Infusorial Catarrh and Asthma.

Discovery of the cause of one Form of Hay Fever, Hay Asthma, Catarrhal Fever etc.

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This is purely a parasitic disease, arising from a peculiar animalcular organism (Asthmatos ciliaris (Salisb.) armed upon one side with Cilia. This organism assumes a great variety of shapes and sizes, — during the different phases of its existence. In the same case, by watching carefully its development and metamorphoses under the microscope, it may be seen to transform it self into all the different forms represented in the figures from 1 to 17 II. Taf. I. The most usual shapes appear to be either spherical or oval; as seen in figures 1 to 8 II. Taf. I. These frequently send out a long proboscis, at the end of which is a dilated and elongated cilium, as represented at 14, 15, 16 and 17 II. Taf. I. This proboscis may be in the centre of the mass of cilia, as at 15 and 16, or at one side as at 14 and 17. It may be drawn in, leaving a nipple like elevation as at 10, or may disappear entirely, leaving the organism oval (8) or spherial (6). The proboscis often only partially disppears, or is only partially drawn in, while a constriction occurs in the form, as represented at 13 and 14. It may be simply a largely dilated cilium, as at 17 and 18 II. Taf. I.; — or the cell walls may go out forming a more or less sharp protuberance as at 15; or the walls may go still farther out forming a more or less fusiform organism as at 16. The cilia are simple extensions of the cell wall, are hollow and communicate with the cell cavity; and can be dilated and elongated at the pleasure of the animal. The parasite consists of a simple sac, — armed upon one side with cilia and inclosing one or more large nuclei, — and many smaller germules of varions sizes as seen in the figures.

The young are developed within the parent cell, and when mature are discharged at the end of the organism opposite the cilia, as seen at Fig. 18 II. Taf. I. The parent becomes quite large before delivery; and as the young one is discharged the parent cell becomes shrunken and shrivelled for a time. The aperture soon however closes, the rinkled shrivelled condition of the sac walls disappear and the parent moves about again fresh, plump and lively as ever.

The cilia are in active motion during the greater part of the life existence of the animal, and produce a most aggravating irritation of the mucous surfaces they infest. The young organisms 1, 2, 3, 4, 5 and 6, have a rolling, rocking vibrating motion, from side to side, making abont one third of a revolution on the transverse axis at each oscillation. The more mature cells, either vibrate slightly or have a tremulous motion, — their cilia not moving alltogether as at 5, — but vibrate in different directions.

Symptoms. After once obtaining a foothold on the mucous surfaces of the air passages; they multiply rapidly. At first they attack the mucous surfaces of the eye aud nose, producing sensativeness of the parts, which results in a free secretion of tears and thin mucus, and in uncomfortable and often intense paroxysms of sneezing. The organisms gradually travel from the nasal surfaces down into the fauces, larynx, tracheae, and larger and smaller bronchii. As soon as they reach the fauces there is a burning heat and irritation in the parts, that excites severe coughing. This tendency to cough constantly increases as they and the irritation gradually travel farther and farther down the air passages. When the larger bronchii are reached, a heavy hot, feverish pain is felt in the parts they invade, accompanied by more or less flushes of heat and fever. These symptoms ordinarily and very naturally, suggest to the physician „Catarrhal Fever“ under which head this disease is usually placed, especially when occurring during the winter and spring. This stage is accompanied by most intense paroxysms of coughing, which are frequently long and most painful; especially in the morning.

If the parasite makes its way into the smaller bronchii and air cells; asthmatic symptoms of a distressing character often supervene, — and the sufferings already almost unendurable, are much intensified.

The disease may continue for a long time, if the parasite is not destroyed; though after a period longer or shorter, — accord-

ing to the temperament and constitution and state of health of the patient; the irritation assumes a chronic form and the sufferings gradually grow less and less till they disappear. In irritable sensative constitutions, — the irritation in the fauces, larynx, pharynx and bronchii — become so great that the parts spasmodically close in attempts to swallow, — or to inhale air charged with anything which excites the inflamed parts. I have no doubt from what I have seen but that death may have occasionally occurred in the acute stage of this disease, from spasms of the pharynx and epiglottis.

Secretion. The cells of the mucus, first secreted from the surfaces invaded, are large round mucous cells, not differing materially from those in health. Soon however, they begin to be shrunken and jagged and in a few days they asume, many of them, — the appearance and characters of pus cells (muco-pus). The amount of secretion discharged from the air passages at any one time is small; yet the presence of this small quantity creates so much irritation, that it is very difficult, — during the acute stage of the attack, — to keep, for any length of time from coughing and sneezing. The secretion is thin, clear and watery at first and small in quantity, — soon becoming thicker and more turbid. The cough is short and somewhat painful and the invaded surfaces feel irritated, raw and hot. The cough raises but a small quantity at each time, and relieves the irritation and itching but for a few moments.

Whenever the parasites are developing rapidly on the velum palati, — most intense paroxysms of coughing are excited, which are long and persistant and painful and sometimes are accompanied by severe spasms of the epiglottis. Often an irritation and itching will be felt, on one side of the throat only, — exciting constant desire to cough. In such cases the irritation will always be on the side on which the nasal passage is closed. Under such circumstances, inhaling remedies through the mouth very often fails to check the coughing for but a few moments only. By clearing the closed up nasal passage, and inhaling through it, — the coughing and irritation is soon checked. The reason of this is, — that the parasites are developing rapidly on the posterior surface of the wing of the palate on the side of the nasal stoppage; and are constantly working down into the larynx and pharynx on that side.

Asthmatic symptoms. When the parasites reach the smaller bronchii and air cells, — especially in irritable and sensative constitutions, — Asthmatic symptoms begin to show themselves, — and often become distressing and almost unendurable. Any excitement in the circulation aggravates the symptoms. The evening and night air always increase the sufferings.

Season of Invasion. This disease is much more common from July to November (in this Climate) — than at any other season of the year, though it may occur at any season. When it occurs during the latter part of the summer and in early Autumn, it is usuallv called „Hay Fever“ or Hay Asthma“ and sometimes „Malarial Asthma“ of which class it is one form only. During the winter it is freqently called „Catarrhal Fever“; and with very good reason; — as the disease is always accompanied with fever and chilly sensations. The face is usually flushed, head hot and pulse rapid, — especially during the acute stage. How long the disease would continue, if left to itself, I do not know, as I have never let a case run long without the use of remedies to destroy the cause.

Contagion. This disease belongs to those that may be transmitted from one individual to another; though the transmission is not very readily accomplished. In working very closely over about sixty cases of the disease, — examining the sputa under the microscope for many hours together in each instance; and in several severe attacks, devoting days to the examinations, — I have taken the disease but six times myself; and in two instances have transmitted it to my family. I have usually began to feel symptoms of the presence of the parasite in from 4 to 8 days after beginning to treat a case. In all of my late cases — I should state, — that I have taken the precaution to inhale, —, — a solution of crystalised carbolic acid, — $\mathfrak{Z}^{1}/_{1}$ to the pint of water, every two or three hours; and to take 20 drops of Tinct. Feni — chlorid, in a tumbler of water 2 hours after each meal. This course has lately protected me from taking the disease.

Name of Disease. I have given to this disease the name that stands at the head of this paper. It has been given after carefully studying for over six years with great interest, the symptoms and peculiarities of the complaint. During that time I have treated about sixty cases of „Infusorial Catarrh and Asthma“, and

made over one hundred drawings of the parasite, — eighteen of which are given in the accompanying plate.

Treatment. All means ordinarily used for colds and coughs are worse than useless in this disease. While they tend to get the system out of order, — they do not retard the developement and progress of the cause. The only remedies that do any good, are such as either destroy or retard the growth and reproductiveness of the parasites.

Fortunately we have many agents belonging to this class; — among which are carbolic acid, Tinct. Feni-chlorid, quinia sulph, sulphuric acid, sulphurous acid, Nitric acid, Hydrochloric acid etc., all of which remedies should be in solution with sufficient water, so that they can be inhaled without producing irritation. The inhalations should be made freely and as often as every hour or two. In addition to inhaling; — give 2 grains of quinia sulph, every 4 hours and 20 drops of Tinct. Feni chlorid in a glass of water morning, noon and night.

It is surprising how much a single thorough inhalation, will relieve a suffering patient. If the sputa is examined before the first inhalation and then again after it, a remarkable difference will be observed in the condition of the parasites. Before inhalation, they are all in active motion, — after it, — if thoroughly done, — they will nearly all be found either dead or motionless. Occasionally one will be seen that has either not been reached at all, — or has not received a sufficient dose to destroy life. As they develope in the follicles, as well as on the plain surfaces of the air passages, it will be seen that frequent inhalations must be resorted to, or, the parasites will soon again be as numerous as ever. By keeping up the inhaling at short intervals, and inhaling thoroughly; the parasites have no chance to get very numerous; and soon the follicles become permeated with the inhaled materials and the cause is entirely destroyed. The sufferings of the patient, are much relieved, or almost disappear in a short time after entering thoroughly upon the treatment. In fact after they are almost entirely gone in a few minutes after taking the first inhalation. This shows conclusively that the parasite is the cause of the disease.

Asthmatos Ciliaris (Salisbury). I have taken the liberty to give this little parasite a name, — which perhaps a more extended acquaintance may deprive it of. It may be found to be

one of the many forms that are already described, — that inhabit stagnant and running waters, — and under certain conditions, — fermenting organic matter. The name Asthmatos ciliaris, here suggested will however answer present purposes. The generic title is indicative of one form of disease it causes, when it attacks the human system; while its specific name is suggested from the cilia with which it is armed. The figures from 1 to 18, represent the different forms and shaper the parasite assumes during the different phases of its existence. They are magnified from 300 to 500 diameters.

Fig. 18 represents the mode in which the parasite reproduces and discharges its young. The young animal grows within the parent cell and when mature is discharged at the posterior part of the organism. In figs. 7, 8, 14, 15, 16 and 17 are seen the young cell developing inside the parent cell. As the young is discharged the parent cell contracts and becomes corrugated and wrinkled and rough outside, as represented in Fig. 18. After the young is discharged, the parent soon begins to assume a more plump appearance, — the opening closes up, the wrinkled, shrivelled condition passes away, the cilia become active and the organism soon assumes the freshness, activity and vigor it had previous to parturition.