had sprung from the older regenerative roots were by March 3, 1925, 2 mm in diameter, 15 to 30 cm long and creamy white in color. They could easily be distinguished from the old roots by their position, their size, color and freedom from "kinks," regenerative buds and shoots. On March 15 the soil was no longer frozen solid, and development of the whole root system became more rapid. Green leaves of the thistle appeared above the surface of the soil on April 12, 1925, and by this time the fall shoots had blackened and died back to the junction with the horizontal roots. In no case had buds in the axils of the scales on the fall shoots developed into new stems. The roots of two other perennial weeds, the common wild morning-glory (*Convolvulus arvensis*) and a poverty weed, *Franseria tomentosa,* were studied throughout three winters from 1925 to 1928, at the Agricultural Experiment Station at Fort Collins, Colorado. Although the size of the roots of these latter plants is different from that of roots of the Canada thistle, their cycle of bud and root formation is similar in almost every respect to that described for *Cirsium arvense.*

CHARLES F. ROGERS
UNIVERSITY OF MINNESOTA

AN ARTIST LOOKS AT GORDONIA

THE writer had been much interested in many newspaper items about a rare plant which had been introduced in one or two Macon gardens, a native Georgia species discovered by the famous Bartram in his travels through eastern Georgia, a species now supposed to be almost extinct, save for a plant kept alive through the years in a northern botanical garden and the parent of the plants introduced in Macon. The name given in the press of "Gordonia Altamaha" had a romantic sound but otherwise meant nothing.

However, the artist had an opportunity to converse with a friend who is a distinguished horticulturist, and this conversation, which revealed further enchanting facts about the famous Gordonia, led to a desire to see and know better a rare plant and the still greater desire to paint that plant.

Realization is often the disappointment of imagination and the present case was no exception, a first glimpse of Gordonia conveying to the neophyte only that here was but a variety of the familiar "Cape Jasmine" plant. Gradually with the help of the horticulturist the plant's rare beauty began to reveal itself. The rich foliage was a delight, shading from a pale to a beautiful bronze green, the designs of the veined and pointed leaves, the smooth, almost blue-green stalks from which the leaves seemed to grow in clusters, the variety of greens in the leaves, the undersides sometimes a silvery tinge, and in some cases of an almost green-gold luster. The tops of the leaves were glossy but of varied shades of green, scarcely two leaves being of the same shade, the young leaves appearing a delicate pea color, while the more matured ranged from almost a blue-green through the yellow-greens to a real bronze tone. The play of sunlight and shadow on this varied foliage produced a beautiful effect.

Then the horticulturist pointed out a bud, apparently about the size of the common marble or agate. The bud appeared to grow from a main stem, nestled in leaves which grew out from beneath it in a star-like radiation, the young leaves atop the more matured. There seemed to be only the one blossom-bud on the entire plant, and when first seen it was of a delicate pale pea-green, shading to a decided light yellow in the top center. The artist preparing his materials sat down to watch the unfolding of the blossom, for it was said that the flower of the Gordonia opened, bloomed, folded and died in a single day. Forgetful of time, of the hot sun, of the prick of insects, the artist sat enthralled by the miracle unfolding before his eyes and tried desperately to catch some of its wonders on his sketch pad.

The bud split in three main divisions and seemed gradually to curl and spread back from the yellow center. The green seemed to recede into the stem, drawing the yellow with it. The yellow, as it followed, took on a deeper tinge underneath, while towards the center it grew pale and, as the blossom opened, a pure white appeared. Then, somewhat like the magnolia, the petals unfurled more, and instead of three there were five divisions, and in the heart of the white a dash of gold appeared. The main flower, except for the yellow-green and pale yellow of the under part, near the stem, was of the purest and most exquisite white imaginable. The flower had now spread to a size larger than that of the "Cape Jasmine," being almost the size of a small tea-cup. The edges of the five main petals ruffled and began to curl back, allowing the beautiful yellow gold of the heart to appear. The heart, as the petals now opened rather rapidly, was of a mushroom shape and appeared to consist of closely bunched stamens growing from the center with globular pistils producing the mushroom effect. This rounded top of the mushroom-like center was a brilliant golden yellow, while the stem section was of a golden orange tone. This center glowed like a jewel, and with the pristine white of the now unfolded petals the flower was indeed a thing of beauty. A faint, pleasing odor, hard to describe, emanated from the flower.

The flower was now at the height of its blooming and the artist completed his sketch, but even as the finishing touches were put on, the white petals began

to curl inward towards the golden heart. The yellow-green of the under-section of the petals now began to reappear as they folded together. Soon the golden mushroom-like center became hidden by the enfolding petals, then disappeared in the ball of white with its pale yellow under-side. The flower seemed to shrivel and shortly after the sinking sun threw the last glorious tinge on the summer twilight sky, the white globe which had been the lovely flower of the famous Gordonia dropped off the stem, leaving only a pale green scar in the heart of leaves, a scar scarcely seen, but eloquent relic of one of nature's dramas.

EDWARD S. SHORTER

ANTI-EVOLUTION IN NEW ENGLAND

THE following letter coming from Hartford, Connecticut, and signed by a well-known New England name may be of interest to readers of SCIENCE:

You may discontinue my subscription to Ecology.

Ecology now has articles from the standpoint of evolution; for instance Further Views on the Succession-Concept, H. A. Gleason, July, 1927. It is with regret that I do this. I have found a great deal about ecology in it. I have taken it ever since the beginning as I was one of the subscribers to the Plant World. I have no use for evolution and do not see how any intelligent person can have.

BARRINGTON MOORE

AN ANTI-VIVISECTION SCREED

THIS anonymous note reached me a few days ago following a very simple operation that I had. I thought possibly the readers of SCIENCE would be very much amused at this ebullition of temper. I take it that it is from a woman, and if so I pity her possible husband.

Why didn't you have the operation without anesthetic, so you could see how the animals feel, that you have tortured all these years? You will have an awful body in the next incarnation!

That notorious old French vivisector at the age of eighty in Paris, has acknowledged that no good has come of it, and that he knows it is not good for the students minds. You could do much good before you die, by expressing your self in like manner. You have one foot in the grave now, and the other on a banana peel, you old fiend.

The fun of the thing is that I have *never* been a research worker. The first laboratory of Medical Research was established in connection with Bellevue Hospital Medical School by Andrew Carnegie in 1884. By that time, my career was marked out for me very clearly as that of a clinical surgeon. I have never experimented on *any* animal, not even a mouse or a frog.

I shall keep my eye on that banana peel you may be sure.

W. W. KEEN

SPECIAL CORRESPONDENCE

THE STUDY OF GEOLOGY BY AEROPLANE

ON January 12, 1929, my class in "Sedimentation" at the University of Southern California took an aeroplane trip along and over the Whittier Hills and Santa Ana Mountains, east and southeast of Los Angeles, California. The plane, a four-passenger type, was supplied through the kindness of the Stoody Company. It is believed that this was perhaps the first use in the United States of an aeroplane by an entire geology class. Since each student was aloft an hour and a half, it has seemed worth while to record their impressions and to ask for suggestions from other schools that may be planning flights, or may perhaps have antedated this one.

The students had already spent a semester in studying the peneplained Triassic basement complex of quartzites and slates, shot with Jurassic intrusives and partly overlain by Jurassic (?) extrusives; as well as the Cretaceous and Eocene formations, chiefly heavy sandstones where exposed in the Santa Ana region. All the formations are tilted into an unsymmetrical anticline with its gentler dip to the southwest and complicated by a dome-like anticline striking north-south on the western flank of the major structure.

We were uncertain as to how much could be observed from the air during the time each student was allotted. Accordingly, directions were given to center attention on four points:

(1) A fault which runs along the entire southern front of the Whittier Hills.

(2) Terraces, due to the latest uplift, along the canyons of the Santa Ana Mountains.

(3) The contacts between Triassic and Cretaceous, Lower? Cretaceous and Upper Cretaceous, Upper Cretaceous and Martinez Eocene, Martinez and Domengine? Eocene.

(4) The great Perris peneplain to the northeast of the Santa Ana Mountains. This plain had never seemed to the students a base-leveled region, because, observed from the earth, the flatness is obscured by elevations, numerous, highly irregular in shape, and often five hundred feet high.

I accompanied each group of three. After the first gazing at the ground was over—some of the students had never been aloft—the three began to take notes. Note-taking, as well as use of topographic maps, proved easy for the better students. I made occasional suggestions, but most of the time confined myself to observing the elevation and the effects of