about the middle of their length there follows a narrower cross band of red color, vermilion toward the base, intensely pink toward the outside, not reaching the margins of the petals, sometimes dissolved into several separate spots; lastly, beyond the middle of the length of the petals there are three to eight smaller roundish spots of paler violet pink color. The flowers of *Veronica chamædrys* prove that also gay blue colors are perceived and selected by *Ascia*.

Bees and Flowers.—Mr. Thomas Meehan, in a note in the *Bulletin of the Torrey Botanical Club*, says: I find that the behavior of bees is governed by circumstances. When flowers are abundant they visit those only which they prefer; at other times they examine anything which comes in their way. At the time I am writing, May 18, there is a dearth of garden flowers. Those of the early spring are gone, and the later ones are not well formed. But Columbines in many species are in bloom. The humble bee bores the ends of the nectaries and sucks the honey stored there; and the honey bee follows and sucks from the same hole what may be left, or what may be afterward generated from the honey gland. I have often watched closely to learn whether the honey bee bored for honey. Its quick motions are unfavorable to correct observation. I thought once I had caught it boring lilac flowers, but I afterward counted all the flowers that had been bored by the humble bee, and then watched the work of the honey bee on the cluster, and there were no more bored afterward than before. The Columbines (*Aquilegiæ*), with curved nectaries, such as *A. vulgaris* and *A. olympica*, are very favorable for observation, as the slit is made on the upper side of the curve, and the honey bee can be easily seen following after the crumbs that have been left on the strong one's table. I have no doubt, however, that it would bore for itself if it had the power, and perhaps it sometimes does. The humble bee and the honey bee are evidently not the insects for which the Columbine had this beautifully contrived nectar cup provided to induce cross fertilization; and what particular insect was designed to be the favored one, so that it, and no other, could turn its tongue around these twisted spurs to get at the honey in the end, I think no student has yet discovered.

A Fresh Water Jelly Fish.—In the Botanical Gardens, at Regent's Park, London, a new jelly fish, about half an inch in diameter, was discovered on June 10, by Mr. W. Sowerby, and has created no small stir among the zoological celebrities of the metropolis. It has already received two names, one from Prof. Allman and the other from Prof. Ray Lankester, and has formed the subject of two papers, one at the Royal and the other at the Linnæan Society. Hitherto no jelly fish has been found in fresh water, and therefore the discovery of this species is the more remarkable. Prof. Lankester concludes that it is a tropical species, as it is active only at a temperature of 90° F., becoming sluggish at 60° F. It comes nearest to a Brazilian species, and one might therefore suspect that it came originally with the *Victoria regia*. As the tank is cleared out every year, and this water lily has been grown several years from seeds ripened at the gardens, it seems singular that the animal should not have been observed before if such were its source. Professor Lankester thinks it may have been introduced from the West Indies.

Natural Spread of the Apple Tree in South America.—It is surprising how quickly the vegetation of many countries settled by Europeans has been modified. A writer in Petermann's *Mittheilungen* on the flora of Chili south of the Valdivia River, states that the scenery between the Rio Bueno and its winding affluents reminds one very much of home. In the park-like prairies, associated with *Fagus obliqua*, a deciduous beech, are numerous scattered apple trees, originally introduced from Europe. The apple tree has spread from Valdivia to Osorno, and even crossed the Andes into Northwestern Patagonia, and thence eastward. Indeed, it has become so widely spread, and so general, that the Indians from the distant regions of the Argentine rivers Rio Negro and Rio Colorado, are called manzaneros, or apple Indians. As a matter of fact, they and their kin in the provinces of Valdivia and Osorno live far more on the fruit of the apple tree than any European people, for it affords them both food and wine.

Irritability in Leaves of Robinia.—M. Phipson read a note at the recent session of the Academie des Sciences on development of sensitiveness in the common locust (*Robinia pseudacacia*). In his first experiment, tried last September, on an afternoon when the sun was shining brightly, he found that by giving the terminal leaflet a series of ten to twenty smart raps with his finger he was able to cause all the leaflets to close up, just as those of the sensitive plant do under like circumstances. On a second experiment he obtained the same results, and found that it took two or three hours sunshine to cause the leaflets to unfold again and resume their horizontal position. Heat applied to the terminal leaflet had no effect on the lateral ones, as it does in the sensitive plant, hence M. Phipson is led to conclude that the sap moves more slowly in the locust than it does in the latter plant. M. Phipson believes that these experiments add another proof of the truth of an opinion enunciated by him in 1876, to the effect that sensitiveness or irritability in the sensitive plant should not be regarded as a property peculiar to that plant, but rather as the highest manifestation of a phenomenon the traces of which are to be observed running throughout the entire vegetable kingdom.

THE AILANTUS TREE.

Not long since the well known authority on arboriculture, Prof. C. F. Sargent, urged the claims of the ailantus as a timber tree. Among other valuable properties, it was said to possess greater tenacity or ability to resist a strain than even the elm and the oak. Some experiments made in the French dockyard at Toulon showed that the ailantus, on an average of seven trials, broke with a weight of 72,186 pounds, while the elm yielded to 54,707 pounds, and the oak gave way under a pressure of 43,434 pounds.

Such a great tenacity as this, together with the rapid growth of the tree, ought certainly to make the ailantus worthy of culture for industrial purposes were it also durable when grown in exposed situations. The latter point, however, being one that has not as yet been ascertained, we are able to judge of the durability only from specimens seen in cultivation, and these would seem to give an answer in the negative. It is a well known fact that during the progress of the wind storms, which occasionally rise suddenly in this latitude during summer and sweep with terrific velocity through our streets, the very first tree to give way, in the majority of cases, before the brief fury of the storm, is the ailantus. This was notably the case in the hurricane of Sunday afternoon, June 13, when, out of the large number of trees blown down in various parts of our city, nearly every one was a to-all-appearances healthy specimen of this same Chinese "Tree of Heaven." All of the trees examined by us had snapped off close to the ground. In nearly every case the base of the trunk, although it gave no outward sign of the fact, had rotted away internally to a depth of two to three feet, leaving nothing but a shell to support the otherwise seemingly sound tree. The reason of this decay was not apparent.

In an ailantus which was blown down in Fifth Avenue last June during a similar storm of wind, the trunk broke off about two feet above the ground. This tree, to all external appearances, was extremely healthy and in vigorous growth, the bark being perfectly sound and the tree in full flower; but an examination showed that the interior was a mere mass of corruption from base to apex. The inner surface was literally alive with the large white fleshy grubs of some tree-boring beetle, which had riddled the heart wood to such an extent as to convert it into sawdust, and to leave nothing but a mere external shell of bark and sapwood not more than two and a half inches thick—a mere skeleton, certainly not well calculated to resist much wind pressure. Here, then, in this insect we have one hidden enemy at least that may prove disastrous to the culture of the tree for its timber, one that may even now be committing its ravages unobserved in trees still living, and one that may have been the cause of death of those trees whose trunks are allowed to stand here and there along our streets.

Two years ago the city was sued by the family of a lady who was killed by the fall of an ailantus tree in Eleventh street. It was proven by the plaintiffs that the tree was not in foliage during the year previous, and that it was hence rotten, and should consequently have been removed by the authorities. However derelict the authorities may have been in this instance, it is quite probable that this dead tree was no more dangerous than a large number of those that are now living, and filling the atmosphere with the unsavory odor of their blossoms.

A question of prime importance, therefore, for the lives of our citizens would appear to be this: How many of the ailantuses standing along the edge of our sidewalks are in the condition of the one above mentioned—all soundness and beauty without, but all rottenness and corruption within, and liable to topple over on the passer-by without warning on the occasion of the least gust of wind? The ascertaining of so important a fact probably comes within the scope of the duties of the Board of Health. From these statements, based on our own observation, it will be seen that, however great a future there may be for this malodorous tree as a timber producer, the ailantus can scarcely be recommended as a safe shade tree for the streets of a populous city like New York; and, moreover, that it would be prudent to give it a wide berth whenever the wind rises to more than ordinary velocity.

The Creosote Plant.

According to a note in a recent botanical journal, the resinous substance found on the branches of *Larrea Mexicana* has been proposed as a substitute for lac in the preparation of lac dye. The plant, which belongs to the natural order *Zygophylleæ*, is a shrub from four to six feet high, growing in dense scrub-like masses in Mexico, especially on the borders of the Colorado desert, where its luxuriant growth forms an impenetrable mass of vegetation, effectually preventing the inroads of the drifting sand. The presence of this plant is said to be a sure indication of a sterile soil, little else being found where it flourishes, though the bright green of the foliage imparts a freshness to the surrounding scenery. The common name is derived from the fact that the plant has a strong creosote-like odor, which is so powerful that no animal will touch it. The resinous matter to which the smell is due is abundant in all parts of the plant, the branches being frequently covered with it, in the same manner as true lac. The resin itself is of a light ruby color. It is used by the natives in the treatment of rheumatism; it is also used by the Indians for fixing their arrow heads to the shafts, and for forming into balls, which they kick before them as they journey from point to point of their trail.

Bacteria in the Air.

By a certain process M. Miquel has succeeded in seizing and numbering the spores or eggs of bacteria, and while confirming M. Pasteur's observation, that they are always present in the air, shows that their number presents incessant variations. Very small in winter, it increases in spring, is very high in summer and autumn, then sinks rapidly when frost sets in. This law also applies to spores of champignons; but while the spores of moulds are abundant in wet periods, the number of aerial bacteria then becomes very small, and it only rises again when drought pervades the soil, a time when the spores of moulds become rare. Thus, to the *maxima* of moulds correspond the *minima* of bacteria, and reciprocally. In summer and autumn, at Montsouris, one finds frequently 1,000 germs of bacteria in a cubic meter of air. In winter the number not uncommonly descends to 4 and 5, and on some days the dust from 200 liters of air proves incapable of causing infection of liquors the most alterable. In the interior of houses, and in absence of mechanical movements raising dust from the surface of objects, the air becomes fertilizing only in a volume of 30 to 50 liters. In M. Miquel's laboratory the dust of 5 liters usually serves to effect the alteration of neutral bouillon. In the Paris sewers infection of the same liquor is produced by particles in 1 liter of the air.

These results differ considerably, it is pointed out, from those published by Tyndall, who says a few cubic centimeters of air will, in most cases, bring infection into the most diverse infusions. M. Miquel compared the number of deaths from contagious and epidemic diseases in Paris with the number of bacteria in the air during the period from December, 1879, to June, 1880, and, certainly, each recrudescence of the aerial bacteria was followed at about eight days' interval by an increase of the deaths in question. Unwilling to say positively that this is more than a mere coincidence, he projects further observations regarding it. M. Miquel further finds (contrary to some authors) that the water vapor which rises from the ground, from rivers, from masses in full putrefaction, is always micrographically pure, that gases from buried matter in course of decomposition are always exempt from bacteria, and that even impure air sent through putrefied meat, far from being charged with microbes, is entirely purified provided only the putrid filter be in a state of moisture comparable to that of earth at 0·30 meter from the surface of the ground.

Bees and Sugar Refineries.

The Council of Hygiene, of Paris, says *La Nature*, was recently called on to pronounce upon quite a singular question. There are in Paris, especially in the Thirteenth, Nineteenth, and Twentieth wards, depots of bee-hives, which, of little importance at the start, have finally become quite extensive establishments. Certain of these depots contain no less than from 120 to 150 hives. Now, as each hive contains upward of 40,000 workers, there are several millions of bees in each depot. At first sight it might seem surprising that a honey-producing industry should be carried on in the heart of a great city, where there are no flowers that the bees can visit to obtain nectar; but on investigation it has been found that these establishments have either through accident or design (undoubtedly the latter) located themselves in the vicinity of the large sugar refineries. The consequence is that the latter are constantly visited by the bees in immense numbers, to the serious annoyance of the workmen. In a short space of time the sirup pans are completely filled with bees, and the loss occasioned by this amounts, in one refinery alone, to about $5,000 a year.

Various means of extermination have been devised, but thus far to no purpose. One refiner, M. Say, destroys the insects by means of fly-traps placed near the windows. There are about 60 of these traps in his refinery, and the number of bees captured per diem in each one of them amounts to about a quarter of a bushel. But in spite of all this the works continue to be infested. The sugar refiners have asked for damages, but at present the Prefect of Police has at his disposition no ordinance which will permit him to allow them. The refiners will be obliged to suffer the loss and inconvenience till the Council makes some ruling on the subject.

AGRICULTURAL INVENTIONS.

Mr. John L. Brinly, of Louisville, Ky., has patented an improvement in plows, the object of which is to prevent the plow from being broken should the front bolt that secures the plow to the beam break, and to facilitate the renewal of the land side when worn.

An improvement in plows has been patented by Mr. Zeadock R. Percefull, of Port Smith, Ark. This invention relates to a combined mould board or turn plow and subsoiler; and it consists in a vertical standard blade, having a mould board adjustably fixed thereto on its side, and carrying at its bottom a point in advance of the mould board, and just in rear of this a share and heel piece, by which arrangement the furrow is turned by the mould board, the earth pierced in advance of the mould board by the subsoil point, and then broken by the share in the rear, the adjustable connection of the mould board affording means for regulating the relative depth of the furrow and subsoil track.

Mr. Perry R. Weatherford, of Waverly, Ky., has patented a combined rotary and drag harrow, so constructed that it can be adjusted to work at any desired depth in the ground, and can be readily raised from and lowered to the ground.