Within the next few days crepitations gradually developed all over both lungs, and there was constant short, dry cough, but no expectoration. Intestinal matting occurred throughout the abdomen, especially in the flanks. A distinct squint developed in the left eye, but no choroidal tubercles were discovered. The ophthalmoscopic examination was not very complete owing to the patient's deplorable condition at this time. He became delirious, with constant twitchings of the face and eyes, and emitted loud meningeal cries.

About this time the patient was seen by several eminent medical men, including specialists, from London and Paris, and I think I may fairly say the consensus of opinion was that the boy could not live more than three or four weeks; at any rate, I expressed that opinion emphatically to the relatives. He had been given sodium cacodylate and 8000 mg. T.R. injections without apparent effect.

On January 17th, 1909, after the patient had been acutely ill for a month, Dr. Marmorek arrived from Paris, and in spite of the fact that the lad was almost moribund, with every evidence of generalized miliary tuberculosis, he took a positively cheerful view of the case, and advised injection each day of 5 c.cm. of his new serum, which is made from what he calls the primitive tubercle bacillus obtained from the growing margin of a culture. With this he immunizes a horse for about eight months, and thence obtains his serum. Injections were made subcutaneously in the thighs in the usual way through a bead of lysol for twelve consecutive days, at the end of which some abatement of the acute symptoms was observed. Dr. Marmorek then visited the patient again and advised 10 c.cm. of serum per rectum, but this produced no good result, and this, indeed, has been my experience of giving any serum by the rectum.

Hypodermic injections were therefore resumed, and twenty-eight doses of 5 c.cm. were given during the ensuing seven weeks, during which time the patient slowly but surely improved. He gained weight and strength, intestinal matting subsided, diarrhoea ceased, squint disappeared, and the urine showed no blood except under the microscope. Crepitations and rhonchi gradually subsided, and though a pleuritic effusion of slightly turbid fluid appeared on the left side, this absorbed rapidly after tapping.

By April the patient was able to return to Paris, looking the picture of health and having regained his normal weight. Dr. Marmorek has sent most favourable reports since. The only apparent abnormality now is the presence of a little albuminuria, and this is diminishing. The last report, received during October, was that the patient was very well and putting on weight.

The chief features of interest were:

1. Repeatedly negative Widal's when every symptom was consistent with typhoid. I may say that in my experience Widal's test is actually more reliable than clinical evidence. This was very noticeable in the Bristol typhoid epidemic some years ago.

2. There seemed no doubt that Marmorek's serum—of which this patient had forty injections, or nearly half a pint altogether, in less than three months—was responsible for the improvement. The clinical signs pointed to tuberculous lesions of the intestines, peritoneum, bladder, lungs, and meninges, and I suppose the invasion was of the miliary type, in which case, by all the rules of medicine, surgery, and midwifery, the patient ought to have died.

3. Temperature reactions, commencing about three hours after injections, are prominent in the charts.

4. Of course it is impossible to say that the lad will not ultimately become a chronic phthisic, but his improvement being so steady and consistent is most encouraging.

I have not entered into minutiae of symptoms and treatment, and I am aware the case is open to certain criticisms, inasmuch as no tubercle bacilli were actually demonstrated in the urine or elsewhere, and there was no sputum at any time to examine. I have merely published the crude facts as they appeared to me, and I think they justify a more extended use of this antituberculous serum.

THE SCIENCE COMMITTEE OF THE British Medical Association.

REPORT CXVII.

FURTHER RESEARCHES INTO THE BACTERIOLOGY AND VACCINE THERAPY OF COMMON COLDS.

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In a former paper¹ I drew attention to the occurrence of a diphtheroid bacillus for which the name *Bacillus septus* was suggested. This germ was associated with the *Micrococcus catarrhalis*, and occurred in 20 out of 21 cases examined during the winter 1905-6.

During the winters of 1907-8 and 1908-9 further researches have been carried out on similar lines, with results which may be summarized as follows:

1. The prevailing organisms—that is, those which were present in greatest numbers and grew most readily—were the *Micrococcus catarrhalis* and the *Micrococcus paratetrigenus*.

2. The *Bacillus septus* was present in a number of the cases, but did not grow readily, and was difficult to isolate. This is in marked contrast to its behaviour in 1905-6, when it grew with great ease on ordinary media.

3. The bacillus of Pfeiffer was present in small numbers in a few of the cases, but it was not possible to isolate it.

Fig. 1.—Photomicrograph of a forty-eight hours' culture of *Micrococcus catarrhalis* × 1,000 diameters.

4. The pneumococcus was seen in the swabs in a few cases, but in small numbers, and it was not isolated.

5. The bacillus of Friedländer was isolated from a few of the cases.

The organisms which appeared to me to be the causal factors in the majority of the cases were the *Micrococcus catarrhalis* and the *Micrococcus paratetrigenus*. The *Micrococcus catarrhalis* is already well known, having been described in a paper by Drs. Dunn and M. H. Gordon on The Bacteriology of an Epidemic Simulating Influenza.² It is described at length in an article by Neisser and Kolle in Wassermann's *Pathogenen Microorganismen*.³

Characters.—It is a rather large coccus, occurring in pairs, or sometimes in dense masses, in the sputum or in swabs taken from the noses and throats of patients suffering from common colds, "influenza," bronchitis, and pneumonia. It can be seen in masses in pharyngeal cells, and occasionally in leucocytes. It is negative to Gram's stain, and resembles the gonococcus, though I think it is usually rounder and less bean-shaped.

Cultures.—It grows readily on nasagar, blood agar, and on ordinary agar (especially if made with 2 per cent. of Witte's peptone).

On these media colonies appear in twelve to eighteen hours at 37° C. They are at first translucent, but rapidly become yellowish-white, rounded, and raised above the surface of the medium. The colonies are very viscid, and adhere firmly to the medium, so that it is easy to touch them without removing any of the growth. This may account for the difficulty of subculture which the writer and others formerly experienced. If one is careful to remove a visible portion of

growth from a colony, the subcultures grow readily and are vigorous.

On gelatine growth takes place more slowly, and the gelatine is not liquefied. It grows in broth, and does not produce acid in broth containing 1 per cent. of glucose, lactose, maltose, saccharose, or mannite.

Fig. 4.—Culture of *Micrococcus paratetrigenus*.

The *Micrococcus paratetrigenus* is not so well known as a pathogenic organism. I think it has been taken for the *M. catarrhalis* by some observers, and described as a large staphylococcus by others. It has been described at length by Bezançon and de Jong,⁴ who believe that it can be distinguished from the ordinary *M. tetrigenus* of the mouth by its peculiar morphology and staining reactions. On this point I am not quite convinced, but have nevertheless adopted the name *Micrococcus paratetrigenus*.

Its characters are as follows: It is a coccus of very variable size, and is very common in the sputum in all kinds of pulmonary affections, as well as in mild catarrhal cases.

It can frequently be seen packing pharyngeal cells, and its peculiar morphology is very characteristic. It occurs in masses, pairs, or tetrads, often surrounded by a very definite capsule or zoogloea. The masses consist of several very large tetrads which stain deeply with aniline dyes, and are intensely stained by Gram. These are embedded in a mass of smaller tetrads and diplococci, amongst which are often minute bacillary forms. The smaller elements stain feebly, and are negative to Gram's stain.

In cultures the *M. paratetrigenus* grows very readily on all the ordinary media. On agar definite colonies appear in twelve hours at 37° C., and growth also takes place freely but rather more slowly on gelatine at 22° C.; the gelatine is not liquefied. The colonies are rounded, creamy white, and glistening, but occasionally they have a yellowish tinge. They are soft, and are readily removed from the medium by the platinum wire.

Acid is formed in glucose, lactose, saccharose, maltose, and mannite broths. The appearance of the cocci in subcultures varies very greatly, but there is nearly always a considerable difference in the size and intensity of staining of the various elements. Commonly very large tetrads without zoogloea appear in twenty-four hours, but sometimes large single cocci or diplococci, which are strongly positive to Gram's stain, and might on a cursory examination be taken for large staphylococci.

The above have been the prevailing organisms, but numerous others have been found with less frequency. In a few cases I have found the bacillus of Friedländer, and in a few cases Pfeiffer's bacillus in very small numbers.

Pneumococci have been seen in throat swabs, but in small numbers, and I have not succeeded in satisfactorily growing them. There is also a polymorphous organism which occurs frequently. It forms dewdrop-like colonies, which resemble those of a streptococcus, and consist of chains of oval cocci, bacilli, and wedge-shaped and irregular forms. The cocci are very variable in size and shape, and often seem to be capsulated. As to the nature of this germ and its possible rôle I am at present uncertain, but it appears to correspond to an organism resembling a streptococcus, and described by Thiercelin as the "enterococcus."⁵

Are these organisms pathogenic?

The *Micrococcus Catarrhalis*.

1. This organism has been found in "influenza" cases by the following: Sternberg,⁶ Hastings,⁷ Rubermann,⁸ Kleiberger,⁹ Bulloch,¹⁰ Gordon,² the author.¹

2. It causes fatal peritonitis when injected into the peritoneal cavity of guinea-pigs (Gordon²).

3. Gordon states that he contracted an acute cold by accidentally sucking up a pure culture of *Micrococcus catarrhalis*. Quoted by Allen.¹¹

4. Variations of opsonic index to *M. catarrhalis* in cases of common cold (Allen¹¹), and improvement in clinical condition after injection of vaccine.

The *Bacillus Septus*.

1. This bacillus has been found in cases of common cold (Edmund Cautley¹² (*Bacillus coryzae segmentosus*), Gordon,¹³ Prosser White,¹⁴ the writer,¹ R. W. Allen¹¹).

2. Some of Dr. Allen's most successful cases of treatment of common colds by vaccine therapy have been cases in which *B. septus* was the infecting agent.¹⁵

The *Micrococcus Paratetrigenus*.

1. This micrococcus has been found in cases of influenza (Bezançon and de Jong⁴), and in a case of fatal pulmonary gangrene (Bezançon¹⁶). The writer has found it in a large number of cases of common colds and mild influenza.

2. Opsonic determinations are at present few; the writer is of the opinion that variations of the opsonic index occur after the injection of a vaccine of *M. paratetrigenus*, but his observations are at present too few to speak with certainty.

The *Bacillus of Friedländer*.

1. This bacillus has been found in coryza (Cardone¹⁷), in aphthous stomatitis (Bernabei¹⁸), in acute pharyngitis with oedema of glottis (Weichselbaum¹⁷), tonsillitis (Nicolle and Hébert¹⁷), parotitis (Girode¹⁷), middle-ear disease (Zaufall¹⁷), in cases of common cold, especially chronic nasal catarrh (Allen¹¹).

2 Vaccine therapy, in cases of common cold, especially chronic nasal catarrh (Allen¹⁷).

Opsonic Work.

The writer has recently carried out some observations on the opsonic index in cases of common cold and mild influenza. The results, as far as the *Micrococcus catarrhalis* is concerned, appear to confirm those of Allen. A few observations have been made with *M. paratetrigenus*, *B. septus*, and Friedländer's bacillus, but the results obtained have not been conclusive.

A few illustrative cases will be quoted.

CASE I.

Throat and ear specialist. Acute cold in the head, sore throat, cough five days.

In this case there was a rise of the opsonic index from 0.8 on the day preceding the injection of 125 million of stock *catarrhalis* vaccine to 1.6 six days later. The patient was already recovering from his cold when the injection was given. I could not be certain whether the treatment accelerated his recovery or no. He has had several slight colds since.

CASE II.

Throat and ear specialist. Is subject to acute colds, which usually last three weeks, beginning with sneezing, dryness and tickling of nose and upper surface of soft palate, and usually going on to naso-pharyngeal catarrh, with irritable cough and mucous expectoration.

Present Attack.—Caught while having his hair cut by a hair-dresser who was suffering from a streaming cold. Within twenty-four hours there was sneezing and tickling in left nostril and pharynx, and mucous membrane of nose appeared red and glazed. In the direct smears taken from the posterior pharyngeal wall the *M. catarrhalis* was seen and afterwards

Fig. 2.—Plaque of pharyngeal cells containing *M. paratetrigenus*.

Fig. 3.—Pharyngeal cell containing *B. septus*. A group of *M. paratetrigenus*.

CASE I.—A=Injection of 125 million stock *M. catarrhalis*.

isolated. Two hundred and fifty million of stock *catarrhalis* vaccine prepared from a case of acute influenza by the writer

CASE II.—A = Injection of 250 million.

were given within twenty-four hours of the onset. The attack appeared to be similar to previous attacks, but by the third day the symptoms had completely disappeared, he saw his out-patients at the hospital, attended the hospital committee, and read aloud to his wife in the evening.

On the eighth day a further dose of 250 million of stock vaccine was given, without subjective symptoms, but with a more prolonged rise in the opsonic index. The patient remained perfectly well for five weeks, when he had a second acute attack following a journey to town, and an injection of 250 million of stock *catarrhalis* vaccine was given twenty-eight hours after the onset.

Four hours after the injection the patient felt ill, had a rigor, and a temperature of 104° F., and was confined to his bed next day. The *Micrococcus catarrhalis* and the *Micrococcus paratetragenus* were both isolated and autogenous vaccines prepared.

The patient was better on the third day, and the symptoms disappeared with the exception of a feeling of prostration and a slight cough. As he had some important engagements and did not wish to risk a severe negative phase,

CASE II.—Opsonic index to *M. catarrhalis*; opsonic index to *M. paratetragenus*. A = Injection of 250 million.

the autogenous vaccines of both *M. catarrhalis* and *M. paratetragenus* been used a still better result might have been obtained.

This case illustrates the danger which Allen¹¹ points out, of giving a vaccine on the second day of an acute attack.

CASE III.

Mr. O., dispensing chemist. The case was one which any clinician would diagnose as one of mild "influenza." The onset was acute, and in twenty-four hours the patient was ill, with severe headache, sore throat, backache, stiff neck, and a temperature of 103°.

CASE III.—Temperature; opsonic index to *Micrococcus catarrhalis*. A = Injection of 250 million. The chart illustrates the inverse ratio between the temperature and the opsonic index.

The *Micrococcus catarrhalis* was isolated from the throat, and a vaccine prepared from it. On the sixth day the patient seemed better, and the temperature was normal in the evening; but on the seventh day it rose to 102.4° in the morning, and there was acute pain and feeling of tension in the right ear, with a swollen, tender gland in anterior triangle of neck on right side; 250 million of the autogenous vaccine were given, after which the temperature rapidly came down, the pain in the ear and the glandular swelling disappeared. His convalescence was fairly rapid, and he returned to work in a fortnight.

CASE IV.

Housewife, aged 35. "Influenza" coming on after a drive on a very cold day. Severe frontal headache, malaise, pains all over; temperature 102.4°. *M. catarrhalis* isolated; 250 million of a stock vaccine prepared from Case III were given on the third day. Within twenty-four hours the patient was convalescent, the temperature normal, and the attack was certainly cut short. A slight cough remained, which was loose. The patient remained well until the twenty-second day, when there was a further sore throat and nasal obstruction. A further dose of 500 million of stock *catarrhalis* vaccine was given. For the following twenty-four hours there was considerable malaise and an irritable cough, but the patient again became rapidly better on the third day after injection.

A third attack took place six weeks later, in which the *M. catarrhalis*, *M. paratetragenus*, and *B. septus* were all present. A dose of Dr. Allen's mixed vaccine was given, with the result that there was some improvement in the cough, but this did not disappear for several weeks. There have been several abortive colds since, lasting only a day or two.

CASE IV.—Temperature; opsonic index to *M. catarrhalis*; opsonic index to *M. paratetragenus*. A = Injection of 250 million, and B of 500 million.

Relapse six weeks later. The opsonic curve to the *Micrococcus paratetragenus* appeared to follow that of *Micrococcus*

CASE IV.—Opsonic index to *M. catarrhalis*; opsonic index to *M. paratetragenus*. A = Injection of 100 million.

catarrhalis very closely during the period immediately following the injection of the vaccine.

CASE V.

Medical practitioner. Has suffered from winter cough for the last fifteen years. It usually comes on in the autumn and lasts till the spring, with repeated acute attacks of naso-pharyngeal catarrh. Last winter he had an acute attack six weeks before treatment was begun, and had had troublesome cough with a little mucous expectoration in the morning ever since. He was advised to winter in Egypt, as slight emphysema was present.

The *Micrococcus catarrhalis* and *Micrococcus paratetragenus* were isolated and a vaccine made of the *M. catarrhalis*.

On November 24th 250 million of stock vaccine prepared from Case III were injected. The opsonic index at time of injection was 1.4. Four hours later it fell to 1, then rose to a maximum of 1.95 on November 27th.

On November 30th the opsonic index was 1.45; 250 million of autogenous *catarrhalis* vaccine were injected. Four hours later the index had fallen to 1, but on December 1st had risen to 1.5, and on December 2nd to 1.85.

On December 12th a further injection of 250 million appeared to produce little result. A mixed vaccine was then made from a nasarg plate on which a piece of washed sputum had been smeared; all the organisms were washed off indiscriminately, and a vaccine made in the usual way. It consisted of *M. catarrhalis*, *M. paratetragenus*, a small diphtheroid bacillus, and other organisms; 500 million of this were injected on December 22nd, with a rise of the index to *M. catarrhalis* to 2.1 on December 24th. The opsonic index to *M. paratetragenus* stood at 1.35 on December 22nd, and had fallen on December 24th to 0.95, but in a subsequent observation taken on January 11th it had risen to 2.25. Treatment on these lines was continued until the middle of February.

Notes of Symptoms.

November 30th. Cough certainly better, nasal catarrh somewhat improved.

December 3rd. Post-nasal catarrh continues; cough much better, not so irritating; expectoration slight and looser. Has been to London in thick fog, and seems none the worse.

Case v.—Showing the results of the first two months of treatment. Opsonic index to *M. catarrhalis*; opsonic index to *M. paratetrigenus*. A = Injection of 250 million stock *catarrhalis*; B of 250 million autogenous *catarrhalis*; and C of 500 million mixed vaccine.

December 12th. Cough very slight; post-nasal catarrh still present.

February 10th. Treatment discontinued. Patient is suffering from a detachment of retina, and has to stay in a darkened room for three weeks. "The cough has certainly been less troublesome this winter than previous winters."

These cases appear to me to prove:

1. That in cases of catarrh caused by *M. catarrhalis* there are marked fluctuations of the opsonic index.
2. That a fall in the opsonic index corresponds with an increase in severity, and a rise in the index with a decrease in severity of the symptoms. All the cases illustrate this, but it is naturally most marked in the more acute cases (III and IV).
3. That a suitable dose of vaccine given at an appropriate time will cause a rise of the opsonic index, which may be preceded by a negative phase of short duration (Case v).
4. That it is probable that similar fluctuations occur in the case of the *M. paratetrigenus*, though my observations are at present very limited in number.

I have not succeeded in getting good cultures of *B. septus* and Friedländer's bacillus for opsonic work at present.

My results as far as they have gone appear to confirm those of R. W. Allen,¹¹ and it would therefore seem that there are good grounds for hoping that common colds may be successfully treated by vaccine therapy.

The subject is not of such minor importance as it might appear, for it seems certain that the mild affections called colds are closely allied, if not identical pathological processes, with more serious pulmonary affections. Every general practitioner must have observed the "common cold" extending down the trachea and causing laryngitis, and further into the larger and smaller bronchi causing bronchial catarrh, then bronchitis or bronchopneumonia. Is it not reasonable to suppose that this is a mere extension of the area of infection, the whole process being a general infection of the whole surface of the lining membranes of the respiratory tract?

Dr. Butler Harris has drawn my attention to a very interesting case in which pneumococci were found in the throat in a case of "common cold" for some weeks, but this was followed by a typical attack of lobar pneumonia.

The *Micrococcus catarrhalis* has been found in healthy noses and throats, in the lung in cases of acute pneumonia (Bernheim¹⁷), and in all the organs in a fatal case of "pneumo-typhus" (Petruschky¹⁷).

The *Micrococcus paratetrigenus* has been found in the blood of a patient who died of pulmonary gangrene (Bezançon¹⁸); and I have found it in the pus from a very foul empyema.

The medicine of the future will concern itself more and more with prophylaxis, and my small researches will not have been in vain if they lead vaccine therapists to the consideration of the possibility of the prevention of severe diseases of the respiratory organs by paying very close attention to the mild infections of the nose and throat which precede them, and by studying all the methods by which such infections may be treated, whether by local treatment, general hygiene, or vaccine therapy, or by a combination of all these methods.

I wish to express my thanks to the Science Committee

TABLE I.—Showing Prevailing Organisms and Symptoms of Cases in Series 1907-8.

	<i>M. paratetrigenus</i> .	<i>M. catarrhalis</i> .	<i>B. septus</i> .	<i>B. Friedländer</i> .	Staphylococci.	Streptococci.	<i>B. Pfeiffer</i> .	Pneumococci.	Symptoms.
1	+								Female, aged 7. Acute cold three days, caught in Paris. Laryngeal stridor; cough; sneezing; coryza; temperature 101°; stiff neck.
2	+	+	+		+	+			Female, aged 25. Sore throat fourteen days; backache; sneezing; cough.
3	+	+	+	+	+	+			Female, aged 8. Sore throat. Follicular tonsillitis.
4	+	+							Male, aged 7. Caught from Case 1. Malaise; temperature 102°; pain in left shoulder; no cough or coryza.
5	+	+	+					+	Female, aged 4. Seven days. Cough loose; coryza; sore throat; fauces red; earache left ear.
6	+	+	+		+		+		Male, aged 10. Cold in head one week; severe cough two days; pleurisy left side; temperature 103°, pulse 148.
7	+	+	+						Female, aged 19. Laryngitis; cough forty-eight hours; sore throat.
8	+	+			+				Male, aged 55. Coryza; headache; cough three days.
9	+	+	+		+		+		Male, aged 30. Cold in head; cough three days; stiff neck; pains in shins; temperature 98°.
10	+	+	+		+	+	+		Female, aged 30. Cold in head; headache; cough; epistaxis.
11	+	+	+		+				Female, aged 35. Cold in head; sore throat ten hours.
12	+	+	+	+					Female, aged 25. Sore throat and cough five days; headache; pains in arms; stiff neck.
13	+	+	+	+			+	+	Female, aged 48. Very mild bronchitis seven days.
14	+	+	+		+	+			Male, aged 32. Coryza three weeks; cough and sore throat three days.
14	13	11	3	8	4	4	2		

TABLE II.—Showing Prevailing Organisms and Symptoms of Cases in Series 1908-9.

	M. paratragenus.	M. catarrhalis.	B. septus.	B. Friedländer.	Staphylococci.	Streptococci.	B. Pfeiffer.	Pneumococci.	Symptoms.
1	+								Irritable cough one week.
2									Chronic nasal catarrh; clear discharge every morning.
3		+							Acute cold, on chronic six months.
4	+								Acute cold and cough three days.
5					+				Chronic nasal catarrh.
6	+		+						Acute sore throat twenty-four hours; yellow exudation on left tonsil; muscular pains.
7			+						Sore throat, cough, occurring during convalescence from abdominal operation. CHCIs.
8			+		+				"Clergyman's sore throat" four months; laryngitis; cough; slight nasal obstruction; left otitis media.
9		+					+(?)		Acute coryza twenty-four hours; headache, malaise.
10	+	+	+			+	+		Acute coryza occurring in Case 8.
11		+	+			+			Acute cold seven days; sore throat, malaise, muscular pains; no cough.
12		+	+			+			Acute cold five days.
13	+	+	+						Sore throat three days; "chest feels stuffy"; no physical signs.
14	+		+				+(?)		Acute sore throat three days; fauces red; cough; no coryza.
15	+	+	+(?)						"Influenza"; temperature 103°; severe headache and muscular pains; sore throat; right otitis media.
16	+	+							Acute cold twenty-four hours.
17	+		+				+(?)		Acute cold.
18									Acute cold; negative bacteriological examination.
19									Acute cold; nil; had been using atomizer.
20	+	+			+				"Influenza" three days; temperature 102.4°; headache; muscular pains; cough.
21		+	+						Coryza; headache one week; suffers from chronic nasal catarrh.
22	+	+	+		+				Cold and cough fourteen days.
23	+	+	+						Chronic cold.
24	+	+	+				+(?)		Winter cough fifteen years; acute exacerbations.
25	+	+	+						Acute cold.
26		+	+	+(?)	+	+			Acute exacerbation in Case 24.
27	+						+(?)	+	Severe nasal catarrh three months; profuse coryza; acute exacerbation twenty-four hours.
28	+		+						Same patient as Case 20. Coryza; headache; cough four days.
29	+		+		+				Follicular tonsillitis; temperature 102.4°.
30		+	+	+		+			Same patient as Case 24; slight increase of nasal catarrh.
31	+	+	+	+		+			Acute coryza on chronic; slight cough.
32	+	+				+			Acute cold four days.
33	+	+	+		+				Coryza five days; sore throat; temperature 100°.
34	+		+						Acute exacerbation in Case 31; sneezing, sore throat, backache; some cough.
35	+	+	+	+	+	+			Chronic nasal catarrh.
36					+	+			Follicular tonsillitis.
37		+			+	+			Chronic nasal catarrh; pus in left nostril; irritable cough all winter for twelve years.
38	+		+			+			Acute exacerbation in Case 31.
39	+			+		+			Chronic cold 6 years.
40	+		+					+	Follicular tonsillitis; painful; temperature 102°.
	25	21	25	5	10	11	6	2	

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REFERENCES.

¹ Bacteriology of Common Colds, BRITISH MEDICAL JOURNAL, May 5th, 1906. ² Dunn and Gordon, Epidemic Simulating Influenza, BRITISH MEDICAL JOURNAL, August 26th, 1905. ³ Kolle and Wassermann, *Pathogenen Microorganismen*, article on *M. catarrhalis*, vol. ii, 1903, p. 146.

⁴ Bezançon and de Jong, *Bull. Soc. Méd. Hôp. de Paris*, March 2nd and 16th, 1905. ⁵ Bezançon, *Précis de microbiologie clinique*, Paris, 1906. ⁶ Sternberg, *Soc. des Méd. Vienne*, 1905. ⁷ Hastings, *Medical Record*, March 18th, 1909. ⁸ Ruheman, *Berl. klin. Woch.*, March 13th, 1905. ⁹ Kleinsberger, *Deutsche med. Woch.*, April 13th, 1905. ¹⁰ Bulloch, *Lancet*, May 13th, 1905. ¹¹ R. W. Allen, *Lancet*, 1908. ¹² Cautley, Report of the Medical Officer of Health to the Local Government Board, 1894-5. ¹³ Gordon on *B. diphtheriae*, etc., Report of Medical Officer of Health to the Local Government Board, 1901-2. ¹⁴ Prosser White, *Catarrhal Fevers*, Lewis, 1906. ¹⁵ R. W. Allen, *Vaccine Therapy*, second edition, p. 186. ¹⁶ Bezançon, *Précis de microbiologie clinique*, p. 143. ¹⁷ Bezançon, *ibid.*, p. 195.