

ject is worthy of consideration regardless of the size of the course. Machinery and golf turf are both too expensive to trust to any kind of worker, and possibly the higher type of laborer could be used with real economy. A different situation exists in every club. Greenkeepers differ widely in the methods which they use and in the response which they can get from their men. Definite working rules are useful in some cases.

### Learn to Plan

It will be more of a problem than ever to maintain a contented, interested and loyal working force after a series of pay cuts during these times. Yet it can be done. Men will work wholeheartedly under adverse conditions if they feel that they are treated fairly and that their efforts are appreciated. Much of the responsibility for the working force rests on the greenkeeper. Usually he must be a hard worker himself if the others are to have the right attitude, and yet who has not seen the foreman who is so engrossed in the work he himself is doing at the moment that the labor force is wondering what to do half of the time. At any rate, he must plan his work or lose much time.

Improved machinery made it possible for some clubs to keep up normal maintenance last summer. Others practically abandoned topdressing and fertilization throughout the season. While the grass held up remarkably well, a day of reckoning will probably come if such a practice is continued. Radical changes in such operations as topdressing enabled certain clubs to get along fairly well in spite of a reduced labor force. Some clubs are handling topdressing soil in sacks, which eliminates some shoveling, and are using one of the newer types of topdressing distributors. These enable the work to be done in a fraction of the time that the work formerly took by hand and the application is much even. In this and other cases, the money spent by some clubs for equipment of this type is proving to be a far-sighted economy.

There are great opportunities for the extension of golf in the smaller communities of the country. The small town golf clubs are playing an important part in the social and recreational life of the community. Those responsible for keeping the smaller courses should aim high. Already many small town greenkeepers have demonstrated that the large clubs have no monopoly on good layouts.

# Greenkeeping Progress Through Self Education

By JAMES G. MOORE\*

Dept. Horticulture, Univ. of Wisc.

**T**HERE is nothing in golf more important or vital than greenkeeping. It has had more to do with the development of the game and the amazing strides it has made than anything else, until today there are more than two million players in this country. Very few play for exercise, and were it not for the pleasure connected with the game, it never would have attained its present popularity which is rapidly increasing every year.

To the greenkeeper is primarily due the responsibility of making courses playable and attractive. The more he makes them so, the more players the game attracts and the greater the appeal to all classes of people.

If links are in a condition which leads only to complaint and irritation, some other means of recreation will be sought

as players today not only want, but demand, almost perfect putting greens, and fairways. When links which receive little attention, or are neglected, are contrasted with those in charge of a competent greenkeeper, then his great value to the game is realized. His work has led to more than 5,000 links and clubhouses in this country, the municipal courses which are being constructed everywhere, the daily fee courses which are becoming so popular, and hundreds of millions of dollars invested in the supplies and accessories of the game. It is no exaggeration to say that over one billion dollars is invested in some way in the playing of golf.

### The Forgotten Man

The greenkeeper, however, has not I fear, received the appreciation and gratitude from golfers to which he is entitled. They keep in touch with the professional

\*Digest of Greens Convention address.

through lessons or the buying of supplies, but they seldom see or have any contact with the greenkeeper. It is very much like a general in command of a battle. The soldiers do the fighting and are visible to onlookers, but the commanding officer is behind the lines, often unseen, but it is his thought, experience, initiative, and planning which directs the battle and wins victories.

We see men working on a golf course, we play over fine turf, we have a pleasant afternoon, but how often do our thoughts turn to the greenkeeper whose ability, experience and direction have made all this possible? If he is interested in his work, which with many, is his very life and soul, he is often on the links very early in the morning and late at night. Few realize his anxiety when owing to some climatic condition or something else, brown-patch or some disease strikes the grass, and how he strives to effect a cure so the players may enjoy their game. He is to golf what the mainspring is to a watch. I am convinced that the part the greenkeeper plays in bringing elderly men out of their poorly ventilated offices, clubs, and homes, into the open and with the exercise they obtain, has done more for the preservation of health than tens of thousands of doctors could ever do. He has been the means of prolonging and saving many lives, and if he has done nothing else it is something well worth while.

Greenkeeping today is more or less a profession, requiring technical and scientific knowledge, and it is to the credit of greenkeepers that they are anxious to obtain it. One of the ways is membership in an outstanding greenkeepers association like yours, which among other things is doing such splendid work in arranging the instructive addresses you hear at your conventions.

Your success is due to the many years of service and loyalty of your officers, among whom the most credit must be given to the founder of your organization, whose devotion to its interests should never be forgotten, Colonel John Morley. In his resignation as president, he carries with him the affection and gratitude of us all, but we rejoice that in his successor you have a man who is splendidly equipped to go on with the work, John MacGregor.

In referring to the educational side of greenkeeping, I feel I should speak of the benefits greenkeepers have received in the instructive articles appearing in GOLF-DOM and *The National Greenkeeper*.

**Green Section Cooperation**

Another way in which greenkeepers have been helped is in the results obtained by the Green Section, USGA, in its experimental and research work, and I wish to take this opportunity to express to the green-

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keepers our hearty appreciation of the cordial support they have given our efforts for many years past.

Years ago, I fear, there was a feeling by some greenkeepers that we were usurping their privileges and treading on forbidden ground. We were and are only desirous of being helpful to those who know very little about the conditioning and proper maintenance of new golf courses continually springing up, and giving to greenkeepers of experience valuable information obtained from experimental and research work. There has been absolutely no thought or intention of forcing this on greenkeepers or clubs, and they have been entirely free to use or discard it as they think best.

*The Green Section, Mr. Depew went on to point out, is only too glad to have greenkeepers conduct their own experiments, but elaborate tests are generally financially beyond the means of the individual, while the Section has funds to carry such work forward. Appreciation of this work is shown by the increased attendance at Green Section meetings and by the increased daily mail received at Arlington from greenkeepers everywhere.*

*Many problems remain unsolved, the speaker continued, such as leaf spot dis-*

*ease, turf insect control and fairway improvement. Solving these will reduce greatly the cost of course maintenance. He went on:*

### States Turf Problems

May I briefly state some of the problems to which we all should direct our earnest attention, but they require in experimental and research work far more money than is at present available. Insects still continue to be the greatest source of trouble on many golf courses, such as the mole cricket in the south, ants, grubs, earth, army and grass webworms, and many others and until adequate information is obtained, a large sum of money is spent each year on golf courses without results. At Arlington some opportunity was afforded for study of cutworm and sod webworm control, and it is now felt that these pests may be satisfactorily controlled on fine turf or by any of several poisons. Earthworms were particularly troublesome, as elsewhere in the country, and remained so in spite of repeated trials of remedies hitherto effective. More work is needed on this problem. Most of the experimental work thus far has been in the growth and treatment of putting greens, but the con-

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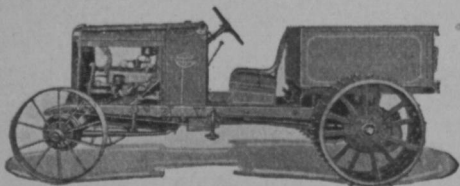
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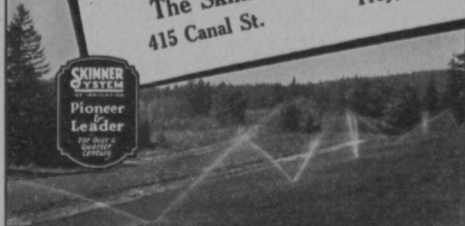
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dition of fairways is just as important, and few clubs have perfect ones.

This brings to the front problems which in most cases have been unsolved, such as the best methods of preparing, fertilizing and seeding various soils in different degrees of climate; time of application of the fertilizers, and their rotation; best use of water, particularly in view of the sprinkling systems which many clubs have installed; best height to cut, control of weeds, particularly clover which too great use of water promotes; the renovation of poor, weedy turf; the perpetuation of good Bermuda grass; and the treatment of brown-patch, concerning which we have learned much in the past two years.

A systematic study and experimentation is necessary to enable us to solve and successfully meet these problems. In all of

them the greenkeeper can be of the greatest assistance and in our combined efforts, success will be finally attained.

### Midwest Garden Continued

The USGA regrets the necessity of the strictest economy which will materially curtail the activities of the Green Section, but I am glad to tell you that it has decided to continue the midwest turf garden near Chicago in the interest of the many clubs in this district and adjacent states.

Each year we are getting closer and closer together in our mutual efforts and we like to think you are a part of us in 6 of your members being on the Advisory Committee of our Green Section. As I said in my address two years ago at your Columbus Convention, only in a hearty and cordial cooperation among us all can the best results be obtained.

# Grass Growth Factors That Control Cutting Practices

By C. M. HARRISON\*

Among the problems confronting the greenkeeper today is the problem of cutting. What responses are made by the grass plant to close and frequent removal of the green leaf blades?

The life of a plant is probably more dependent on the proper functioning of the part that is above ground than on that of the part that is below. Roots serve a plant primarily in absorbing water and nutrient material from the soil; they also serve as a storage place and as a means of anchorage. The leafy portion, on the other hand, serves mainly as a factory in which the carbon dioxide of the air is changed into carbohydrates (starches and sugars).

The chief function of the leaves is the combining of carbon dioxide with water, which is absorbed by the roots. The green parts of plants contain a certain green pigment called chlorophyll which is necessary to this process, and only in its presence can the plant make carbohydrates. The whole process of putting together the carbon dioxide and water is called photosynthesis.

Several factors influence the rate at which this manufacturing process will go on. The amount and intensity of sunlight has a marked influence. In most plants,

the process is probably checked when temperatures fall below freezing or rise above 90° F. Given some green leaves to serve as a factory, sufficient water absorbed by the roots, an available supply of carbon dioxide, light, and a proper temperature, the synthesizing process will go on.

### Close Cutting Retards Grass

The products of the process—the carbohydrates—are very necessary to the plant in building new leaves and roots, and in keeping alive the parts that already exist. The more green leaf area there is exposed to the light, the larger the factory, and the more food can be manufactured. Whether the efficiency of the factory as it enlarges remains the same as when it was small is not definitely known, but usually as the leaf area exposed to light becomes larger, more food is manufactured. As the amount of food increases, more is available either to increase the size of the plant, both top and bottom, or to be stored for use when the synthesizing process is checked.

Partial or complete removal of the top or green part of the plant seriously affects the amount of food it can manufacture. The shorter the grass is cut, the more of the factory is removed, unless the plant responds by flattening out on the ground in

\*Digest of Greens Convention address.