Soils and Sub-Soils

BY BILL LINDSAY, Greenkeeper
Manchester (N. H.) Country Club

PRESENT day greenkeepers are expected to produce a healthy growth of grass to withstand the ravages of golfer's footwear throughout the year.

In many cases the soil on golf courses is of a heavy clayey nature more suitable for producing bricks than for getting a first class turf on it. In other cases it consists of a pure sandy loam that will not retain either fertilizer or moisture in any shape or form. Between these two extremes we find golf courses laid out in peat, gravel, chalk and loam.

Now a greenkeeper, to be successful, must have a working knowledge of these soils; in a word he must have an elementary idea of the origin, composition and general classifications of soils; in short, a slight understanding of Geology. Let me explain here.

Now, the actual surface of the earth as we see it to-day in the cultivated parts of the country consists of mold or vegetable soil; in other parts we see large tracts of barren rocks which vary in character, some are brimstone, sandstone, granite, slate, etc. The most common must have originally been formed by and with water, others have been formed by fire. Now bearing these simple facts in mind it is well to remember that rocks are the mineral constituents of the earth, beneath any mold or soil that may have accumulated upon them and that the most of the soils that we find in our golf courses are originally derived from rocks and many of these important properties of the soil can be traced to the rocks beneath them.

It is well known from the best authorities that every kind of vegetable soil was once rock which by the repeated action of heat, cold, air, and water has been broken down to a fine state of dust, mud or sand. This process is known as weathering. But vegetation has a good deal to do with this also, for doubtless you have noticed small lichens growing on the face of rocks exposed on the cliff or quarry.

We wonder how any plant can live in such a position, but the secret of it is that the lichens draw a good deal of the nourishment necessary for their existence from the atmosphere. Now all this is weathering and goes to illustrate how soils are formed.

Having said so much with regard to the origin of soils I want next to bring your attention to the distinction between sub-soils and top soils. This is easy to detect; the top soil acquires its richness in humus mainly from the decaying of deeper roots, also to the work of earthworms. Top soils are generally rich in humus and the elements of plant life.

Fortunate indeed is the greenkeeper whose course is laid out on loam, the richest soil and well supplied with humus and the other elements of plant foods. These soils are usually deep and not compact, thus admitting of the percolation of water, consequently very little drainage is necessary. At the same time they retain moisture during the summer months and do not dry up too rapidly.

The first necessity for a good soil on a golf green I consider to be one that will hold moisture and the second, one that has power to suck up water from lower levels by capillary attraction. Of the requirements sand has the least water retaining or absorbent power, clay has four times and humus six times the capacity of sand to hold moisture. When water

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drains away from loam or clay the drainage is never complete for these soils after being watered retain some little moisture, but on very sandy soil you lose even that little amount of moisture.

The moral of this is to change that soil, either by fertilizer or top dressings of good loam. With regards to great cohesion, I am convinced that this is sometimes brought about by over rolling with a heavy roller in some shape or form, thus causing bad drainage, sourness and coldness.

I think that you will readily agree that the ideal soil for producing a suitable turf for golfing purposes the whole year through, having due regard to climatic conditions during the year, is a medium loam. For such a soil is fine grained in texture and has the power to lift water easily by capillary attraction during dry summers, at the same time is sufficiently open for air to enter freely and water to percolate during wet weather. and in such a soil you do not get the bad faults of clayey or sandy soil.

There are three things which are absolutely essential for the growth of good grass, 1st. humus; 2nd. warmth; 3rd. moisture. To sum up in a few simple words it means you must have nitrogen in your dressing which must change into nitrate before it is available for the roots of the grass plants.

Lastly, I'll conclude that these are my own simple convictions in regard to soils and foundations for a good course and greens.

California Gossip  
By ARTHUR LANGTON

Royal Palms Golf club has been bought by the county of Los Angeles. This course, which is located on the cliffs near San Pedro, Los Angeles Harbor, and the immediate surroundings will be turned into a public golf course, bathing beach, and recreation park.

Midwick Country Club in preparation for the 1932 Olympic Games which will be held in Los Angeles has built a new polo field to accommodate the international competitors. This club also has built three new greens and three new fairways.

Old San Gabriel Country Club is in the process of completing seventeen modern greens. The work, which was started on May 30 under the supervision of William P. Bell, has been put through in record time.

Death Valley golf course, all grass, and located in the lowest and hottest point in the United States, is being made ready for the tourist season which starts in November. In spite of the heat and the arid environment, the surrounding mountains supply enough water to irrigate the course every day. The fairways are of Bermuda grass and the greens and tees are of Pacey rye. During the summer months the thermometer hovers around 130 degrees in the shade.

Flintridge Country club in Pasadena is about to construct a new number 4 hole on its championship course.

C. M. Cavanaugh, greenkeeper of the Los Angeles Country club recently has returned from the Hawaiian Islands where he made an extensive survey of turf production and maintenance conditions in that territory.

The Greenkeepers' Association of Southern California in conjunction with the Southern California Golf Association, is arranging for the construction of a greenkeepers' experimental station on the grounds of the Brentwood Golf club at Santa Monica. Under present plans, greenkeepers will take complete charge of the station and will attempt to solve some of the unique problems which vex them on the Pacific Coast.