The second annual greenkepeers' convention sponsored by the United States Golf Association was held at the Country Club of Atlantic City on the 4th of June and continued at Pine Valley Golf Club on the 5th, after which several of those in attendance at these meetings came to Washington to study the turf experiments at Arlington Farm. While the number present was smaller than the previous year, there was much interest in the work carried on at the various points visited. The greenkeepers were invited to play golf at both these clubs, and prizes were awarded at the Country Club of Atlantic City. An evening meeting was held at this club, during which many topics of interest were discussed. The United States Golf Association Green Section is much indebted to both of these clubs for the courtesies extended, and especially to Mr. H. Kendall Read, of the Country Club of Atlantic City, and Mr. Norman Mattice, of the Pine Valley Golf Club, for their personal efforts to make these meetings a success.

To those of us who have followed the turf grass experiments closely it becomes more and more apparent that there are many problems, such as drainage, soil texture, and proper construction of the greens, that are much more closely associated with the development of a satisfactory putting surface than was formerly believed. The problems are so numerous that we can not hope to solve them in one year nor in five years. Scientists have been working for years on farm crop problems and are still finding an abundance of investigational work. Why then should we become impatient in the solution of turf problems? Still with the loyal support of the United States Golf Association, such as we have had in the past, and with the assistance of the greenkeepers, green committee chairmen, and others interested in golf, these problems will gradually be solved.

Greenkeeping Yesterday and Today

By John Morley

About fifteen years ago there were scattered throughout the United States a few hundred golf courses. The word "greenkeeper" was not generally known. About 70 per cent of the courses were under the direct supervision of professionals, most of whom had received their training in the British Isles. In most cases the methods to which they had been accustomed proved very unsuccessful owing to the climate and soils of the United States being different from those of their native land. They were to a large extent handicapped because very little knowledge was to be obtained, even from Washington, on the best methods to pursue. Not more than 10 per cent of these professionals would have qualified as the greenkeeper of today.

In those early days, although we were fortunate in being able to import good grass seed from foreign countries for use on our golf courses we were lacking in knowledge of the proper care of turf. It is true that we had our turf experts. One of the leading experts was the late Fred W. Taylor, of Philadelphia, who claimed to have discovered that by mixing clay, bone meal, and cow manure in a cement mixer and using the mixture in layer formation in the construction of a putting green, the problem of raising ideal turf was solved. This method we all know proved to be a failure.

In those early days also there were very few pieces of equipment suitable for keeping a course in excellent condition. We first had to cut our fairways with the one-horse mower. Then came the gasoline mower, which weighed nearly a ton, with a single cutting unit. If on an 18-hole course we wanted to cut the fairways once in 9 days we were compelled to use two mowers, for one or the other was out of commission most of the time. Then came the sulky mower with three cutting units, drawn by a horse which had to wear iron or aluminum shoes. If the turf was soft and the horses were not flat-footed they would dig the toes of their shoes into the turf and leave the fairways full of small holes.

About twelve years ago, golf in the United States began to make rapid strides, and with this progress came improvements; but new courses multiplied so fast that it was impossible to secure enough men well versed in the art of greenkeeping. To a large extent we were very fortunate in securing men who had at one time been well versed in farming and gardening. But it was soon discovered that the methods used in farming and gardening were not successful with turf on golf courses. Each in his own way endeavored to find other methods, and with so many working along different lines we gradually commenced to get information that tended to produce better turf and better working equipment.

Since the World War golf courses have sprung up by leaps and bounds, and from a few hundred 15 years ago they now number over 4,000. Out of the vast number of men selected to take charge of these courses we have been able to produce a large number of successful men who are today well versed in greenkeeping. In the past few years greenkeeping has been placed in the position in which it properly belongs. While 15 years ago 75 per cent of the golf courses were taken care of by professionals, today over 80 per cent are in charge of greenkeepers.

It requires from three to five years to produce turf that will stand the wear and tear of the players, and to a certain extent it also requires the same amount of time for a pupil to acquire sufficient knowledge to make him rightfully known as a greenkeeper. Officials of new courses should take this into consideration. It also happens during the early existence of a course that conditions are such as often to breed dissatisfaction among the members. No matter how hard the chairman of the green committee and the person who has charge of the course may strive to correct conditions, they may still fail to obtain results owing to the fact that the soils specially used in the making of putting greens were selected and developed by some of our golf architects for the growing of bluegrass and clover instead of the various strains of bent grass. I am of the opinion that the time is not far distant when the officials of a proposed new course who decide to hire a golf architect will at the same time hire an experienced greenkeeper, who will be under the supervision of the officials during the building of the course and divorced entirely from the architect.

I have always been at a loss to understand why, when a new club has been organized and has selected a site, often consisting of 150 to 200 acres of land generally embracing two or more farms, one farm having been kept in the pink of condition and the others completely run down, instead of giving the poor land more fertilizer and seed after the course has been constructed and is ready for fertilizing

and seeding, and giving the good land less in proportion, they usually give both the same quantity.

The greenkeeper of yesterday had a more peaceful mind, although he lacked the knowledge and experience which greenkeepers possess today. When he retired for the night his sleep was usually quiet and refreshing. The greenkeeper of today, especially during the playing season, knows no rest or contentment. When he gets up in the morning and goes forth to take up his daily tasks on the course, he never knows what Nature has in store for him. We know that if we are kind to Nature she will endeavor to repay us for that kindness. But unintentionally we have tried to force her to give us more than she could produce; and by so doing we have brought about diseases of turf which we are unable to control. A few of the leading greenkeepers of today are commencing to dig into the mysteries of Mother Earth.

The season of 1928 was one of the worst I have witnessed as regards turf diseases. I am, however, of the opinion that the results achieved during the past season will be a blessing in disguise. I believe that in the season of 1929 we shall make rapid progress in knowing what is right and what is wrong in our efforts to lessen or eliminate these obnoxious diseases. Not all of the large browned patches that appear on our putting greens during periods of excessive heat and humid atmosphere are caused by parasites.

In recent years practices in golf course maintenance have been changed considerably. The putting green mowers formerly did not cut the grasses as close as they do today. We used to cut the putting greens every other day; now we are often compelled to cut them twice a day. The old-style mowers left ridges in the turf. We used to roll the greens every day with a heavy iron roller. Next we used long wooden rollers. With the improved mowing machines of today most greenkeepers do not need to use a roller except in early spring. When we allowed the grass to grow long in former days and kept the blades of the grass down by rolling, we did not have so much disease, if any, on our putting greens. Yesterday golf courses did not have water systems equal to ours today. During a hot, dry spell, the putting greens often turned brown for lack of water. We formerly used the old-fashioned sprinklers, watering six or seven putting greens each night. Today, with our high-pressure pumps, a large number of courses are watering their putting greens every morning before cutting the grass.

In the early days of greenkeeping chemical fertilizers were rarely used on golf courses. We were using cottonseed meal, bone meal, sheep manure, some nitrate of soda, and a few other fertilizers. We believed it was necessary to have alkaline soils, especially for putting greens. We did not as a rule have the fine grasses which we have today, although we were able to obtain seed of the finest of the bent grasses. Nearly every time we top-dressed our putting greens, which was done mostly with humus that we had to buy, we gave each putting green about 15 pounds of grass seed. With a few exceptions most putting greens were a mixture of creeping bent, fescue, rough-stalked bluegrass (*Poa trivialis*), annual bluegrass (*Poa annua*), and often lots of clover. Today the condition of our soil for putting greens is reversed; instead of being alkaline it is made slightly acid by the application of certain chemical fertilizers. There is an honest difference of opinion among greenkeepers and others as to whether

we are justified in using acid fertilizers. While I did not discover the value of sulphate of ammonia as a fertilizer for putting greens, which produces an acid condition in the soil, it having been previously used in England and America but practically discarded, in the early history of the Green Section I advocated acid soils for the bent and fescue grasses. I have probably used sulphate of ammonia more than any other greenkeeper in this country, and I have never found any reason for discontinuing its use. When I had nine putting greens on various parts of the course of the Youngstown Country Club analyzed by a competent chemist, he reported that four were sub-acid, three minimum acid, and two neutral. This demonstrates that by the continued use of sulphate of ammonia you can not make soil such as I have on my course too acid. There are some who believe that sulphate of ammonia is the cause of brown-patch and other diseases which affect turf. Before we were using sulphate of ammonia we had brown-patch. For instance, I may refer to the condition of the greens on Columbia Country Club, at Washington, D. C., at the time of the National Open Championship several years ago. They were not using this fertilizer there at that time. One of the greatest dangers that may attend its use is that at times we may use too much of it, thereby excessively forcing the growth of grass and making it too tender. During brown-patch weather we should apply only enough nitrogen to keep the grass healthy and alive.

Yesterday chemicals on a golf course were in very limited use; today, with the big array of chemicals being advertised as fertilizers, fungicides, insecticides, or what not, the greenkeeper must have some technical information, or a source from which he can obtain such information, unless he is to become a victim of the salesman with the best line of talk. This is exactly the situation which is found in comparing modern farming with farming of some years ago. Years ago the more progressive farmers learned that they could not become expert in all features of crop production—expert chemists, expert disease men, expert mechanics—all in a lifetime. They have therefore demanded help from the Federal Government and the state governments in providing the highly specialized information which they themselves have not time to gather. There are various farmers' organizations which have served to bring together technical and practical details and to prove mutually helpful in other respects.

Greenkeeping, as I see it, is now reaching the point which farmers were forced to reach several years ago. In other words, I think you will readily agree with me that the demands of the golfers have become more exacting and the problems of greenkeeping have increased tremendously during the past few years. This calls for better trained greenkeepers and for men who are willing to keep abreast of developments. The day of the greenkeeper with an unwillingness to learn from or to help others is fast coming to a close. Greenkeepers have been too modest all along, and for that reason golfers have blamed them for everything from an incurable slice to a lost ball. If the greens are in good condition the player is happy. If the greens are not kept in good condition the player loses his temper and goes home cross and his affairs suffer.

I am inclined to believe that with so many new courses being constructed with the intention of further progress, the greenkeeper who is aiming to give the service that will be demanded will be compelled to be well versed in botany and plant pathology. While we all real-

ize that the best education he may get is from practical experience, yet I am of the opinion that knowledge along theoretical lines is helpful.

Old and New Turf Problems As Viewed By a Green Committee Chairman

By R. F. Arnott

Exactly how much a green committee chairman should know about turf is perhaps a question. It might very well be that the less he knows, the better. When he first starts in as a green committee chairman, he is very deeply interested in everything he sees. He has had his game of golf, he has learned to play a little, and he feels he can perhaps do a little to help his club by spending his time with his greenkeeper. So he goes on the first year, the second year, and the third year, getting more and more interested all the time. He buys a number of books and spends his days and time on them, gets up at 4 o'clock in the morning to study fungi, and helps his greenkeeper as much as he can. He finds his game is gradually falling away as he is getting more and more interested in turf; and after a while he does not know so much about either.

The answer to it all seems to be that the position of the chairman is not to delve too far into the turf questions, but rather to be a help to his greenkeeper—to be a sort of go-between. Those of you who have done some chemistry will understand what I mean in classifying the chairman as a sort of catalyst. He is there for the purpose of carrying on a reaction between the greenkeeper and his surroundings, his turf and his club, while at the same time there is not much real action required on his part. He will take a real interest in the turf, for the reason that it makes the conditions better for his club and for the members of the club in playing that game which he believes is the best game ever invented. He will for this reason try as far as he can to help his greenkeeper work out his ideas; and in so doing the chairman comes in as the catalyst.

The greenkeeper will get his ideas about the turf and what he shall do for it. He finds himself a little uncertain, perhaps confused at times, as to just what he should do. He can have a talk with his men and he can talk with his green committee chairman. After a little while the green committee chairman in his ignorance asks stupid questions and very likely starts a thought in the greenkeeper's mind which he has no idea of starting. The greenkeeper can make the connection that the chairman was not looking for. It is also a fact that the green committee chairman is able to help his greenkeeper in handling his problems of machinery and in arranging his plans for work. His actual experience and acquaintance with the turf is something which he gets at odd times.

The man who is looking after the grass and the turf itself should be there all the time—should be out on the course early morning and all day and late at night to see just what the grass needs. The turf and the grass are in this respect comparable to a little baby. Its mother can see what it wants just when it wants it and is there to give whatever is needed at the right time. The doctor is the man whom she wants to see when there is something wrong. In the old days of humanity there were not many doctors, and mothers got along