REMARKS

ON

TONSILLITIS AS A FACTOR IN RHEUMATIC FEVER.

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It has long been thought that the rheumatic condition must be due to a special poison in the system, probably circulating in the blood, but how or where produced was doubtful. Clinical observers have for some time noticed that rheumatic fever is often preceded by tonsillitis. It was at first supposed that the tonsillar affection and that of the joints were each equally manifestations of the action of the postulated rheumatic poison.

It was, I believe, Dr. W. Hill who first distinctly suggested that the poison of rheumatic fever might be fabricated in the mouth and throat, and gaining thence entrance into the tonsils and into the system, produced first the tonsillitis and then the rheumatic fever. Later investigations would seem to show that this view, if at all tenable, will have to be amended to the extent that the microbes primarily multiply in the lacunæ of the tonsil, and that they or their toxins enter the system through the abundant lymphatics in the neighbourhood of the lacunæ.

To put the amended theory concisely, tonsillitis is a primary infective disease of the lacunæ, rheumatic fever a secondary disease arising from the absorption of microbes or their products into the system.

The microbic origin of rheumatic fever did not obtain much acceptance for a long time; indeed it cannot be said to be even now very generally held. But it is making way, as we may see by referring to Dr. T. J. MacLagan's article on Rheumatism in the *Twentieth Century Practice of Medicine*, and to the reported discussion on rheumatic fever at the last annual meeting of the British Medical Association.¹

There is one prominent circumstance which has militated against it. The tonsillitis usually precedes the rheumatic fever; sometimes, no doubt, so immediately, that even a patient will tell us that his illness "began in the throat." But in other—perhaps more numerous—cases, the throat has been well for some, often for many, weeks. Moreover, it occasionally happens that the rheumatism precedes the tonsillitis.

I shall endeavour to explain these anomalies, for my present object is to further the acceptance, with certain modifications, of the previously-stated amended theory. Even if we come to the conclusion that certain cases of rheumatic fever arise from microbic infection of the throat, it would not quite necessarily follow that the disease had always a microbic origin. And it would not at all necessarily follow that, if it be always a microbic disease, the infection should invariably gain entrance by the throat. Indeed, we have already evidence that this is not so. The disease known as gonorrhœal rheumatism occurs most often in a subacute form, but occasionally in as acute a form as ordinary rheumatic fever, from which it cannot be distinguished except by its clinical history and its rebelliousness to ordinary antirheumatic treatment.²

Most persons who have had large experience of typhoid fever have met with cases in which at an early stage there have been painful swelling and redness of several joints, large and small. This has been seen also in relapsing fever by Murchison.³ Both these diseases have been proved to originate from the presence of a demonstrable microbe. Non-critical sweating, a notable feature of rheumatic fever, occurs also in typhoid. I have often met with it. I quote Murchison's evidence on this point: "Some years ago I noted considerable perspiration in 19 out of 84 cases, and since then I have met with several instances in which there have been frequent and considerable perspirations with only temporary abatement of the fever" (p. 518).

Again, except by its history, there are no means of dif-

ferentiating post-scarlatinal from ordinary rheumatic fever. The microbic origin of scarlet fever will hardly be contested, though its special microbe has not been identified. We thus find three diseases in which the most notable characteristics of rheumatism are liable to occur. And of these diseases two are certainly and one almost certainly due to microbic invasion. This certainly enhances the probability that rheumatic fever may have a similar origin.

Let us now consider the nature of tonsillitis. This was fully discussed in the Laryngological Section at the British Medical Association's last annual meeting. This important body came to a unanimous conclusion that it was an infective disease upon grounds which may be summarised as follows:

1. The clinical phenomena correspond in every particular with those of an infective disease.

2. Cases have been noted in which the disease had undoubtedly been transmitted from one person to another.

3. Various species of coccus and bacillus are to be found within the lacunæ, within the closed follicles, and even within the epithelial cells of tonsils removed during the acute stage. Leucocytes in large number are found associated with the microbes.⁴

There can, then, be no doubt that there is an abundant crop of microbes in the tissues of an inflamed tonsil. Some are of kinds which usually do, and others of kinds which usually do not, produce noxious effects upon their hosts. But it must be remembered that the products of microbic growth vary much under differing conditions of that growth.⁵ It is to me inconceivable that bye-products should ever be absent. The abundant lymphatic tissue in the tonsil renders the absorption of such products easy. The completeness with which this tissue is able further to decompose and recombine the absorbed bye-products, or the incompleteness of these processes probably determines the extent to which the body suffers when these bye-products, if noxious, are absorbed. We can then understand that if the protective efforts of the lymph system have been exhausted in combating such poisoning, it might be unprepared to deal efficiently with a subsequent invasion of even less virulent microbes.

All clinicians concur in recognising a catarrhal element as an early factor in the production of tonsillitis. We can well comprehend how an arrest of mucous secretion, or a change in its composition, or a denudation of the membrane might favour both the introduction of microbes and their growth. Indeed, thus only can we explain the well-ascertained fact that the throat is habitually infested with microbes, some of them known to be usually poisonous, and yet infection occurs occasionally only. The case of long persistency of diphtheria bacilli with only rare recurrence of infective manifestations is highly interesting in this connection. Which single microbe or what combination of microbes are the essential element in tonsillitis has not yet been ascertained. Still less can we say what is the microbic element in rheumatism assuming that this is a microbic disease.

The case as regards the tonsils stands thus: Though not proved in the stringent manner properly required by Koch, there is the highest degree of probability that tonsillitis is an infective disease. The case as regards rheumatism stands thus: Inasmuch as it so frequently follows an infective disease, and that all its features can be explained by the assumption of a microbic infection, there is a high degree of probability that it also is an infective or microbic disease. If we take into account other features of rheumatic fever besides those already alluded to, this probability will be heightened. Among the prodromata of the full attack we may observe (1) anæmia, (2) undue fatigue, (3) chill, (4) wandering pains.

1. The anæmia so constantly observed after the subsidence of an attack has generally been regarded as a consequence of the attack. No doubt this is partly so, but I long ago satisfied myself by minute inquiry into the previous history that in a majority of cases there had been a precedent anæmia often disguised during the fever by febrile flush.

I had at one time ample opportunity of observation in a hospital devastated by pyæmia, and became quite convinced

¹ BRITISH MEDICAL JOURNAL, January 11th, 1896.

e Lydston of Chicago, *Twentieth Century Practice of Medicine*, vol. i.

³ Murchison, *On Continued Fevers*.

⁴ See report of discussion, BRITISH MEDICAL JOURNAL, October 26th, 1895.

⁵ There are strong reasons for supposing that appendicitis is due to migration of bacillus coli. In the colon it is innocent but to the peritoneum poisonous

that anæmic persons were exceptionally liable to pyæmia after primary operations. The anæmia might be due to hæmorrhage, to lead poisoning, to the chlorotic condition, or to other causes. This extra liability was not at the time explicable. Now that we know what an important part the blood plays in protecting the system against microbic poisons, we see its probable meaning. The disproportionate results between the length or severity of a tonsillitis and its effects on the system have been noted and counted as an argument in favour of the infective nature of that disease; perhaps previous anæmia may have something to do with these differences.

Erythema nodosum is most common in anæmic young women. It is recognised as having affinities with rheumatism. It is "often preceded and attended by febrile symptoms, and is not infrequently associated either with rheumatic pains or distinct rheumatism" (Bristowe). I have found it distinctly amenable to salicylate of soda, the anæmia being subsequently treated by iron; preferably, as in most cases of post-rheumatic anæmia, by the iodide of iron. I have seen a case lately which had been preceded by a "very sore throat" a few weeks previously, in a young woman who some years ago had rheumatic fever.

2. Overfatigue. Of this I may say that it is reputed to favour infection. Thus persons living in a malarious district are especially warned not to "expose themselves to the malarious influences when they are ill or fatigued" (Bristowe). We must content ourselves with saying that undue fatigue seems in some way to lessen the body resistance either to the invasion, or the development of microbes, or to their poisonous influences. The exercise which has produced the fatigue may also determine to particular joints a poison already in the system, as in gout.

3. Chill. I have already stated that throat specialists recognise catarrh as a clinical item in tonsillitis. Chill as a factor in the production of catarrh is indisputable. That rheumatic fever also includes chill as an item in its history is therefore quite consistent with a microbic origin.

Though it may not yet be established that all cases of lobar pneumonia are due to a special infection, yet the trend of opinion is certainly in that direction. That a chill is nevertheless oftentimes immediately connected with the commencement of pneumonia is to my mind quite incontrovertible. An adequate explanation would appear to be that under such circumstances the diplococcus or the bacillus pneumoniae find suitable conditions for growth. "An exceedingly interesting fact is that the sputum of healthy persons frequently contains the capsule coccus"—diplococcus (Coats's *Pathology*).

Persons who have been well saturated with malarial poison are liable for long after to have from a chill a return of their former symptoms, whether these have been of the remittent or of the intermittent type. This fact is not altogether irrelevant, although bacteria belong to the vegetable, while the protozoon of malaria belongs to the animal kingdom. They are all organisms of the lowest type, and it shows that certain states of the system are equally favourable to each. The protozoon multiplies by fission, as do bacteria.

It may be convenient here, though a little out of logical order, to refer to some other facts which have an important bearing on the probability of rheumatic fever being a microbic disease.

The habit of rheumatic fever to attack one joint after another, sometimes leaving the first joint to return to the various joints after having subsided—the tendency, in short, to metastasis and relapse—seems to suggest, at all events, that it may be explicable by the infusion of fresh doses of poison. That one person should pass through three or four attacks of fever without any heart affection, whilst another has the heart attacked on the first and perhaps on several subsequent occasions, is remarkable. Cases with high fever and notable joint affection escape, others of a milder type suffer. Chorea cases, in which rheumatic fever is rather rare, are yet conspicuous for the frequency of endocarditis.

These considerations suggest a poison which is capable of modifications, such as would arise from an admixture of various bacilli. Ulcerative endocarditis, which, though occurring in rheumatic fever, is by no means confined to that condition, is, there can be little doubt, due to the

presence of the bacterium which is found associated with it. This shows that, if there be a rheumatic microbe, this is capable of coexistence with other forms. Diphtheria and typhoid bacilli are each liable to similar combinations. It has long been clinically noted that a considerable fever may precede by some days the joint affection; the latter, indeed, may be no more than just enough to establish the diagnosis. The fever may similarly, without any joint affection, precede an endocarditis. I have seen not a few cases where an unidentifiable fever attended by much sweating has immediately yielded to salicylate of soda, and has, therefore, appeared to me to be rheumatic.

These things all suggest mixed poisons, capable of acting either separately or in various combinations, and, in the latter case, in varying proportions. The sudden super-vention of hyperpyrexia suggests the infection of the system by either a fresh thermogenetic poison or a fresh dose of that poison which causes the original fever in a greatly enhanced quantity, out of proportion to the other morbid poisons. The fact that the action of the heat centre may be affected by coarse brain lesions or by excessive external heat does not prove that it is insensitive to subtle bacterial poisons. In fact, we know that it is sensitive to them.

That there is an intimate relation between chorea and rheumatism is universally admitted. Various *post-mortem* changes have been found. But Coats is only expressing the general opinion about their relation to the disease when he says: "These lesions, however, are by no means constant, and are to be regarded as consequences of irritation of the brain, or as coincident phenomena" (p. 649). This applies also to hydrophobia.

Now let us look at chorea from a microbic point of view. In tetanus and hydrophobia we have two diseases which affect motor nerve tracts. The bacillus of tetanus has been identified, isolated, and cultivated. The toxin produced by these cultures freed from bacilli has been injected into animals and has produced in them the symptoms of tetanus. The toxin of hydrophobia has been isolated, though its bacillus has not been identified; the injection of this toxin affects the motor system. We have thus two diseases produced by toxins. In the one certainly, in the other almost certainly, these toxins are produced by bacilli. This is cogent evidence of the reasonableness of the view which attributes chorea to an analogous cause.

In all three the motorial system is not exclusively attacked. In all three we know that the movements are much aggravated by emotional excitement. In all three there are evidences of hyperæmia and exudation from the vessels of the nervous system, as consequences of its irritation. Two clinical facts seem opposed to this view. The one is the causation of some cases by fright, which may be either slight or severe. But we can understand that the nervous system may be at first only rendered unstable in a minor degree which, before the fright, had not given rise to notable motor affection. From a large experience of chorea, which is very common among the hospital population of Birmingham, I know that in many cases, apparently due to fright, close inquiry will elicit evidence that this is so.

Paresis frequently precedes choreic movements. A child drops a teapot in consequence of this muscular feebleness; the mother violently abuses the child, already frightened at its accident; the choreic movements then developed are attributed to the fright, whereas the choreic paresis already existed.

The second objection is the origin of chorea from imitation. I have seen several supposed examples of this, but not on the large scale recorded by some writers. I will not dispute this mode of origin, but we can see that the close association of a hospital ward is well calculated to promote the infection of one throat from another, if that is the source of the rheumatic and choreic poison. Reason will be given to think that such infection does not necessarily imply any violent inflammation of the throat such as would be sure to attract notice. Minor affections may easily be overlooked when we are not on the look-out for them, for it is easy not to see that for which we do not look, and not to look for that which we do not expect to find.

But it must be admitted that chorea may be due to a constitutional instability of the nervous centres in some, and

especially in female, children. This may be conceivably the cause of chorea from fright, and also from imitation. An added instability from poison would enhance such a condition of instability, but might not be necessary.

4. Wandering pains. The clinical history of febrile diseases, which we believe or know to be of microbic origin, shows that various pains oftentimes accompany their early stages. The backache of small-pox is an example. The prodromal pains of rheumatic fever are often associated with pyrexia, usually moderate in amount. This state is really rheumatic fever. For it has been shown by P. M. Latham and others that this disease may exist without either arthritic or cardiac affections.

A little girl suffering from chronic moderate chorea was seized suddenly with fever without apparent external or local cause. I judged that it was probably rheumatic, and so treated it. As it was subsiding both wrists became somewhat swollen and painful.

Cases of moderate fever with wandering pains are often allowed to lapse into ordinary rheumatic fever through want of immediate and vigorous treatment. It can scarcely then be disputed that these early wandering pains point to the inclusion of rheumatic fever amongst microbic diseases and not to its exclusion therefrom. Tonsillitis is often accompanied by such pains even in cases in which no distinctive rheumatic symptoms are subsequently developed.

I have already referred to fatigue as a cause of rheumatic fever. It is convenient to add a word on that topic. It may be that it is the stress thrown upon the joints by the exercise which has produced the fatigue which causes the disease to be attracted to and concentrated in the joints. I have pointed out elsewhere⁶ that something of the same sort occurs in gout.

We have now surveyed the chief phenomena of rheumatic fever as well as of some other diseases having superficially something more or less in common with it. These latter are generally reputed, though not all with quite the same certitude, to be due to poisons generated by microbic growths.

The facts of rheumatic fever have not been harmonised or explained by any as yet recognised theory. They can be harmonised and explained by the hypothesis that they also are due to poisons generated by microbic growths. In a large number of cases we find microbes which commonly produce toxins multiplying in a part so freely supplied with lymphatic tissue as to render the entrance of toxins into the system exceedingly easy and therefore probable. We find also microbes in the closed follicles and the epithelial cells. Do not all these considerations afford a strong presumption that rheumatic fever itself has a microbic origin?

Let us now look at the question from a throat point of view. The natural history of tonsillitis shows that it is divisible into several classes. In considering these we have nothing to do with any hypothesis or theory as to the origin or nature of rheumatism. These classes are:

1. Tonsillitis, with or without abscess, which is neither preceded, attended, nor followed by rheumatism.

Everyone must be able to recall such cases. There may be a history either of a single attack or of repeated attacks.

2. Repeated attacks of tonsillitis without rheumatism, and then one immediately followed by rheumatism.

Miss P., aged 18, had for several years been subject to attacks of tonsillitis, several with abscess. She got a chill while skating, the throat became inflamed, and in about a week she had several joints swollen and painful, and some pyrexia. She had never before had any rheumatic symptoms.

3. Cases of repeated tonsillitis without rheumatism, then an attack remotely followed by rheumatism. A young lady had three attacks in the course of about seven months, the last one followed after an interval of several weeks by rheumatic fever.

4. Cases of first attack immediately followed by rheum-

atism. A lady and her child's nurse contracted tonsillitis in a foreign hotel. The nurse had rheumatic pains, rapidly developing into rheumatic fever, which she had never had before. Miss P.'s sister (see No. 2) caught a chill at the same time. Her throat became very sore, and in three or four days she was very ill with tonsillitis and rheumatic fever, neither of which she had ever had before.

5. Cases of first attack remotely followed by rheumatism. A lady got severe tonsillitis in Rome. After that several febrile attacks ranging over about a year, then rheumatic fever. She had before had scarlatinal rheumatic fever. She had two more attacks, one without preceding sore throat, the third immediately following a tonsillitis of moderate severity.

These are cases which would come under another class or classes with which I will deal presently.

Let us now consider how far the cases already specified can, having regard to other known microbic disorders, be harmonised with a microbic theory of rheumatism. A microbic tonsillitis with or directly followed by rheumatism we could completely explain without assuming a special rheumatic microbe. But they oppose no obstacle to such an assumption. On the other hand, the existence of cases unattended by rheumatism seems almost to require the assumption of a special rheumatic microbe, sometimes associated with the bacteria of tonsillitis, sometimes not. This would also explain the undoubted fact that repeated attacks of tonsillitis without rheumatism may precede an attack with rheumatism.

How rheumatism, remotely following a cured tonsillitis, may be produced we can also understand. We may suppose, for example, that an "unformed ferment" may in some cases pass immediately into the system, or may, on the contrary, be indefinitely detained in some part—possibly in closed follicles of the throat. I shall not pursue this further, because, in my opinion, the supposed facts which it is required to explain are non-existent.

The supposed fact is that not only has the tonsillitis gone but that the throat is sound. The real fact is that the throat is not sound. A condition of chronic catarrh remains behind, sometimes attended with persistent or recurrent slight soreness, or what the patient calls "stiffness" of the throat in swallowing; more often with recurrent soreness, of which the patient makes light and which he will not mention spontaneously, generally requiring to be closely interrogated; collection of phlegm in the pharynx during the night, with "hawking," sometimes producing retching in the morning; the marks of chronic catarrh or relaxation are visible on inspection. This condition may continue not only for weeks and months but even for years. I saw a gentleman lately who said: "I have had what I call a 'scrapy' throat for years. About twice a year I get a more or less severe sore throat. I had one about six weeks ago." Just about that time, but whether before or after the throat he could not remember, he got a pain down the outside of the right arm—musculo-spiral neuritis, still existing when I saw him—then pain and tenderness down the right side of the neck from the mastoid process; a tender narrow cord with very small nodules here and there in its course; neurasthenia; the throat bore marks of chronic catarrh and lymphoid granulations; no rheumatism. In another case recovering from rheumatic fever similar symptoms, but on both sides of the neck; pain and tenderness extended to the point of the shoulder. From this I inferred that there was a neuritis of some cervical nerves as well as irritation of absorbents. The last case but one is mentioned to give an opportunity of pointing out that such a throat condition is not so insignificant as is commonly supposed. It is a factor in some, perhaps in many, cases of neurasthenia, anæmia, and general ill-health. This was so in the case of Miss P., above quoted. It was for such symptoms she first consulted me, five years after the rheumatic attack. During that time she had never been well, and had had slight transient soreness of the throat frequently, often twice a week. In such cases the irritation of the absorbents is certain proof of the entrance of poisonous matter into them. The co-existent neuritis is another scarcely less cogent proof; for consider the known causes of neuritis—lead, arsenic, alcohol, diphtheria, exanthemata, gout.

It is most important to observe the parallel between these

⁶ On Gout as a Peripheral Neurosis (London, 1892). In this memoir I have shown that many of the symptoms which have been supposed to be due to changes in the joints are really due to changes in the nerves supplying or surrounding the joints. Anyone can ascertain for himself whether or no this is true. None, so far as I know, who have taken the trouble to acquaint themselves with my views and to examine cases by the light of them, dispute their accuracy. These facts suggest further that the actual arthritis may be due to these nerve changes rather than to a primary and independent arthritis.

two cases. In both throat disorders of a catarrhal character, followed by irritation of absorbents and neuritis; in the one rheumatic fever, in the other no rheumatism. It can scarcely be denied that this brings rheumatism into very close quarters with an infective disease originating in the throat, at all events with a throat disorder capable of manufacturing a poison infecting the system. And it must be presumed, in the present state of science, that such a disorder is itself produced by infection. Herein also we find, I think, a hint of the connection between rheumatic fever following tonsillitis immediately and that which follows it only remotely, perhaps also a clue to the real meaning of a "rheumatic diathesis." Let us again assume, for the sake of argument, that this fever depends upon the growth of a specific bacillus or group of bacilli. Since not all cases of tonsillitis are followed by rheumatic fever one of two things is pretty certain: either that a special bacillus, or group, must to produce rheumatic fever be added to those which cause tonsillitis; or that it requires a special constitution of the system to allow of the development of acute tonsillitis and the rheumatic fever which follows it, but with a considerable gap between the two, the gap being bridged over by continuous or remittent catarrh. These clinical facts strengthen the suspicion that there is a special bacterium or combination of bacteria capable of affecting the system without producing any of those vehement local symptoms characteristic of acute tonsillitis; it is also legitimate to suspect that such a body or bodies may have a faculty of growth in throats which have never been the seats of an acute tonsillitis.

This special constitution may be an absence of protective faculties in, for example, the blood; or the presence of a special susceptibility of some part of the system, for example, of some section of the nervous system. In either case we are able to attach a definite meaning and reality to the conception of a "rheumatic diathesis."

The fact that so many cases of tonsillitis are never followed by rheumatism; the fact that repeated attacks may never be so followed, and yet that ultimately a similar attack may be so followed—these facts, taken together, seem to point strongly to the conclusion that there is a special rheumatic bacillus or bacilli; and, further, that this special bacillus may or may not be associated with those of tonsillitis. That such an association is common, and the result immediate cannot be denied. The remote cases still more forcibly suggest a special bacillus, the tonsillitis in some way preparing the parts either for its more luxuriant growth or for the more ready entrance into the system either of the bacillus or of its products. If this be so, since the immediately accompanying sore throat is trivial, it is clear that the local action of the bacillus is trivial, though its secondary effects are so formidable. We can further understand that the local action may be entirely overlooked unless specially inquired for, from all which it is reasonable to suggest that rheumatic fever may have its origin in the throat in other cases than those in which it is manifestly (in some way) connected with acute tonsillitis; for till the subject has been further investigated it is premature to conclude that an acute tonsillitis is an essential prelude to the growth of the special bacillus.

I will now again refer to another class of clinical facts in themselves important directly for practical guidance. They are important also indirectly in their bearing upon the possible production of rheumatic fever by locally insignificant throat disorder. I have seen not a few cases in which the prominent symptoms have been neurasthenia, anæmia, general debility, general ill-health, often with slight, recurrent febrile symptoms, disturbance of stomach, or liver, or kidneys. In some of these, but not in all, there was tenderness in a line running from the mastoid process down the neck; in some, a very tender spot over the upper part of the scapula, suggesting neuritis of upper cervical nerves, as a branch of these runs down and terminates there. One does not see how lymphangitis in the post-sterno-mastoid region should extend to this point. But that there is lymphangitis in some of these cases is certain, because not only tender cords can be felt, but at intervals distinctly enlarged lymphatic glands, also very tender. They are mostly of the size of shot of varying diameter. One I have seen as large as a small horsebean. The tenderness, whether it be in nerve or lymphatic, varies in a fitful manner.

Occasionally there is a fitfully recurrent tenderness, redness, and puffiness over the mastoid process. We find a history of sore throat—probably not very severe—early in the case, oftentimes with irregular recurrences. Pyrexia is not a necessary element, either initially or subsequently. It may be absent even when there is considerable local affection, and where other symptoms of blood poisoning are conspicuous. I have lately seen a well-marked instance of this. These cases have not got well either spontaneously or under ordinary treatment. Examination of the throat reveals some or all of the following conditions: Slight enlargement of one or both tonsils, with a velvety appearance, streaks or patches or general redness of soft palate, uvula, and pharynx, streaks of mucus descending from the naso-pharynx, adenoid growths. These cases have been most intractable by ordinary treatment, such as iron in cases of anæmia, nerve tonics in cases of neurasthenia, and so on. But they readily respond to such treatment when to it is added disinfection of the throat by means of gargles, sprays, or insufflation. One of the best gargles is R mellis Ziv , lot. nigr. Zvijss . The sprays I have found most useful are: R Zinc. sulpho-carbol. gr. iv, aq. Zj ; and R Acid. sulphuros. Zj to Zij , aq. ad Zj . As an insufflation, R Salol, sod. bicarb. aa gr. iij to gr. v. If the patient uses the spray himself he should direct it through each nostril as well as through the mouth.

The history of blood poisoning from slight throat disorders has yet to be written. In the meantime I most earnestly recommend practitioners to adopt the hints above given in suitable cases. These they will readily find on inquiring into the throat condition and history of intractable cases of general ill-health, etc.

The bearing of such cases which present no rheumatic symptoms on the possibility of rheumatic fever arising from slight throat disorder will be apparent, and does not require elaboration.

The facts and considerations which I have stated have certainly convinced me, and will, I hope, have a similar effect upon others, that there is a very high degree of probability that rheumatic fever does directly depend upon microbic poison. To convert this probability into certainty much is required. We want further clinical evidence of the association of the disease with slight throat disorders, whether these have or have not been preceded by flagrant tonsillitis, and whether they are continuous, or remittent, or recurrent. This applies also to chorea and to erythema nodosum, to slight or subacute rheumatism, as well as to pronounced rheumatic fever.

To bacteriologists I would suggest the separate cultivation under varied conditions of the microbes usually found in acute lacunar tonsillitis and the physiological testing of their products. But more especially a similar investigation of the slightest throat disorders associated with blood poisoning, whether rheumatic or not. It is, of course, possible that, as Dr. MacLagan suggests, the morbid element may be allied to that or those found in malarial poisoning. It should, therefore, be attempted to settle this point by examination of the blood.

In medicine, as in all other walks of life, our actions must, on a vast number of occasions, be guided by and based upon not certainty but probability. I therefore take the liberty of urging upon practitioners the necessity of attending to the disinfection of the throat in rheumatism, however slightly it may be disordered, and however slight the rheumatic symptoms may be.

It is proposed to build a large animals' hospital in memory of "Jack, the judge's dog." The buildings of the Animals' Institute, 75, Kinnerton Street, Wilton Place, S.W., have been taken over as a temporary hospital. Sir Henry Hawkins, the president, and Professor Atkinson are the organisers. The objects of the Institute are to carry out the humane treatment of domesticated animals, the study of comparative pathology without vivisection, and the alleviation of pain in the lower animals.

VENEREAL DISEASE IN RUSSIA.—A Congress of members of the medical profession is to be held in St. Petersburg in November, 1896, for the purpose of discussing what steps should be taken to check the spread of syphilis and venereal diseases in Russia.