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Round Table Discussion on the Tonsil Question

Leader: Dr. Isaac A. Abt, Chicago

The Round Table Discussion on the Tonsil Question, held in connection with the American Academy of Pediatrics Fourth Annual Meeting of June 11 and 12 at Wade Park Manor Hotel, Cleveland, Ohio, was called to order by Dr. Isaac A. Abt, Chairman.

General Considerations

DR. A. D. KAISER (ROCHESTER, N. Y.).—Progress in the knowledge of the tonsils has been stationary for the past ten years. My interest in the question resulted from a study of rheumatic fever. Recurrent infections of rheumatic disease are often due to residual tonsillar infection.

From a historical viewpoint, tonsillectomy is an ancient operation since it was performed 2,000 years ago. The operation consisted in tying a cord around the protruding portion of the tonsil and letting it slough off and in that way getting rid of the surplus tonsil.

It was not until about a hundred years ago that any new information on the tonsil could be found, and then the operation was one largely of removing the surplus tissue. The real incentive to the study of the tonsils came at the time when the theory of focal infection was rather popular. In the course of a very few years, dating back to about 1910 or 1912, the tonsil received perhaps an undue amount of prominence as a focus of infection. Tonsillectomy became a popular fad. In our own city over 50 per cent of the children had had their tonsils removed some five years ago. It has always been incomprehensible to me how in the course of about ten years tonsillectomy became the most common pediatric procedure next to smallpox vaccination. In the city of London at one time 3 to 5 per cent of the children had tonsillectomies. A communication recently published stated that in some districts in London 50 per cent of the children had had their tonsils removed. In the city of Munich less than 10 per cent of the entire school population have had their tonsils removed, and their health record, compared with the health record in London, Paris, New York, and Rochester, is just as good. These results encourage a skeptical attitude toward tonsillectomy. The problem for us to consider is whether the tonsil is a factor in the vital economy of the child; whether it has a function essential to the welfare of the child; whether the child whose tonsils have been removed suffers as a result of the operation; whether the child whose tonsils have been removed has a better chance to escape infection than the child whose have not; and then perhaps also to give some consideration to the question whether the tonsils actually are of any value to the growing child.

Is tonsillectomy harmless? Postoperative mortality from tonsillectomy varied from 185 to 95 each year since 1922. That is not very many deaths for four or five hundred thousand tonsillectomies a year. The number of children who die of hemorrhage is difficult to learn because they are not generally listed as such, but, according to figures on small groups, there are a good many children in the course of a

year who die following operations because of immediate hemorrhage. When the number of children who die from lung abscess that might be directly attributed to the operation and, perhaps a less definite cause of death, pneumonia, meningitis, and perhaps the number of things that might be attributed to the operation are included, we cannot say without reserve that the operation is harmless.

There is increasing evidence to support the opinion that the lymphoid tissue plays some protective part in the mechanism of the young child and that these little children who have their tonsils removed for no good reason, except prophylaxis, will perhaps suffer from some other infection which might be more severe than an attack of tonsillitis.

Again I think it is very important to remember that you cannot compare a ten-year-old child with a five-year-old child. We all know that the incidence of infection at five years for certain diseases is very much higher than the incidence of different infections at ten years. In our control studies, we have compared children of the same ages, children who have had very much the same social environment and the same general type of food. It is likewise difficult to get suitable controls.

Mere physical inspection is insufficient to determine whether the tonsils are infected; nor is the size of the tonsil a satisfactory criterion. The pediatrician, the internist, or the practitioner is in a better position to decide indications for tonsillectomy. The course of the child's physical condition is probably the best index for determining whether a child's tonsils ought to be removed.

We are now testing the children who come up for tonsillectomy with a nucleoprotein of the hemolytic streptococcus, to determine if those who have a given allergic response to the hemolytic streptococcus are especially suitable for tonsillectomy. About 50 per cent of those tested reacted to the hemolytic streptococcic protein. After six months a certain number of these children lost their allergic response, a fact which is perhaps merely suggestive that many of these children had infected tonsils and that the others had large tonsils which had not become infected.

There are two outstanding indications for tonsillectomy. One is hypertrophy of the lymphoid tissue, including adenoids and tonsils, sufficient to give mechanical symptoms of obstruction. Although tonsils and adenoids may be hypertrophied in the winter, they may shrink to normal size in the summer. During the course of school examinations, it has been found that many tonsils spontaneously shrink in size, while being observed over a period of years.

The most common symptomatic complaint is interference with normal breathing. Tonsillectomy here gives excellent results. Good results have also been obtained in patients with dysphagia and halitosis. Speech defects or stuttering have been unmodified by tonsillectomy.

The second indication is infection of the tonsil. The tonsillar tissue takes care of itself in a great many instances. In studying these records it was found that the tonsillectomized children as a class are as well as the children who were not operated upon. Actually, their benefit has been greater than statistics prove because they probably represent the susceptible individuals, or they would not have been operated upon and would have been much worse had they not been operated on.

What are the indications in cases in which the tonsils are infected? What can be expected from operation in these children?

Bacteriologic study of tonsils indicates that the type of infection does not seem to have any particular bearing on the appearance of the tonsil.

Tonsillitis is still an important indication for tonsillectomy. However, removal does not guarantee against future infection, and it is a rather disappointing experience to have parents come back and say, "My child has a sore throat." Fifty per

cent of the children who were subject to two or more attacks of tonsillitis a year have been definitely relieved by tonsillectomy, not for one year but over a period of ten years. If a child has repeated attacks of sore throat after tonsillectomy, there is another factor to blame.

In the question of the rheumatic syndrome, the tonsil is very important. Tonsillitis is the most important preceding infection in rheumatism and occurs in a large number of cases of cardiac disease.

Tonsillectomy is not of any great value in the prevention of ear infections. The removal of adenoids probably is beneficial to younger children, but ear infections are seldom benefited to any great degree. Incidentally, more mastoid operations are reported in tonsillectomized children than in those with tonsils.

Cervical lymphadenopathy is a good indication for tonsillectomy. Tuberculous glands of the neck are one of the strongest indications for tonsillectomy. If there is associated pulmonary infection, tonsillectomy is useless. In a case of an active pulmonary tuberculosis in which there is tuberculous adenitis and the tonsils might be implicated, tonsillectomy may be done.

In sinus disturbances, postnatal discharges, and persistent headache, tonsillectomy has been disappointing. We find as much or more sinus disease in tonsillectomized children than we do in those with tonsils.

Statistical studies indicate that such pulmonary conditions as bronchitis, pneumonia, asthma, and tuberculosis have not been particularly benefited by tonsillectomy. In fact, there was a higher incidence of laryngitis, bronchitis, and pneumonia in tonsillectomized children.

Dr. Ruby Cunningham, at the University of California, in studying the incidence of pulmonary infections, found the same thing to be true, that there were more pulmonary infections in the tonsillectomized students than in those with tonsils. It may be that the tonsillectomized group represents the susceptible group.

The Rheumatic Infections.—Tonsillitis plays an important part in the causation of rheumatic disease. Tonsillectomy in children subject to tonsillitis distinctly aids in preventing rheumatic infection as shown by a study of disease incidence. From 10 to 30 per cent fewer children developed rheumatic infection in the tonsillectomized group. Likewise, the death rate from rheumatic disease was somewhat less in tonsillectomized children than in the others. As far as the question of recurrence was concerned, there was absolutely no difference. Removing the tonsils after the first attack did not influence incidence of recurrence.

Infectious Diseases of Childhood.—Tonsillectomy exerted no particular influence on the incidence of *scarlet fever.*

It is reasonable to expect a beneficial effect from tonsillectomy in preventing *diphtheria* because diphtheria is so often a tonsillar infection. Of course, there is a definite indication for tonsillectomy in curing diphtheria carriers.

Measles and *pertussis* were not appreciably benefited. In *head colds* there was possibly only a slight benefit. If colds are a virus disease, it is perhaps not reasonable to expect that taking out the tonsils would be of any great benefit in the prevention of colds. Children who have nasal obstruction are probably benefited by adenoid removal.

Renal Conditions.—There was slight benefit from tonsillectomy in patients with enuresis, recurrent pyelitis, and nephritis. Tonsillectomy after an acute attack of nephritis is rather dangerous. The operation should be done some time after the acute attack.

Nutritional Disturbances.—From statistical studies one cannot claim that the nutrition of individuals is very much improved by tonsillectomy although individual cases may show striking improvement.

Cyclic vomiting may be improved by tonsillectomy.

Asthma was not particularly affected by the presence or absence of tonsils.

The Mental Disturbances.—Some types of mental retardation due to respiratory obstruction or infection may be helped by tonsillectomy. Mentally defective and behavior problem children are not influenced by tonsillectomy.

That in a general way covers the symptoms as we encounter them in our practice. It is difficult to draw general conclusions as it is necessary to study the individual patient, but from statistics we might be able to surmise what can be expected in the individual case. When performed for proper reasons and definite indications, tonsillectomy is a very beneficial procedure.

It is important that these children be examined thoroughly from a general standpoint by the pediatrician, before any final judgment is passed by an otolaryngologist.

Bacteriology and Immunology of the Tonsils

DR. HORTON CASPARIS (NASHVILLE, TENN.).—The tonsils are exposed lymph tissue with a fairly large amount of surface which has a good many crypts. The tonsils probably play some part in building up immunity against common infections in the respiratory and gastrointestinal tract. A few days after the child is born, positive bacterial cultures can be obtained from the tonsils. Cultures of hemolytic streptococci vary from 10 or 15 to as high as 90 per cent. Other pathogenic bacteria found are pneumococcus, diphtheria bacilli, *Micrococcus catarrhalis*, influenza bacilli, and tubercle bacilli. Likewise, there is syphilitic and mycotic tonsillar infection, and more rarely, herpes virus infection. These infections may induce some degree of immune reaction in the tonsil. Repeated attacks have been known to become progressively milder, indicating a developing immunity.

There are some physicians who say that the tonsils function no longer after puberty and begin to atrophy. There are many who feel that it is quite necessary to keep the tonsils, at least for the first five or six years, simply because they are immunity-building organs and the severity of these infections is lessened when they occur later. The pathogenic significance of the hemolytic streptococcus is still in doubt. It is necessary to estimate the individual case on its own merits.

Tonsils and Tonsillar Infections

DR. I. A. ABT (CHICAGO).—Before proceeding with that portion of this review on the tonsil question allotted to me, I desire to refer briefly to what is known about the function of the tonsils.

The participation of the tonsils in the formation of new lymphocytes is the only firmly established function that can be ascribed to them. The structure of the tonsils is characterized by the infiltration of their epithelium with lymphocytes. A similar infiltration occurs along the entire digestive tract. It may occur diffusely, as in the small intestine, or in specific organs of the mucous membrane, as in the tonsils, the pharynx, or the solitary follicles and Peyer's patches in the intestine. It has been held that these collections of lymphocytes constitute a defense mechanism against the entrance of toxic products and microorganisms into the body. On the other hand, pathogenic bacteria may be found in the lymphoid tissue of the tonsils and follicles of the intestine in perfectly normal individuals. It has been suggested that the bacteria which gain access into the lymphoid tissue become modified and rendered less virulent, and thus come to act as vaccines, stimulating the production of antibodies, though it is recalled that the tonsils, as well as the follicles of the intestine, have been proved to be the atria of infection by different forms of bacteria and that general sepsis has resulted.

It has also been suggested that the tonsils may be glands of internal secretion. However, the proof for this assumption is entirely lacking. It has been assumed that because the construction of the tonsils is similar to that of the thymus gland and, that, since both are considered lymphoepithelial organs, both structures have similar functions, though evidence is lacking that the thymus gland itself functions as an organ of internal secretion in man. Certainly, extirpation of the tonsils has not shown any loss of recognizable endocrine function.

Tonsils as Foci of General Infection.—It is a generally accepted fact and hardly needs repetition that the tonsils may be the foci for general infections, producing metastasis in various parts of the body. Clinical observations have frequently shown that nephritis, carditis or endocarditis, meningitis, and rheumatism, as well as general sepsis, bear a causal relation to tonsillar infections. Such infection may be acute or chronic. In the acute infection there may be an associated pharyngitis. The tonsils become swollen, the excretory ducts of the crypts and the lacuna become closed, and eventually the crypts are filled to bursting. The microorganisms are now enclosed in this stagnating mass which offers an excellent culture material. The plugs which close the crypts of the tonsils may be extruded and drainage may occur though, on the other hand, toxic products which have been formed in the crypts may burrow deeper through the loosened epithelium and gain access to the body through the lymph stream.

Though following acute tonsillitis the little patient frequently makes a perfect recovery, in some cases the tonsils may remain enlarged after an acute attack, resulting in a so-called hyperplasia, which is characterized by the persistence of crypts containing infected material and closure of the excretory ducts. This condition predisposes the patient to recurrent attacks of angina, which present themselves as acute tonsillitis. A chronic inflammatory condition of the tonsils may persist in large as well as in small tonsils, and these persistent foci may produce general infection through the lymph tracts, or they may be the source of protracted ill health.

In adults, after the tonsillar tissues have undergone involution and have been replaced by connective tissue, the crypts may still persist and serve as a breeding place for bacteria and become foci for systemic infections.

The question of deciding whether tonsils are actually the portals of infection or the primary foci is discussed in every treatise on this subject. An important factor is a positive history of infection; however, the size of the tonsils should not be taken as a criterion, for a small tonsil may be the site of serious infections. Superficial redness or dilated blood vessels suggest disease of the tonsils. Bacteriologic smears or cultures made from the tonsils need have no definite etiologic significance.

Although it is sometimes easy to determine that a secondary infection has resulted from tonsillitis, at other times the decision is difficult or impossible. It has been maintained that there is a relationship between angina and appendicitis, also that certain skin diseases such as purpura and erythema multiforme may follow acute infection of the tonsils. It may be accepted as a general proposition that general sepsis arises from special foci of tonsillar or peritonsillar infection. As such are to be considered peritonsillar and retropharyngeal inflammations and abscesses, or thrombophlebitis originating in the tonsillar veins and continuing its course into the jugular vein. More recently, suppuration in the parapharyngeal space has been emphasized as a source of postanginal sepsis. This space is closely connected by blood and lymph vessels with the tonsils, and infection of the tonsils and peritonsillar tissues has ready access to the parapharyngeal space.

While a general systemic infection may occur during an attack of angina or peritonsillar abscess, it must be remembered that these remote infections may develop when an acute tonsillitis is subsiding or days or weeks thereafter.

At this point a brief anatomic description of the retropharyngeal and parapharyngeal spaces should clarify our clinical conceptions.

The retropharyngeal space lies anterior to the vertebral column and extends upward to the base of the skull and downward toward the posterior mediastinum. It lies between the pharynx in front and the vertebral column behind. It is enclosed anteriorly and posteriorly by two layers of fascia. It invests the superior constrictor of the pharynx and is continued forward on the buccinator muscle. Laterally it blends with the sheaths of the great vessels. There is a chain of lymph nodes on either side of the midline between the pharyngeal and prevertebral muscles.

The parapharyngeal space is the region of connective tissue which is separated medially from the tonsil by the constrictor muscles of the pharynx and the parapharyngeal fascia. The lateral boundary is formed by the internal pterygoid muscle, the ascending ramus of the lower jaw, and the capsule of the parotid. The space extends upward to the base of the skull and downward along the esophagus and larynx into the posterior mediastinum. It is filled with connective tissue and fat, as well as important vessels and nerves. Here are found the carotid, the internal jugular, the ninth to twelfth cranial nerves, and the sympathetic nerves. There is also a rich network of small veins and numerous lymphatic glands.

An opening in the parotid fascia communicates this space with the parotid gland. Through an opening at the styloid process infection may spread from the pharyngeal space into the parotid gland, and from here, upward to the bony and cartilaginous ear, which may become actively involved.

Peritonsillar Abscess.—While in adults one of the most frequent local complications of tonsillitis is the so-called peritonsillar abscess, also known as phlegmonous tonsillitis and quinsy, this complication is, however, uncommon in infancy and early childhood. Not only the peritonsillar tissue, but the tonsil itself, is often involved. Essentially, however, the suppuration occurs in the loose connective tissue behind the tonsillar capsules. The abscess may arise about the paralacunar abscesses which spread to the capsules of the tonsils, eventually rupture through the latter, and invade the loose peritonsillar connective tissue. The peritonsillar abscesses usually develop when the angina is subsiding or has recently subsided.

The peritonsillar abscess is characterized by fever and pain and difficulty in swallowing; it is usually unilateral, though it may involve both sides. On examination, one observes that the tonsillar region is red and swollen, that the palate is usually arched forward, and that the tonsil is pushed toward the middle line. Frequently the abscess ruptures spontaneously.

The diagnosis is usually suggested by the appearance of the patient. He has difficulty of articulation, his speech is altered as though he had a foreign body in the pharynx; he holds his head to one side and has difficulty in opening his mouth. Occasionally, no pus is found even after incision has been made. This condition is undoubtedly due to simple inflammatory edema. The best results in evacuating the pus are obtained if incision is delayed until definite fluctuation of the abscess is elicited.

The complications of peritonsillar abscess are similar to those of acute tonsillitis. Among these may be mentioned hemorrhage, laryngeal edema, and aspiration of pus into the respiratory tract. Those abscesses which lie posterior to the tonsils may cause a collateral edema of the lingual surface of the epiglottis, or the edema may spread to the arytenoepiglottic folds and into the sinus pyriformis. Displacement of the larynx and obstruction of its lumen may lead to stenosis, and not infrequently to a fatal termination. Hemorrhage may occur as a result of the erosion of important vessels by the infiltrating abscess, or there may be bleeding following the incision of the suppurating focus, due to the injury of a blood vessel. As a rule, this bleeding can be controlled by local methods.

Severe hemorrhage may occur after peritonsillar or retropharyngeal abscess complicated by suppuration in the parapharyngeal space, as well as in cases of severe cervical abscess or cellulitis. In the patients who have been studied it has been found that the common carotid, the internal carotid, less frequently the external carotid, the internal jugular vein, the superior laryngeal artery, the lingual artery, and the pharyngeal artery are the vessels most frequently involved. Unsuspected aneurysmal dilatations of the common carotid and its branches may lead to hemorrhage during various operations in the pharynx and on the tonsils, as well as during pharyngeal and parapharyngeal suppurations.

The citation of a case which occurred in our own practice will illustrate the onset and course of a hemorrhage following a pharyngeal abscess. N. C., an eight-year-old boy, fell ill during the winter of 1933 with severe tonsillitis followed by a diffuse phlegmonous process in his pharynx. He had considerable fever, difficulty in swallowing, earache, but no otitis. The pharyngeal abscess was not incised. After he had been ill for about two weeks, we were summoned because he had suddenly developed a severe spontaneous hemorrhage of the throat. The blood was gushing from his mouth and through his nostrils. All local attempts to stop the hemorrhage or to find the bleeding point were unsuccessful. The boy was immediately removed to the hospital where the otolaryngologist and a general surgeon proceeded to ligate the internal carotid artery on the left side, the point from which the hemorrhage seemed to come. He seemed better for twenty-four or thirty-six hours, after which he had another profuse hemorrhage; he became faint and pallid and showed evidence of shock; a transfusion was performed. In twenty-four hours he had another severe hemorrhage which nearly exsanguinated him. At this time it was decided to ligate the common carotid on the left side. This was done as rapidly as possible, and after the ligation the patient received another transfusion of about 300 c.c. of blood. He was returned to bed, and the hemorrhage ceased. No further hemorrhages occurred; the boy made a complete recovery and is perfectly strong and well.

A retropharyngeal abscess is an inflammation of the pharyngeal lymph nodes with secondary cellulitis and suppuration. It occurs most commonly in infancy and young childhood. It has been maintained that the disease never occurs when the tonsils have been removed, but this is probably not correct. The abscess is not necessarily preceded by tonsillar inflammation. It occurs rarely during scarlet fever or measles, and it may complicate a severe erysipelas of the pharynx. The retropharyngeal abscess may be due to an injury of the pharyngeal wall caused by swallowing hard-pointed substances, or it may arise from suppuration of the lymph nodes or nasal pharyngeal infection of any kind. In rare cases the abscess may be caused by tuberculous cervical spondylitis. Retropharyngeal abscess may occur after tonsillar enucleation and may lead to infection and suppuration of the retropharyngeal lymph nodes. An abscess of considerable size may develop.

Abscesses of the Tonsils.—Single or multiple abscesses may occur in the tonsillar tissue. They may lie superficially and arise in the crypts of the tonsils, or they may be located centrally and lead to inflammation and swelling of the tonsils. Not infrequently they rupture spontaneously.

Vincent's Angina.—For the purpose of completeness a brief reference is made to this condition. It occurs in persons of all ages. The cause of the disease appears to be a symbiosis of the fusiform bacillus and the spirochete. It occurs most frequently in debilitated persons. The organisms may be found in healthy subjects in the crypts of the tonsils and on unclean teeth. The condition may be confused with diphtheria and syphilis, from which it may be readily differentiated by closer examination. On examining the mouth and pharynx, one frequently finds an exudate under which lies an ulcer, or in the milder cases, the exudate may be removed, leaving a bleeding surface. The cervical lymph nodes may be enlarged. They rarely sup-

purate. Severe types are observed with grave general symptoms. Though in the milder cases improvement occurs in a few days to several weeks, in the severer types, ulcerative stomatitis, necrosis of the tonsils or jaw, and otitis media may occur.

Agranulocytic Angina.—Agranulocytic angina, also called granulopenia or the neutropenic state, has been described by a number of authors. The disease is characterized by reduction in the number of leucocytes and by the disappearance of the granulocytes. I do not intend to give an exhaustive description of agranulocytic angina, but to trace its connection, if there is any, to preceding tonsillar disease. In the series of cases reported by Givan and Shapiro,* there is a review of about twenty-nine cases. With only four exceptions, all of them had definite antecedent history of acute infections of one kind or another, leading to the onset of agranulocytosis. The preceding disease varied. Some of the patients suffered from gingivitis, tonsillitis, otitis, tooth extraction; others had pyodermia, osteomyelitis, and acute upper respiratory infections.

It has been held that the necrotic, ulcerated, membranous lesions occurring on the tonsils and in other regions are secondary to the granulopenia. It has been thought that the white cell count is low before the necrotic lesions develop.

The differentiation of agranulocytic angina and tonsillar general sepsis is possible only by the examination of the blood. The cause of agranulocytic angina is not known although several theories have been suggested.

The treatment is for the most part unavailing. Blood transfusions give only temporary relief, if any, use of roentgen rays is of no proved value. A preparation of nucleotide may stimulate the bone marrow, and it is thought to be of value in cases of primary granulopenia.

Monocytic Angina.—Another form of necrotic angina is the so-called monocytic angina. The tonsils are large and inflamed, they are covered with a purulent, greenish, membranous exudate, with an underlying superficial necrosis. The affection is often unilateral. The patient usually suffers from elevation of temperature, with the constitutional symptoms associated with a general infection. The lymph nodes are swollen; the spleen is also frequently enlarged; the liver, more rarely. The diagnosis is established from the blood examination. The total leucocyte count is moderately or relatively high, though there is a marked increase in the mononuclear cells. The course of the disease is nearly always favorable. The principal point to be emphasized is the value of the blood examination. One can at once differentiate an agranulocytic angina with its characteristic blood findings from a monocytic angina characterized by leucocytosis and mononucleosis.

Tuberculosis of the Tonsils.—Tuberculosis of the tonsils has often been observed, especially in those cases in which the condition has been sought. Generally one finds miliary nodules, less frequently, tuberculous ulcers. Sternberg reports the case of a child eight years old who died of general tuberculosis and who showed tuberculous ulcers on the tonsils. In thirty-two autopsies on infants, Geipel found thirteen cases of tuberculosis of the tonsils, though these may not have constituted the primary lesions of the infection. In general it may be said that the tonsils are not frequently the atria for tuberculous infections, and primary tuberculous lesions in the tonsils are extremely rare.

In this short sketch I have very briefly mentioned some of the complications of the diseases of the pharynx and tonsils, and in order to avoid repetition I have omitted to refer to the cardiac, renal, nervous, and other complications, which have been assigned to the other participants in this symposium.

*Givan, T. B., and Shapiro, B:. Am. J. Dis. Child. 46: 550, 1933.

DISCUSSION

DR. SAM P. WAINWRIGHT (BIRMINGHAM, ALA.).—Dr. Kaiser mentioned certain accidents that occurred during a tonsil operation, such as deaths from anesthesia, which may be of an allergic nature, and also postoperative hemorrhages. I suggest the importance of preoperative treatment in prevention of hemorrhage and unpleasant allergic reactions.

I routinely give patients for tonsillectomy a high protein diet along with viosterol and calcium and have had a minimum of hemorrhagic complications.

DR. KAISER.—We have given no calcium or viosterol to the large number of patients—over twenty thousand now—who have been operated on in the clinic. The great majority, however, have had cod liver oil or viosterol, or both, prior to their operation. Most of the otolaryngologists give calcium for a number of days prior to the operation and then test the blood coagulation time.

The other question which might be brought up in connection with preoperative treatment is one concerning the thymus gland. In Boston it is felt that no tonsillectomy should be made without an x-ray examination of the thymus gland. We have operated upon twenty thousand children in the clinic, and there have been six deaths immediately associated with the operation. All six of these children were autopsied; but none of them had any thymus disturbance.

All cases are hospitalized the night before, are examined, and are refused operation if there is fever.

DR. A. G. MITCHELL (CINCINNATI).—It has already been mentioned and very well stated by Dr. Abt that we really do not know very much about the function of the tonsils except as part of the lymphoid structures in the body. Certainly there is no evidence that removal of the tonsil is particularly detrimental.

It is interesting to note that one never removes from the nose and throat all the lymphoid structures present. After tonsillectomy there is hypertrophy of the remaining lymphoid structures. Is this remaining tissue with its hypertrophy potentially a source of difficulty from the point of view of general distribution of infection?

With regard to the bacteriology of the nose and throat, there is still much to learn. In tonsillectomized persons there are the same type of organisms, perhaps less in number.

Coburn has reported his experience with children who had rheumatic infections and were hemolytic streptococcus carriers. They were removed to Porto Rico where it is said that hemolytic streptococci are very seldom, if ever, present in the noses and throats of the people. These children during their sojourn had no recurrence of rheumatic manifestations. Some of them were returned to their previous environment with the return of hemolytic streptococci and recurrence of their rheumatic manifestations.

With regard to age incidence, May Wilson has reported that rheumatic conditions continue from approximately four years of age, increasing up to nine or thereabouts, and then the curve of incidence decreases after puberty.

Repeated respiratory infections are very common in early childhood.

I think Dr. Abt mentioned the matter of peritonsillar infection and the statement that is often made that these occur only when the tonsils are present. That is not so because they do occur when the tonsils are not present. It may occur when the tonsils have not been properly removed.

Detrimental effects after tonsillectomy should not be overlooked. One of these is increased incidence of lower respiratory tract infections.

Statistical studies based on parental information are unreliable. The merits of tonsillectomy must be decided by the status of the individual patient.

DR. JOHN D. STEVENSON (BEAVER, PA.).—Has any particular study been made of the effect of climate upon tonsillitis?

DR. KAISER.—As Dr. Mitchell has indicated, in the Coburn studies, in warmer climates there are fewer streptococcic infections and fewer cases of tonsillitis. In our extreme southern Gulf Coast regions and in the West Indian Islands, there are fewer of those infections. In Canada and England, there is a much higher incidence of streptococcus infections and rheumatic fever. In Arizona and in high dry climates there is likely to be fewer respiratory infections.

Five years ago I was in Africa and went from Cairo up the Nile to central Africa. All the way I examined the tonsils of children wherever I had a chance and was amazed to find that the farther inland I went the smaller the tonsils became. Of course, these were all untreated natives of wild tribes. In the southern Sudan and in the Belgian Congo where I spent some time, I could not find tonsils in a large number of those children. The medical missionaries and government officials whom I met said the natives never had any ear trouble, tonsillitis, or swollen glands unless caused by sleeping sickness. Climate must have something to do with it. Whether the hypertrophy of the tonsils, as we see it in the East, is a result of the infection or Nature's efforts to guard against the infection, I do not know.

DR. JAMES DUNN (DAVENPORT, IOWA).—How many attacks of tonsillitis should a child have had before tonsillectomy is considered?

Personally, I have always felt that during an acute attack the tonsils should not be removed, but we have members of the profession in our community who say that since we remove the appendix when it is acutely infected, why not remove the tonsil when it is acutely infected.

DR. KAISER.—I will answer the second question first. I absolutely disagree that the tonsils should be removed when acutely inflamed. The age of the child and the extent of recovery are the chief criteria in deciding whether tonsillectomy is indicated after repeated tonsillitis. Thus, a child of two or three years who recovers completely from attacks of tonsillitis needs no tonsillectomy.

DR. LOUIS H. SEGAR (INDIANAPOLIS).—There may be exceptions to this age limit. I had under my care an infant with repeated attacks of tonsillitis from the third to sixth month of life. When the infant was nine months old, a tonsillectomy was performed, after which the infant was perfectly well.

As pediatricians, we must impress the otorhinolaryngologists as to the importance of a thorough general examination of the patient from a pediatric standpoint before tonsillectomy is done.

DR. HERBERT E. HALL (UNIONTOWN, PA.).—Enough statistics have become available for a guide as to the general conception of the indications for tonsillectomy. Personally, I have seen more first attacks of rheumatic carditis, rheumatic fever, and chorea in patients who have had their tonsils removed than in those who have not.

DR. W. C. FARGO (CLEVELAND, OHIO).—The remarks I wish to make are prompted largely by an experience of about thirteen years in connection with the Children's Fresh Air Camp here in Cleveland where I have under my supervision daily from sixty to a hundred youngsters. Some of these children progressed poorly from early infancy. They had poor feeding histories and weighed 16 or 18 pounds at the end of the first year. These continue below normal, regardless of tonsillectomy.

As regards postoperative care, it is desirable that the children be kept in bed until the throat is healed. I have had the opportunity of observing the throats in tonsillectomized children daily over a period after the tonsils had been removed. The exudate never disappears under ten days, and it is usually fourteen days before the tonsil sites are completely epithelized. The sites from which the adenoids have been removed also heal slowly.

Some of these throats become very acutely inflamed, and the uvula frequently reaches a size six or eight times its normal size. These children run a temperature; the cervical glands are enlarged; and it is exceedingly difficult to swallow. Observation of weight records show that children lose from 3 to 8 pounds after a tonsillectomy.

DR. WILLIAM WESTON (COLUMBIA, S. C.).—I was particularly impressed with the tremendous reaction voiced against the indiscriminate removal of tonsils when this subject was discussed at the last meeting of the American Laryngological Association. Many otolaryngologists are treating these patients through dietary measures.

DR. J. A. JOHNSTON (DETROIT, MICH.).—What is the opportune time to perform a tonsillectomy after acute fever? I have seen a number of recurrences which I felt were due to too early operation.

DR. JOHN F. CAREY (JOLIET, ILL.).—I find that the early removal of tonsils does tend to increase hyperplasial lymphoid tissue in the pharynx. I practice in an industrial community of about fifty thousand population where recently we had a preschool roundup. Sixty-five per cent of those children had had their tonsils removed, and 95 per cent of the remainder were advised to have them removed.

I feel definitely that tonsillectomy has not lessened the attacks of streptococcic infections that develop in the pharynx. Abdominal pain is frequently noted in children when they have this hyperplasia in the pharynx. Likewise, long-continued fever may be due to this lymphoid hyperplasia.

DR. ARTHUR ABT (CHICAGO).—I had the opportunity of observing over one hundred children with rheumatic heart disease who were attending a special school. When these children are admitted to this school, the question is always asked in the history, "Did the rheumatic disease develop before or after the tonsils were removed?" In many of these children the first sign of rheumatism, joint rheumatism followed by the cardiac condition, developed after tonsillectomy.

I agree with Dr. Graeme Mitchell as to the importance of age incidence. I believe that peritonsillar or retropharyngeal abscesses are more common in very young babies.

The case of the pharyngeal abscess with arterial bleeding mentioned by Dr. Isaac Abt was in a boy eight years old. In the last year we have seen in our practice four girls, four years or older, whose tonsils had been removed, with parapharyngeal abscess and cervical adenitis. It was very interesting to discover that children over four years of age who had had their tonsils removed developed this parapharyngeal infection.

When would you rather operate; in winter or at the end of summer? Perhaps in summer the tonsils would be in better condition for removal than during the late winter or early spring.

CHAIRMAN ABT.—In Spokane there has been a considerable number of cases of poliomyelitis lately. The physicians feel that they must not perform any more tonsillectomies during this time because they find that most of the poliomyelitis attacks occur in tonsillectomized children.

DR. EDWIN CLAY MITCHELL (MEMPHIS, TENN.).—Does a high carbohydrate diet tend to hypertrophy the lymphoid tissue in this region?

As a rule, only the infected tonsil is removed. Do you find it necessary or beneficial in certain conditions to remove the lingual tonsil later or to drain the sinuses?

DR. O. W. ROWE (DULUTH, MINN.).—I have never seen a peritonsillar abscess or glandular disease in a child who has had a complete tonsillectomy. As regards cyclic vomiting, Dr. Sedgwick twenty years ago recommended tonsillectomy. We have been following his advice with results in more than 50 per cent of the cases. I have seen migraine and epilepsy develop in children who have been cured of cyclic vomiting by tonsillectomy.

DR. H. B. HAMILTON (OMAHA).—With reference to Dr. Rowe's statement that he had never seen parapharyngeal abscess in a tonsillectomized child, I may say that I have one under observation at the present time.

I am convinced that coal tar products are abused in the treatment of the throat infections. There is a demand on the part of the people that the fever be controlled to the extent that I think many men are tempted into the overuse of the coal tar products.

I am quite convinced that a lot of our beneficial results are the result of adenoidectomy rather than tonsillectomy.

DR. ELI FRIEDMAN (BOSTON, MASS.).—Dr. Kaiser said there was no relation of asthma to the tonsils. This is a debatable question. I had a child who developed asthma after tonsillectomy.

Scarlet fever seems to be more severe in patients who still have their tonsils.

DR. H. H. PERLMAN (PHILADELPHIA).—I would like to ask if the essayist has histologic studies of removed tonsils. It seems to me that in this enthusiasm for wholesale enucleation of tonsils, perhaps more normal tonsils are removed than should be.

The second question I would like to ask is whether the local use of various dyes in gargling or swabbing the throat has any effect in curtailing so-called acute tonsilitis? I believe it is also timely to speak of the use of drugs which have been exposed as a cause of agranulocytosis, particularly pyramidon.

DR. KAISER.—It is of great importance, as Dr. Graeme Mitchell brought out, to know about the age incidence of tonsillitis in children. Tonsillitis has an incidence of about 10 per cent in children of preschool age; about 25 per cent in children between five and ten years of age; and then in later years drops off, so the incidence in a given community of these infections must be known to compare controls with so-called operative children. We have tried to do that in some of our studies. The age incidence has been particularly stressed in connection with rheumatic disease, and the benefit of tonsillectomy has been noted in the so-called peak age, i.e., between five and ten years of age. After ten years of age no benefit could be seen in either primary attacks or in the later course of the disease. A similar analysis should be made of each one of these complaints.

Postoperative care of tonsillectomy, as Dr. Fargo has brought out, is often neglected and should be given much more attention. Dr. Shick suggests that tonsillectomy disturbs the entire metabolism of the child for a time. Insist upon five days in bed after a tonsillectomy, no matter what the condition may be, and much longer after severe illness. Too much food will cause vomiting and bring on certain complications.

The dietary factor is of great interest, and some day it may play a very important part in our conception of this question. We became interested a short time ago

in the relationship of vitamins to rheumatic disease. It has been found that animals fed on a diet deficient in vitamin C developed scurvy and symptoms which simulated rheumatic infection. In testing the effect of vitamin C on rheumatic patients, we found eight times as much vitamin C in the tonsillar tissue as in the blood. But there does not seem to be a deficiency of vitamin C in the diet of these children who have rheumatic infections. Vitamin A could not be found in any of the tonsil tissue.

The optimal period for tonsillectomy after an attack of rheumatic fever is a matter of individual opinion. Tonsillectomy rarely prevents recurrences, and if the operation is performed immediately after an acute attack, an endocarditis may start up. Chorea also occurs frequently after tonsillectomy. For that reason every patient should have a month or six weeks elapse before the operation. There should be a normal white count and the pulse rate under a hundred per minute before one advocates tonsillectomy. The temperature does not make so much difference as the pulse and sedimentation rates.

A few years ago Syracuse had three or four times as many cases of poliomyelitis as Rochester. The health officer felt it was because there were fewer tonsillectomized children in Rochester. The situation was reversed later, and Rochester had three times as many cases as Syracuse. Tonsillectomy gives absolutely no protection against poliomyelitis. It is unwise to operate during an epidemic period of virus disease.

I doubt very much whether pyuria is cured by tonsillectomy. In few instances, in which the pyuria was a result of chronic infection in the tonsil, tonsillectomy may relieve the pyuria. It may be tried if every other procedure has failed.

In a study of children with asthma, removing the tonsils seemed to make no difference. After tonsillectomy some children have reacted to an infection that was localized in the tonsil.

The same thing is true of scarlet fever. There is a very slight advantage for the tonsillectomized child. The period in the hospital is a day or two shorter; there are fewer streptococci in the throat and fewer complications, but the benefit is so small as to be of hardly any value.

On the basis of some experimental work, I believe that not only the tonsillar tissue, but all lymphoid tissue in the nose and throat, plays a part in local immunity. It may be vitamin content; it may be an enzyme; and it may be internal secretion which plays some part in protecting individuals against infection.

DR. CASPARIS.—The one encouraging thing is that we are giving a great deal of thought to the individual who has tonsils. We are accumulating information from time to time which helps to decide when tonsils should or should not be removed.

Tonsils are very valuable organs, and the time to remove them is when they become more of a handicap than a benefit to the individual. We must study our patients as individuals. We must take into consideration the appearance of the tonsils—whether or not the crypts are closed, and the presence of dilated blood vessels over the anterior folds of the tonsils.

I would like to make one point in this connection. A number of children are being examined superficially by school physicians. We have asked the State, County, and City Health Departments to formulate this policy: that a school physician should never say that a child ought to have his tonsils removed but should say to the parent, "See your physician about your child's tonsils," should advise that parent or child to see about this particular defect and should not give recommendations as to what should be done about it.

DR. JOHN L. MORSE (BOSTON).—I agree entirely with Dr. Kaiser that too much attention is paid to the tonsils and altogether too little to adenoids. A great

many infections attributed to tonsils are really infections of adenoids. Most of the obstructive symptoms attributed to tonsils are due to adenoids. Inflammation of tonsils alone is very seldom accompanied by ear complication. They are due to infection of the adenoids.

I advise removal of adenoids for repeated colds, for trouble with the ears, for difficulty in breathing, and also for difficulty in swallowing. I dislike very much to remove the tonsils in a child under five years of age although Dr. Kaiser said that under certain conditions age makes no difference.

The indications which I consider sufficient to justify tonsillectomy are tuberculosis of the glands in the neck, repeated attacks of tonsillitis, and cervical adenitis which persists after tonsillitis. However, I have observed children whose parents had neglected my suggestion of tonsillectomy for repeated tonsillitis and cervical adenitis. Several years later the tonsils appeared normal, and the indications had spontaneously disappeared.

After tonsillectomy there is hypertrophy of lymphoid tissue on the posterior pharyngeal walls. Tonsillectomy and adenoidectomy does not remove all the lymphoid tissue in these regions.

My general conclusion would be that adenoids should be removed oftener than at present and tonsils much less frequently.

DR. HERMAN SCHWARZ (NEW YORK CITY).—The evaluation of the benefits from tonsillectomy is difficult. I doubt the existence of a pure acute tonsillitis. There is always an inflammation of the other lymphoid tissues. On the other hand, I have to turn around and say that there is no question but that, as Dr. Kaiser has brought out so well, the age when tonsillectomy is done is important so far as immunity is concerned. We studied seventy-eight histories from this point of view. In those under five years the results were not very good. From five years up the results were good.

The indications for tonsillectomy given here today are very conservative, and I agree with them absolutely. It gives me a great deal of pleasure to note this attitude.

Also, I should like to discuss pharyngeal sepsis. It occurs especially in very young infants and has no relation to the tonsils. This sepsis is followed by streptococcemia. There may result metastatic abscesses; with surgical treatment recovery results, or peritonitis, or meningitis with a fatal result may develop. In another type of upper respiratory infection with streptococcemia there is otitis media and sinus thrombosis. Metastases occur in the lungs and joints. There are two types of pharyngeal sepsis; a benign type with recovery and the other with septicemia and a very high mortality.

Finally, a word about chorea. Most of these patients developed chorea long after the tonsils were removed.

DR. ALBERT J. BELL (CINCINNATI, OHIO).—As Dr. Morse has said, too little attention probably has been paid to the adenoids; in all probability the removal of adenoids might have done what the combined operation achieved. Unfortunately, the tonsils might become infected later and necessitate a second operation.

While it may be safe to say that by removing the tonsils the chief source of infection in the throat has been removed, they are only part of the lymphoid tissue in the throat. It is possible that infected tonsils may act as an allergic factor and even produce an immunity against the particular bacteria.

DR. KAISER.—It is important to be careful about the criteria and the time elapsed in comparing results after tonsillectomy. We should compare the effect on specific symptoms at least five years after tonsillectomy for any trustworthy

statistical information. I have used as many private cases as dispensary cases. If you compare them complaint for complaint, then the results are practically the same in private and in dispensary practice.

In some instances tonsillectomy has been advised for the prevention of children's diseases or for improving the general condition. Such vague indications tend to bring the operation into disrepute. I have become very cautious about advising the removal of tonsils and adenoids to increase the child's appetite, to improve his general condition, or to prevent colds.

DR. ALLAN L. RICHARDSON (DETROIT).—Dr. Canfield has described the dolichocephalic blond type in whom there is excessive regeneration of lymphoid tissue. Incidentally this type of child is particularly subject to anesthesia reactions on the operating table.

May I ask whether there are patients with an allergic background who have unfavorable results after a tonsillectomy even to the extent of developing asthma?

DR. CASPARIS.—There have been some cases of this nature, but I do not know the explanation.

CHAIRMAN ABT.—That was mentioned in the round table conference on allergy. Tonsillectomy has been the deciding factor in the allergic state of the child.

DR. J. V. GREENBAUM (CINCINNATI, OHIO).—What is the opinion about removing the tonsils only?

Based on the work of some English observers who put blue dyes in carious teeth and observed the dyes deposit in the tonsils, we made a rule in our hospital that no child should have his tonsils taken out if his teeth showed a number of cavities. The teeth should be in as perfect condition as possible before the tonsils are removed.

DR. KAISER.—I doubt whether the same results would be obtained if the adenoids were not removed.

Our clinic was started in the dental dispensary. The primary purpose was to clear up the teeth of these children. No child could have his tonsils and adenoids out until he had been through the dental dispensary and had all the infections cleared up. There was no difference in the two groups—those who had their infections cleared up and had their tonsils removed and those who had clean teeth and had their tonsils removed.

DR. WALTER B. STEWART (ATLANTIC CITY, N. J.).—Do the tonsils clear up after the badly infected teeth are removed?

DR. KAISER.—Badly infected teeth will often cause some of the symptoms that we ascribe to infected tonsils. We found that 20 per cent of the children who had cervical adenitis got it from infected teeth and not from infected tonsils. School examinations have failed to take into consideration that infected teeth should be cared for before the tonsils are removed.

DR. FRANK LEECH (WASHINGTON, D. C.).—Did the children with infected teeth have root abscesses or carious teeth?

DR. KAISER.—Most of them had infected gums.

DR. WARRIN R. SISSON (BOSTON).—Of all the indications for tonsillectomy, mechanical obstruction seems to be the only reliable one. It would be a great service if this organization should reduce the needless indications for tonsillectomy.

DR. CASPARIS.—Sometimes it takes a year to decide whether or not tonsils should be removed. It is necessary to study the history, the physical findings, and the general health of the child before deciding on tonsillectomy.

DR. FRANK T. MITCHELL (MEMPHIS, TENN.).—There is still a tendency to make the whole decision on the basis of one examination and not to give the thorough consideration that has been spoken of here. I think that explains why in a study made by the Metropolitan Life Insurance Company it was found that as many as 60 per cent of the eleven-year-old children have their tonsils out. It was also found that a large part of that influence was brought to bear by school nurses, and all they had to go on was a look at the tonsils made by the school physician instead of an examination based upon a thorough history and study of the individual. I think it is very important that the members of the Academy influence favorably this public health problem.

DR. STANLEY NICHOLS (ASBURY PARK, N. J.).—We should follow up cases from two to three years after tonsillectomy in order to record the end-results. We found x-ray treatment ineffective and followed by recurrences within six months to a year. In children in whom for one reason or another it is necessary to postpone operation, it is still worth while to try x-ray treatment.

School nurses have a habit of saying that the tonsils must come out if there is a moderate cervical adenitis present. I have had the experience of looking at large numbers of children in the spring and in the fall. In the fall there are about 30 per cent of those glands moderately palpable, and in the spring there will be about 90 per cent of them. The school nurse sometimes gets into difficulty here.

Finally, we should recommend that all children have a thorough pediatric examination before having the tonsils removed by an otolaryngologist.

CHAIRMAN ABT.—I am going to ask Dr. Morse to discuss the dentition aspect of this subject.

DR. MORSE.—I feel quite certain that I have seen more than one baby, just before a tooth erupted, whose gum was swollen and purple, who lost his appetite temporarily, was unusually fussy and perhaps had a little temperature. I think I can also remember two or three babies that at about that same stage would have loose bowels. Outside of that I don't think that I have ever seen any disturbances which I thought could be attributed to dentition.

DR. KAISER.—The increased incidence of lower respiratory infections occurred at all ages, but more particularly in the younger children. Perhaps you are familiar with Dr. Ruby Cunningham's figures based on a statistical study at the University of California. She found that the tonsillectomized students had a higher incidence of lower respiratory infection. She explained it on the ground that they were a susceptible group.

Personally, I have never felt that the teething was a factor in respiratory infection. I think it is a question of the prevailing infection in the community, rather than teething.

DR. CASPARIS.—The efficacy of vaccines in the treatment of "colds" is a difficult matter to evaluate. There is a possibility that colds are not infectious but allergic reactions.

CHAIRMAN ABT.—Dr. Barnett, will you tell us about your operative procedure in relation to the poliomyelitis?

DR. E. J. BARNETT (SPOKANE, WASH.).—There is a clinical experience in this field that I should like to report. We have had in our community annually in July and August what might be called an epidemic of infantile paralysis. It is rather peculiar that infantile paralysis in our community is usually the bulbar type, but the striking fact is that the majority of these cases of the bulbar type of infantile paralysis come on immediately after tonsillectomy. In the presence of this

annual epidemic at the same time each year, it may be pointed out that tonsillectomies are usually done before entrance into school. About the third or fourth day after tonsillectomy many of these children develop bulbar poliomyelitis. These children do not have a preparalytic stage. Those who develop infantile paralysis while they are convalescing from tonsillectomy never have the spinal type. The mortality in these children with bulbar poliomyelitis following tonsillectomy without preparalytic stage is terrifyingly high. For this reason when our annual epidemic begins, we insist that all operations be held up.

DR. THEODORE ELTERICH (PITTSBURGH, PA.).—A few years ago one of the physicians of Pittsburgh reported that a child who previously had had encephalitis precipitously developed a nervous syndrome soon after the anesthetic was given. A neurologist who was there said it was his experience that one must be very careful in giving an anesthetic to an individual who has had encephalitis. We have all had the experience that children who show mild symptoms of chorea develop a precipitious chorea when they are subjected to an anesthetic at that time. The thought occurs to me that it is not the operation but perhaps the anesthetic.

DR. KAISER.—We have studied some twenty thousand records of children who came in for operation; none of them had x-ray examinations of the thymus. Five or six died immediately after the operation; three died from hemorrhage, and in the others the cause was unknown. The autopsies showed normal thymuses as far as the weights were concerned. The children were not blonds. They happened to be Italians and all brunets.

The diminished incidence of rheumatic fever is probably true but must be correlated with the differences in various communities. I doubt very much if there is any marked difference in rheumatism or scarlet fever after tonsillectomy. One may see the lessened incidence in communities in which few have been tonsillectomized. I believe it is due to changes in severity of the disease rather than the effect of tonsillectomy.

Chorea certainly is a disease which is not benefited by tonsillectomy as far as the symptoms are concerned. There is a tendency in our figures to show that the disease occurs and becomes worse after operation. However, there is some justification in the procedure in that the tonsillectomized children had somewhat less carditis than the children who were not operated upon.

The whole subject of rheumatism can be summed up with this statement that, though statistically we cannot prove anything, there isn't anybody in this room who would not feel that there is some advantage in operating upon the rheumatic child.

We have been studying the effect of tonsil filtrates on the growth of streptococci in culture and in immunity studies. There was no difference in the effect on growth in streptococci in culture media or in animals. However, when we used the filtrate of the tonsillar streptococcus, we found that the tonsil of the child who had been free from infection did not act the same as the tonsil from the child who had had repeated infection.

Ultimately, chemical and dietary regulation may be more effective than surgery. I have made myself very unpopular in my community in trying to stop indiscriminate practice of tonsillectomy. Instead of 50 per cent, probably 10 or 15 per cent need the operation. I believe the otolaryngologists are in sympathy with this trend and will be glad to cooperate with us.

CHAIRMAN ABT.—One thought occurs to me in closing. We must study the individual.

In acute tonsillitis conservative treatment is needed. What are the criteria of chronic infection in the tonsil? We might find hemolytic streptococci or diphtheria

organisms in normal throats but do enlarged cervical glands, an increased leucocyte count or an increase of the polymorphonuclear cells mean anything to us?

DR. KAISER.—The four signs of tonsillar infection that can be observed are: the escape of pus from the crypts when pressure is applied to the tonsil; an enlarged tonsillar gland behind the angle of the jaw, varying in size and sometimes tender; a purplish red tinge limited to the anterior faucial pillar; and an abnormal preponderance of leucocytes in material from the tonsillar crypts, frequently accompanied by general hyperemia of the pharyngeal and palatal mucosa. The size of the tonsil is no criterion of the degree of infection within it.

DR. A. GRAEME MITCHELL (CINCINNATI, OHIO).—I am interested in the work of Jarvis, mentioned by Dr. Weston, and think something more should be said about it. We must admit there is something to the benefits of general diet and the upbuilding of health in relation to many conditions, including perhaps infections and infected tissue in the nasopharynx.

CHAIRMAN ABT.—First of all, we have learned that we are going to do everything that is reasonable to prevent hypertrophy and disease of the tonsils and of the pharyngeal lymphoid tissue; second, we are going to determine when the tonsils are diseased; and third, we are going to set a reasonable logical indication for leaving them alone. Then we are going to set a reasonable logical indication for their removal when they are diseased.

News and Notes

The following men have been certified by the **American Board of Pediatrics** since the last report:

Harold Abramson, New York, N. Y.
Donald Jerome Barnes, Detroit, Mich.
Harry S. Berman, Detroit, Mich.
Harry S. Bikoff, Brooklyn, N. Y.
Kenneth D. Blackfan, Boston, Mass.
Frank Otis Calaway, Houston, Texas
Moses H. Edelman, New York, N. Y.
John S. Fenby, Baltimore, Md.
Stanley Gibson, Chicago, Ill.
Roy M. Greenthal, Milwaukee, Wis.
Harry Mordecai Greenwald, Brooklyn, N. Y.
Arthur G. Helmick, Columbus, Ohio
Maurice Taggart Briggs, Lynn, Mass.
William J. Corcoran, Chicago, Ill.
Bradford French Dearing, San Francisco, Calif.
Helen G. Dennis, Portland, Ore.
Robert J. Dostal, Santa Monica, Calif.
Lucius Davis Hill, Jr., San Antonio, Texas
Edward James Lamb, Santa Barbara, Calif.
Jefferson Ralph Lemmon, Amarillo, Texas
W. McKim Marriott, St. Louis, Mo.
Robert George McAliley, Atlanta, Ga.
Samuel J. Levin, Detroit, Mich.
Ernest Langsdorff Noone, Drexel Hill, Pa.
Charles Sigmund Raue, Philadelphia, Pa.
Julian Leo Rogatz, New York, N. Y.
Abraham S. Small, Boston, Mass.
John Dawson Sturgeon, Jr., Uniontown, Pa.
Fritz B. Talbot, Boston, Mass.
Alfred S. Traisman, Chicago, Ill.
Joseph S. Wall, Washington, D. C.
Marshall Wallis, Houston, Texas
Joseph Ioor Waring, Charleston, S. C.
John H. McLeod, Washington, D. C.
Rudolph Duryea Moffett, New York, N. Y.
William A. Mulherin, Augusta, Ga.
H. T. Price, Pittsburgh, Pa.
Edwin F. Robb, Minneapolis, Minn.
Lewis Robbin, Newark, N. J.
Harold R. Roehm, Birmingham, Mich.
Councill Courtland Rudolph, St. Petersburg, Fla.
James Banister Stone, Richmond, Va.
John Garnett Young, Dallas, Texas