

CASE 8.—In another case, every coryza that affects the olfactory fissure produces asthma, for the time, of the coryza.

#### INFLAMMATORY CASES

In some of my cases, intelligent effort to prove some sensitization to proteins failed to reveal it. These cases were apparently of local inflammatory origin. Some were acute, and some were chronic hyperplasia, without bacteria that could be grown by our present laboratory methods. Others, such as the hay-fever group, are clearly sensitive.

Clinically, the local inflammatory cases depend for their relief on the control of the local lesion. Aside from the indicated surgery, an autogenous vaccine, when bacteria can be grown from the lesion, is sometimes helpful, making the interval between coryzas longer. The cure of the case depends on the cure of the local lesion. Inasmuch, however, as no preventive for coryzas is known at present, the acute inflammatory action so produced in that district is apt to rekindle the trouble. This has been my experience. The patients may be much relieved, just as headaches from such lesions may be very greatly relieved, but there are almost sure to be recurrences, just as a coryza in that district can always make headache, because the nerves remain in their vulnerable positions, and are affected by the inflammatory action.

Thought of the sympathetic nervous system in relation to asthma, as here detailed, raises the question of why there are not more cases of this kind; or of why not all patients suffering from nasal ganglion or vidian nerve lesions have asthma; or of why some have asthma only, and no other manifestation, from a most pronounced lesion of these parts. There does not seem to me to be any direct answer.

Speculation, however, continues with the thought that there may be anatomic variations sometimes which explain some cases; for example, the (normal) fibers of the cervical sympathetic nervous system arise in the thoracic nerves and pass up to the superior cervical ganglion (preganglionic neurons), and from this ganglion proceed (postganglionic neurons) to or through the nasal ganglion. Should, however, these arrangements be changed and the relay station be the lower cervical or first thoracic ganglion, there are met the vasomotor fibers for the lung and accelerator fibers for the heart. In what way the reflex is then transferred is beyond speculation.

#### SENSITIZATION

In this immediate association of thoughts comes also the question of sensitization. Some nasal ganglions and vidian trunks are sensitive to things that do not affect others, as, for example, Case 4, in which the patient was sensitive to silver nitrate solution locally, and in Case 5, in which the patient had a vidian trunk sensitive to menthol. In both of these cases asthma is produced by these irritants. Probably for all hay-fever patients, the ganglion is sensitive to locally applied pollen extract; but if the anatomic arrangement of the sympathetic nervous system is normal, they have hay-fever without asthma. Should, however, the lower cervical or first thoracic ganglion be the relay station, that patient may develop the asthma. (The questions of sensitization in general cannot be considered here.) That there are anatomic variations in the sympathetic nervous system seems certain to me from my observations of the nasal ganglion. Sometimes the pupil

dilates from cocainization of it, and once I saw the eyelid droop from it; and I have seen the cocainization of the ganglion of one side stop pain on the opposite side.<sup>10</sup>

#### NASAL OR SPHENOPALATINE NEUROSIS \*

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In 1914 I presented a paper on the "Injection of the Sphenopalatine Ganglion in some of the Commoner Diseases of the Nose<sup>1</sup>." I was very much surprised to learn that the average rhinologist did not interest himself in this particular phase of our specialty. In the past few years, however, considerable interest has been taken in the subject, although there is not, even now, attributed to it the importance which I consider it deserves.

To understand the etiology of these various neuroses, a fairly clear conception is necessary of the anatomic relationship of the ganglion to the various accessory sinuses of the nose; therefore I will review the anatomy of this region rather extensively. The sphenopalatine, Meckel's or nasal ganglion is deeply placed in the sphenomaxillary fossa, close to the sphenopalatine foramen. It is triangular and is situated immediately below the superior maxillary nerve, just as it passes the fossa. Its sensory root is derived from the superior maxillary nerve, through its two sphenopalatine branches. Its motor root is derived from the facial, through the large superficial petrosal nerve and the large, deep petrosal nerve. These last two join before their entrance into the ganglion to form the vidian nerve; its sympathetic root from the carotid plexus.

The branches of distribution are in four groups: ascending, which passes to the orbit; descending, to the palate; internal, to the nose, and posterior, to the nasal pharynx (Gray). The ascending branches supply the mucous membrane of the postethmoidal and sphenoidal sinuses. The descending branches are distributed to the roof of the mouth, soft palate, tonsil and lining membrane of the nose. The internal branch is distributed to the septum and outer wall of the nasal fossa, and to the mucous membrane behind the incisor teeth. The posterior branch is distributed to the upper part of the pharynx and to the region behind the eustachian tube.

As can readily be seen from the wide distribution, there are numerous points which may be irritated and cause symptoms, either locally or reflexly at some distant point. Nevertheless, owing to the great area of the nasal mucosa, including the lining of the nasal accessory sinuses, to the fact that the mucous membrane is brought into contact with various irritating substances by breathing and to the further fact that the sinuses are often the seat of suppurative processes, we must look here for most of the causes that produce symptoms of nasal ganglion neurosis.

Most textbooks state that the ganglion lies in the upper portion of the sphenomaxillary fossa, but does

10. An extensive interesting historical résumé of the observations on asthma is to be found in Brown, O. H.: *Asthma*, St. Louis, C. V. Mosby Company, 1917.

\* Read before the Section on Laryngology, Otology and Rhinology at the Seventieth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1919.

1. Pollock, H. L.: *Injection of the Sphenopalatine Ganglion in Some of the Commoner Diseases of the Nose*, Illinois M. J. 27 (May) 1915.

not explain its relation to the various accessory sinuses which surround or are in intimate contact with it. To understand some of the etiologic factors causing neuroses of this ganglion, it is necessary to study the relation of the ganglion to the accessory nasal cells. I quote from Sluder:

*Relation of the Nasal Ganglion to the Wall of the Paranasal Cells.*—When the upper boundary of the fossa is made entirely of the sphenoid sinus, the ganglion lies in close relation to the sphenoidal sinus; when the upper boundary of the fossa is made by the sphenoid sinus in its posterior half, and by the posterior ethmoidal the anterior half, the ganglion lies in close relation to both. When the sphenoid sinus is prolonged downward and forward, the ganglion will lie in close relation to it, in front. When the sphenoid is prolonged downward into the pterygoid process, the ganglion will then lie posteriorly in close relation to the sphenoidal sinus. Anteriorly, the fossa is formed by the wall of the maxillary sinus, but the ganglion can never lie in close relationship to this wall because of the pad formed by the arteria-palatine descendens and the arteria-spheno-palatina with their accompanying veins and the surrounding connective tissue.

*Relation of the Nasal Ganglion to the Lateral Wall of the Nose.*—The sphenopalatine foramen is accurately placed at a point just posterior to, and immediately above, the posterior tip of the middle turbinate. The ganglion usually lies close to the plane of this foramen. The ganglion does not, however, always show the same relation to the foramen. I have found it as close as one-half millimeter from the general membrane of the nose, and as far as nine millimeters.

Judging from this close relationship of the ganglion to the accessory sinuses, one cannot but believe that an inflammation or suppuration in these sinuses must at times involve the ganglion itself, and give rise to the neurosis which we so often find.

Clinically, we divide the neuroses into two great classes; namely, the neuralgic and the sympathetic (Sluder)<sup>2</sup>. When a patient presents a clinical picture of a ganglion neurosis, one must attempt to ascertain the underlying pathology and correct it before attacking the ganglion itself.

The neuralgic syndrome consists of pain, intense and excruciating in character (in some, cases of milder variety), radiating to any and all points supplied by the branches of the ganglion. The typical location of the pain is over the root of the nose, in and about the eyes, over the frontal region, into the pharynx and tonsil region, in and around the ear, posterior to the mastoid, into the occiput, to the neck, the shoulder, the arm and, at times, even to the fingers. The most severe and constant pain seems to concentrate at a point about 6 mm. back of the mastoid. Not all patients present this typical picture, as usually only one or more of the named are involved; but I have seen a few cases in which all of them were affected at the same time. In practically all of these types of cases, the pain just posterior to the tip of the mastoid is present.

When a patient presents this clinical picture, the diagnosis is simple. All local points of irritation or inflammation must be searched for and corrected before an attempt is made to attack the ganglion itself. By these points I mean the teeth, gums, deflected septum or spurs, and all sinus diseases, either suppurative or nonsuppurative.

I have described the sympathetic syndrome before<sup>3</sup>. The condition comes on at any time of the year, is

irregular in its time of appearance, duration and severity, and is in no way associated with the ripening of the various pollens, to the inhalation of which hay-fever has been ascribed. On the contrary, those of my patients who have had these symptoms for a number of years inform me that the attacks scarcely ever occur during August or September, and that if they do, the severity of the attack is lessened.

The paroxysms are often brought about by contact with or inhalation of a specific kind of perfume, a particular flower, the odor of various animals, a slight draft of air, or the inhalation of ordinary dust; or they may come on apparently spontaneously. These paroxysms usually begin just on arising, with attacks of sneezing. The patient sneezes from five to fifty times, and the attack is followed immediately by a profuse watery discharge from the nose. At the same time there is a reddening of the mucous membrane of the eyes, accompanied by profuse lacrimation. The nose becomes blocked, and breathing is naturally difficult. These symptoms may be of short duration, lasting only an hour or so, or they may continue for six or eight hours, and then suddenly abate, only to reappear on succeeding days, or when the patient is again brought into contact with the specific irritant. Some of these acute attacks may continue for a week or ten days, and some, only a day. The appearance of the nose between attacks, is usually normal except, possibly, for a slight paleness of the mucous membrane. During the attacks, however, the turbinates are swollen, soft, pale and edematous, and have a boggy appearance. This is especially true of the inferior and, to a lesser degree, of the middle turbinate. The mucous membrane of the septum is also pale. The eyes are red, the conjunctiva is injected, and at times there is an accompanying itching.

The secretion is thin, watery and acrid. After a few days of the attack, the upper lip becomes irritated and excoriated from the constant clearing and blowing of the nose, and from the acrid reaction of the secretions. Even the entire tip of the nose may become red and swollen from the same cause.

Just why some of these cases present symptoms of the neuralgic and some of the sympathetic type is difficult to explain. We know, however, that other ganglion present the same phenomena. The lenticular ganglion, for instance, when inflamed, may have its sensory cells or its motor cells affected. In the one case we have pain, or perhaps herpes oticus, and in the other we may have a facial paralysis as first described by J. Ramsay Hunt<sup>4</sup>.

The prognosis of these neurosis is always bad if left alone. When proper treatment has been resorted to, the prognosis is naturally improved; but at this point I desire to state emphatically that the brilliant results which we desire or ought to expect in the neuralgic type are not often achieved. When perchance we do succeed in stopping these severe pains, if only in a small percentage of cases, the results certainly justify the efforts in this direction.

That we secure temporary relief, say, for a few months, can readily be explained by the work done by Otto May<sup>5</sup> on the alcoholic injection into various nerves of animals. He has shown that alcoholic injections do not destroy completely the nerve fibers and

2. Sluder, Greenfield: Concerning Some Headaches and Eye Disorders of Nasal Origin, St. Louis, C. V. Mosby Company, 1918.

3. Pollock, H. L.: Hyperesthetic Ethmoiditis, read before the Illinois Medical Society, 1919.

4. Hunt, J. R.: J. Nerv. & Ment. Dis., 1906.

5. May, Otto: Functional and Histologic Effects of Intraneural and Intraganglionic Injections of Alcohol, Brit. M. J. 21 (Aug. 31) 1912.

nerve cells, as they recover their function a few months after the injection. The alcoholic injection does, however, inhibit the function of the nerves for that length of time and, as a consequence, we obtain during this period, a cessation of the symptoms produced by an inflamed nerve or ganglion. We do not often penetrate the ganglion itself, but only bathe the surface with the alcohol which we inject into the sphenomaxillary fossa. We obtain a much larger percentage of cases of improvement in the sympathetic neurosis than in the neuralgic type. In a large percentage of these sympathetic affections we obtain complete cure and, in practically every case, an improvement in the symptoms.

#### TREATMENT

As I stated before, all pathologic conditions of the upper respiratory tract must be corrected; and these conditions include those affecting tonsils, teeth, gums accessory sinus, deflection and spurs on septum.

We have had one case referred to us in which a mastoidectomy had been performed to relieve the severe pain located just back of the mastoid proper. No relief was obtained; the diagnosis had been made of a primary mastoiditis, but at the operation no pathologic condition was found. In taking a roentgenogram of the teeth, we discovered an upper impacted third molar, the removal of which cleared up the condition completely.

I now have a young woman under treatment who developed a typical neuralgic syndrome, following an attack of influenza. Hers was one of the most aggravated cases I have ever seen. She had her ethmoids completely extenuated, and the sphenoids opened, without relief. An otologist diagnosed primary mastoiditis and performed a simple mastoid operation, but found no pathologic condition. I injected the ganglion with a 2 per cent. phenol alcohol solution, and it lessened her pain decidedly, although it did not destroy it completely, so that now no narcotics are necessary, whereas, formerly, large doses were required to give her some relief.

One of the most valuable prognostic points is the application of from 20 to 90 per cent. cocain solution in the region of the sphenopalatine foramen. If this stops or ameliorates the pain to a great degree we can be reasonably positive that the injection of the ganglion will give good results.

The technic is simple. I first cocainize the posterior end of the middle turbinate and the wall just behind it, with a 20 per cent. solution of cocain. Then a sword needle of Sluder is employed, a straight needle  $5\frac{1}{4}$  inches long with a cross bar near the end. The needle is introduced from the septal side of the nose. I transfix the posterior end of the middle turbinate and press the needle gently through the turbinate until the posterior wall is felt. The needle is then pushed upward, outward and backward through the bony wall which is the anterior boundary of the sphenomaxillary fossa, in which the ganglion lies surrounded by connective tissue. Usually, by tactile sense, one feels the needle slip into the cavity. The ganglion is about 0.66 cm. back of the wall. A 5 c.c. Luer syringe, filled with a 2 per cent. solution of phenol (carbolic acid) in alcohol is then attached to the needle, and from 5 to 15 minims are injected. If the needle succeeds in penetrating the ganglion, the patient complains of excruciating pain in the eye, ear, top and back of the head and in the shoulder, but should the phenol alco-

hol solution merely surround the ganglion, the pain will be less severe.

The pain usually lasts anywhere from a few minutes to twenty-four or forty-eight hours, and it is in cases in which the pain is prolonged after injection that the end-results to the patient are most gratifying. The number of injections necessary is variable. If the ganglion is penetrated the first time, as indicated by the severe pain, only one injection is required. If not, two, three or four attempts may be made at intervals varying from a few days to several weeks. If no relief is obtained after four such injections, I feel that further attempts would be useless. Often we find the posterior wall so thick that it is impossible to push the needle through, and in these cases I have resorted to the use of a mallet to drive it into the cavity. In using the mallet one is not so sure of being in the proper place, so I usually withdraw the needle and then reintroduce it by tactile sense, as I then have a far better knowledge of where the end of my needle is.

I have not said anything concerning the medical treatment of or rather topical applications to, the region of the sphenopalatine foramen, for the reason that in my experience I have seen nothing but the most transitory results occur from these applications, and do not believe the method worth trying.

#### SUMMARY

In every case in which a diagnosis of nasal ganglion neurosis has been definitely established, we should at least attempt to give patients permanent relief from the severe neuralgias. That we do not obtain as large a percentage of results as we desire may probably be due to faulty technic. Nevertheless, on account of the simplicity of the injection and the freedom from danger, it ought, in every case, to be given a trial, as nothing is to be lost and everything gained. Even if only transitory results, say from four to nine months' duration, are obtained, we have accomplished much, as the patients can be injected at the expiration of this period with probably less danger than before.

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#### ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. BRUBAKER, THOMPSON, SLUDER  
AND POLLOCK

SIR ST. CLAIR THOMSON, London, England: This is a most interesting subject and I have heard much of it for twenty-five years. I am afraid we have all talked of it and heard of it, and "evermore came out by the same door by which we entered." I am inclined to think that just as the lunatic, the lover and the poet are of "one nature, all akin," so hay-fever, rhinorrhea, spasmodic sneezing and asthma are somewhat of "one nature, all akin." What that nature is, I am not prepared to say, but I think there are more things in our inheritance and in our nervous system than are dreamed of in our rhinology.

Inquiring into the history of many of these patients we find that they come most distinctly from what, for want of a better word, we call the neurotics. I will not go as far as the man who said his practice was confined to the neurotic, the erotic, and the tommyrotic. He was a neurologist. But in tracing the history of these people I have been struck by finding that a patient who has hay-fever or attacks of sneezing, had a father who had asthma, and I have lived long enough to find that that patient who in youth or adult life suffered from sneezing and rhinorrhea will get quit of it and in later years become a wheezy, placid old gentleman with bronchial asthma which takes him off to the silent realm. So that part of the subject I would suggest that we do not forget.

I endorse everything Dr. Thompson said in his paper, which my own experience entirely confirms. A few years ago the term "vasomotor rhinitis" was used, but the word "hydrorrhea" is better. I think I understood the doctor to say that cerebrospinal rhinorrhea came from traumatism. I have seen two cases where there was no traumatism, and by searching the literature and analyzing the cases reported by Bosworth in the earlier edition of his textbook, I find that he found, from postmortem records, that several of his cases were cases of cerebrospinal rhinorrhea. Of the two cases I had I have published one, and in that my conclusion was that the poor girl, 22 years of age and unmarried, with no bad family history, died of cerebrospinal rhinorrhea, at the time thought to be meningitis. My other case was seen in consultation with Sir Victor Horsley, and he threw out the suggestion that he was not sure it was not syphilitic. I have not published that case yet, although I have the notes and intend to do so; but the postmortem findings showed that Sir Victor Horsley was right, it was a syphilitic neurosis of the anterior fossa of the skull; but it was a case of rhinorrhea.

In regard to the tests, nasal rhinorrhea secretion contains mucin, while the cerebrospinal rhinorrhea secretions contain glucose or some other variety of sugar reducible by Fehling's solution. But there is a simple test, and that is, that with nasal rhinorrhea the handkerchief of the patient, when soaked, becomes stiff, as if it were starched; while with the cerebrospinal rhinorrhea the handkerchief remains soft. I have seen many cases that were not recognized because they did not give a Fehling's reaction; but if the fluid is not tested within an hour the sugar decomposes and you get no reaction. The other points Dr. Thompson brought out are all admirable, the fact that climate and age make very little difference, that the patient dies a natural death; also that the effect of the cerebrospinal rhinorrhea is more or less continuous, while the real rhinorrhea has its periods of intermission.

As regards treatment, I will never forget a paper read some twenty years ago by Dr. William White, the great surgeon of Philadelphia, on the success of the operation per se. He gave a record of cases out of his enormous experience, in which he had operated for symptoms, say abdominal or hemiplegic, and after he had done all this work, the patient got well. I think we should probably remember this in all the treatments we suggest. I do not wish to depreciate research in this condition; I think it is most admirable, and any of us who have had relatives or friends suffering from the agony of trigeminal neuralgia, will welcome the injection of alcohol or anything that will give them relief. We have a saying that the German doctor kills you, and the English doctor lets you die. I think, therefore, that both of us ought to cross the Atlantic and learn from you and your society how to make the patient comfortable.

DR. WOLF FREUDENTHAL, New York: From a clinical point of view it seems to me that the action of sneezing is analogous to that of coughing. That is, just as an effort is made from the lungs and lower respiratory tract to bring up the secretions or foreign bodies that get down into the deeper bronchi by coughing after the epithelia have brought them to the upper air tract, so it is natural that when any foreign body or substance gets into the nose, we should want to get rid of it in some way. In the lower area we can blow it out, but when this foreign substance gets into the region of the nervus ethmoidalis we cannot do so; in many instances it requires further action, and that act is sneezing. I do not understand the doctor's explanation of the action of the soft palate. After one or two inspirations we make an expiration. It seems to me the most natural thing that the palate would do is to close up. Is it open during this action, or can we keep it closed and yet sneeze? From the doctor's description we see that from many points in the system impulses may be brought to the nose. From a clinical point of view I want to remind you of the epistaxis that occurs during menstruation and the attacks of sneezing that occur before the end of menstruation. On the other hand, impulses that start in the nose may go to any other part of the body, including the lungs and bronchi. In reference to Dr. Thompson's paper

I have seen about six such cases. There is no doubt that an angioneurosis is at the bottom of the disturbance. I have seen one case of rhinorrhea cerebrospinalis of the type described by St. Clair Thomson. No treatment seemed to make any impression on the patient. After six years she had an acute frontal sinusitis. I operated and she recovered soon afterward. Three or four years ago this rhinorrhea suddenly appeared again. A very peculiar fact was that after she left the hospital I was called to her house on account of a swelling over the frontal sinus, the side operated on. I ordered the usual medication and next day the swelling was gone. About eight days later there was an edema over the other frontal sinus and over the antrum. I knew then that it was an angioneurosis.

In regard to the papers of Dr. Sluder and Dr. Pollock: In trying to solve the problem of the acute asthmatic attack by physiologic experiments and in trying to look into the etiology of this condition during the attack—I studied this condition thoroughly—and am inclined to believe that the sympathetic nerve is the most important one during the acute attack. I would, however, like to remind those who do this work that the sympathetic and the vagus nerves are so interwoven that often we do not know which is the action of the sympathetic and which is that of the vagus.

DR. EMIL MAYER, New York: I have been greatly interested in this splendid presentation of Dr. Brubaker as I feel that it throws light on a question that I have not as yet been able to answer satisfactorily. It may help also to explain the effect of affections of the sinus on asthma in showing a direct connection between the nose and the spinal column. I have at various times called attention to the remarkable results following the use of cocain and trichloroacetic acid applied to certain sensitive spots in the nose in cases of dysmenorrhea. It is really remarkable to note the prompt relief sometimes occasioned when women are in very great pain, unable to move about, pale and listless, and then to see their color return and absolute freedom from pain immediately follow this application to the nose. While the fact of relief in a large majority of cases has become fully established, the explanation as to why it occurs has until now not been sufficiently clear. It has been shown here that there is a direct connection between the nose and certain ganglions. Dr. Sluder asked one question: Why are there not more of these cases? The answer rests with the general practitioner. When he knows as much about these cases as we do, there will be more cases. I can say from my own experience in a large general hospital, in association with a visiting staff that made thorough examinations, there were daily requests from the physicians for examination and report on their patients by the laryngologist as well as by the other specialists whose opinion might be desired. In this way I had occasion to see many cases of asthma that would ordinarily not come to the laryngologist, and the number of cases were by no means as few as they would seem to be from the question put by Dr. Sluder.

I do not recall that Dr. Thompson spoke of the advantage of the internal administration of arsenic in the cure of these cases of hydrorrhea. I have used this remedy successfully in a number of cases of this affection looking on them as being analogous to affections of the skin. This is a field which many of us have overlooked. I have found a number of instances in which there was a remarkable similarity to the skin diseases in the mucous membrane. In a recent case of hydrorrhea I told the patient that I was going to give her some arsenic to relieve her trouble and she then informed me that some years previously she had had an affection of the skin which was entirely relieved by the internal administration of that drug and hence she was glad to take it in this present instance. The result was entirely satisfactory and the patient has remained well.

DR. ORVILLE H. BROWN, Phoenix, Ariz.: The hypersensitivity of this ganglion may play an important part in asthma. Asthma is a very complicated condition. As a disease it must have one exciting cause, although it may have many contributing causes, and in my opinion the probable cause may overshadow the essential, primary and direct cause. The muscular effort in normal inspiration and expiration is

wholly a passive process. In forcible expiration the air gets tangled up and in an effort to get out it rushes from one cell to another. That produces a much increased intralveolar pressure. It presses on the blood vessels, not only the chest but the abdomen. Theoretically, then, asthma might be produced in a normal individual by prolonged forcible expiration. Given, then, this condition which ordinarily produces this nonpassive expiration, without bronchitis, without nasal infection, without hay-fever, and there is an ideal condition for the individual to become asthmatic. Often there is also a pulmonary phthisis, and that helps to keep up the inflammatory condition. I have often wondered whether hay-fever was not due to focal pathology of the nose; but whether it is or is not we must get at the focal condition, and we must not forget that any inflammatory conditions around the nose or respiratory tract contribute to the pathology, and that an inflamed appendix or prostate can help to keep up this process which originally started in an inflamed sinus. Whatever keeps up the hay-fever condition must be ferreted out, and desensitization or removal of the pathology should be recommended.

DR. JOSEPH C. BECK, Chicago: One point impressed me with reference to the etiology, and that is the "etiology of the etiology." The gentlemen do not go far enough. Dr. Thompson merely touched on the subject by saying that the question of the endocrinology or what the internal secretions have to do with hydrorrhea nasalis is not in place. I do not know whether he meant that we were not fit or able to discuss the subject. However, I believe that the question of asthma and all this matter of sensitization is a disturbance of the glands of internal secretion. For instance, I do believe that the suprarenal glands play a most important part in the chemical change in the blood as, for instance, in the calcium content. You know how Wright of England treated the question of angioneurotic edema by administration of large doses of calcium. Crile has shown that marked changes take place when the suprarenals and other glands of internal secretion are affected and how the calcium content is changed. Give a large dose of epinephrin hypodermically to a patient during an attack of asthma and, as a rule, it has an effect. I believe that this is due to the hypoepinephrinization, and that day by day the dose will have less effect because there is a tolerance developed and the etiology of the etiology has not been studied and removed, that is, to know what is the cause of the disturbed condition of the suprarenal glands. It is well known that chronic infection, whether from bowels, appendix or teeth, produces a change in these glands, and there I think lies a great part of the trouble, the etiology of the etiology.

In reference to the affection of the ganglions and the work of Sluder, as presented by Dr. Pollock in his paper, there is not enough emphasis laid on the fact that men will not try this method of treatment because some other man says "I have tried it and it is no good." I had a patient referred to me recently by a neurologist in Chicago who has recognized that this ganglionic disturbance exists and has come to stay. It was referred for ganglion injection. The patient was difficult to anesthetize locally, so had to be put under general anesthesia. The operation was followed immediately by paralysis of the pupillary sphincter and the motor muscle (internal rectus). There was a loss of sensation to the cornea. We ought to be careful in such sphenopalatine cases where this complication occurs not to lose an eye following the injections.

DR. JOHN A. THOMPSON, Cincinnati: The necessity of writing a paper that can be read in fifteen minutes precludes any mention of the bibliography. Perhaps for the reason of condensing I spoke of the escape of the cerebrospinal fluid as being traumatic. I meant to include in that form those cases where the escape is caused by disease. A woman had an aphonia for nine months. She had a laryngitis secondary to a badly deflected septum. I straightened the septum and found behind that a bad infection of the posterior ethmoid and sphenoid. When I opened these cavities the dura was bare for one by one and a half inches; you could see the brain pulsating. A careful examination showed there was no bone between the nose and brain, and a very little fur-

ther extension of the diseased condition might have caused a fatal meningitis, or by perforation of the dura permitted the cerebrospinal fluid to escape. Most cases are traumatic in the sense we usually use the word, but in other cases the perforation is through disease.

In regard to Dr. Beck's statement that we have not gone far enough with the etiology of the etiology, I meant only to say that so far there has been no observation, either experimentally or clinically, to show the relationship of the endocrine glands to nasal hydrorrhea or rhinorrhea, whichever term you prefer. As for asthma: While cases of nasal asthma do occur, in a majority of these cases the cause is outside the nose. Treating these patients by tracheal injection for twenty-eight years I have come to feel that bronchitis exists in all cases of asthma. If you will cure the point of infection from which the acute attacks spread out, you will cure many more cases of asthma than you do by treatment through the nose.

DR. GREENFIELD SLUDER, St. Louis: Dr. Beck spoke of some unfortunate experiences with the injection of the nasal ganglions. I, too, have had some unfortunate experiences. In the course of probably 1,500 injections I have had hemorrhage four times, once a hemorrhage of clinical issue immediately on the insertion of the needle. Three times I have had secondary hemorrhage. If an accident happens, it seems to me it punctures the internal maxillary artery rather than the sphenopalatine. When a hemorrhage occurs it must be packed at once, but that packing is very easily inserted and the flow is easily controlled if you follow the track of the needle. If one does not know the origin of the trauma and attempts to pack such a case, he must pack anteriorly and posteriorly. I have also had the misfortune to paralyze the external rectus. When that happens it can be explained by the connective tissue of the sphenomaxillary fissure being unusually loose, permitting the flow of the alcohol upward and outward. I believe Dr. Beck's trouble would have been avoided by the very slow instillation of the alcohol.

DR. HARRY L. POLLOCK, Chicago: Regarding the nasal hydrorrhea of the sympathetic type: In order to make a diagnosis of the sympathetic type, I stated that all pathologic conditions must be excluded. In some cases Dr. Thompson said polypi were present. In my cases where I diagnosed sphenopalatine neurosis of the sympathetic type, everything was normal, except a slight paleness of the mucous membrane, so I think we had a noninflammatory ethmoiditis. In regard to the treatment of this sympathetic type: It is explained by my chart. I have had many of these cases, and if you shut off the afferent impulse you are bound to cure the patient at once. In regard to the cause of asthma: I presented a paper on this and went very thoroughly into it, to find what was the underlying cause of asthma. Polypi, focal infections, split proteins, these are not the real cause, but the underlying principle of all is the altered secretion of the ductless glands. You may have one patient with nasal polypi and asthma, and the next twenty-five will have a nose full of polypi and no asthma. More cases of nasal polypi are complicated by asthma than not. I believe it is due to the altered secretions of the ductless glands; otherwise every patient with polypi would have asthma.

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**An Early Spanish Physician.**—Dr. Francisco Javier Balmis, a Spanish physician, was, while residing in Mexico, the individual selected by the Archbishop-Viceroy of that country, to take to Europe specimens of the plants of the agave and begonia, which were in favor at that time for the treatment of venereal diseases and scrofula. In 1804 he was ordered by the king of Spain to introduce vaccination against smallpox in the Spanish colonies and at the same time to establish boards to promote its use. He did this in the Canary Islands, Porto Rico, Cuba, and in Venezuela, Guatemala, and New Spain (Mexico), and also introduced it in the English settlements and among the Moors and Chinese in Asia. He wrote a number of articles on these subjects.—From Beristain's *Bibliografía Mexicana*.