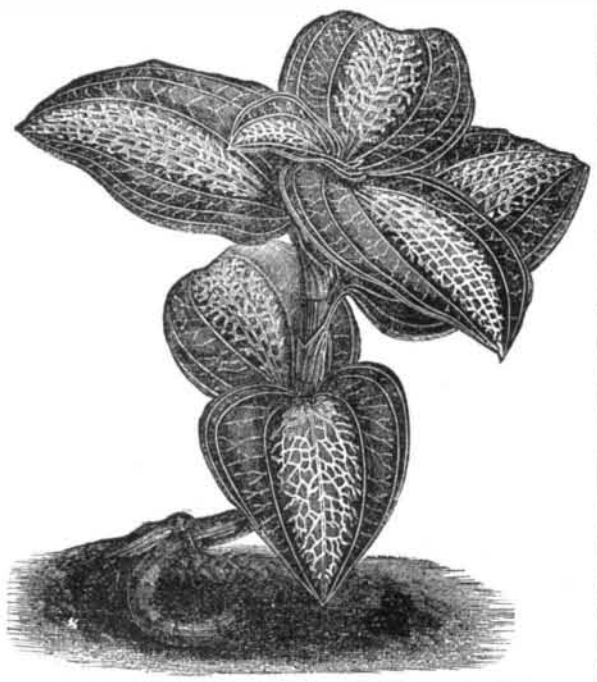
Sensitizing Gelatin Paper.

This is accomplished in a solution of one part bichromate of potash in twenty parts of water. The purer the bichromate salt, the better the paper. If small sheets of eighteen to twenty square inches are to be sensitized, the above solution is poured into a zinc or porcelain dish, the bottom of which should be covered to the depth of half an inch at least. The gelatin paper is dipped into the solution and left there until it gets soft, which generally takes thirty to forty seconds. It is then taken out and laid, gelatin side down, on a well cleaned glass plate. By rubbing with a piece of india rubber, not too hard, the greater part of the liquid is removed from the paper. On lifting the paper from the glass, it has a fine, smooth surface, on which there will be no streaks or drops formed afterward, as it is already half dry. It is then hung, on laths provided with pegs, to dry. Thus prepared, it will bear a much higher temperature than when the solution is not pressed out. In cold weather, the paper can remain some minutes in the chromate bath; it should be left there until soft and pliable.

In preparing large sheets, another method must be employed. A sufficient number of thin strips of pine wood, three fourths of an inch wide and long enough to rest on the opposite side of the dish, are saturated with shellac varnish, and, when dry, rubbed with cocoa butter, and then polished with an old linen rag. Horizontal sticks are put up in the preparation room with notches to receive these strips. The dish for a large chromate bath is best made of stout zinc. A sheet of gelatin paper is allowed to float on the bath, gelatin side down, until soft, when one end is lifted up and laid on one of the pine strips; another strip is laid on the paper, and the two clamped together. The paper is then drawn, face down, over a glass rod or tube fastened to one side of the dish. In this way small air bubbles are removed, as well as a large portion of the solution. The paper is now hung up by placing the strips of wood clamped to it in the notches on the horizontal sticks. A third strip is pressed gently against the back of the paper just below the others, and drawn down to the lower edge, thus partially removing the solution from the back. It is then clamped to the lower edge. In this manner, says the *Photographische Archiv*, a sheet of paper five feet long may be sensitized in less time than it takes to describe it. The chromate bath should be kept covered to keep out the dust; and before using it, a piece of blotting paper may be drawn over the surface.

AN IRIS AND AN ORCHID.

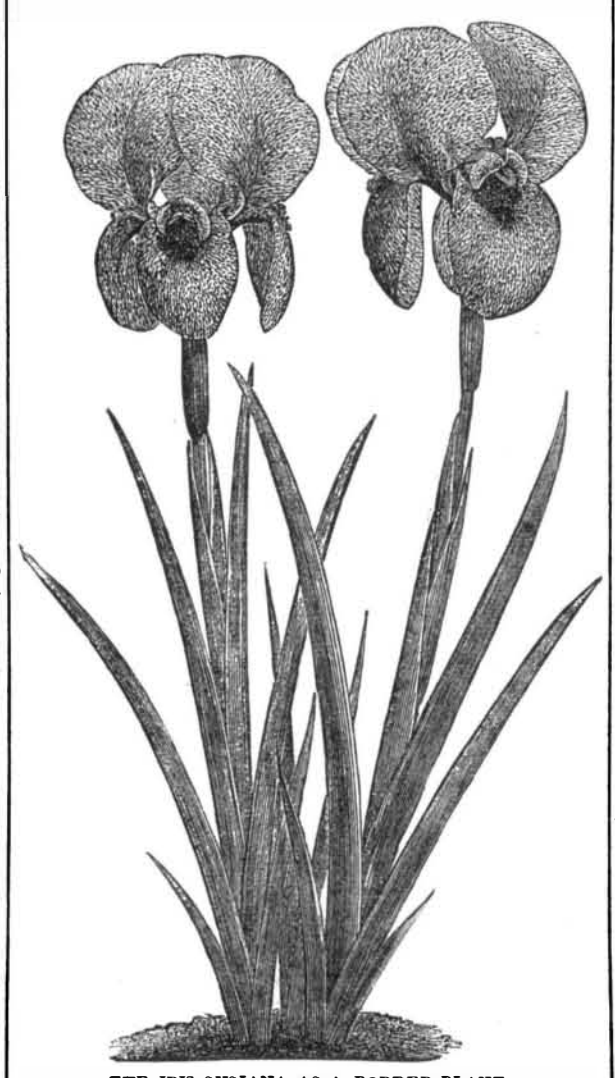
Our first engraving, extracted from *The Garden*, depicts a beautiful specimen of variegated orchid, the leaves of which are richly colored and highly ornamental, while the flowers are quite insignificant. It is indigenous to the East Indian Islands and Continent, and has short rhizomes, very short stems, and alternate leaves, more or less oval in shape, often heart shaped at the base and pointed at the apex, on very short foot stalks, which embrace or clasp the stem. The flowers are arranged in clusters or terminal spikes. They are of a white or reddish color, and are undeserving of notice in an ornamental point of view. The leaves are velvety, of a dark green color round the margins, while the central part is of a yellowish red. The whole of the upper surface is traversed by a network of veinings of a brilliant golden yellow color. The under surface is red. The plant is also known in gardens under the names of *a. xanthophyllus* and *a. latimaculatus*. The plant should be grown in pots, the lower half of which should, for the sake of securing perfect drainage, be filled with broken crocks, while the rest should be filled with a compost of peat, charcoal, and sphagnum,



ANÆCTOCHILUS (XANTHOPHYLLUS) LOBBIANUS.

the surface being covered with a layer of living sphagnum. The plants, after being potted, should be placed under a bell glass or *cloche*, in a warm house, where the temperature during summer should range from 70° to 78° Fah., and in winter from 55° to 60° Fah. A moist atmosphere is indispensable, and this should be maintained equally and constantly during the summer; but in winter, when the plants require some rest, the supply of moisture should be considerably diminished. The plants should at all times be kept well sheltered from the direct rays of the sun, and the inside of the bell glass or *cloche*, under which they are placed, should be carefully wiped out every morning and evening, otherwise the condensed moisture, accumulating on the glass, will drip on to the leaves, making holes wherever it touches. As the principal object in cultivating these plants is to bring the foliage to its full perfection of beauty, the flowers should be pinched off as soon as they begin to appear. This will throw more vigor into the leaves, cause them to grow closer together, and vastly improve the luster and richness of the coloring. It is also favorable to the multiplication of the plant, as it causes numerous shoots to spring from the axils of the lower leaves, and also from the rhizome. These shoots, when detached and planted, will form each a new plant. They should, of course, be potted in the same compost, and subjected to the same treatment which has been above described for full grown plants.

The plants of the *iris* family, of which the *iris susiana*,



THE IRIS SUSIANA AS A BORDER PLANT.

represented in the second of the two engravings given herewith, is a very beautiful variety, exist both in the temperate and torrid regions of the globe. There are several species similar to that in our illustration, having bulbous roots or stems, and exquisitely scented blossoms of an elegant pearl white hue. Almost every variety of the flower has some intrinsic value—the root of one species is the orris root sold by apothecaries; the powdered root of another gives a kind of snuff; the same powder of another variety may be used for making ink; and the fresh juice of other species is said to be a valuable cathartic medicine.

Hypodermic Medication.

The day that Alexander Wood, of Edinburgh, discovered "that a solution of morphia injected under the skin, in the vicinity of a painful part, afforded remarkable relief to the pain," the clock of ages marked an epoch in scientific medicine, which indeed rivals Harvey's discovery of the circulation, or Morton's discovery of anæsthesia. At that hour, throughout the civilized world, suffering humanity became heirs to a boon which has been to them as a pearl of price, and that particular province in the practice of medicine which looks to the alleviation of pain, which in times gone by was the bane of the physician's life, became so modified that pain presents but a few phases that we may not readily overcome, and but few characters we may not subdue. Such crises in medicine as have been wrought by the discoveries of Jenner, Cinchon, Harvey, Morton, and Wood are precursors of glorious "gala days" in their departments, and command the admiration and respect of not our profession alone, but the good and noble the world over.

Dr. Wood, after his discovery, continued to practise the method from November, 1843, to 1856, a period of thirteen years, and until he became thoroughly convinced of its utility and worth, when he published his first account of the subject in the Edinburgh *Medical and Surgical Journal*—now over thirty years ago.

I have known the hypodermic syringe to be employed almost in every available portion of the body, and on an average of four times in twenty-four hours, for a period of several years, in the same patient, making an aggregate of six thousand and four hundred times, without the slightest accident and without even the formation of an abscess.

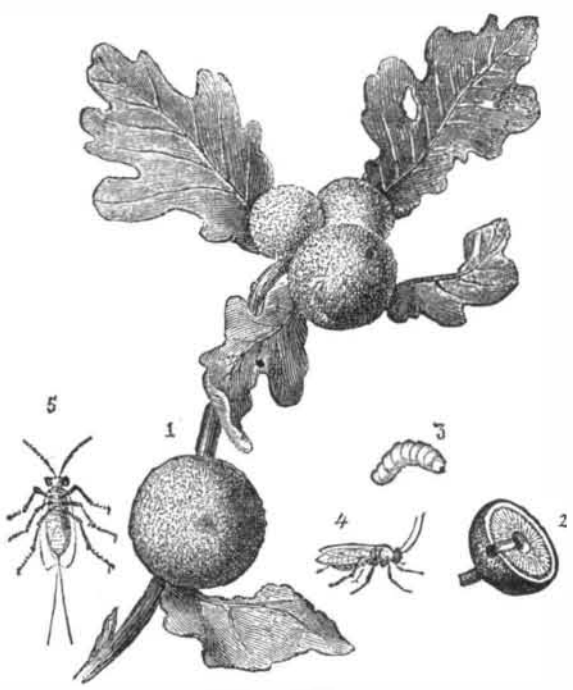
My own method of using the hypodermic syringe is as follows: After being satisfied that the instrument is in perfect order, the piston properly fitted, the barrel clean, etc., I draw up slightly more fluid than I design using, invert the syringe, press up the piston to expel the air which is nearly always drawn in, and the surplus solution; then with the thumb and finger of the left hand, I pinch up a fold of integument, pressing it pretty firmly for a few seconds, to lessen its sensibility; with a firm, steady pressure I introduce the needle at an angle of about 45°, directly into the cellular tissue, to the depth of one eighth to a quarter of an inch, according to circumstances; press down the piston, withdraw the needle quickly, place a finger over the puncture to prevent the escape of fluid, and the operation is complete.

The first drug employed hypodermically was morphia. And its range of application has kept pace, co-extensive with its employment. While its various salts have been used, the sulphate seems to have outgrown all others in favor, for various reasons, and is at present the favorite; it is perfectly soluble in distilled water, which is, for all purposes and under most circumstances, the very best vehicle for hypodermic use, on account of being perfectly unirritating to the tissues and not liable to produce inflammation or abscess.

The physiological effects of morphia are too well understood to require repetition here. It was early—in fact, first—employed in neuralgia, in which a single application cured the disease. It had yielded equally as good results in my own hands a number of times; and although we will often fail to cure so promptly, by perseverence, for a limited time even, we will be satisfied with its results. At present, I cannot call to mind a single case of ordinary neuralgia which I have treated hypodermically that was not speedily and, so far as I know, permanently cured by a few applications.—*J. C. Bishop, M. D, in Southern Medical Record.*

OAK APPLES OR GALLS.

These, says the *Garden*, are produced by an insect known to entomologists under the name of *cynips quercus-petioli*, which deposits its eggs in the tender bark of the young twigs of the oak. Soon afterwards the portion of the bark in which an egg has been deposited begins to swell, and ultimately forms a rounded tumor or excrescence, sometimes over an inch in diameter. "On cutting into these galls," says Dr. Fitch, "the small limb on which they grow is found to have its wood thickened or swollen, and, over it, forming the chief bulk of the tumor, is a corky substance of a yellowish brown or snuff color, between which and the wood are several small hard grains (resembling seeds, each having a cavity in its center), in which, doubled together, lies a soft, white, footless worm or maggot. This, on completing its growth, changes to a pupa in the same cell, and, subsequently, into a fly; whereupon, to escape from its confinement, it gnaws through the corky substance and the external bark, thus producing those small perforations like pin holes, which are always seen in these tumors after the insects have made their exit therefrom." Fig. 2 in our illustration represents a section of one of these galls cut through the middle, and showing the central cavity in which the grub grew to maturity, prior to eating its way to the outside, through the channel which is also shown. The injury done to oak plantations by these insects is sometimes very great. A few years since they appeared in such numbers in England as to create quite a panic among the landowners, who were threatened with the entire loss of their oak plantations Some of the trees withered and died, others had their leading shoots killed, while the younger trees were seriously checked in their growth. There is another species of cynips which deposits its eggs in the same manner in the leaves of the oak, causing them to swell similarly. The tumors, however, pro-



OAK GALLS

duced by this insect are soft and much smaller than the bark galls. In both cases it is probable that the parent insect, when depositing her eggs, injects with each a small quantity of some acrid secretion which has a specific effect in so irritating the tissues of the bark or leaf that they at once commence to swell and produce the spherical induration which forms the *nidus* of the future larva.

Fig. 1 shows the oak gall in its natural size, and Fig. 2 is a section of the same. Figs. 3, 4, and 5 are, respectively the larva, male and female of the cynips.

© 1874 SCIENTIFIC AMERICAN, INC.