Observations

ON

THE BACTERIOLOGY OF CHRONIC NASAL CATARRH AND ITS TREATMENT BY AUTOGENOUS VACCINES.

BY

LEONARD MACKEY, M.D., M.R.C.P.,

PHYSICIAN TO OUT PATIENTS, QUEEN'S HOSPITAL, BIRMINGHAM.

THE cases on which this paper is based were of patients suffering from (1) recurrent acute nasal catarrh, (2) chronic nasal catarrh, or (3) chronic post-nasal catarrh.

They do not include (a) simple brief nasal catarrhs, (b) epidemic nasal catarrhs, influenzal or otherwise, or (c) nasal infections associated with polypi, diseases of antrum or sinuses, atrophic rhinitis, or any discoverable surgical lesion, with the exception of some cases of adenoids which will be referred to later.

All the cases were sent to me with a view to vaccine treatment, and the bacteriological examinations were made for that purpose.

On the records kept during the past seven years this paper is based. Nearly every case was examined by a throat surgeon, whose opinion enabled me to exclude local lesions and abnormalities.

Method of Making Cultures.

Having ascertained that the patient has not recently used any antiseptic nasal douche, I gently pass a nasal swab along the floor of the nasal passage till it reaches the back of the nasopharynx, move it about a little, and then withdraw it in such a way that it rubs against the turbinate bone. Having swabbed the other side in the same way, I immediately inoculate two plates of blood agar and place them in the incubator.

A nasal swab is made like a throat swab, but is much smaller and on much finer wire so that it follows any twisting of the nasal passages without hurting the patient.

At first I used a nasal speculum when taking the swabs, but now I only use it when the nostrils are very hairy or sore. A post-nasal swab passed through the mouth and behind the soft palate has proved of no use to me.

It is of the utmost importance that the cultures should be put on and incubated as soon as the swab has been taken, and if this is impossible the swabs should be kept warm (for example, in the waistcoat breast pocket) till they can be taken to a laboratory. A delay of a few hours may spoil the cultures. It is impossible to place any reliance on a nasal swab sent through the post, for two of the most important germs found in nasal catarrhs—namely, *Pneumococcus* and *B. influenzae*—die quickly if the swab gets cold, while germs of minor importance, such as *Staphylococci* and diphtheroid bacilli, actually multiply in the mucus on the swab and become more abundant as time elapses between the taking of the swab and the making of the cultures. So that in a case where the immediate cultures showed, say—

Pneumococcus ... 1,000 colonies
Staphylococcus ... 8 colonies

a similar swab sent through the post and cultured the next morning will grow—

Staphylococcus ... 1,000 colonies
Pneumococcus ... nil

This result is utterly fallacious, and if followed by an autogenous staphylococcal vaccine could only bring it into disrepute. If anyone doubt the truth of this apparent paradox, he need but try the experiment a few times to convince himself of its accuracy.

The Bacteriology of Healthy Nasal Passages.

It is essential to know something of the bacteriology of normal nasal passages if we wish to interpret accurately our findings in catarrh.

The nose is not, like the mouth and throat, a breeding place for all sorts of germs. Compared with the pharynx the healthy nasopharynx is wonderfully sterile—at least, that part of it which can be reached by a nasal swab.

Cultures, made in the way described above, have been made by me repeatedly from healthy persons, and they bear little or no resemblance to cultures made from patients with nasal catarrhs.

In catarrh almost invariably a profuse growth is obtained of the causative germ, which is usually *Pneumococcus*, *B. influenzae*, *Micrococcus catarrhalis*, Friedländer's bacillus (*B. mucosus capsulatus*), or a special type of streptococcus.

In health, cultures are sometimes quite sterile, but more often show a few odd colonies of *Staphylococcus albus* and diphtheroid bacilli. Sometimes in healthy persons one gets a profuse growth of these two germs, and for that reason should be very chary of accepting them as causal in cases of catarrh.

Diphtheroids, under the names *B. septus* and *B. coryzae segmentosus*, have been described as causes of catarrh, and even as causes of epidemics. I do not deny that they can become pathogenic, but the more I see of them the less is the importance I attach to them, and for some years I have refused to make vaccines from them alone.

Staphylococcus aureus sometimes appears in cultures from a healthy nose, but more frequently when there are pimples or sores in the passages. It is seldom the sole cause of an ordinary nasal catarrh, and, when associated with a purulent discharge, points rather to definite disease of the antrum or sinuses.

I believe—and I think every one must believe—that healthy persons can carry catarrhal germs in their nasal passages without suffering from catarrh, but I am sure it is a mistake to think that such examples are common, and I have never obtained good cultures of the pneumococcus and influenza bacillus from healthy nasal passages.

On the other hand, it is quite common to find a person with post-nasal catarrh who is unconscious of the fact, though greenish mucus can be seen trickling down from his nasopharynx.

The practical point is that such bacteria as may be present in healthy nasal passages should not deceive the investigator in nasal catarrh except in rare instances, provided always that he makes his cultures from fresh swabs.

The following is a short table of the germs found in 558 cases of chronic nasal catarrh during the past seven years. It shows that seven or eight different germs are capable of causing chronic catarrh, and that the pneumococcus is easily first and the influenza bacillus second.

Table showing Micro-organisms found in 558 Cases of Chronic Nasal Catarrh (only good growths on blood-agar are tabulated).

(October, 1912, to July, 1919.)

	Occurred in	Pure cultures in
<i>Pneumococcus</i> ...	191 cases	103 cases
<i>B. influenzae</i> ...	142 "	48 "
<i>M. catarrhalis</i> ...	119 "	49 "
<i>Staphylococcus aureus</i> ...	104 "	56 "
<i>Streptococcus</i> (not <i>S. mucosus</i>)	52 "	18 "
Diphtheroid bacillus (<i>B. septus</i> and <i>B. coryzae segmentosus</i>)	46 "	10 "
<i>Streptococcus mucosus</i> ...	41 "	22 "
Friedländer's bacillus (<i>B. mucosus capsulatus</i>)	41 "	14 "
<i>Staphylococcus albus</i> ...	40 "	26 "
<i>M. tetragenus</i> ...	5 "	5 "
<i>B. proteus</i> ...	4 "	0 "

351 cases showed pure cultures.

207 cases showed mixed cultures.

The above figures need little comment, but I must again remind the reader that the list does not include (1) cases of a single attack of "cold in the head," or (2) epidemics of nasal catarrh. Obviously figures based on an epidemic in a school or town would be most misleading if applied to common colds in general.

It is also possible that the simple acute [nasal catarrh, which clears up rapidly and does not recur, may be due to a germ which occupies a low place on my list. In other words, my figures may show that pneumococcal and influenzal colds are not really the commonest, but only the most difficult to get rid of. More research is needed to clear up these points.

My cases may be divided clinically into three main groups, and in each group the pneumococcus and influenza bacillus predominate over all other germs.

1. Cases of Frequently Recurring Acute Attacks of Nasal Catarrh, leaving the Patient apparently free from Catarrh between the Attacks.

These persons are usually carriers. The acute attack gives them a few weeks' protection and respite, after which they develop a fresh attack, the onset of which is often

determined by a chill, a change of weather, a long railway journey, or a visit to a stuffy and crowded entertainment.

If tested in the interval between the attacks they will be found infected. In children such a condition is usually due to adenoids, and clears up after their removal.

2. *Cases of Chronic Nasal or Post-nasal Catarrh in which the Patient's Chief Complaint is the Discharge itself.*

The catarrh either necessitates the frequent use of a handkerchief or worries the patient by the constant discharge at the back of the nose. Sometimes such persons get acute attacks also.

In such patients' evidence is frequently discovered of ill health, such as lack of energy, indigestion and lack of appetite, shortness of breath on exertion, and hearts which are easily strained by exercise, but the chief trouble, from the patient's point of view, is the incessant nasal discharge. In children such cases are usually due to adenoids, and the removal of the adenoids cures the child.

3. *Cases in which there is Post-nasal Catarrh, but the Patient is not aware of its Existence, and complains only of its Consequences.*

Such consequences are :

- (a) Chronic or recurrent bronchitis, sometimes associated with asthma.
- (b) General ill health and incapacity for ordinary work.
- (c) Chronic gastric catarrh and disorders of digestion, due presumably to the swallowing of pus and germs.
- (d) Signs of heart strain, presumably from toxic action on the myocardium.
- (e) Neurasthenia.
- (f) In rare cases pleurisy, pains in joints, muscles and fascia.
- (g) Otherwise-unexplained spells of mild pyrexia.
- (h) Such infections may act as a contributory cause in more serious diseases of doubtful origin, such as nephritis and arthritis.
- (i) In children sharp attacks of pyrexia with enlargement of the cervical glands may be the only symptom of chronic post-nasal infection, and earache and otitis media may arise from the same cause. In children such infections are usually associated with adenoids, and the germs disappear after the adenoids have been removed.
- (j) Two adults and three children were sent to me because they had had several attacks of lobar pneumonia within a few years; all showed a pure culture of pneumococcus from nasal swabs.

Now I do not wish the reader to run away with the idea that I believe neurasthenia and gastritis is often due to nasal infections, but I do believe that chronic nasal infections are capable of causing those and many other diseases, and that a routine investigation of the nasal passages would be worth making in many instances of chronic and inexplicable disorder. But I do wish to assert most emphatically that chronic and recurrent bronchitis is frequently due to post-nasal catarrh, and that the causal and dominant germs in the sputum can usually be obtained in pure culture from a nasal swab. Any bacteriologist who has worked with sputa and who knows how difficult it may be to grow the germ that he can see in the sputum, will appreciate the importance of knowing where he can find profuse and frequently pure cultures.

In some cases of asthma, especially when associated with bronchitis, the nasal passages contain the causal germs, usually *Micrococcus catarrhalis* and *Pneumococcus*, but in the great majority of cases of true asthma the nasal passages show no infection.

Once more I lay stress on the point that obstinate nasal infections in young children depend upon adenoids, and that such adenoids do not necessarily cause nasal obstruction.

I maintain that the person who carries pneumococci or influenza bacilli in his nasal cavities is not really healthy though under ordinary circumstances he may appear so. He is capable of infecting others. In times of stress and unusual effort, and on exposure to "fogs" and chills his infection finds him out. I suspect that such carriers are to be found among the men who developed heart strain under military service, among the business men who become neurasthenic from worry and overwork, and among the women who cannot stand up against the strain of domestic worry.

The man who gets lumbago after gardening, stiffness after tennis, sciatica after sitting on the grass, neuritis from starting his car, and a cold in the head after a long

dusty ride is not necessarily "gouty"; he may be simply infected. The pains and disorders which accompany all acute infections show what germs and their toxins can do, and in a mild degree chronic infections produce similar symptoms.

Nasal infections are commoner than pyorrhoea and much more important. I am sure that they are a cause of pneumonia and bronchitis, and lead to pulmonary complications after anaesthetics. Otitis media and its complications begin as infections of the nasopharynx. That chronic post-nasal infection may prepare the way for tuberculous infection cannot be doubted.

Whoever discovers a simple and effective method of sterilizing the nasal passages will deserve the thanks of mankind.

Vaccine Treatment.

I can only hope that what I am about to write will be believed, but, after what has been said and written on vaccine treatment in the last ten years, I can forgive anyone who reads such accounts with the utmost scepticism.

In the past seven years I have treated over 500 cases of chronic catarrh with autogenous vaccines. The patients were not soldiers, nor victims of the influenza epidemic; they were persons suffering from chronic nasal catarrh who were sent to me by their doctors because ordinary measures had failed to cure them.

Before they were sent to me they had tried the usual remedies, nasal douches, nebulizers, antiseptic applications, and so on; they had sometimes benefited by a stay at the seaside, but "caught a fresh cold" on the return journey; naturally, most of them had consulted a throat surgeon, and, indeed, many were sent to me by the throat surgeon with the statement that nothing abnormal could be seen beyond catarrh of the nasal passages. It is to be understood that I am not making any comment on the value of ordinary methods of treatment; I am simply pointing out that these patients had failed to respond to them.

In the case of children vaccines were seldom used, for I soon learnt that chronic catarrh in children is due to adenoids, and can be cured by the surgeon. Why is it so commonly believed that a child who breathes comfortably through its nose cannot have adenoids?

The vaccines were made from the germ or germs which I believed to be responsible, and always from the primary cultures when these were pure. Mixed vaccines were made when two or more catarrhal germs grew profusely on the plates, or when, as sometimes happened, a different infection was found in the two nasal passages.

The vaccine most frequently used was pneumococcus, either pure or combined with some other germ, and the next on the list was Pfeiffer's influenza bacillus (I have not observed any difference since the epidemic); and then *Micrococcus catarrhalis*, *Staphylococcus aureus*, *Streptococcus mucosus*, *B. mucosus capsulatus* (Friedländer's), and, last of all, *B. septus* and *B. coryzae segmentosus*. The vaccines were made in such strengths that 20 minims represented the maximum dose, and I began with 4 or 5 minims and gradually increased, giving twelve doses at intervals of a week. The maximum dose of pneumococcus and streptococcus used was always 150 million for an adult, and of the other germs 300 or 400 million.

The vaccines were administered by the patient's own doctor, and, as a rule, he or the patient reported the result. I have not heard of any difficulties or unpleasant reactions in the course of the treatment.

The results are good; they have been better in the last three years than they were in the first three, simply because I am better able to judge what germs to use in the case of mixed cultures, and because in doubtful cases I insist on repeating the test before I prepare the vaccine. In some instances the vaccine has failed completely, but such cases are fortunately rare.

The fairest summing up I can give—naturally, I have not been able to trace every case—is as follows:

In many cases the patient is pleased and grateful and believes himself cured, there is no sign of catarrh, but the same germ is still in his nose, and after two or three years the catarrh will reappear.

In half the cases the catarrh is cured and the nasal passages are normally sterile.

In about a third of the cases the catarrh persists in a modified degree.

Considering the type of case tackled, the results amply justify the treatment, but fortunately there is something more to be said. In the case of a patient with secondary disorders the results of the treatment are still better, for whether the catarrh is cured or only reduced, the general health is improved and the patient gains weight and strength. He ceases to fear chills and "fugs," is in better spirits, and loses the dread (so common in catarrhal subjects) of tuberculosis.

Preparation of Autogenous Vaccines.

I have no experience of stock vaccines, but to those who are interested in autogenous vaccines I should like to say that they will not find nasal catarrh easy at first, but that success will follow if they bear in mind the importance of:

1. A suitable form of nasal swab.
2. The use of good media.
3. The making of cultures *immediately* the swab is taken.
4. The dominating part played by the pneumococcus.
5. The part played by Pfeiffer's bacillus of influenza.
6. Treatment over a considerable period, however rapidly the patient may appear to be cured.

Some day we may know why nasal catarrh, so slight and transient an ailment with most of us, proves so obstinate and intractable in some; meanwhile nothing but good can come from further investigation and discussion.

The recent correspondence in this JOURNAL on infective catarrhs encouraged me to publish these data from my own practice.

THE TREATMENT OF CHRONIC URETHRITIS:

WITH A DESCRIPTION OF A NEW INSTRUMENT
FOR CAUTERIZING THE LACUNAE.

BY

W. WYNDHAM POWELL, F.R.C.S.,

LATE SURGEON TO THE WESTERN GENERAL DISPENSARY, LONDON.

In the treatment of chronic urethritis, whether due to the gonococcus or some other microbe, local instrumental methods are more than ever in use, and for the present, at any rate, it is clearly recognised that medicines, injections, vaccines, etc., play only a subsidiary part, and are by themselves, in the majority of cases, of no value whatever unless accompanied by instrumental interference.

It will, I think, be agreed that of all instrumental proceedings dilatation, whether by means of sounds or the four-bladed dilator, is the most valuable, but is far too often neglected. If young surgeons would only thoroughly learn the possibilities connected with dilatation of the urethra under all conditions and stages of disease, it would be infinitely more profitable than experimenting with such doubtful proceedings as electrolysis, hot sounds, suction, etc. I have repeatedly seen cases in which the urethra, already narrowed to half its size by recent infiltration, had been subjected to electrolysis for the cure of a discharge without benefit, and not infrequently with positive harm, when a few simple dilatations would have effected a cure.

The treatment of gleet by means of bougies is very old. Benjamin Bell in 1785 was perfectly cognizant of the good effect of dilating the urethra in cases of gleet, and says "that the largest bougie that the urethra will take should be passed for its cure."

In my opinion every case of gonorrhoea—certainly every prolonged attack—should be subjected to a dilatation on recovery. The young practitioner will be surprised to find how frequently contractions will be present without signs or symptoms. He should not take too literally the patient's statement that the stream of urine is perfect. He may be an optimist or merely unobservant. Only a few days ago I performed urethroscopy on a man who complained of a slight urethritis of a week's duration. It was his first attack so he repeatedly assured me. Imagine my surprise on finding an advanced stricture in the bulbous urethra. On being pressed he confessed to a similar slight attack eighteen months before which was not worth bothering about or mentioning. His present non-gonococcal discharge was probably a relapse, after alcohol, of his previous urethritis.

Almost all inflammatory processes of the urethral mucous membrane throw out cellular deposit, of which part, should absorption be at all delayed, becomes

converted into young fibrous tissue. If the irritation be prolonged, sufficient material will be deposited to cause considerable narrowing of the urethra, which may or may not progress to form real stricture, and eventually interfere with the urinary stream. The mucous membrane may heal without instrumental assistance in any of these stages and the discharge cease.

J. D. First gonorrhoea ten months ago, cured in four months. Never had an instrument passed. Wishes to marry, and comes to make sure that he is well. No symptoms, no discharge, no threads. Says the stream is as good as ever. Urethroscopy: Strictures from one to three inches; admits No. 15 F. only. Could dilate only up to 17 F. at first sitting, which means a condition of dense induration. I have partially softened this with the electrolytic sound connected with the positive pole of the battery, after the method of Luys, using 10 milliamperes for ten minutes. The silver-plated sound which fits the urethra fairly firmly may be kept on the move or the current reversed for a few moments before withdrawal. This is the only condition in which general electrolysis of the urethra appears to be of any use.

Occasionally cases of persistent discharge are met with where no infiltration material has been thrown out, and these are among the worst cases one has to deal with. Fortunately they are not common.

E. T. Married recently. Gonorrhoea five years ago; many relapses. Says he has not been reinfected since. Discharge and heavy flakes crowded with gonococci. His wife also has a discharge containing the gonococcus. Urethroscopy: Mucous membrane very flabby, like perished rubber. Four-bladed dilator up to 80. No resistance. Vaccines may be tried. Lost sight of him.

On the other hand, extensive deposits may take place early during an attack, certainly at the end of one month, the result of bacterial activity, often reinforced by the chemical irritation of concentrated injections or strong irrigations.

M. T. First gonorrhoea two months ago. Mild attack with very little discharge. Had solution of argyrol sealed in the urethra for three hours on twelve different occasions; does not know the strength. Gonococci now abundant. Urethroscopy: Pronounced infiltration one to three inches; admits 21 F. with pressure and followed by slight bleeding. After a week 23 F. passed easily without pressure and with no bleeding, showing rapid absorption.

These deposits in themselves are of a beneficent nature, and represent the local effort to combat the disease. They are therefore the surgeon's friend if he recognizes the condition before much organization has taken place. Anyone who has carried out a dilatation or two under such circumstances will remember the astonishing rapidity with which the discharge disappeared. In this connexion it should be mentioned that recent deposits may become absorbed to a considerable extent without the assistance of an instrument if the irritation be removed.

G. B. Gonorrhoea ten months ago. Discharge ceased after two months. Two relapses since. Has used pretty regularly an injection of argyrol 5 per cent., holding it in for ten minutes, three times a day. Urethroscopy: Patchy infiltration stained black by the silver extending from 1 to 4 in.; admits a No. 24 F. cannula only. No dilatation done. To discontinue the injection, and to come for treatment in a week. His military duties prevented him from coming for eight months, when the canal was found to be wide and pale, and with only a trace of sclerosis. He had had no treatment. A 27 F. sound was passed easily, and a few days later a four-bladed dilator up to 68. Recovery was complete.

The commonest region to be affected with infiltration is what may be called the glandular and lacunar area, extending from the lacuna magna at three-quarters of an inch from the meatus for about three and a half inches. It affects in the first place the roof chiefly, but eventually extends around the canal. It is somewhat superficial at first, and if left untreated may heal, leaving behind slight general sclerosis or isolated strictures of large calibre. On the other hand, the infiltration may spread more deeply and the contracting process progress so as to interfere eventually with the urinary stream. It must be borne in mind, however, in connexion with the frequency of infiltration in this region that strong injections which cause, or assist in causing, these deposits are often used indifferently or are intentionally injected so as to reach only 3 or 4 in. of the urethra.

Much less frequently met with is an infiltration of the region of the bulb where severe stricture is commonest. This seems paradoxical, but the explanation is that an infiltration in this situation is of more serious import than elsewhere, owing to the laxity of the mucous membrane