in good condition for rolling.

If the few suggestions that I have made are given careful consideration, especially those in reference to the making and upkeep of fair green turf, I am sure good will come of it, as the fair greens of the American golf courses are undoubtedly their weak spot.