September 15, 1879.—"The Habits and Anatomy of the Carnivorous Plants," by Dr. Hunt.

October 4, 1879.—"General Remarks upon the Histology of Tumors," by Dr. Carl Seiler.

October 20, 1879.—"Summer Walks After Unseen Things," by Dr. Hunt.

November 17, 1879.—Lantern Exhibition, by Dr. Hunt.

Among the important contributions were:

"Observations upon the Vocal Cords in the so-called *Falsetto Voice*," by Dr. Seiler.

"Observations upon the Early Symptoms of Tubercular Deposit as Indicated by the Pyriform Swelling of the Arytenoid Cartilages," by Dr. Seiler.

"On Double Staining," by Dr. Seiler.

"On the so-called Sphincters of the Vocal Cords," by Dr. Seiler.

"On the Existence of True Vocal Cords," by Dr. Seiler.

"Abnormal Development of the Male Organs in the *Polytrichum Commune*," by Prof. Wm. Barbeck.

"Upon the Fungus *Cystopus candidus* Parasitic upon the *Capsella bursa-pastoris*," by Prof. Barbeck.

"The Fungus *Leangium Floriforme*, from the Park," by Prof. Barbeck.

"A Peculiar Form of Vegetable Crystal in a Species of *Lygonium*," by Mr. Potts.

"Upon the Advantages of a Movable Screen in Lantern Exhibitions," "Upon the Use of High Powers in the same, and the Employment of the Lantern to Show Opaque Objects," by Prof. Holman.

Exhibition of a horse with a living *Filaria* in his eye, and extended remarks upon this parasite, by Dr. Charles Turnbull.

In the course of Dr. Hunt's lectures the following objects, new to science, were described by him and exhibited for the first time:

The new rotatoria, described October 20, 1879.

The jelly glands of *Brasenia peltata*.

A peculiar square cell layer in the epidermis of *Sarracenia purpurea*.

A third variety of gland in the *Drosera*.

The peculiar cog-like projection upon the cells of the *Schizea*.

A new species of bell animalcula, related to the genus *P. chrydium*, described by Dr. H. C. Everts.

Observations upon the protoplasmic filaments of the teale, by Mr. John Ryder.

Two new myriapods, the new genus *Eurypauropus* and *Polyzenes*, by Mr. Ryder.

An exhibition of living agricultural ants and their habitations, by Rev. H. C. McCook.

The following are the more important mechanical inventions or improvements brought to the notice of the section by members during the year:

An improved microscope of Beck, of compact and economical make, for dissecting, as well as for use, as a compound instrument, by Mr. Walmsley.

An improvement in the economic microscope of Beck, consisting of the substitution of a tripod base, by Mr. Walmsley.

A new and improved economic microscope of Beck, consisting of the addition of the binocular tube, and the substitution of a tripod for the horseshoe base, by Mr. Walmsley.

A compound section-cutter, by Dr. Seiler.

An immersion microtome, consisting of a knife, arranged in a trough, by Dr. Seiler.

A rotating disk for opaque objects, by Mr. J. O. Shimmel.

A new form of rotating cage for the exhibition of live objects, by Mr. Shimmel.

A rotating table, by Mr. Jacob Binder.

A microscope for micro-mineralogical purposes, by Persifor Frazer, Jr.

A substage, with special mechanical arrangements, by Mr. Joseph Zeutmayer.

A cobweb micrometer, by which objects $\frac{1}{1000}$ to $\frac{1}{10000}$ of an inch in diameter could be accurately measured, by Mr. Joseph Zeutmayer.

MEETING OF THE BIOLOGICAL AND MICROSCOPICAL SECTION OF THE ACADEMY OF NATURAL SCIENCES. PHILADELPHIA, DEC. 1, 1879.

Director Dr. CARL SEILER in the Chair.

Dr. JAMES MCCOART presented for examination the lungs taken from calves that died from a disease resembling pleuro-pneumonia.

The tracheæ and the bronchi to their minute ramifications were filled with worms from one to two inches in length and about the thickness of and resembling ordinary white thread.

These worms were not encysted, but in some places were rolled together in masses or knots. The evidence of inflammation caused by these parasites was marked throughout the entire lungs.

The doctor gave a detailed history of the specimens brought before the section, and read the following article upon

PARASITIC BRONCHITIS.

Judging by what has come under my notice since the pleuro-pneumonia scare last spring, I am inclined to think that the farmers and dairymen throughout the State are prepared to, and with few exceptions do, class all bronchial affections of cattle under the head of pleuro-pneumonia.

I am sorry to say that I think in many cases they are supported in this opinion by amateur veterinarians who find it very convenient when called to see a case they do not understand to go with the tide and say the animal has (the fashionable disease) pleuro-pneumonia. This is accepted without cavil, and the vet. saves his reputation and the farmer loses a cow or calf, as the case may be, and is satisfied because he knows nothing about the diseases of cattle, and especially diseases that are very seldom discussed in the agricultural journals.

As we very seldom see an article in any of the journals on parasitic bronchitis, also called *husk*, or *hoose*, I will call your attention to a few cases, not with a view of introducing anything new, as the disease is, or at least should be, understood by veterinarians. I am afraid amateurs know very little if anything about it.

On October 28 a friend was called to see some calves that were sick at Mr. John Heiny's place in Northampton County, of this State. On arriving there he found one in a dying condition and five others very sick. He was told that two died before he was called on. The third died that afternoon.

The doctor made a *post mortem* examination and brought

a portion of one of the lungs to my place that evening. I found on examining it that the disease was, as I stated before when presenting the specimens, parasitic bronchitis, and advised him to give to the balance of the calves that were sick half a drachm of turpentine and half a drachm of linseed oil three times a day (as a drench), and should any of the cows become affected to give them one drachm of the turpentine and oil at a dose, and in either case make the animal inhale turpentine.

This can be done by putting some bran in a bucket and then pouring a small quantity of turpentine on it, and over all boiling water. The bucket must be held under the animal's nose so that the steam may penetrate, not only to the frontal sinuses, but to the trachea.

Two died after that, one on Nov. 12, the other on the 20th. The lung presented for examination was taken from the calf that died on the 20th.

This case the doctor writes me had been improving very fast until Mr. Heiny turned the animal out in the meadow that the calves were in when first taken sick, and it died in about a week afterwards.

There was only one cow affected with the disease and she recovered.

As the name denotes, this disease is caused by parasites in the bronchial tubes, and as a general thing affects calves that are pastured in low marshy meadows.

Professor Gamgee, in speaking of this disease in sheep, says (page 365) the *Strongylus filaria* is a worm from one to two and a half inches in length, the male smaller than the female, and yellowish, whereas the latter is white.

On page 366 he says, in calves similar parasites abound, under certain circumstances, in the respiratory organs.

The *Strongylus bitulorum* (Reed) or *Strongylus micrurus* (Mehlis), Clater by Armitage says (page 508), most commonly attacks young lambs and calves during the first year, and generally seizes them while at grass in the summer. He further says, in some dry summers the disease has carried off large numbers. Again, on page 509, he says, worms in horned cattle, we believe, are not very common. Dr. Teller, in "Diseases of Live Stock" (a very good work published in this city), defines it (page 339) as a disease caused by the irritation in the wind pipe, bronchial tubes, and lungs, of a parasitic worm called the *Strongylus*, and tells us that the disease is very fatal to sheep in many parts of this country.

Professor Law, in the "Farmer's Veterinary Adviser" (page 100), says, the calf, horse, ass, and mule have the *Strongylus micrurus* of from one and one half to three inches long, and on page 101 and 102 describes the symptoms very minutely and offers very sound advice as to prevention. On page 103 he says the symptoms in the sheep, goat, and camel are the exact counterpart of those in the calf. As to prevention, he says all the measures advised for the calf will apply equally well here.

Professor Williams, in speaking of hoose in calves, says (page 660) this disease very closely resembles that in lambs, and is caused by a parasite termed the *Strongylus micrurus*. Cobbold (page 335) says the nematodes of the ruminants are both numerous in and destructive to their bearers, those infesting the lungs being productive of a parasitic bronchitis termed husk, or hoose, and in cattle the *Strongylus micrurus* is particularly fatal to calves, whilst the *Strongylus filaria* attacks sheep and lambs.

The following are some of the most prominent symptoms: Animal dull and losing flesh and strength, frequent grinding of the teeth, and if compelled to move will lament and groan, breathing labored, cough harsh, and sometimes in the act of coughing the animal will discharge large flakes of matter, and on examining it we can very often detect large bunches, or nests of parasites in it. As the disease advances the breathing becomes more labored, and sometimes catching as if the animal was suffocating.

On examining the lungs after death we will find they differ very much in different cases. In some we will find both very much inflamed, in others one lung inflamed and the other apparently healthy. But in all cases, on making an incision through the lung and exposing the small bronchial tubes, we will find them filled with mucus containing more or less of the parasites in it. On exposing the large tubes we will very often find large bunches or nests coiled together like a rope and completely closing the tubes. They are from one to three inches long, and about as thick as the fine white wrapping yarn used by grocers and druggists.

On opening the trachea (wind pipe) and examining the mucous membrane we will, in the majority of cases, find them adhering to it. In fact, I do not think there is any part of the respiratory organs exempt. In support of this assertion I will cite a case.

Dr. Cobbold says (page 335) about the middle of October, 1875, he received from Mr. Geo. Farrow, of Durham, a fresh and characteristic specimen of diseased lungs in which the bronchi were swarming with filaria.

Now, in conclusion, permit me to repeat that I think this disease is met with quite frequently, but is not understood by amateurs, and if this brief sketch will be the means of causing them to investigate not only this, but all other diseases of cattle, I will feel amply rewarded for the time spent in writing it.

ROSE-FARMING.

ROSE-GROWING for perfumery is a branch of industry which appears to deserve the attention of some of our colonial friends in localities where the agricultural conditions are favorable and labor cheap. The pursuit would be an attractive one, and tried on a suitable scale, large enough to pay, but not so large as to disturb the market, it might, we consider, be made a very remunerative affair. The pure "attar" or "otto" of roses—never very abundant at the best of times—has risen enormously in price since the despoliation of the Turkish and Bulgarian rose-farms during the war of 1877-78; indeed, we are informed, it is now rarely to be found in the European market, and for this article, even more than the rose-water, a ready sale could doubtless be commanded.

A short account of the methods of growing and manufacturing attar and rose-water followed in Bulgaria and in India may supply some useful hints and suggestions to those disposed to give the subject consideration.

Colonel Baker—not Valentine Baker, by the way—in his recent work on Turkey, gives the following account of the method pursued at Kezanlik, a small district south of the Balkans and about 1,500 feet above the sea level, which is or was the center of the industry:

"The flowers have the appearance of our common dog-rose, and are of the varieties *R. damascena*, *R. sempervirens*, and *R. moschata*. The last affords the chief ingredient of the attar. The natives know very little of varieties, and are concerned only with the profits they can make out of the oil. The rose is grown by the farmers in every village in

the district, and requires a sandy soil on sloping ground exposed to the rays of the sun. The greatest care is bestowed on the cultivation and on the harvesting of the crop. A rose-garden may be laid down in spring or autumn, in ground that has been well cleared and plowed. The young rose-shoots are torn off larger plants, so as to carry with them a portion of the roots, and these are laid, almost horizontally, in trenches about 1 foot deep and 5 feet apart, so as to form a future hedge; they are then covered with earth and manure and carefully trodden down. Under favorable circumstances the shoots will appear at the end of six months, when they should be earthed up, and the plants will be over a foot high by the end of the year. In the second year they yield a few flowers; but they are not a source of profit till the third year. They are in full bearing in five years, at a height of about 6 feet, and last for about fifteen years, when the trees cease to flower. They require earthing-up four times a year, and should be manured every second year; but, although the manure increases the quantity, it interferes with the quality of the attar. No pruning is required except cutting off dead branches. Very severe cold kills the trees, and those of the whole district were thus destroyed in 1870. Hoar-frost and foggy misty weather are also injurious to the crop, and hot weather during distillation interferes with the yield of oil. The harvest begins in May, and lasts about twenty days. The farmer counts the buds upon his trees, which he makes a divisor for the whole, and so counts the number of buds which will blossom daily, and the number of days his harvest will last. The flowers must be gathered before the morning dew is off them, and be distilled at once. Herein lies the difficulty, because it is impossible to judge, even approximately, of the rapidity with which the buds will open; consequently, unless a very large staff is kept, so as to pick off all the blossoms of a heavy crop in the short space available, and unless a number of alembics are ready to distill them, a great part of the crop may be wasted in the case of rapid blowing. When the temperature during harvest is cold and damp, the blowing is gradual; when hot and sunny it is rapid.

"The yield of attar varies, but, on an average, it takes 4,000 rose-blossoms to make one lb. of oil. Best quality attar varies in price from 17 to 18 Turkish piastres the miscal, or 15s. 4d. to 16s. 10d. the ounce; inferior qualities, 14 to 15 piastres the miscal. The mode adopted for testing the purity of different qualities of oil is to put the essence into flasks, which are immersed in water of 63 to 68 degrees Fahr., when, if good, it congeals. This is considered the purest oil. A stony, sandy ground, impregnated with iron, produces the best oil, while a hard, badly cultivated land will only yield an inferior quality, which will not congeal at temperatures above 53 degrees Fahr. . . . An English acre produces 4,000 lb. to 6,000 lb. of blossom in fair years, and 34½ lb. of blossom produce 1½ drachms of oil, which may be said to be worth in this market 4s."

The roses, it may be added, are put in the stills without detaching the calices, the charge being 25 lb. to 50 lb. of roses per still. The above description was written previous to the war, it should be said. The last really good year in Bulgaria, 1873, produced a rose-crop valued at 70,000.

At the recent Agricultural Exhibition at Kilburn, Messrs. Piesse & Lubin exhibited a vase of attar distilled by MM. Pappazoglou Brothers, of Constantinople, from roses grown in the Kezanlik district, the price of which was marked 35s. per oz.

Turning next to India, we find roses grown for attar and rose-water at Lahore, Umritzur, and elsewhere, but the chief site of the industry is Ghazepore, on the Ganges, where about 150 English acres in the suburbs are grown with *Rosea damascena* for that purpose.

According to information quoted by Dr. W. W. Hunter, in his "Statistics of Bengal," the ground is divided into small fields carefully protected on all sides by high mud walls and prickly pear fences to keep out the cattle. These fields, which belong to the zemindar, are planted with rose-trees and let by the year, at so much per *biggah* for the ground, and so much extra for the trees on it. The rent is generally 5 rupees per *biggah* for the ground, and 25 rupees extra for the rose-trees, of which there are 1,000 on each *biggah*. If the season be good, these 1,000 trees should yield 1 lac of roses, the value of which will vary with the year from 40 to 70 rupees, i.e., 4l. to 7l. The purchases are always made at so much per lac. The rose-trees come into flower in March and continue so throughout April. The flowers are plucked in the early morning by men, women, and children, and are conveyed in bags to the contracting parties for distillation into rose-water. The growers themselves rarely distill. The stills are of the most primitive make. There is a great variety of rose-water manufactured in the bazaar, and much that bears the name is nothing more than a mixture of sandal-oil. The best rose-water procurable may be computed as requiring 1,000 roses to a seer of water, which yields 1½ seer of rose-water. The boiler of the still holds from 8,000 to 12,000 or 16,000 rose-blossoms. On each 8,000 roses 10 to 11 seers of water are placed, and 8 seers of rose-water distilled. This is placed in a glass carboy, and exposed to the sun for a few days to become *pucka*, or ripe; it is then stopped with cotton and luted with wet clay to prevent the scent escaping. The 8 seers of rose-water will fetch 12 to 16 rupees. The value of the roses sold at Ghazepore is estimated at 15,000 to 20,000 rupees per annum, and the profit thereon, at the prices asked and given, 40,000 rupees (£4,000).

To procure the attar or otto the roses are put into the still and the water passed over gradually, as in the rose-water process; after the whole has come over, the rose-water is placed in a large metal basin, which is covered with wetted muslin to prevent insects or dust getting in. The basin is then let into the ground about two feet, the ground having previously been watered, and allowed to remain quiet all night. This is always done at the beginning of the season, when the nights are cool; in the morning the little film of attar or oil which has collected on the surface during the night is removed with a feather and placed in a small phial, and day by day, after the collection has been made, it is placed for a short period in the sun, and after a sufficient quantity has been procured, is poured off clear into fresh phials.

From one lac of roses it is estimated that 180 grains or one *tolah* of attar can be obtained, or more if the roses are full-sized and the nights at the same time cool enough to admit of perfect congelation. The attar sells in India at 50 to 90 rupees the *tolah*. None has hitherto been exported.

In both cases it will be seen the processes of culture and manufacture are of the most primitive kind. In skilled hands they might, no doubt, be materially improved at comparatively small cost, and the profits, already considerable, increased proportionately.—Colonies and India.