Cocaine in hay fever : a lecture delivered at the Chicago Medical College / by Seth S. Bishop, M.D., surgeon to the South Side Free Dispensary, and to the Illinois Charitable Eye and Ear Infirmary; member of the American Medical Associaton.

COCAINE

IN HAY FEVER.

A Lecture Delivered at the Chicago Medical College,

BY

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COCAINE IN HAY FEVER.

Gentlemen:—America has probably a hundred thousand sufferers from hay fever, a number about four times that of the standing army. Any information relative to this subject, especially if it offer a ray of hope of relief or cure, is eagerly sought by this vast army of unfortunates. After several years' study of this disease I shall endeavor to present a correct account of the present status of our knowledge concerning its pathology and treatment. The several names which this affection bears are unfortunate ones, inasmuch as they do not adequately express its pathology, symptoms, or causes. The pollen of grasses, weeds and flowers, and the heat of summer, are but a few of the large number of exciting and predisposing causes.

If I were to invent a name for it, both simple and expressive of the nature of the disease, I should call it nervous catarrh. I do not know that it has ever been called by that name, but it has not been generally conceded, until recently, that the malady was essentially a nervous one. Perhaps a better name than the one I propose could be found, if one should insist that technical terms only, such as neurasthenia, should be admitted into medical nomenclature. But nervous catarrh is an expression which would indicate both the true nature of the disease and the prominent symptoms which characterize it. The term hay fever does neither; for while hay, in common with many other kinds of pollen, dust, fumes, gases, and so forth, may excite attacks, many suffer from paroxysms into which neither hay nor fever enter as a factor, either causative or symptomatic.

In my first efforts to gather information on this subject I discovered that hay fever was considered a conundrum by a part of the profession and a myth by the remainder. By the paucity of the literature of the subject it was evident that medical authors did not mean to write most concerning that of which they knew the least. From the time of Bostock's discovery of the disease in 1819 to the year 1876, the nature of this affection seemed to be but ill-understood. In the light of the accumulated knowledge of the past ten years, however, it seems to be well established that its proper classification is among the neuroses. During my first experience with this intensely distressing disease, I followed Helmholtz's suggestion to destroy the vibrio-like bodies which inhabited the nasal secretion, and which he supposed caused the attacks, by the inhalation of a nebulized solution of quinine. This gave relief. I next tried the effects of administering the same drug internally, and was rewarded by even more satisfactory results. Certainly the infusoria in the nasal secretion were not destroyed by the internal use of half a dozen grains of quinine a day.

The susceptibility must exist in the nervous centres as well as in the end organs of the nerves. Otherwise there is left no rational explanation of the fact that heretofore internal medication by nerve tonics and sedatives have proved more serviceable than local treatment. This conclusion seemed to be verified by the fact that it had been demonstrated that a severe catarrhal condition of the nasal mucous membrane followed ablation of the sphenopalatine ganglion, which shows the intimate relation sustained between that sympathetic nervous centre and the nervous supply of the mucous membrane involved. Branches from this ganglion are distributed to the lining membrane of the nose, soft palate, and the end of the Eustachian tube. The motor root of this ganglion is derived from the facial, and

the auricular branch of the pneumogastric nerve unites with the facial. Thus is established an intimate connection between the nervous supply of the nose, throat, Eustachian tube, larynx, and bronchial tubes; and the explanation of the occurrence of aural and asthmatic symptoms as the result of nasal irritation is made clear. It becomes evident, then, if we study the disease from anatomical, physiological and clinical standpoints combined, that there is but one theory which satisfactorily reconciles all the known facts. According to that theory three conditions are requisite to the existence of a paroxysm of hay fever: First, abnormally sensitive nerve centres; secondly, a hyperæsthetic condition of the peripheral extremities of the nerves; and thirdly, the presence of one of a vast number of irritants.

The truth of the first proposition is evident from the fact that it is the only one which satisfactorily explains why but few individuals are affected, out of a large community, all the members of which are alike exposed to the same irritating ingredients of the atmosphere; why ablation of the spheno-palatine ganglion causes a severe catarrhal condition of the nasal mucous membrane; why nervous depression, or exhaustion (neurasthenia) predisposes to hay fever attacks; why tonics and sedatives to the central nervous system alleviate, abort, or prevent attacks; why sudden mental excitement may prevent an impending paroxysm, or abbreviate one after its onset; why the disease generally attacks one at precisely the same time, lasts the same length of time, and disappears at the same time on each recurring season; why the class of people who suffer from this affection are the nervous, brain-working type, instead of the phlegmatic, slow-going kind, who may be more exposed to the pollen of the field or the dust of the work-shop and street, but whose minds are strangers to the nervous stimulation and mental tension of the professional man; why the paroxysm

is as sudden in its invasion as asthma, striking one at any moment of day or night, awaking one from sound slumber, or taking one unawares during the pleasant engagements of the day, and leaving one as quickly and mysteriously as it came.

Moreover, some functional nervous diseases are transmutable, one into another. I have witnessed cerebral hyperæmia decline and disappear as hay fever superseded it, and after several years' duration the hay fever has in turn been displaced by asthma, as spasmodic and characteristic in its nature as the hay fever itself. Simple asthma may not only supplant, but may complicate it, constituting hay asthma proper.

An error which has been as popular as the Helmholtz theory is the supposition that this affection is necessarily limited to any particular season. The enervating effect of extreme heat in summer is an important predisposing cause, as affecting the nerve centres; but in the colder seasons the depressing effect of the heated atmosphere of overcrowded, ill-ventilated rooms, and any causes which render the nerve centres more sensitive, and consequently less able to resist impressions from external irritants, are also provocatives, and bear the same causal relation to hay fever as does the heat of summer.

In stating the second condition, it will be noticed that I have not limited the hyperæsthetic condition of the peripheral nerve fibres to those which terminate in mucous membrane alone. To demonstrate the correctness of my implied hypothesis it is necessary only to cite those cases in which paroxysms are produced by the rays of the sun, or other bright light, irritating the retina, or an attack provoked by irritating the scalp with a comb, or shaving the upper lip, or a draught of cold air chilling the back of the neck, or hands, or feet. A reciprocal relation exists between the capillary circulation of the skin and that of the internal organs, but more especially af-

fecting the mucous membrane lining the air passages. Let the surface of a hay fever patient become chilled, the skin anæmic, the perspiration checked, and immediately there follow a corresponding hyperæmia of the mucous membrane of the respiratory passages, an increased activity of the muciparous follicles, exquisite tickling and painful itching in the nose and pharynx, succeeded by violent sneezing, profuse discharge of nasal mucus, suffused and tear-bedimmed eyes, photophobia, a rush of blood to the head and face, severe headache, complete occlusion of the nostrils, nervous exhaustion, and such a desperate shaking up of the whole being as is comparable to a wrecked vessel in a terrific storm. But in this violent agitation of the body I have discerned a blessing in disguise, for it restores the balance of circulation to the skin, the temperature rises, the sudoriferous glands resume their activity, and the skin is again bathed in perspiration. At this juncture the vicarious suffering of the respiratory surface is relieved, and the normal equipoise of functional activity ensues. In one who suffers from the asthmatic form of hay fever, to the symptoms already enumerated should be added the characteristic symptoms of asthma proper. These alone make one's lot hard enough, but when added to the so-called aristocratic disease, present a highly colored picture of the refinement of torture.

The truth of the third proposition is self-evident, and the number of irritants, such as pollen, dust, matches, and so forth, which directly excite attacks, would be too extended to enumerate.

The treatment of hay fever is preventive and palliative. No curative treatment has heretofore been discovered. The preventive treatment has compelled sufferers to become fugitives from the air breathed by common mortals, and to seek mid-ocean or the tops of mountains in their seasons of distress. The most important palliative remedies are quinine, chlo-

ral, and morphine internally, and quinine, chloroform, and carbolic acid by inhalation. In my experience quinine has given more relief than any other remedy; but there is great danger of impairing the hearing by the use of large and frequently repeated doses, for it causes congestion of the middle ear, and probably of the labyrinth. The ideal curative treatment would be that kind which addressed itself to the seat of the disease, which resides in the central nervous system. Narcotics are the only known remedies which render it entirely oblivious to the presence of the many harassing irritants which insist on being recognized, and which appear to have the same relation to the nervous centres that persistent office-seekers do to the President. But since it might be objectionable to keep patients in a comatose condition during the weeks or months of their hay fever seasons, the only medicinal treatment left to our choice is that which affects the peripheral termini of the nerves.

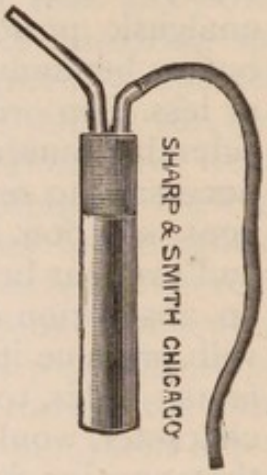
Cocaine has grown, mushroom-like, into a wonderful popularity. Let us hope that its usefulness in hay fever may not prove as ephemeral as its growth. Unfortunately, those drugs which are most influential for good are also most disastrous in their effects when their use is not directed and limited by skill. Cocaine is no exception to this rule, and the sooner the knowledge of its harmful properties is widely disseminated the better it will be for all who may have occasion, or invent an excuse, for its use. Serious results have attended its use in the nasal cavities. Being a powerful local anæsthetic, its advent has been hailed with enthusiasm by all that large class of sufferers whose sensitive mucous membranes make them miserable. Many who used cocaine during their attacks last summer believe themselves to be cured. But let us look facts fairly in the face and state candidly truths which we cannot evade if we would. Can we expect the cure of a disease, the

perpetuity of which seems coextensive with the subject's life, by a remedy the effects of which are transitory? The rapidity of action and the intensity of analgesic power of cocaine are indeed remarkable, but its benumbing effect lasts but one or two hours, or less. In order to extend its influence over a considerable number of consecutive hours or days, it is necessary to repeat the applications of a four per cent. solution as often as once in an hour or two, and even at briefer intervals. The consequence is an absorption of so large a quantity of the drug as will produce its physiological and even toxical effects. This, together with the fact of its evanescent character, would seem to render it highly improbable that cocaine will ever prove to be a cure for hay fever. As a palliative it acts like magic in some cases. At first I employed a four per cent. solution of the hydrochlorate, applying it to the sensitive points by means of surgeon's cotton twisted on a holder. That failed to relieve, and excited paroxysms of sneezing. This result was due to the fact that too little of the solution was conveyed to the parts. Afterwards I used the same solution with a camel's-hair brush, taking pains that the parts were first thoroughly cleared of mucus, and immediate relief was obtained. A two per cent. solution has often proved effective.

I have more recently used a six per cent. powder of cocaine and sugar of milk, in an insufflator which I have devised for hay fever patients, for self-treatment. The instrument is small enough to carry readily in the vest pocket, and can be used easily the instant an attack seems imminent. The insufflator consists of a two-drachm vial with a stopper through which pass two vertical tubes. These do not extend below the under surface of the stopper. Above it they are bent in opposite directions. To one of these bent extremities is attached a rubber tube, to the free end of which the mouth is applied.

A slight puff of the breath is sufficient to send the powder through the opposite tube into the nasal cav-

Office Insufflator.



Pocket Insufflator.

ities, when the instrument is in position. The tubes should be made of vulcanite, and the vial should not be more than two-thirds full. The instrument is constructed after the plan of my larger office insufflator, except that in the latter a rubber bulb supplies the place of the mouth. This method of applying cocaine in powder is simple, effective and easily practiced even in public assemblages, without making one feel offensively conspicuous. I may dismiss this part of the subject by remarking that many cases have been wonderfully relieved by this treatment. In compliance with the request preferred by some of you, I shall speak of its general as well as its topical effects.

When applied to the mucous membrane of the nose, a four per cent. solution produces, in a few seconds, a sense of numbness which grows more marked as the applications are repeated. If they are renewed at intervals of five minutes for fifteen or twenty minutes, at the expiration of that time the mucous tissue may be cut or cauterized without any well defined sensations, unless the instruments enter very deeply into the sub-mucous tissue. If sensations

and pain return soon after an operation it may be obliterated again by a fresh application. Very soon after cocaine has been applied, the membrane looks pale and turns almost white, so anæmic does it become. It retracts in a marked manner even if it were swelled before the application. But I have repeatedly observed a still further effect which I have not seen mentioned in any account of the action of cocaine. Although its primary action produces anæsthesia and anæmia of the membrane, there occur secondary effects which will materially impair or destroy its usefulness in some cases. These secondary effects are great swelling and hyperæsthesia of the parts treated, and these symptoms are even more prominent than they were before the drug was applied. This unhappy result I observed in the treatment of a severe form of hay fever, and in consequence of the augmentation of all the symptoms after the effects of the cocaine wore off, I was compelled to abandon that treatment. Several cases have come to my knowledge in which this action of cocaine has ensued. It seems to act upon the vaso-motor nerves, independently of the central nervous system. The blood-vessels are at first constricted, then dilated, and generally resume their normal calibre. In the exceptions which I have mentioned the dilatation remained for hours, and in one case persisted for a number of days, accompanied with varying degrees of hyperæsthesia. The latter symptom was very acute for several hours succeeding the anæsthetic effects, but gradually diminished until the membrane became no more sensitive than it was before the treatment. The secondary swelling closed the nostrils so completely that no air could be forced through them. In sleep it was necessary to breathe through the mouth, which occasioned extreme dryness of the throat. The breath had to be held while eating, and with every act of swallowing the air was forced into the Eustachian tubes, and even particles of food seemed to

take the same course. No one can realize the importance of open nasal flues until he attempts to eat, sleep or talk with them closed. Cocaine would relieve this secondary tumefaction temporarily, but it would return after each application. Fortunately there seem to be but few who are so peculiarly affected by this remedy. I have employed it in many cases of various diseases in which I have observed no disagreeable consequences, and shall be glad to relate the gratifying results obtained at another time.

The physiological and toxic effects are somewhat similar to those of theine and caffeine. Cocaine is a powerful poison affecting the nervous, respiratory, circulatory and vaso-motor systems. In small doses it is a prompt and decided cerebral and cardiac stimulant without inducing coma. The pulse and respirations are accelerated, the intellectual processes quickened and exhilarated, and the mental vision delighted with agreeable hallucinations. Diplopia, constipation, muscular tremors, vertigo and nausea are a series of symptoms attending larger doses. Still larger doses produce contracted pupil, complete paralysis of sensibility, tetanic spasms, and death. It does not produce muscular paralysis, but does paralyze the entire posterior columns of the spinal cord, and the entire system of peripheral sensory nerves. Accounts of cocaine-poisoning disagree as to the condition of the pupils. In some cases they are said to have been widely dilated, in others contracted, as in opium-poisoning. Cocaine placed in the eye dilates the pupil widely. However, cocaine-poisoning simulates opium-poisoning so closely that the former has been mistaken for the latter and treated for opium-poisoning, with recovery.

The new surgical treatment of hay fever, which consists in cauterizing the sensitive areas, is too recent to have afforded permanent results. Not wishing to prejudice against the operation those to whom it might prove beneficial, I willingly part company

with this phase of the subject. But I cannot do so with fidelity to the profession and to this class of patients without warning them of possible consequences. This treatment may precipitate paroxysms of veritable asthma. In fact, two applications of the galvano-cautery, under cocaine anæsthesia, have superinduced true asthma without curing the hay fever.

He who finds a cure for this disease need take no thought for the morrow, for that great army of sufferers would cast their golden treasures at his feet, and profession and people alike would erect to his memory a monument more enduring than bronze and more lasting than stone.

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