are the long black feathers. These are all that are taken from the bird. In this room the feathers are sorted into various qualities, tied up in bunches, and packed in cases ready for shipment to London.

Fig. 6 shows a coolie with his lot of young birds. It should be explained that to each lot of about thirty birds a man is told off, who from sunrise to sunset goes about in the lucerne fields with them, cutting up the lucerne for them, or breaking bones for them, and finding them gravel and water. They become immensely attached to their nurse.

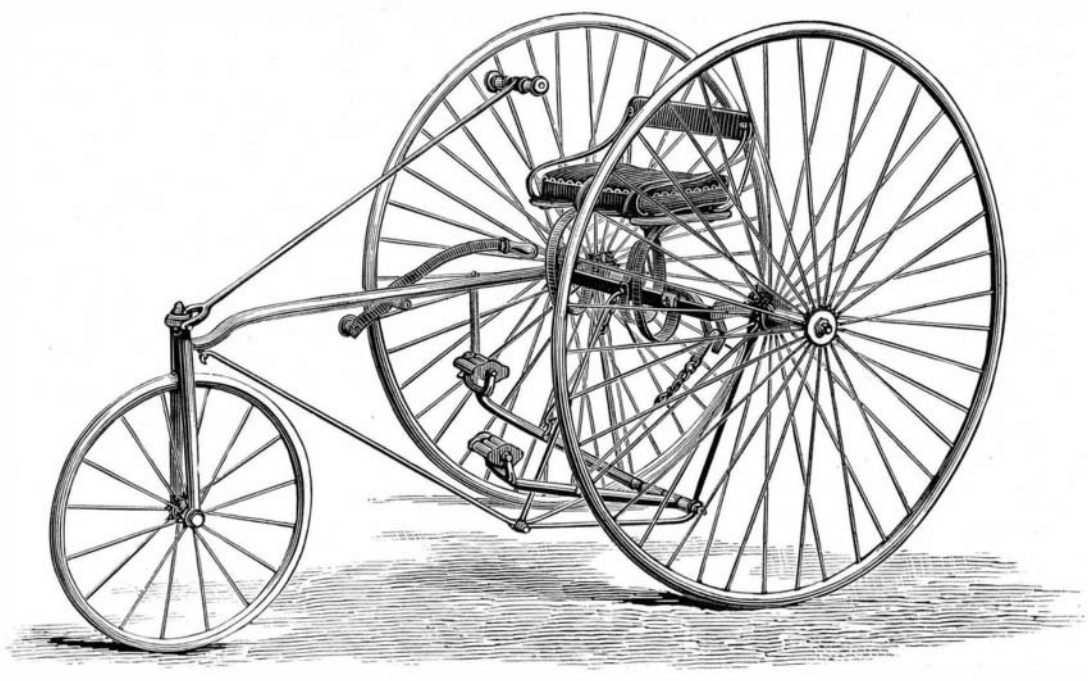
Fig. 7 shows a bird sitting on her nest. The hen sits by day and the cock by night, except in wet weather, when the cock will remain on day and night, being evidently afraid to trust his wife.

Fig. 8 represents "a find." It is often a serious matter to find the nests; the bird is in anger at being disturbed, and, if a male bird, would soon send horse and rider flying to escape his furious kicks.

THE PREMIER TRICYCLE.

The tricycle illustrated on this page is an English machine, made by Hillman & Herbert, of Coventry. The engraving we copy from *Iron*. The framework is a horizontal bar, bent into a rectangle, with a double-throw crank axle running in anti-friction roller bearings, which are bolted to the frame. Two large wheels, from 46 to 50 inches in diameter, are mounted upon this axle, one of them being the driver. Three C-springs are also bolted to the frames, to support the seat, and two rods, extending downward, carry a steel bar, whereon the pedal levers are pivoted. A stout tube connection for the guiding wheel is also bolted to the framework, and is curved so as to be out of the way of the feet and legs, and render the machine suitable for ladies as well as gentlemen. The guiding wheel is 22 inches in diameter, and runs upon an adjustable double-coned pin in an upright fork, about 4 feet in advance of the crank axle, and exactly midway between the large wheels. Its handle is very conveniently pivoted, so that it may be turned over or reversed, and used to draw the machine when necessary, as in the case of steep hills. The wheels are all tired with Para rubber, and their fellies are of U-shaped steel, while a powerful roller brake is attached to the driving wheel, the lever being at the right hand of the rider.

The steel bar carrying the propelling levers is placed as near the ground as safety permits. It is strengthened by a couple of steel rods projecting under the pedal levers in such wise that the double purpose is served of imparting perfect rigidity to the bar, and supplying a guard or stop in case of the pedal levers and crank becoming broken or unhinged. Without such a guard, serious accidents might occur, in spite of the best workmanship and materials, by the pedal dropping and catching the ground while the machine is in progress. The pedals are rubber-cushioned, and the connections are adjustable to suit length of leg. A step is fixed on the right side for mounting and dismounting, while the back of the seat is arranged to carry any amount of luggage.



THE PREMIER TRICYCLE.

Reversed Speech.

Messrs. Jenkins and Ewing have recently made some investigations into the capabilities of the phonograph for reversing sound when turned in opposite directions. They state that both vowels and consonants are unaltered by being spoken backwards; and that, whether the pulsations of air be made in a given order or in the reverse order, the ear accepts the sound as indicating the same letter. Consonants between single pairs of syllables, as *ada, aba,* etc., are identifiable quite as well backwards as forwards. *Ab,* however, said backwards becomes *ba,* and thus the investigators suggest we have here a standard of what does really constitute a single letter or element of articulate speech: it is any one reversible part. The word *noshaeesossa* pronounced in the phonograph is reproduced very clearly as *association.*

A New Grain Elevator in New York.

The New York Central and Hudson River Railroad Company are about to construct another grain elevator in close proximity to that at 60th street and North river in this city, illustrations of which we published about a year ago. The new building will have a capacity of about 800,000 bushels of grain, and is to embody all the latest improvements in elevator construction.

Contagion by Mail.

The London *Telegraph* has recently published a correspondent's letter setting forth a remarkable instance of scarlet fever being communicated by a letter. A lady wrote to a friend to inform her that she was nursing her daughter, suffering from scarlatina. The friend, after reading and burning the letter, gave the envelope in which it was contained to one of her children to play with. Shortly after, the child became sick of the same disease, which the physician traced to his own satisfaction to the infected letter. It might be suggested that an examination into the prevalence of contagious maladies among post office employés would throw some light on the danger of a possibly infected mail. One letter capable of communicating scarlet fever or small pox would probably render every other missive in the same pouch equally dangerous as a disseminator of disease. At any rate it is on the safe side to send no communications from infected houses save those that are absolutely necessary, and these should be immediately burned.

PLANT MIND.

V.

VEGETABLE ANATOMY.

Exquisite sensibility to all the powerful agents of Nature, heat, light, cold, moisture, drought, favorable and unfavorable surroundings, and even kind or unkind treatment, ever responsive to loving care, and drooping under chill neglect, are undeniable characteristics of plant life; and in so delicate an organization need we be surprised to find a complete analogue to the anatomical structure of animal and animated beings?

Among the ancients we find a continual recognition of the male and female, or principle of distinctive sexes, in vegetable creations; and Pliny taught that "in all trees and plants, nay, rather, in all things that proceed out of the earth, even in the very herbs, there are both sexes;" while the catalogues of the sixteenth century invariably recognize this distinction. In the "Philosophia Botanica," the parts of a flower are described by Linnæus in strictly anatomical terms, while the botanical text-books of the present day admit the fact as no longer to be questioned.

Has there been convincing proof of the existence of a correspondent collection of parts, which constitute not resemblances alone, but parity of functions? Replies are made in the affirmative by those who are familiar with the revelations of the modern microscope. There are a complete system of absorbent vessels, lacteals, and lymphatics; a pulmonary and arterial system, with glands for the separation of honey, gum, wax, resin, starch, sugar, essential oil, etc.; organs of reproduction, muscles, and, we think, *nerves,* although researches relative to the existence of nerves in plants are yet in their infancy, and may be guessed at rather as exhibited in action than actually seen in their minute reality. As the magnifying powers of the microscope have not yet reached their ultimatum, neither have explorations yielded all their secrets.

There are three systems of absorbent vessels in plants, namely, lymphatics, lacteals, and placental vessels for the nourishment of the embryo. The vessels which in plants correspond to the lacteals in animal beings are those which imbibe nutriment from the earth in the form of moisture; these are abundant in the roots, they flourish when supplied with water, and die when it is wanting.

The openings of the lymphatic vessels are to be found on the external surfaces of the bark and leaves, on the internal surfaces of all the cells, and between the bark and alburnum or sap wood. By Grew and Malpighi, these were supposed to be air vessels, but later observers have decided that conclusion to be erroneous. The absorbent vessels on the under side of a leaf prevent speedy death when laid upon the surface of a vessel of water, while a leaf placed with its upper side next the water will speedily decay or dry away. Moisture imbibed through these vessels will keep alive for some time the bark of a separated branch, and the alburnum or sap wood may be kept in the same manner.

By careful observation and experiment, an arterial system may also be detected. These experiments are usually made with the aid of colored decoctions upon plants which have a white blood or circulating medium. Their structure is in the form of a spiral line, but not interrupted by valves; at least the valves, we believe, have not yet been discerned. The vermicular motion of the spiral has been conjectured to be the equivalent for the action of the valves in the arterial system of animal beings, as each spiral ring pushes forward its contents by means of contraction, and, with a retrograde movement of the absorbent vessels, conveys moisture downwards as well as upwards. The sap is very generally admitted to be true vegetable blood, or to be to the vegetable just what blood is to our animal economy.

In addition to this system of absorbent vessels is also to be found a systematic apparatus for the purpose of exposing to the action of the atmosphere the fluids absorbed by the lacteals and lymphatics. This may be considered as an equivalent for the pulmonary system in animal life or in human organization. This is to be found in the leaves and in the petals of flowers. Above ground, or in the atmosphere, it answers to the lungs in animals, and in sub-aquatic or marine plants, to the gills in fishes. The fluids absorbed from the earth or atmosphere are carried to the foot stalk of every leaf, while the absorbent vessels of each leaf unite into branches and form pulmonary arteries, which are dispersed to the extremities of each leaf. In the leaf we behold the pleasing object of a complete circulation, with a pulmonary vein receiving the blood from each artery on the upper side of the leaf; while again, uniting in the foot stalk of the leaf, these veins form aortas, dispersing new blood over the new bark, elongating its vessels, or producing new secretions. The vessels in the intertexture of the bark are so minute that the venous system cannot be fully investigated without the aid of more powerful microscopes than we now have; but reason is always in advance of experiment, and we do not attempt to invent; we only try to discover facts.

As the corols or petals act as lungs to the flower or fruit, as it is called in botanical language, much of the process may be seen by the naked eye, for in these organs the vegetable blood is brought into contact with air and light. These vessels are all extremely sensitive to the stimulus of fluids received, and propel them upwards with great force. This susceptibility to irritation from juices absorbed, with their increased activity in the warmth of spring, proves the immediate presence of a vital force, and resembles in the minutest particular the action of similar vessels in animals.

In the "Veget. Stat." of Dr. Hales, the above statements are verified by experiments, which may be easily repeated.

Indeed, the analogy between the breathing apparatus of animals and the leaves of plants is so complete that it may be accepted as an undisputed fact in regard to the organic life of plants. A thin pellicle or membrane protects while exposing the vegetable blood to the action of the atmosphere, upon the upper surfaces of leaves, or organs of respiration. (*Vide* Bonnet, "Usage des Feuilles.") Leaves continue green many days when placed with the *under* surface in contact with water; but, if with the *upper* side next the water, they soon die. In aquatic plants it is the *under* side which lies upon the water, but the *upper* which is exposed to the action of the air and light. That leaves act the part of lungs, or giving out a phlogistic material to the atmosphere and inhaling oxygen or vital air, is no longer a subject of dispute among the learned.

Aquatic plants afford very marked illustrations of the above assertions. The lower leaves of the *Trapa* being beneath the water are divided into minute capillary ramifications, either getting from or giving to the water the indispensable oxygen, thus answering in their office to the gills in fish. The upper leaves of the *Trapa* are broad and round, with air bladders in their foot stalks, by which they are supported above the surface of the water. These upper leaves are undivided, while they are found below the water cut into fine divisions. These minute subdivisions of sub-aquatic plants may also facilitate the separation of the air by their points or edges. The contained air finds at the point of each fiber a place where the resistance to its expansion is less, and it there expands and becomes a bubble of air.

On very high mountains, where the atmosphere is of great rarity or thinness, the reverse arrangement has been noted, the upper in place of the lower leaves being finely divided, and thus affording a larger surface of contact necessary for the welfare of the plant individual.

R. C. K.