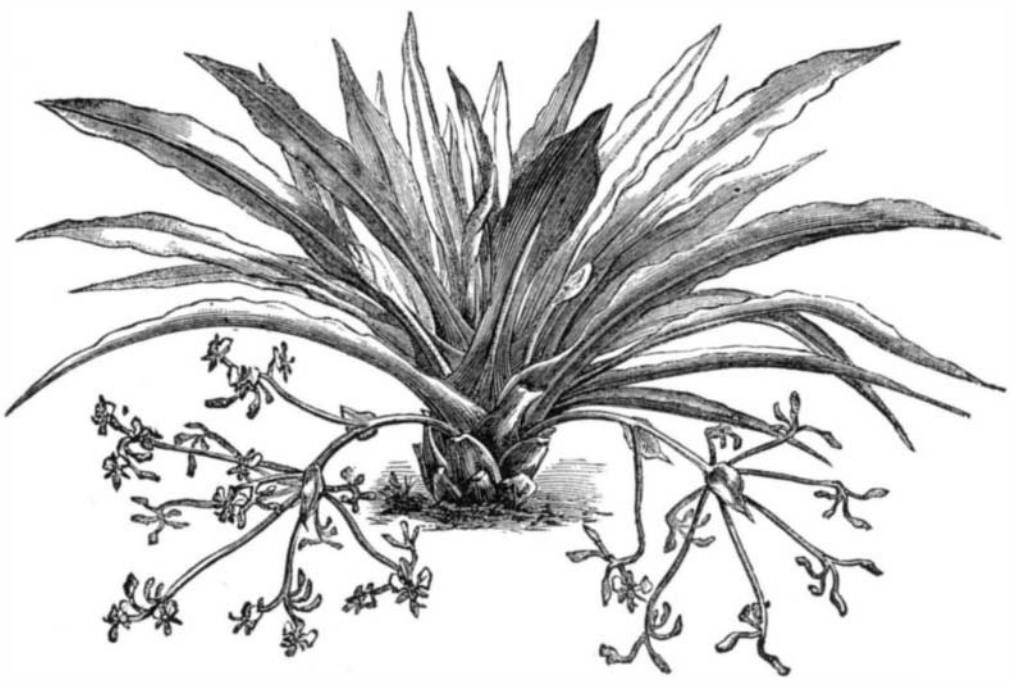
COCHLIOSTEMA JACOBIANUM.

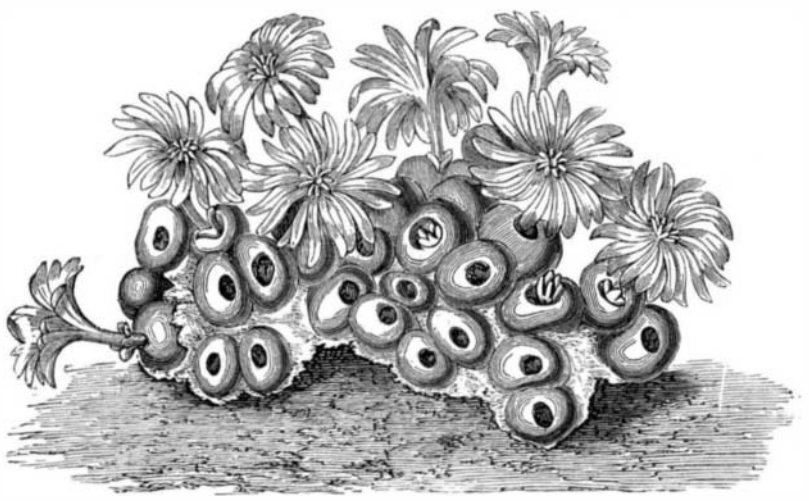
This singular plant, with agave-like foliage, and somewhat orchid-like blossoms, is one of great beauty. A plant belonging to the same genus was introduced in England some few years ago, and more than one of the principal nurserymen flowered it successfully. M. E. Andre, however, who, in the *Revue Horticole*, recently gave a figure of what he deems to be a new species, appears to think that the elder species is now entirely lost to the English gardens; but whether he has sufficient proof that such is the case we doubt. Our engraving will serve to convey an excellent idea of the agave-like foliage of the plant described as a new species by M. E. Andre. An engraving, however, can give no idea of the beauty of its inflorescence. The petals of the flowers, which are of a soft velvety purple, measure 1½ inches across, while the sepals are of a pale rosy white. The spoon-sbaped bracts are of a deep bright salmon color, the whole of the stalks being of a paler tone of the same color, flushed at the joints with a full brownish pink. The flowers exhale a delicate perfume, similar to that of certain *oncidiums*, to the blossoms of which they present a superficial resemblance. The beautiful flowers of *c. Jacobianum* have the defect of being exceedingly evanescent, as noticed in the previously known species which has flowered in England. This defect, however (which is peculiar to nearly all commelynaceous plants), is more than counterbalanced by the profusion with which the flower spikes are seemingly produced on well grown plants. In the new (?) species described by M. E. André, he relies for its distinctness on the following differences from the old one: First, by the far less hirsute character of the flowers; and secondly, by the uniform green of the leaves, the elder species having them either strongly blotched or bordered with purple. He also relies on the much larger general dimensions of tbe plant. It is presumed that so large a plant can only be an epiphyte upon some of the forest giants that clothe the deep slopes and valleys of equatorial America. In a shaded part of the stove house it is not difficult to flower, and its multiplication may be effected by the separation of the small lateral buddings until seeds shall have been obtained. It is well worthy of a place in the orchid house.



COCHLIOSTEMA JACOBIANUM.

MESEMBRYANTHEMUMS.

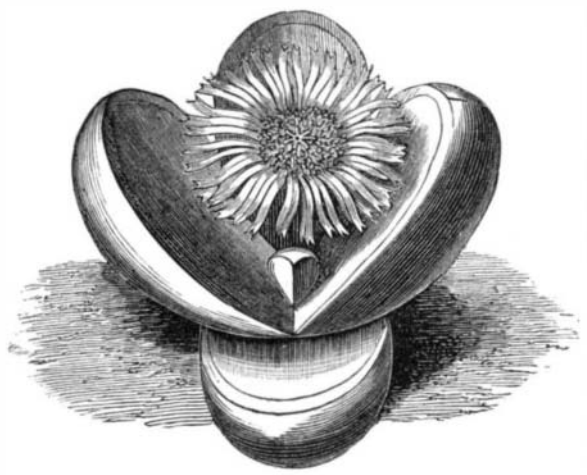
These beautiful flowers belong to South Africa, where there may be found no fewer than 250 species or thereabouts. For the sake of convenience, Haworth has divided mesembryanthemums into forty-three sections and sub-sections. *M. debile* and *crassifolium*, though thought by some to be Australian species, nevertheless belong to the Cape, and probably went first to Australia from there or from England. *M. cordifolium* (the ice plant), so well known in country districts, was sent to England a few years ago by Baron Müller; but it is likely that some plant-loving emigrant took it out to Australia. The majority of mesembryanthemums are easily grown, and make firstrate window and rockwork plants. Common garden soil suits them perfectly; the kinds represented in the accompanying illustrations, and their immediate congeners, may be placed among fancy sorts—little gems well worth cultivating on account of their quaintness and variety rather than as subjects for purposes of general decoration. For those who are fond of uncommon forms among plants, but who have little time or space to devote to their culture, these are plants well worth attention. *M. minimum*, of which we give an engraving, belongs to the sphæroide section, a group in which there are four others, *m. truncatulum*, *obconellum*, *nuciforme*, and a new species which is much larger than the others, and which has been named *m. truncatellum*. These plants never form a stem, and increase in size by bursting through the fleshy top, when the outer part shrivels up, and the new formation takes its place. The flowers, which issue from the center, are pale rose. Plants like these require to be potted in very sandy soil, and require to be well drained, when they will grow well. *M. testiculare*, of which an illustration is also given, is a rare and beautiful plant, with a skin as smooth as silk, and very glaucous. It is sometimes called *m. octophyllum*, but we never yet saw it with eight leaves. It is somewhat delicate, and should be potted in half silver sand, the other half being loam and brick rubbish, and should be kept near the glass in a dry house. *M. fissum* is closely related to this species, but it is more easily cultivated than *m. testiculare*. Among the most interesting of the mesembryanthemums are *m. tigrinum* (tiger's chap), *m. lupinum* (wolf's chap), *m. felinum* (cat's chap), *m. erminum* (rat's chap), *m. murinum* (mouse's chap), and *m. mustellinum* (weasel's chap), all exceedingly interesting, and easily cultivated kinds; their flowers, which are all yellow, open in the afternoon. They form valnable plants for rockwork in summer, standing well out of doors in the south of England from May until October. They are easily propagated by pieces pulled or cut off and laid in the sun on moist sand, where they root freely in a few weeks, and often keep on flowering as though nothing had happened.



MESEMBRYANTHEMUM MINIMUM.

A Profitable Source of Picric Acid.

G. C. Wittstein calls attention to a new source of picric acid. This is a long and well known drug, the resin of *xanthorrhœa arborea*, a plant which is a native of Australia. It is known as acaroid resin and as the yellow resin of Botany Bay in New Holland (*resina acaroidis* and *resina lutea Novi Belgii*). The advantages of using this substance for the manufacture of picric acid are twofold. First, the material is cheap; second, the yield is large. About one hundred and fifty grains of the pulverized resin were placed in a beaker glass, and 750 grains crude nitric acid, of specific gravity 1·16, poured over it; the beaker was covered with a glass capsule and digested at a gentle heat. The mass soon swelled up, and a deep brown crust formed over the liquid. This crust needed to be broken up from time to time with a glass rod. After about three hours, nitrous fumes ceased to be evolved, and the mass was allowed to cool. The next day, he found the bottom of the beaker covered with a thick layer of yellow crystals. Above this was a brownish red tarry mass, which hung together in a lump. This was taken out and again digested with 375 grains nitric acid; but there was almost no action, at least no more nitrous acid was formed, and no crystals were deposited from this second liquid on cooling, showing that it is unnecessary to treat the resinous mass with nitric acid a second time. In the present case it was desirable to lose as little as possible of the product sought; hence, after the crystals that formed had been taken out, the second liquid was added to the mother liquor and evaporated to dryness. The first crystals were added and the adhering nitric acid driven off at 212° Fah. The total residue weighed 100 grains, almost ⅔ of the resin taken; it was yellow and crystalline, and contained nothing amorphous but single crystals of oxalic acid. The picric acid thus obtained, after recrystalizing to secure the oxalic acid, weighed 75 grains. Hence, the yield is 50 per cent of the crude material.



MESEMBRYANTHEMUM TESTICULARE.

Fused Boracic Acid.

Fused boracic acid, which approaches glass in some of its external charaeteristics, presents some properties worthy of note. In the viscid state it may be drawn out into threads, which solidify rapidly, and from this point of view its ductility rather resembles that of silica than of glass. Its hardness, between 4 and 5, places it between fluor spar and apatite; it scratches glass, and is with difficulty attacked by sand, and even by emery, dry or with oil. It takes seven to eight times as much time in grinding as glass under the same circumstances. This resistance to friction, which does not accord with its hardness, depends doubtless, as M. Damour has recognized in the case of other minerals, on a speciality of structure. Melted boracic acid, in mass, becomes slowly hydrated in contact with water. In powder it is acted on rapidly, as shown by Ebelmen. If thepowder is sprinkled with water, its temperature may rise to 100°. Boracic acid is chiefly remarkable for the persistence of its temper. If poured upon a cold metallic surface, glassy plates are obtained, the under surface of which, chilled by the metal, is more strongly tempered and more expanded than the upper. Hence results a flection which may be strong enough to cause the rupture of the plate and its projection in fragments. If poured into oil it may be obtained in small masses with short tails, under the same conditions as Prince Rupert's drops. A tempered plate of boracic acid, with parallel surfaces, acts upon polarized light like tempered glass; but while the latter loses this property by re-heating, boracic acid preserves it with great tenacity.—*V. de Luynes.*

Eighty Miles an Hour in Pneumatic Tubes.---The Atmospheric Post between Paris and Versailles.

The National Assembly of France holds its sittings in Versailles, a kingly residence distant some eleven miles from Paris. The latter is the real seat of government, and it was therefore of great importance to introduce a means of communication by which official documents could be transmitted between the two places, at any moment when required, with great rapidity. For this purpose the pneumatic method has been put into operation, with much success, and it is stated that letters and packages are now sent through, in either direction, in eight minutes' time, being at an average velocity of more than eighty miles an hour.

To produce this enormous velocity—the tubes being only four inches in diameter—requires the use of three steam engines having an aggregate of one hundred and fifty horse power, besides other extensive apparatus, which we will briefly describe, quoting from a recent number of the *Engineer*.

A report on the system of M. Crespin, on the application of pneumatic power over long distances, has been reported upon by M. Tresca, of the Conservatoire des Arts et Metiers, with the Academy of Sciences, and the report is now published. We copy from the *Engineer*.

When it was found necessary to connect Paris and Versailles by means of a pneumatic tube, it was impossible to make use of the method adopted in Paris, which only gives the required speed over a distance of about 1 mile. The problem was to apply the same force along a line from 11 to 12 miles in length. This result has been obtained by the adoption of an apparatus called a relay, which, placed at various points along the line, acts upon the train and urges it at full speed to the next station. The column of air within the tube is set in action by forcing or by exhaustion, and the two operations are employed concurrently, but in a novel manner.

As in the pneumatic telegraph, M. Crespin uses a series of boxes to form a train; the impulse is given by forcing the air in at one end of the tube and exhausting it at the other; the pressure accumulated in the reservoirs comes into action at the moment the train passes a relay, and continues until the arrival of the train at the next post, when it is taken up by another reservoir, and so on to the end.

The line is double, up and down, and each is divided into sixteen sections of 3,650 feet in length, and each section has its relay. The necessary motive power is obtained from three stations, one at each end of the line, the other in the middle. The last is the most important, and comprises two engines of fifty horse power each, with pumps capable of exhausting the 280 cubic yards contained in the part of the line it serves in ten minutes, at the same time storing it in the reservoirs under the pressure of one atmosphere, necessary to supply successively behind the train 188 cubic yards