T H E S I S.

R E P O R T

on the

CLINICAL AND BACTERIOLOGICAL FEATURES

of

VINCENT'S ANGINA

with

notes of cases

by

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A REPORT ON THE
CLINICAL AND BACTERIOLOGICAL FEATURES
OF VINCENT'S ANGINA
WITH NOTES OF CASES.

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Vincent's Angina is a comparatively little known disease, at least in this country.

The following observations are based on notes of cases admitted into Lightburn Hospital for Infectious Diseases, Shettleston.

While giving a full general report, they deal more particularly with the fusiform Bacillus and Spirillum of Vincent; in all probability the causative agents of the disease.

The notes were commenced at a time when the identity of the micro-organisms was unknown to the writer and, when afterwards this was discovered, a search through English Literature (both Medical and Bacteriological) gave but scanty information concerning them. In many the organisms were not mentioned; in others dismissed with a line or two. As the cases in which the Vincent Organisms occur are very liable to be mistaken for Diphtheria, as well as for other less serious conditions of the throat and mouth, the importance of their recognition will be fully appreciated. In the following cases the organisms were found on each occasion in patients who were notified/

notified and admitted into Hospital as suffering from Diphtheria, my experience of Vincent's Angina being limited to such cases as are likely to find their way into an Infectious Diseases' Hospital.

As far as possible, the information given in the following pages has been taken from my own notes, written on the admission and during the residence of the several patients. This information, however, I have verified and supplemented by that obtained, after an exhaustive search, from all available literature. Such help is fully acknowledged throughout the report, whilst a Bibliography is appended. Until 1902 nothing appeared in the English language concerning Vincent's Angina. In that year an article (by the Mayor of New-York) in the February number of the American Journal of the Medical Sciences gave me the first hint as to the organisms I was dealing with; the Magazine not coming into my hands till October of the same year.

The notes appended cover a period of two years. Of the six cases in which the organisms were found, and which are fully described below, four were admitted within a short time of each other, but, between the 4th and 5th and again between the 5th and 6th, an interval of respectively five and twelve months elapsed. In no case, however, was there any connection or evidence of contagt

contact between the patients concerned; all, in fact, coming from different localities.

VINCENT'S ANGINA.

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DEFINITION. Vincent's Angina may be defined as a type of membranous sore throat caused, in all probability, by certain specific organisms and presenting clinical symptoms closely resembling those of diphtheria. It is not contagious and its duration varies from 10 days to 6 weeks.

AETIOLOGY. The history of this affection is largely that of its bacteriology. Although it has long since been recognised that many membranes, other than that produced by the Bacillus Diphtheriae may appear in the throat, it was not until 1896 that Vincent first drew attention to the fact that there were certain forms of ulcerative Angina "associated with" if not caused by a "Fusiform Bacillus" and "Spirillum" His observations, embodied in a report on Hospital Gangrene, were the result of a series of bacteriological investigations of cases of phagedaena conducted by him while in Algiers. In some cases he recognised the organisms found as having characters both morphologically and culturally resembling those of micro-organisms which he had previously met with in certain ulcerative conditions of the throat and mouth. In the meantime Bernheim, in 1897, published a record of 30 cases of/

of Angina and Stomatitis in which he had discovered (evidently quite independently) an organism identical with that described by Vincent; and in the succeeding year he was followed by that observer who furnished a report of 14 additional cases all associated with the same organisms.

Because of the difficulty or impossibility of obtaining these organisms in pure culture, neither observer was prepared to say that the "Fusiform Bacillus and Spirillum" were the sole causative agents of the disease and hence mostly referred to their cases as those of "Diphtheroid Angina" This difficulty persists until the present time, although the opinion is growing that, in spite of the hitherto incomplete bacteriological evidence, the fusiform bacillus (with or without the associated spirillum) is the sole aetiological factor. Since 1898 many cases have been reported by Continental and, later (1902-1903-1904) by American and English writers

SEX & AGE. From an analysis of published cases, Vincent's Angina seems to be met with more frequently in males than in females. Thus, out of 21 consecutive cases, 14 were males and only 7 females, a proportion of 2 to 1. It is also more common in Children between 3 and 8 years of age, although adults are by no means free from the disease. Dr Mayer of/

of New-York, in fact, states that the disease seems to have a "predilection" for the adult male, but I do not find this to be the case. Under 3 years of age, the affection seems to be rare, but I have met with it in two instances in infants aged respectively 5 months and 14 months and in both of whom the disease had a fatal termination. In recognising this predominance amongst children, it must be borne in mind that the affection, especially in its mild firm, will be more likely to be noticed by and to receive attention from parents and guardians, and, consequently, more likely to be seen by physicians than in adults who often ignore or treat by simple home remedies " a mere sore throat"

SEASON. Judging from the dates on which cases are met with, the disease seems to be more prevalent during the latter half of the year. A gradual increase, beginning in September and reaching a maximum towards the end of October, can be noted in ~~a~~ the number of cases reported. A decline then sets in, reaching a minimum in February and March.

DISSEMINATION. Unlike Diphtheria, the disease which it most closely resembles, there is no evidence to show that Vincent's Angina is contagious, although Auché reports two cases occurring in ~~the~~ one family. Both

Both were children; both sickened at the same time, the elder with a very severe attack, the younger escaping with a mild form of the disease. We do not find, however, that cases of Vincent's Angina admitted into Hospital as Diphtheria spread the disease amongst the other patients, although it has been said that the Fusiform Bacilli and Spirilla find the diphtheritic throat a congenial soil (Vincent) Thus, out of 51 cases of Diphtheria admitted into Lightburn Hospital (all of whom came into contact with one or other of the cases I describe below) examination did not reveal the presence of the characteristic Bacilli & Spirilla, nor did any clinical symptoms arise pointing to infection.

It may also be remarked here that Vincent's Angina is occasionally found complicating syphilitic and Mercurial Stomatitis; and, as already remarked, it may be associated with diphtheria; in fact, it may even precede or follow that disease (Vincent and Salomon)

CASE II illustrates this latter statement in a peculiar manner. A boy was admitted into Lightburn Hospital as suffering from Diphtheria, but which was found, after bacteriological examination, to be really a case of Vincent's Angina. Two months previously, his sister had been discharged from the same Hospital

Hospital after passing through an attack of faucial diphtheria. Both patients had been in intimate contact with each other. Now, as is well known, the bacillus diphtheriae may have been lurking about the recesses of the girl's mouth, even after apparent recovery; the question arises--Did the sister infect her brother? and, if so, why should they not present the same micro-organisms? Or is it possible that the bacillus diphtheriae in the one could give rise to or prepare the way for the fusiform bacillus in the other? or, again, was the one independent of the other?

The affection is not known to exist in animals, but Niclot & Marotte, after inoculation, found the micro-organisms in the dysenteric discharges of a dog after "third passage"

STATISTICS. At present, statistics are not available as to the prevalance of Vincent's Angina. Many cases, owing to the mildness of their symptoms, are no doubt never seen by the physician; many are mistaken for diphtheria or other disease of the throat and mouth, and, without doubt, many are unrecorded through neglecting the aid of the Bacteriologist: with whom indeed rests the only reliable method of detecting the condition.

PREDISPOSING CAUSES. Although in many cases the disease arises apparently idiopathically, yet, in some, and these especially/

adults, a predisposing cause seems to be present. This is most commonly a slight trauma affecting the pharyngeal or buccal mucous membrane. Thus, e.g., cases are reported following the extraction or irruption of teeth, abrasions of the tongue, etc; while, in others, the presence of a Stomatitis (especially Mercurial or syphilitic) or a relaxed condition of the faucial tissues appear to be the starting point, and again, as we have seen, the disease may follow diphtheria.

IMMEDIATE CAUSE. While this cannot be conclusively stated, yet the great burden of evidence is all in favour of the fusiform bacillus & spirillum being the sole causative agents in Vincent's Angina.

As previously remarked, the inability to produce pure cultures of the micro-organisms alone makes this point uncertain; yet, even without this proof, the constant presence of the bacilli, with or without the spirilla, point to the one conclusion.

From the fact that bacilli alone are sometimes met, it is thought that they may be the more important Aetiological factor. This is Vincent's view. CASE VI is an instance in which only bacilli were found.

The part played by the Spirilla is not quite evident, but it is possible they may "aid in some way the growth of the bacilli" (Bruce)

BACTERIOLOGY. The Bacilli vary in length from 8 to 12 μ but shorter types from 6 to 8 μ are met with. They are fairly thick and mostly pointed at both ends: thus assuming the shape from which they take their name-.the Fusiform Bacilli. Some are thicker at one part than at the other, and occasionally forms are seen much swollen in the centre; this central portion being only faintly stained in comparison with the extremities.

The Bacilli mostly appear as straight rods, but many are curved, giving them a"semilunar"appearance: the shorter forms are often comma-shaped.

The organisms mostly appear in pairs, lying at angles to each other and often in small clumps. When again the Bacilli are few or the Spirilla absent, they are generally seen scattered uniformly over the field.

STAINING. They stain well with the ordinary basic stains and showing best with dilute carbol fuchsin. As a rule, they stain uniformly, but often one or more clear spaces are seen in their length. By Gram's procedure, they are generally decolorised, but frequently a diverse result is obtained, some of the bacilli only being partly decolorised and some not at all; they do not show the Neisser reaction. Sporulation does not seem to occur.

PROPERTIES. Accounts as to the motility of the bacilli vary considerably, but the balance of evidence seems to indicate that they are non-motile. Flagella have not been demonstrated.

CULTIVATION. Up to the present, all attempts at cultivating these organisms have failed; the tubes either remained sterile or yielded only streptococci. Niclot & Marotte in one or two cases succeeded in obtaining the bacillus and spirillum from fluid media and from the water of condensation of the solid media, but they were never pure; Streptococci being always present.

The Spirilla are very long, 25 to 40 μ and have no fixed position in regard to the bacilli. As a rule, they lie at some distance from the latter, but are often distributed very irregularly. They show the same staining reactions as the bacilli, but they do not pick up the stain so readily and are invariably decolorised by the Gram procedure. They are actively motile although Mayer relates a case in which their movement could not be demonstrated. Like the Bacilli, they have yet resisted cultivation.

ORIGIN. At the commencement of the disease, both organisms can be obtained in an almost pure condition in the/

the exudation; later they become more mixed with other organisms. Their presence can be readily demonstrated by smears prepared from swabs or scrapings of the affected parts and stained in the ordinary method.

In mild superficial lesions the bacilli invariably outnumber the spirilla in a marked degree. The Spirilla, in fact, may be absent altogether. On the other hand, in severe cases attended by deep ulceration, the Bacilli are generally associated with the Spirilla and here these latter may predominate.

Both organisms have been obtained from the buccal and pharyngeal mucous membranes of apparently healthy people, from defective teeth, or from teeth covered with tartar and from ulcerative diseases of the throat and mouth. (Salomon has reported two cases where the organisms were obtained from a Syphlitic soil) A spirillum indistinguishable from that associated with the fusiform bacillus has been found in abscesses adjoining the buccal cavity.

As to the different micro-organisms which are generally found with the fusiform bacillus and Spirillum the Staphylococci and Streptococci are by far the most frequent, but occasionally the pneumococcus and the Bacillus Coli Communis are met with. About the presence of the Bacillus Diphtheria, some difference of opinion exists. De Stoechlin and Salomon maintain

maintain that the presence of the fusiform Bacillus and Spirillum precludes the existance of the Bacillus Diphtheriae: but Diphtheria may follow Vincent's Angina and Auché has but recently published two cases of this nature, both of whom were admitted into Hospital with Vincent's Angina, and both of whom showed the Bacillus Diphtheriae (absent on admission) after several days residence in Hospital.%

Vincent himself pointed out that Diphtheria might be associated with his Angina in three forms. The Diphtheria might be the primary disease: sometimes the Angina, and some times both affections occurred together.

In the last two conditions, the B. Diphtheria are never numerous; they appear in the superficial parts of the lesions, and they apparently have not much influence on either the local or general condition.

PATHOLOGY. Beginning as a slight inflammation, the Pathological processes in Vincent's Angina result in a necrosis of the mucous membrane. The lesion may be entirely superficial spreading over a large area, but, often the process penetrates deeply, causing great destruction and consequent loss of tissue.

Starting on the upper part of one tonsil, the free margin of the soft palate or side of the uvula, it may spread to Pharynx behind or to the hard palate in front. In mild cases, the disease is usually unilateral, but, in severe cases, both sides may be involved.

The Necrosed Epithelium forms a deposit, usually yellow in colour but which may be white or ashy gray. The deposit is friable and easily detached, leaving a bleeding surface. It reforms rapidly. Surrounding the necrosed area is a zone of deep congestion. If left alone, the slough separates slowly, granulations spring up, and, once the surface is clear, healing soon takes place.. Where the ulcerative process has been severe, the loss of tissue is very marked; in some instances total destruction of tonsil or uvula has occurred.

The Submaxillary Lymphatic glands enlarge but suppuration never occurs.

CLINICAL HISTORY. Like many other diseases, especially the specific fevers, Vincent's Angina may be ushed in by headache, malaise and loss of appetite, followed shortly by complaint of sore throat or difficulty in swallowing. These symptoms are more pronounced in adults, but, even in them

them and especially in children, the outset may be quite insidious and the condition only accidentally discovered by a casual look at the throat or by enlargement of the glands at the neck, Rigors are rare.

On examining the throat at this stage, the fauces may be found inflamed and a deposit varying in size may be noticed on some part of the tonsil, usually the upper central portion, and surrounded by a small area of deeper injection than the neighbouring parts. The patch is of a yellowish green or greyish colour of irregular shape; as a rule, easily detached and leaving a slightly excavated, raw, bleeding surface behind. Similar deposits may be seen on the same tonsil, the arch of the soft palate and the margin of the uvula. Subsequently the whole may join, forming one mass from which a distinct foetid odour is carried by the breath, The submaxillary glands begin to enlarge and slight dysphagia, if not present at the beginning, now appears and increases as the disease progresses. Pain, if present, is usually slight, and there may be some salivation. The temperature rarely rises above 100-101° F. The urine is free from albumen.

In a day or two, the temperature, if raised, falls to the normal, but the throat condition may still persist for some days longer when the sloughs slowly separate, leaving shallow ulcers with red sharp borders. Small granulations quickly cover the surface and rapidly heal, leaving no trace behind. There are no after-effects. But the disease does not always follow the mild course described above. There is another type met with in which both the local and constitutional symptoms are greatly aggravated. In this type prodromal symptoms may be severe and there may be great pain and difficulty in swallowing. At first the throat conditions are the same as above but the faucial congestion is much greater and rapidly extends. Posteriorly it may spread to the pharynx and larynx and so seriously embarrass respiration as to necessitate tracheotomy. The disease never originates in the larynx and when this part is affected it is due to extension from the fauces, Extension to the posterior nares or to the ears via the Eustachian tubes has not been met with. Anteriorly, from the tonsil, soft palate and uvula, the disease may involve the hard palate and appear on the opposits tonsil. In extreme cases, there may be ulceration of the lips with a line of deposit running along the margin of the teeth in both the upper and lower jaws.

When the necrotic process has extended deeply, the parts involved may be seen covered with a thick foetid pultaceous membrane of a yellowish green or grayish tint crumbling away when touched and revealing beneath ulcers 3 to 4 millimetres deep with bleeding surfaces and edges surrounded by zones of intense injection.

During this time, the constitutional symptoms become more marked: the temperature may rise to 103° or 104° F. There is a moderate amount of salivation. The Submaxillary glands may enlarge and albumen may appear in the urine. The foetor may be noticeable. Between the 7th an d 10th day of illness, or later in the very severe cases, the sloughs begin to separate and, at the end of another 10 days, the throat may be clean. With much destruction of tissue, some contraction results. Part or the whole of one tonsil or part of the uvula and soft palate may be destroyed and, in one case reported, the whole uvula came away as a foul slough.

When once the deposit had disappeared, the ulcers quickly granulate and heal; the other symptoms rapidly decline and convalescence is established at once.

Between the types above described, all degrees of severity may be noticed. The duration of the affection varies from 8 to 10 days in the very mild to 4 or 6 weeks in the very severe. Recovery is usually complete but relapses and second attacks are said to occur..

Complications are extremely rare but Appendicitis, Endocarditis, Rheumatism, Infectious Purpura and Broncho-Pneumonia have each been described.

DIAGNOSIS. Throughout the whole oc~~urrenc~~course of a mild attack and in the early stages of the severe types of Vincent's Angina, the diagnosis between that disease and diphtheria can only be positively established by a bacteriological examination. The clinical symptoms and the naked eye appearances of the affected parts may so closely resemble each other that any other method of differentiating between the two is very difficult, if not impossible.

In severe cases, the great destruction of tissue (not common in diphtheria) the foetid breath (which is distinct from that of diphtheria,) the absence of history of exposure to contagion, the absence of cardiac depression ——— may all help, but, even then, considerably doubt

doubt may remain. A bacteriological examination is practically the only definite guide. By Continental writers the opinion is generally held that, if Vincent's organisms be found diphtheria may be nearly always excluded.

From syphilitic conditions of the throat, the history of exposure, the depth and character of the ulcers, and, later, the effect of treatment may assist, but, as before, the aid of the bacteriologist will often be required and, moreover, it must be remembered that the fusiform bacillus and spirillum may be found engrafted upon a syphilitic soil .

PROGNOSIS. The outlook is, on the whole, good, but, in the absence of statistics, it is not possible to give any precise information on this point. When death occurs, it is generally from some secondary affection, most commonly in children Broncho-Pneumonia, but cases have been mentioned in which toxic absorption from the site of the disease was the apparent cause of death.

TREATMENT. As in many diseases, so in Vincent's Angina, there is a tendency to spontaneous cure, but this may be assisted in various ways. It is not desirable that the membrane should be forcibly

forcibly removed or treated by powerful caustics. The common disinfectants and astringents may be used as gargles, sprays, etc.,or the parts may be brushed lightly over. Lotions of Permanganate of Potassium, chlorine water, Boric Acid, etc.,may be found useful.

In severe cases, with extension to the larynx, a "steam tent" may be necessary, and, if respiratory difficulties arise, tracheotomy may be required. Other treatment is symptomatic.

Many cases, under the belief that they ~~had~~ were diphtheria, have been treated with anti-diphtheritic serum with no evil result; in fact, with seeming benefit, so that in all probability it is judicious treatment to give the serum a trial in addition to the local measures.

The serum appears to have some solvent influence on the membrane, but its local action is not so rapid nor has it the same marked effect upon the temperature and pulse as is seen in diphtheria. This perhaps should not be looked for; but, even with the above points in view, it is good practice to inject the serum and this could be carried out whilst waiting for the bacteriological examination, the treatment holding good in either disease.

Having now completed this report of Vincent's Angina, I append particulars of six cases which came under my care in Lightburn Hospital All were admitted under certificates of Diphtheria and the diagnosis only cleared up after bacteriological examination. To these [redacted], I have added a collection of cases published by others, all illustrating the same disease.

CASE I. On the 28th September, 1902, a child Alex. M'B aged 3 years was admitted to Lightburn Hospital for Infectious Diseases as suffering from Diphtheria. The history was that "four days before admission the patient was fretful, disinclined to play and had a slight cough. On the second day he was noticed to have some difficulty in breathing and in swallowing. On the day previous to admission medical advice had to be procured owing to the increasing difficulty in breathing and general restlessness" Patient was certified as diphtheria and 2000 units anti-diphtheritic serum injected. There was no sickness or vomiting and no evidence of exposure to infection; previous health good. On admission condition was as follows:-Face livid, respirations 36, laboured with great recession of

of soft parts of chest and root of neck; pulse 136 regular, temperature 100°F.

Throat. Tonsils, pillars of fauces soft, palate deeply injected and [redacted] swollen. On the uvula there was a small adherent patch of whitish grey membrane, while the pharynx was covered with a thick viscid exudation, which extended downwards as far as could be seen. The breath was offensive. There was no discharge from the nostrils and the submaxillary lymphatic glands were not enlarged. The urine was free from Albumen.

Tracheotomy was performed an hour after admission and 3000 units anti-diphtheritic serum injected. The child did well; the throat was clean on 1st October, although the inflammatory redness persisted for a week later. Further history was uneventful until 19th October when the throat again became inflamed, the right tonsil much enlarged and its surface covered with pin points of yellow exudation. This condition persisted for two days after which patient made an uninterrupted recovery, being discharged on 3rd November. During the illness, the throat was swabbed with Boroglyceride.

Although little doubt was held as to the accuracy of the diagnosis, in accordance with the routine practice of the Hospital, on admission swabs were taken for bacteriological examination and streaks made on Agar-agar, glycerine agar and blood serum. At the same time several smears were made for the purpose of rapid examination and stained with methylene blue, carbol-thionin blue and by the Gram procedure. On examining the smears, a search for the Bacillus diphtheriae proved negative, but attention was drawn to the preparations by the presence of bacilli of various sizes scattered throughout the field. They were well marked in the preparation, stained with carbol-thionin. The bacilli referred to were mostly semilunar in shape, but some were straight, thicker in the centre with pointed ends. They occurred mostly in small clumps and were generally in pairs. Their outline was regular and they stained uniformly.

At first, they were taken for the larger varieties of the Bacillus Diphtheriae, but a closer examination dispelled the idea and revealed in addition several long spirilla lying at some distance from the clumps and which had at first

first escaped attention. Their association with the Bacilli was not recognised until later.

Streptococci were present in all the slides, but called for no special comment. With Gram's stain, a diverse result was obtained, for, while some retained the colour, others of the bacilli were partly and some wholly decolorised. The spirilla did not retain the stain. Being unable to recognise the organisms, additional smears were made for fresh swabs on the following day, dilute Carbol-fuchsin, Dahlia & M'Conkey's stain as well as the previous ones being used. Again the search for the B. Diphtheriae was unsuccessful but the bacilli and spirilla still remained and were well marked in the Carbol-fuchsin preparation No additional observations were made as regards them, although it was noted that the spirilla did not pick up the stains so well as the bacilli.

Attention was next turned, with some curiosity, to the cultures which had now been incubating 24 hours. Beyond pyogenic colonies, no growths were visible and microscopical examination failed to reveal either the B. Diphtheriae or the organisms above described.

Further inoculations were, therefore, tried and bouillon used in addition to the other media. Again the results were negative as regards both organisms and shortly it may be stated that all further attempts to obtain them either in cultures or smears proved unsuccessful after this date, i.e., the 2nd day after admission into Hospital and 6th day of illness. Although the bacteriological examination for the B. Diphtheriae was negative, still at the time no doubt as to the diagnosis and to the propriety of the subsequent treatment was held as clinically the evidence of diphtheria appeared so strong. The other bacteriological evidence was allowed to lie, the identity of the bacilli and spirilla being unknown and reference to available literature affording no help.

CASE II On the 6th October, 1902 there was admitted to the wards of the same Hospital Andrew M'E aged 5 years with diphtheria of 4 days duration.

History was shortly as follows:-Complaint of sore throat on the 3rd inst.,but not confined to bed until day of admission when he had some slight sickness and vomiting. Previous health good. A sister of the patient's discharged from this Hospital on the 12th July after a severe attack of diphtheria.

On admission colour was good; pulse 116 regular and of good volume, respirations 28 with no obstruction; temperature 97.4.

Throat. All the parts inflamed and tonsils swollen; tonsils, pillars of fauces and uvula covered with a creamy yellow exudation which was easily detached and did not leave a bleeding surface on removal. Nostrils clean. Submaxillary glands not enlarged; the breath was slightly foetid. Had no difficulty in swallowing liquids; no albumen in urine.

4000 units anti-diphtheritic serum were injected. On 8th October throat condition was still the same, the membrane reforming readily when removed. As the patient had no respiratory difficulty and was otherwise well, no further serum injections were made. On the 10th inst. the throat began to clean and three days afterwards the membrane finally disappeared. During the illness, the throat was swabbed with Boroglyceride. Patient discharged well on November 22nd.
As before, the same bacteriological examination was carried out on admission in the expectation of finding the B. Diphtheriae, but again the result was negative, and once more the fusiform

fusiform bacilli and spirilla were obtained from the smears, but not from the cultures, which, as in the previous case, revealed only pyogenic colonies. A second and third series of inoculations were tried and attempts made to get the organism from the water of condensation in the solid media, but in each case without success.

From the smears obtained on the day of admission, the bacilli again stained well with the ordinary basic dyes but showed best in the preparations stained with dulute carbol-fuchsin. Here some of them were noticed as being thicker at one end. They stained uniformly and no spores were found. The spirilla showed the same staining reactions.

Here again was a case which clinically resembled and was diagonised as diphtheria, but which bacteriologically was certainly not the diphtheria Bacilli being absent from cultures and preparations made throughout the illness. In place of the typical bacillus organisms were obtained which seemed to bear some relation to the throat condition, whether diphtheria or not. This second case was all the more interesting on account of the previous history, a sister of the/

the patient's having been discharged from the same Hospital two months before her brother's admission and, after passing through a severe illness which clinically and bacteriologically was true diphtheria.

CASE III. On 7th November, 1902, Tom H. aged 4 years was admitted to Hospital as suffering from Diphtheria of six days duration. Illness began with sore throat and cough. No difficulty in swallowing or articulation until day previous to admission. He has always been a healthy child. No history of exposure to infection. On admission patient was cyanosed and tracheotomy was immediatdy performed. After the operation 4000 units Antitoxin were injected. On the following morning patient was so much better that an examination of the throat was possible, when the condition found was as follows:-The parts were moderately injected and the mucous membrane clean with the exception of that of the left tonsil on which was a patch of greyish white membrane, very adherent and bleeding when removed and soon reforming. The tonsils were slightly swollen and the submaxillary lymphatics enlarged. The nostrils were clean and there was a trace of albumen in the

the urine. The breath was slightly foetid.

The obstruction to respiration here was evidently laryngeal. The throat was clean on 13th November and recovery was uneventful.

At the time of examination, that is on the morning after admission and 7th day of illness, swabs were taken and streaks made on Agar-agar, Glycerine agar and serum, while the usual slides were made and stained as before, and with a like result. No B. Diphtheria could be obtained but the semilunar bacilli ~~and~~ in two's and three's were present in great numbers. With them were associated the Spirilla so that no reasonable doubt existed as to their identification with the former cases. The cultures revealed cocci only.

This being the third case within two months, every care was taken in making further examinations and it so happened that another patient was admitted on 8th November, 1904.

CASE IV. Alice Q. aged 4, admitted on 5th day of an illness certified as diphtheria with history of "Sore throat and cough" No other symptoms; previous health good and no evidence of contact.

On admission, child was well nourished; colour was good; pulse 92 ~~slightly~~ irregular and regular and of fair volume.

~~and ixxbexcxxixtxbexxtx~~ respirations 24, easy.

Throat. Slight redness of soft palate, uvula and fauces; tonsils slightly enlarged, no membrane seen, Submaxillary glands on right side slightly enlarged but not tender. Nostrils clean. No difficulty in swallowing; no albumen in urine. On the day following admission, a small patch of greyish yellow exudation appeared on the right tonsil, but cleared off in two days when throat presented a normal appearance. Recovery was uneventful.

4000 units Antitoxin were injected.. Cultures and slides prepared as before failed to reveal the B. Diphtheria but the smears showed the same bacilli and spirilla as the previous cases. some of the bacilli showed clear spots and spaces chiefly at the centre which gave rise to the suggestion that they might be Spore-bearing organisms. No spores, however, were found. The Spirilla were long and thready and their presence was so constant that they were now held as having more definite relationship to the bacilli and not as an additional or accidental occurrence. They never stained so well as the bacilli themselves and were always decolorised by the Gram procedure.

In cases III and IV repeated attempts were made to obtain the organisms in pure cultures and to give every assistance, no local treatment was prescribed; but, whether due to antitoxin given on admission or to their short vitality, or to imperfect examination, no success attended these efforts.

We had here then within a short period four cases which gave rise to much thought as regards diagnosis. Clinically they presented among them every feature of diphtheria, and yet bacteriologically, through the failure to find the recognised organism, they were non-diphtheritic.

As to the organisms-, that they were the same in each case was beyond doubt. The form of the bacilli; their occurrence often in pairs; the difficulty or impossibilityof isolating them; their staining reactions, especially with the Gram method, and, lastly, the close association of the characteristic spirilla, were all facts which pointed to one organism.

At this time I was not acquainted with the bacillus of Vincent, but some months afterwards in the American Journal of the Medical Sciences I read an article entitled "Affections of the mouth and throat associated with the fusiform spirillum

spirillum and Bacillus of Vincent, which immediately attracted my attention as throwing some light on my own cases. In this article, Mayer described a case beginning as an ulcerative Stomatitis but extending to the fauces and to which a bacteriological report was appended as follows:-"In the spreads were found numerous bacilli and spirochetae and a very few chains of streptococci. The bacilli varied from 4 to 12 m. in length. Some were completely decolorised by the Gram procedure, some partly, and some not at all. The Bacilli were fairly thick: some thicker at one pole than the other while many cases curved and pointed at both ends. They occurred as diplococci in small masses and stained well with the usual basic stains.

The Spirochetae were long and distributed irregularly. They were non-motile and completely decolorised by the Gram procedure. Comparing the above report (which was accompanied by a micro photograph) with my own notes, I had little doubt but that the organisms were the same. → Bac. and Spirillum of Vincent, and, when Meyer went on to say that all attempts to procure the organisms by culture "revealed streptococci only" I was convinced/

convinced that I had been dealing with this particular bacillus.

CASE V. On the 31st July, 1903, an infant Peter R aged 5 months was admitted into Lightburn Hospital with Diphtheria after an illness of 5 days duration. History was very indefinite. The mother did not observe anything the matter with the child except that its breathing did not seem to be "so good" for some days before admission. No history of exposure to infection. Two days before admission the breathing got gradually worse and on admission the condition was as follows:-

"Child, an ill fed and emaciated infant, was in a semi-comatose condition, pulse soft and compressible 136, respirations 28 laboured with extreme recession of the soft parts of neck and chest. Alae Nasi dilating activity. Abdominal muscles acting strongly. Throat, as far as could be made out, was deeply injected; both tonsils were enlarged, and on the upper part of each was a large greyish white deposit; the uvula was clean; the submaxillary lymphatics were slightly enlarged on both sides; there was no discharge from the nostrils. Foetor was distinct; urine not obtained. Tracheotomy was performed immediately and 4000 units Antitoxin

Antitoxin injected, but the child gradually sank and died in the course of the day. A post-mortem Examination was not obtained. Bacteriological examination of swabs revealed the B. and Spirillum of Vincent, the Bacilli being the more numerous. Associated with them were numerous streptococci. Cultivations gave negative results. The Kleb-Loeffler was not found in either the smears or inoculations.

This was then a fifth case and a fatal one, death occurring apparently from toxaemia originating at the site of the disease. Whether this result was due to the susceptibility of the infant in its emaciated condition is open to question.

CASE VI. John M. 14 months, admitted to Lightburn Hospital, certified "Diphtheria" on the 3rd August 1904. There was an indefinite history of "sore mouth" of 7 days duration but attended by no difficulty in swallowing or breathing until the 30th July when a sudden and prolonged attack of dyspnoea occurred from which, however, the patient recovered. On the 1st August a similar attack took place from which again the patient ralied, but since then there has been a gradual

gradual increasing difficulty in breathing, and this becoming markedly worse on the day of admission, the patient was removed to Hospital as an "urgent case". No history of sickness or vomiting. No history of exposure to infection.

The Medical attendant stated that before admission there had been a severe Stomatitis which had abated under treatment. He had not observed any membrane in the throat.

On admission, patient was well nourished, cheeks flushed; pupils equal and dilated; child restless and clutching at its neck with both hands; extreme recession of soft parts of neck, chest and abdomen; pulse 180; respirations 62; deglutition fair and drank greedily. A hurried examination did not show anything in the throat.

Tracheotomy was immediately performed but with no evident relief for an hour or so when patient fell asleep. Next day small pieces of membrane and a great amount of mucus were expelled throughout the tube.

On the 13th symptoms of broncho-pneumonia appeared and the child gradually sank and died on the 21st. No post-mortem examination allowed

Bacteriological report:-

Cultures and spreads were prepared from swabs of the throat and also direct from membrane expelled through tracheotomy tube. The Bacillus Diphtheriae were absent. In their place were numdrous streptococci, and with them in the smears were numerous fusiform bacilli but no spirilla. Cultures revealed only streptococci and staphylococci.

The remaining cases I have selected from various reports.

CASE 7. Male, 23, complaint of "sore throat" of fortnight's duration. Was more or less subject to sore throat which always yielded to gargles of Potassium Chlorate. Previous health good. No history of any venereal disease. Family history excellent.

The pain is of rather mild type; salivation is present and glands at the angle of the jaw are swollen; prefers to swallow soft food.

Throat. Right tonsil is the seat of three separate spots of white deposit; irregular in shape; reddened about the edges; easily detached having no ulcerated and bleeding surface beneath.

beneath.

Between the membranous deposits is normal tonsillar tissue. Two similar deposits exist on the left tonsil. Deposits promptly reformed when removed. A few days later, a few spots showed to the left of the uvula and subsequently all the spots jointed into a single mass of pearly white colour and there was a line of deposit over the gums of both upper and lower teeth. A specimen removed for the bacteriological examination showed the bacillus and spirillum of Vincent with Streptococci

CASE 8. Male, 20 years of age, complained of sore throat of several days duration. Family history excellent.

Personal History. He had had the usual diseases of childhood without residuals and had always been well though not robust. No history of venereal disease. One year previous to his present illness he suffered from diphtheria, and was isolated for several weeks on account of the persistance of Klebs-Loeffler Bacilli in the throat.

Present Illness. Pain in swallowing with a constant feeling of soreness and itching in the throat. There was no glandular enlargement and very little increase in the amount of saliva.

saliva. Four weeks previous to this time he had taken gas (to which he attributed his trouble) for the extraction of the last lower molar on the left side. A week later the gums became hyperaemic and he discovered that the site of the tooth was covered with an irregular superficial ulcer, the floor of which was composed of a rusty grey membranous exudate. From that time until he came under observation three weeks later, the gums were never free from one or more of these patches. He experienced no particular inconvenience from these until the tonsils became involved, between two and three weeks after the appearance of the first ulcer. At this time his temperature was 99°; pulse was full and regular and he felt well, with the exception of a slight soreness in the throat.

Examination of the throat revealed rather large ulcers involving the greater portion of each tonsil and encroaching slightly upon the uvula. These ulcers were rather superficial with irregular inflamed edges, the floor being covered with a greyish membranous exudate, easily detached, but reformed rapidly. The slightest touch upon one of these areas left a bleeding surface. Small/

Small patches resembling those on the tonsils were present at the site of the extracted tooth, on the corresponding area of the lower jaw and on the gum above the left upper bicusped tooth.

The tooth and mouth under three weeks mild antiseptic treatment were entirely healed.
Duration of the disease six weeks.

The bacteriological report was as follows:- Spreads and cultures from the affected areas showed the same characteristics at three successive examinations with a few diplococci and very numerous bacilli and spirilla. Morphologically, the bacilli were from 5 μ to 10 μ in length and quite thick. Some were larger at one extremity than the other; many were swollen in the centre with pointed extremities while a few were curved like a comma. The majority were straight and often occurred as diplobacilli, while they were frequently seen in groups or lying at an angle of 60° to 80° to each other. They were actively motile at first, but lost their motility in a few hours. The majority of them were decolorised by Gram's method, but stained well with the basic stains. A few of them stained with Loeffler's Alkaline Methylene Blue gave the impression of vacuoles, but no spores could be demonstrated,

demonstrated, and in other stains this apparent vacuolation was absent. Efforts in staining for flagella were unsuccessful.

The spirilla were 25 μ to 40 μ in length but very slender. They were completely decolorised by Gram's method; otherwise they reacted to stains precisely as did the bacilli. They, like the bacilli, were actively motile at first, but lost their activity entirely after a few hours in the bouillon.

Cultures on bouillon, agar, glycerine agar, gelatin, litmus gelatin, litmus mulk, etc.,showed only pneumococci and large spore bearing bacilli in the threads. The cultures were all grown aerobically, and were under observation for 62 hours.

CASE 9. Woman, 36 years of age, admitted to Connecticut Hospital for the insane, 24th Nov., 1902, suffering from manic- depressive insanity of one week's duration.

Family and personal history negative. During her period of marked psychomotor unrest, she talked incessantly and refused food. She was constantly moistening her dry parched lips with her tongue, in doing which her tongue came in contact with her partially closed teeth.

teeth. This irritation caused a hyperaemia which finally resulted in an abrasion of the mucous membrane along the edges of the tongue. This surface soon became a superficial ulcer covered with a creamy exudate which assumed a membranous character and was very adherent. A few days later a similar exudate appeared along the border of the lower gums which was, however, easily removed, leaving a bleeding surface. Salivation was not marked, nor were the glands enlarged, but the foetor was excessive. The temperature was normal and the patient made no complaint.

Under daily applications of silver nitrate, the ulcers disappeared in three weeks.

Smears showed bacillus and spirillum of Vincent.

Cultures.produced almost pure growths of Staphylococci.

CASE 10. Boy, aged 12, admitted to Hospital on 11th February, 1903, with a membranous sore throat of 4 or 5 days duration; temperature 100.4° F. Sent to Diphtheria Ward and Antitoxin injected. Face pale but general health good. Dysphagia salivation and slight foetor of the breath were present.

Throat. The right tonsil was covered with a downy membrane of a dirty yellowish brown colour. The superficial part was friable and easily detached, leaving an adherent whitish coat. Beneath was an ulcer 2 to 3 millimetres deep with red perpendicularly cut borders. The free margin of the palate on the right side and the right margin and anterior surface of the uvula were covered by a thin yellowish white membrane resting on a superficial ulcer.

The left tonsil was very red and swollen; its upper third was covered by a thin yellowish membrane which was difficult to detach. Beneath was a red eroded surface which bled easily. The submaxillary glands, especially the right, were slightly enlarged. There was no coryza.

On the 13th whole uvula was covered by a membrane resting on a superficial ulcer. The temperature was 99.5° F.

Bacteriological examination showed in parts of the membrane almost exclusively fusiform bacilli and spirilla; in other parts these Microbes were mixed with staphylococci and streptococci.

On the 16th the tonsillar ulcers were deeper and the summit of the uvula was destroyed. The general condition was good. On the 17th, the bacilli and spirilla were still abundant, but the diphtheria bacillus was found in small numbers. On the 24th the uvula was completely destroyed and its base was covered by a thin opaline membrane.

On the 28th the base of the uvula was completely cicatrised and on March 3rd the throat was healed.

CASE 11. Girl, 8 years, took ill September 12th 1903. On 13th complained of headache and sore throat; on 14th glands in neck were enlarged; on 18th her temperature was 101°F. The right tonsil, the right side of the uvula and the edge of the soft palate were then covered with a foetid greyish yellow pseudo membrane. The lower edge of the affected area could not be seen. On the 21st the slough was separating and by the 28th it had separated, leaving a deep excavation where the tonsil had been, while the uvula which remained was merely a shred, soon drawn up to the opposite side and thereafter could not be recognised. No complications ensued.

CASE 12. Girl, aged 3 years, did not seem well on 17th October: on the 18th she appeared to have some difficulty in swallowing: ~~on the 18th~~ temperature 100.6°F. The upper part of the left tonsil, the upper part of the left side of the uvula and the edge of the palate between ~~was~~ were covered with what looked like greyish exudation. There was distinct foetor on the 20th, the glands were slightly enlarged and the necrosed patch showed signs of separating. On the 30th the throat was clear. The temperature was normal on the 3rd day. The angle between the uvula and the tonsil was considerably enlarged by the loss of tissue which occurred.

CASE 13. Girl, aged 3 years, sick and vomiting on 23rd October. On the 24th the temperature was 100.4°F. and there was a greenish yellow patch on the tonsil with foetor. On the 26th the temperature was normal, and on the 30th the throat was clean.

CASE 14. Boy, aged 5 years. On the 22nd Ded. in course of routine examination, a yellowish white patch was seen on the right tonsil and the temperature was 100°F. On the 23rd submaxillary glands were enlarged, but temperature was normal.

A limited area of ulcerative Stomatitis was present, surrounding two lower molar teeth. The throat slowly healed up.

In these last four cases the fusiform bacilli and spirilla were found in varying numbers in the necrosed areas.

CASE 15. Boy, aged 3 years. On February 2nd during routine examination, the upper part of the left tonsil and the angle between it and the uvula were found occupied by a greenish yellow superficial slough and the submaxillary lymphatic glands were a little enlarged on the same side. The temperature was not raised and the child did not appear ill. There was distinct foetor. The throat cleaned up in 10 days. In this case the spirilla were more numerous than the bacilli.

CASE 16. Boy, aged 3, attention was drawn to this case by glandular enlargement in the neck. A patch was found on the left tonsil in which bacilli and spirilla were found. The throat was clear in a week.

CASE 17. Boy, aged 5 years, was suffering from Congenital Heart Disease. In this case again attention was drawn by glandular enlargement in the neck. A patch of greenish pseudo-membrane

membrane covered the upper part of the left tonsil and the angle between it and the uvula. There was also a localised ulcerative Stomatitis about the lower molar teeth on one side. Bacilli and Spirilla were present in both lesions. Foetor was marked. The throat was clean in 12 days.

CASE 18. Woman, aged 25 years, complained of headache and malaise on March 1st; on the 2nd of sore throat and slight swelling of the glands on the left side of the neck. A greyish patch was present on the left side of the tonsil. On the 3rd day the temperature was normal, but the condition of the throat was unchanged. Two days later it had cleared up.

CASE 19. Girl, aged 8, complained of headache on the 5th April on 8th temperature was 104 F. A thin greyish pseudo membrane covered the left tonsil; the left side of the uvula and the edge of the palate between. Foetor was very marked; there was slight glandular enlargement in the neck; on the 9th the temperature was still 104 F. and the pseudo membrane was thicker. The general condition of the child was distinctly worse. On the 10th the slough was greenish-yellow, exceedingly foul and had invaded the right side of the pharynx. A cloud of albumen was present in the urine. On the

On the 11th both tonsils and the whole of the uvula were covered by slough. Swelling of the fauces was very slight, as it had been all along. A narrow zone of intense injection surrounded the necrosed area. The temperature was irregular but had never fallen below 101.6°F. On the 12th foul diarrhoea set in. The child was pale jaundiced. She sunk and died at midnight. At the post-mortem examination, the whole of the fauces, base of the tongue and the epiglottis were covered by a greenish yellow foul slough. Other organs were healthy.

CASE 20. Boy, aged 9, had suffered from headache and sore throat for a week before coming under observation. There was then a yellowish pseudo membrane covering the right tonsil, the right side of the uvula and the edge of the soft palate between. The temperature was 100°F. There was a little grandular enlargement of the neck. During the next few days the pseudo membrane became a definite slough which, increasing in size, involved the whole thickness of the right tonsil and of the uvula. The left tonsil was also attacked over a limited area. On the 14th day of illness the sloughs were definitely scattering and on the twentieth day the right tonsil had/

had completely disappeared leaving a deep excavation. On the same day the uvula was picked off with forceps as one slough. Sprouting granulations appeared on the raw area left by the separated sloughs. During this period the temperature had been very irregular but always raised and the breath had been very foul. By the 28th day the fauces had healed. On the next day but one some tenderness and swelling appeared over the thyroid cartilage. This was followed by Aphonia, slight stridor and expectoration of pus The temperature was higher. From this time onwards, patient went steadily downhill. A little stridor persisted but there was never respiratory obstruction sufficient to necessitate tracheotomy. Signs of consolidation appeared over the left lower and the right upper lobes and patient died on the 37th day. Post-mortem - In addition to the distinction of tissues, visible during life in the fauces, the right side of the epiglottis had separated and healed. The anterior part of the thyroid cartilage had become necrosed and lay in small pieces in a cavity which opened into the larynx in front. The walls of the cavity and the edges of the opening were green and sloughy. There was much swelling of the upper aperture of

of the larynx. The right upper and left lower lobes of the lungs were affected throughout with broncho-pneumonia which had in many places broken down giving rise to multiple abscesses. The other organs were healthy.

CASE 21. Male, aged 4, recovering from whooping cough. Onset was ushered in with vomiting, sore throat and Adenitis. Admitted on 3rd day of illness, with small patch of ulceration and deposit on left tonsil, faucial congestion and foetor. The ulcer extended, being covered with a greyish slough, until swabbed with pure carbolic acid on the 6th day. Right tonsil was not involved. There was a slight pyrexia for 3 days. No albuminuria. Duration of disease was 13 days.

Smear preparations showed numerous spirilla and fusiform bacilli; cultures showed cocci and some clubs: no bacillus diphtheriae.

CASE 22. Female, aged 7. Disease ushered in with headache and vomiting; admitted on the 4th day of illness: fauces inflamed; furred tongue; pultaceous deposit on right tonsil with specks on left and some loss of substance. The process extended on to the uvula, forming on the 5th day a flat ulcer bitten into the tonsil, with shreds of debris/

debris making a pseudo membrane bleeding when detached. Foetor and glandular enlargement were present. The right tonsil was clean. Much improved by swabbing with liquid carbolic acid on the 7th day. Pyrexia for two days. No albuminuria. Dismissed on 11th day.

Smear preparations fusiform bacilli and spirilla. Cultures showed and spindle shaped short rods: no diphtheria.

CASE 23. Girl, aged 7. Had had diphtheria some years ago. Onset with headache and sore throat. Admitted on the 2nd day with inflamed fauces, glandular enlargement and irregular ulceration of both tonsils, not very deep. On the 4th day, there were three excavated ulcers, one on either tonsil and asmaller one on the right side of the uvula. All were covered with debris and muco-pus and bled easily: glands enlarged: pulse 120: some slough. Gradual healing under irrigation. Pyrexia for three days after admission. No albumen. Lungs clear. In hospital 9 days. Foetor not so marked as in other cases. Smears showed spirilla and fusiform bacilli; cultures yielded an organism resembling pneumo-coccus.

Case 24. Girl, aged 6 years: Onset with sore throat. Admitted on 5th day. Deposit on both tonsils,/

tonsils, glandular enlargement and furred tongue. "Both deposits looked like curling Diphtheritic Membrane" The exudation partially disappeared then recurred on the 7th day and finally vanished on the 13th day under irrigation. Some foetor. In Hospital 13 days. Some Cardiac irregularity on dismissal.

Smears showed fusiform bacilli and spirilla. Cultures showed no diphtheria bacilli.

CASE 25. Male, aged 11 years. Onset with vomiting and sore throat. Admitted second day with inflamed fauces glandular enlargement and pultaceous white deposit somewhat below the surface of both tonsils. The deposit lasted about a week. No antitoxin. In Hospital 41 days.

Smear showed one or two spirilla and some fusiform bacilli; cultures showed diphtheria bacilli.

Case Boy, aged 9 years. Onset with headache, vomiting and sore throat. Admitted on 3rd day. Both tonsils affected. Exudation "Membranous" on following day. Traces of albumen. Antitoxin before admission. No paralysis during first month in Hospital. Heart once slightly irregular.

Smears showed many spirilla with a few fusiform bacilli, and many others resembling diphtheria. Cultures yielded diphtheria bacilli.

Being curious to find out the relative frequency with which Vincent's organisms occurred in the various throat conditions likely to come under my notice in an Infectious Diseases' Hospital I kept a record of the results of bacteriological examinations of such Scarlet Fever, diphtheria and Enteric Fever patients as I thought suitable from the condition of their symptoms as likely to yield some result. To these I latterly added the result of an examination of normal throats, the fusiform bacillus having been occasionally found in the healthy fauces.

To secure as uniform result as possible, the same method of examination was employed in all cases, viz:- Swabs were taken from the throat of each patient on admission and before any treatment was adopted and streaks made on Agar-agar Glycerine, blood serum and in Bouillon. At the same time smears were prepared direct from the throat and stained with dilute carbolic fuchsin, Methylene blue and by the Gram procedure. The cultures were incubated and examined at different times.

The method pursued was, therefore, simple and at the same time fairly thorough.

Taking diphtheria first: out of 51 cases admitted under certificates of diphtheria, 4 proved to be non-diphtheritic as shown by the absence of bacillus diphtheriae after bacteriological examination and by their after history. One of these proved scarlet fever; two were diagnosed as acute tonsillitis, the remaining one presented the fusiform bacillus and spirillum (see page V) In the 47 cases comprising the majority, the bacillus diphtheriae was found in greater or lesser numbers associated as a rule with other organisms chiefly pyogenic.

Thus, out of 47 cases inwhich the bacillus diphtheria was found, the Vincent organisms were absent, and, although the number of cases is comparatively small to draw any decisive inference from, yet the result agrees with the generally accepted opinion that the fusiform bacilli and spirilla are never found in genuine diphtheria. Salomon says that "In practice if Vincent's organisms are found, diphtheria can be always excluded" and quotes in support that out of 737 examinations of throat deposits, Vincent's organisms occurred only in three cases in which no diphtheria bacilli were present. This, it is unnecessary to add, is a point of great importance/

importance in the question of diagnosis between diphtheria and other conditions of the throat. In many cases, even of undoubted diphtheria, we often fail to obtain the bacillus of Kleb-Loeffler in smears direct from the throat, and time must elapse until cultures have been incubated before a positive diagnosis can be given. On the other hand, in any case in which Vincent's organisms are present, they are, as a rule, easily found in the swab, a few minutes sufficing to demonstrate their presence, and, where found, diphtheria can in the majority of cases be excluded, saving time and anxiety to all concerned. From a prognostic point of view also, the presence of the fusiform bacilli would be valuable, the outlook being good as compared with diphtheria.

Of Scarlet Fever some 40 cases were examined the average day of admission being the third day of disease. Three of these were classed as Scarlatina Anginosa. In neither was the bacillus of Vincent found. Both smears and cultures revealed the streptococci as the prevailing organism.

From a good many sub cultures wedgeshaped and spindleshaped bacilli were obtained much smaller but somewhat resembling the Vincent bacillus/

They were probably derived from the streptococcus scarlatinae of Klein and Gordon, the latter having clearly demonstrated that the streptococcus is capable by culture of developing " a bacillary formation" by which great fact they may be distinguished from all other varieties of streptococci. From the fact also that the bacillus and spirillum of Vincent have never yet been observed in scarlet fever, one may assume that Vincent's Angina and scarlet fever were never associated.

In 10 cases of Enteric Fever in which "sore throat" was a prominent symptom of the commencement of illness, and in 20 of the Hospital staff in whom the throat was apparently normal, bacteriological examinations gave negative results as far as the Vincent's organisms were concerned.

The conclusions arrived at, therefore, from an examination of these and other cases were that, where Vincent's organisms were present, diphtheria and scarlet fever could almost with certainty be excluded; second, that the fusiform bacillus and spirillum were associated with lesions of which they were the principal, if not the sole agents, third, that those lesions closely resembled the

condition found in diphtheria, and, lastly, that only by bacteriological examination could a prompt and decisive diagnosis be given.

BIBLOGRAPHY.

Vincent: Annales de l'Institut Pasteur ,
Sept 25th, 1896 and Aug.25th, 1899.

Bernheim : Deutsche Medicinische Woschenschrift 1897.
Centralblatt fur Bakteriologie und
Parasitolgie, Feby. 11th, 1898.

Niclot & Marotte: Revue de Medecine, Apr. 10th 1901.

De Stoechlin : Centralblatt fur Bakteriologie und
Parasitologie Nov. 1898 (page 613)

Salomon: Deutsche Medicinische Wochenschrift 1897
page 297 & 1901 page 575

Baron :- Archir fur Kinderhulkunde 1903, Vol.35,page 161

Mayer :- American Journal of the Medical Sciences,Feb '02

Fisher " " " " " " Sept.'03

Lancet:- 5th March, 1904 and 16th July, 1904

Metropolitan Asylums Board Reports, 1904.

(over)

Districts of the Lower & Middle Wards of the County of Lanark.

M. MACDONALD, M.B. Ch.B.
Physician Superintendent.
TELEPHONE No 5043.

Lightburn Hospital,
Shettleston. 1st Oct. 04

I might here take the liberty of mentioning that I have had great difficulty in obtaining microphotographs of my own slides and hence after several efforts submit only 2 rather poor specimens, one showing the bacilli with cocci; the other bacilli with a few spirilla, the latter unfortunately not coming sufficiently into the field. The drawings are all original.

M. Macdonald MB

Micrographs & Drawings

Fig. I. Microphotograph: Carbol-fuchsin dil.
Reproduced & Enlarged. From American
Journal of the Medical Sciences.

Fig. 2. Photomicrograph. McConkey's Stain.
Spirilla absent. × 1000.

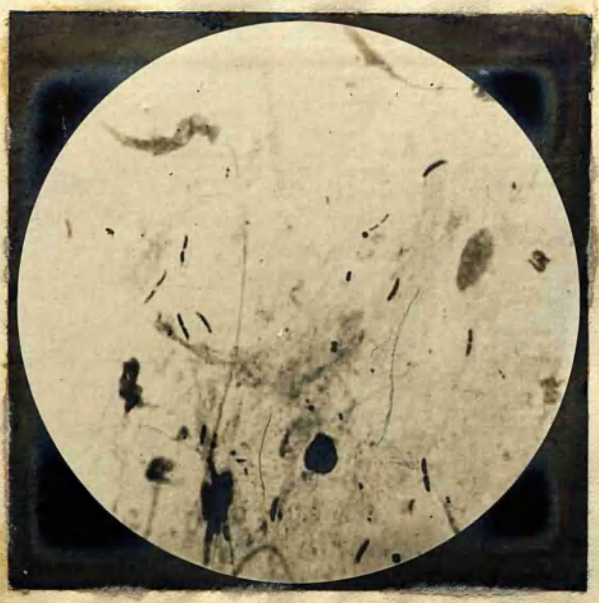

Fig 3 :- Microphotograph. Carbol. fuchsin dil. × 1000.

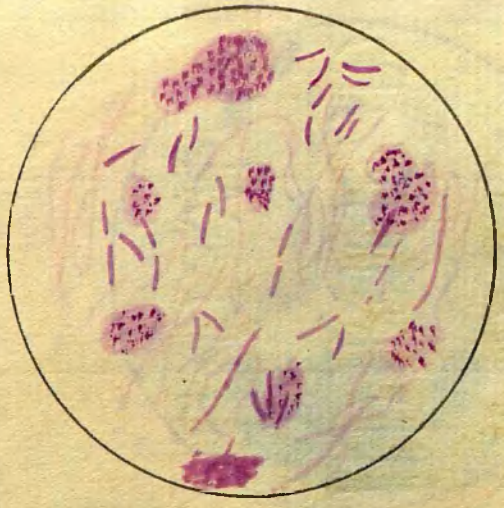

Fig. : 4 : Drawing from Slide. Carbol-fuchsin dil.

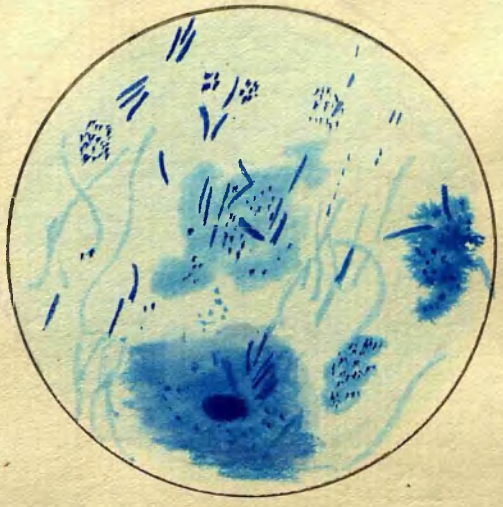

Fig 5:- Drawing from slide. Semi diagrammatic, Methylene blue.

Fig. 6 : Drawing from slide. Carbol-thionin.
Spirilla absent.

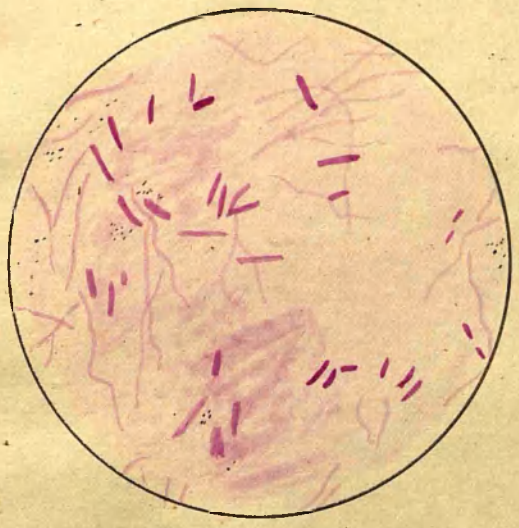

Fig. 7 :- Drawing from slide. Carbol fuchsin dil.

Murdoch Macdonald. M.B.Ch.B.