doubt as to whether it is thrombosed or not it should not be explored with a needle, as some have recommended, for this might carry infected material into an as yet uninfected sinus; if the condition of the sinus is doubtful the operator must carry his mind back to the symptoms observed prior to operation; if these have been such as might accompany an acute local infection only, he may stay his hand at this juncture and wait twenty-four to forty-eight hours to see if the symptoms subside; but if they do not subside, or if they have been such as to indicate, either by their severity or their character, systemic infection, then the jugular must be ligated. So we get the following three indications for tying the jugular: (1) When the sigmoid sinus is definitely thrombosed; (2) when the symptoms of toxæmia do not disappear after the lesser operation—that is, dealing with the mastoid antrum and middle ear, and possibly also with extradural suppuration; (3) even without thrombosis when there is evidence of severe systemic infection. An additional local indication would be feeling the thrombosed jugular in the neck as a hard cord. Whether it is felt or not, it is better always to ligate the jugular in thrombosis of the sinus, for it is impossible to say how far down the thrombus extends. Probing, curetting, and washing out the sinus from above are uncertain processes as far as removal of septic matter is concerned, and unsafe processes in that they are liable to detach clots which may be introduced into the general circulation. Further, bleeding from the lower end of a sinus opened behind the mastoid does not necessarily indicate that it is clear, for such bleeding may come from the occipital or inferior petrosal sinuses. Rather a bogey has been made of the ligation of the internal jugular in this operation, but quite unnecessarily so; one jugular is just as good as two. Some of those present saw a case under my care a little while ago in which the intimate adhesions between the internal jugular and a large mass of glands in the neck necessitated the removal of about 3 in. of the former, yet the patient experienced not the slightest inconvenience and went to a convalescent home within a fortnight of the operation. Similar cases are by no means uncommon.

At what stage in the operation should the jugular be opened? In my cases this was done after opening the sinus, but Ballance has pointed out that it is better practice to open the jugular first, so that the risk of any clot detached entering the circulation may be obviated. The jugular then is reached through an incision along the anterior border of the sternomastoid muscle, and having its centre opposite to the cricoid cartilage. This incision may be prolonged downwards, if necessary, in order to reach an unthrombosed part of the vein; the external jugular usually requires to be tied. The internal jugular, being ligatured, is opened above the ligation, and as much thrombus removed from below as possible. The sinus is then opened by a free vertical incision made with a tenotomy knife. On proceeding to remove the clot free bleeding takes place from the upper end; this should be allowed to continue for a second or two to wash out the septic contents, and is then easily stopped by gauze plugging. Clot is removed down to the bulb, and the venous channel washed freely through with carbolic lotion from the mastoid and from the neck wounds. Some recommend removal of the jugular from where it is divided in the neck right up to the bulb, its tributaries, the lingual, facial, and other veins being tied. This is an additional traumatism, and adds to the length of the operation. It can only be on the principle of minimizing the adverse chances, for it is impossible to block all the infection routes and absolutely remove all the infective sources—for example, the dura on the deeper aspect of the sinus remains as a possible infective source, and the inferior petrosal sinus, the occipital and condylar veins as possible infection routes.

When all the infected clot has been removed the cut end of the vein in the neck is ligatured and the neck wound disinfected and closed with drainage. The sinus openings, the mastoid wound, and the meatus are plugged with gauze and the mastoid skin wound partially closed.

The first dressing need not take place for forty-eight hours, and is preferably done under chloroform. There is usually some bleeding from the upper sinus opening. Recovery may be uncomplicated, or may be complicated by evidences of systemic infection. Antistreptococcus serum should not logically be used until the streptococcus has been found in the discharges, but as one knows that it is the usual micro-organism active in these cases, and further, as there is probably only one kind of streptococcus, and, as far as I know, only one serum, one should not hesitate to give it a trial when circumstances prevent a previous bacteriological diagnosis.

The value of the serum is uncertain, apparent benefit after its use being probably sometimes of the *post hoc* kind.

In conclusion, I should like to express my gratitude to the work of Ballance and Macewen, both pioneers in this department of surgery, and from whose writings I have largely drawn in preparing this paper.

THE PHYSICAL DEVELOPMENT OF THE LONDON SCHOOLBOY; 1,890 EXAMINATIONS.

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At the present time, when the physical development of the rising generation has awakened a real and, by no means, unnecessary interest, among both politicians and educational experts, I venture to think that the statistics of the physical examination of 1,890 scholars of the Technical Education Board of the London County Council may be of some interest to those who are working in this important branch of public health.

The ages of the scholars range from 9 to 16 years inclusive. They are divided into two groups, junior scholars, who are under 13 years of age; and intermediate scholars under 16 years of age, for the purpose of compiling physical statistics, however, it will be more simple to combine these two groups.

The examinations were carried out between the years 1898-1902 inclusive. The class to which the scholars belong is best shown by the following particulars taken from the reports of the Board.

The junior scholarships, of which there are about 350 a year, are open to boys whose parents do not earn more than £150 per annum, and a large number of them are gained by the children of those who are in receipt of less than £100 a year. The intermediate scholarships, of which there are about 70 a year, are restricted to boys whose parents are in receipt of not more than £400 a year, but half of these are reserved for scholars whose parents earn less than £250 a year; in fact many of the parents do not earn £150 a year.

In giving the average number of junior and intermediate scholarships open for competition, only those for boys are mentioned, as the statistics in this paper deal entirely with boys.

Those statistics dealing with the heights and weights, chest measurements, cardiac examinations, and percentage of scholars with normal vision, do not include the whole 1,890 boys, as some alteration in the form of tabulation was made after the first examination in 1898-9, which prevents the inclusion of the whole number; but wherever a smaller number is dealt with, the fact is mentioned.

Analysis of the Physical Examination of 1,890 Boys. General Appearance—879 Good, 679 Fair, 240 Rather Delicate, 84 Delicate, 8 Very Delicate. Table of Heights and Weights of 1,710 Boys.

Age ...	9	10	11	12	13	14	15	16
Total number examined...	1	16	328	969	146	117	120	13
Average height ...	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
No. 10 per cent. above the average ...	4 2½	4 6½	4 8½	4 8½	5 0	5 2½	5 5	5 6½
No. 20 per cent. above the average ...	—	—	7	24	7	2	4	—
No. 10 per cent. below the average ...	—	—	1	2	—	—	—	—
No. 20 per cent. below the average ...	—	—	2	20	4	2	4	—
Average weight ...	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.	st. lb.
No. 10 per cent. above the average ...	4 0	5 0	5 2½	5 6½	6 0	7 0	8 0	8 0
No. 20 per cent. above the average ...	—	—	42	130	18	19	28	3
No. 10 per cent. below the average ...	—	—	36	57	13	13	13	1
No. 20 per cent. below the average ...	—	—	55	128	30	32	32	2
No. 10 per cent. below the average ...	—	—	17	25	4	6	12	1

NOTE.—The boys were measured in their boots, and their weights were taken when they had been stripped to the waist, but had their jackets on.

Degree of Chest Expansion of 1,644 Boys.

Inches.	Number of Cases.	Percentage of Total Number of Cases.
1	22	1.2
2	348	21.1
3	880	53.5
4	363	22.3
5	25	1.5
6	1	0.0

Circumference of Chest at Forced Inspiration, 1,644 Boys.

Inches.	Number of Cases.	Percentage of Total Number of Cases.
23 to 24	2	0.1
24 to 25	14	0.8
25 to 26	80	4.8
26 to 27	229	13.9
27 to 28	413	25.1
28 to 29	371	22.5
29 to 30	239	13.9
30 to 31	124	7.5
31 to 32	55	3.3
32 to 33	47	2.8
33 to 34	35	2.1
34 to 35	21	1.2
35 to 36	9	0.5
36 to 37	5	0.3

LUNGS.

One boy had signs of consolidation at one apex, and gave a history of haemoptysis; he was sent to a convalescent home for six months, and returned perfectly well.

Twelve boys had bronchitis, but in none of these cases was the disease serious.

One boy gave a history of empyema, for which there had been an operation, but beyond some pulmonary collapse on the affected side no signs of disease were discovered.

HEART.

Of 1,438 boys, 90, or 6.2 per cent., were found to have definite cardiac disease.

Classification of Cardiac Lesions.

Mitral regurgitation ...	43 cases
Hypertrophy with albuminuria...	15 "
Mitral stenosis ...	13 "
Simple hypertrophy ...	7 "
Mitral regurgitation and stenosis	6 "
Feeble and irregular heart's action	3 "
Aortic regurgitation ...	1 "
Pulmonary stenosis ...	1 "
Mitral regurgitation and pulmonary stenosis	1 "

In only 5 of the above cases were symptoms of defective circulation complained of, and in those cases the disease was somewhat serious; 4 of these were suffering from mitral regurgitation, and 1 from pulmonary stenosis, probably of congenital origin.

In the remaining 85 cases, the boys were unaware that they had any cardiac lesions, and will probably not feel the effects of their defective circulation, for some years, if at all. Only in 2 cases was a definite history of rheumatic fever obtained, and in one a history of chorea; many of the boys, however, said they had suffered from severe "growing pains." I believe that these pains are, in many cases, of a purely rheumatic origin, and are in reality, slight attacks of rheumatism, which are not diagnosed and not treated, and lead to the development of cardiac disease, only discovered later on when the mischief has been done. This theory is, I believe, the only tenable one to account for the comparative frequency of definite organic cardiac lesions in children who have not suffered from rheumatic fever or chorea. Were it possible to impress upon parents the fact that "growing pains" are not natural, but are the result of a definite pathological and treatable cause, these attacks might not be disregarded, and cardiac disease in children of this class might not be so prevalent as it undoubtedly is at the present time. Children of the more moneyed classes being better clothed and cared for, and much less liable to exposure to cold and wet, do not run such risks, and consequently do not suffer to such a degree.

In addition to the 90 cases of definite organic disease there were a fairly large number of boys with pulmonary basic murmurs, unaccompanied by hypertrophy or any symptoms

of cardiac lesion. These murmurs were probably all of haemic origin. Another class of murmur which was very prevalent, and which was also unaccompanied by any sign or symptom of cardiac disease, was a very definite, very localized presystolic murmur heard over the cardiac apex. This murmur occurred entirely in boys of a nervous temperament, and was, I am convinced, produced by an unusually rapid and forcible propulsion of blood through the mitral orifice, set up by the quickened heart's action of nervousness; it was entirely and absolutely separable from any organic presystolic murmur, and was never accompanied by a thrill or cardiac hypertrophy, two signs which I find to be almost equally common in cases of true mitral stenosis.

SPINE.

There were only 3 cases of spinal disease, all lateral curvatures, two of them of rachitic origin, and one the result of an old empyema.

EYES.

In 49 cases, or 2.5 per cent., the colour vision was affected; in 24 there was "confusion of colours," and in 25 definite colour blindness.

Acuteness of Vision.—In 439 cases, or 23.1 per cent., vision was below "army standard"—namely, less than $\frac{1}{8}$, with one or both eyes tested separately—in 73 of these cases the vision of one eye was normal. Of the 439 boys whose sight was below "army standard," 292 were wearing glasses. Out of 1,649 boys, 619, or 37.5 per cent., had normal vision—that is, could read $\frac{1}{8}$ with either eye.

It must be borne in mind that the chief object of the examinations from which these statistics are compiled is to ascertain if the scholars are in any way physically delicate or defective, and if they are found to be so to draw attention to those defects, so that they may be dealt with, and if possible cured. Dealing with so large a number it is quite impossible to do a retinoscopy in each case, therefore any boy with defective sight is referred to an ophthalmic surgeon, hence no statistics as to the number of hypermetropes, myopes, or astigmatics can be given.

THROAT AND NOSE.

Enlarged tonsils, adenoids, or both, were found in 633 boys, or 33.4 per cent. of the total number examined. Of these, 494 had enlarged tonsils, 98 adenoids, and 41 adenoids and enlarged tonsils; 208 boys of the 633 had defective hearing, and required treatment to avoid increasing deafness, but a very large majority of the 494 with enlarged tonsils only had slight enlargements, which gave no inconvenience and required no treatment.

HEARING.

Three hundred and thirty-three cases, or 17.6 per cent., had more or less defective hearing.

In 164 the hearing was fair (the tick of a watch could not be heard at more than 2 ft.).

In 100 the hearing was poor (the tick of a watch could not be heard at more than 1 ft.).

In 69 the hearing was bad (the tick of a watch could not be heard at more than 4 in. to 6 in.).

NOTE.—The watch used could be easily heard by a person with ordinary acuteness of hearing when 3 ft. distant.

Of the above 333 boys suffering from defective hearing 233 had, or had had, enlarged tonsils, adenoids, or both; 38 had had a discharge from one or both ears, 2 had nasal obstructions, and 1 had received a blow over the ear, which had caused deafness.

In the remaining 54 cases no cause to account for the deafness could be discovered, but it may have been due to collections of cerumen or some forgotten otitis. As in the case of the examination of the sight, no thorough examination into the cause of deafness was possible, but all those boys who were deaf and had naso-pharyngeal growths were referred to a throat hospital, and all those who were deaf, but had no adenoid growths or nasal obstructions, were referred to an ear hospital.

With reference to the hearing of children being affected by naso-pharyngeal growths, Mr. Cheatle notes, in the examination of 1,000 school children attending the Hanwell District School, that in 50 per cent. the hearing was defective, and 38 per cent. of these were suffering from enlarged tonsils, adenoids, or both.

Dr. Wilbert¹ found that, of 231 boys he examined, 27 per cent. were affected in their hearing, 16 per cent. not being able to hear whispered speech at a distance of 1 metre, and all these boys with defective hearing were suffering from

adenoids. He also found that, of 26 boys described as bad scholars, 22 had adenoids, and that of 84, forming the bottom 12 of each class, 65 suffered in the same way.

URINE.

Of the 1,890 urines examined, albumen was found in 172, or 9.1 per cent.

In 73 there was a trace.

In 54 there was a faint cloud.

In 17 there was a fair cloud.

And in 28 there was a heavy cloud.

107 of these urines were examined a second time, intervals of from three to eight months elapsing between the examinations.

In 54 albumen was present only at one examination.

In 53 albumen was present at both examinations.

Of the 172 boys who suffered from albuminuria, 15, or 8.7 per cent., had definitely hypertrophied hearts and increased arterial tension, and were undoubtedly affected with chronic nephritis.

Although there were no such definite signs of chronic nephritis in all the 53 boys in whose urine albumen was found on two separate occasions, I should regard the condition of their kidneys with suspicion, but can come to no absolutely definite conclusion with regard to them, as it is not possible to keep them under observation for a lengthy period.

With reference to the subject of albuminuria, Dr. Samuel West gave some very interesting statistics in his Lettsomian lectures, reported in the *BRITISH MEDICAL JOURNAL* of February 25th, 1899, and the following refer to children between the ages of 10 and 18 years. Stirling found on examining the urine of 369 boys albumen was present in 20.8 per cent. Ribbert in 240 examinations found albumen present in 22.8 per cent.; and Grainger Stewart in 100 examinations found albumen present in 17.0 per cent.

In conclusion, I should wish to record my thanks to my colleague, Dr. Lullum Bathurst, for his assistance in these examinations, especially with reference to the careful re-examination of all the cases in which I found cardiac lesions, and his thorough and painstaking testing of the urines.

I would also thank the Technical Education Board for their unvaried courtesy and kindness in considering and granting all requests I have found it necessary to make for the better carrying out of these examinations.

REFERENCE.

¹ *Deut. med. Woch.*, February 5th, 1903.

EPIDEMIC SORE THROAT FROM SUPPURATIVE MAMMITIS IN COWS.

By ROBERT FRENCH, M.B.DURH., M.R.C.S.,
Finchley.

I HAVE read with much interest Dr. R. W. C. Pierce's account of epidemic sore throat in connexion with suppurative mammitis in cows, in the *BRITISH MEDICAL JOURNAL* of December 5th, 1903, and also Dr. Kenwood's account of a similar epidemic in North Finchley and neighbourhood, in the *JOURNAL* of March 12th. It is quite apparent that these epidemics are similar in nature, and that from their wide-spread and pernicious effect more notice should be taken of their cause and treatment, and, if possible, of their prevention in the future. Prevention, to my mind, can only be carried out by a far more strict surveillance being exercised, by the veterinary inspectors appointed to the farm, when the cows are milked. It is too late to repair the damage when the milk is sampled from the cans during the daily round of the milkman. It seems to me an extraordinary proceeding to allow curdled milk, or perhaps pus, to be drawn from cows suffering from mammitis and distributed for human beings to drink. It is "filthy and disgusting," as Professor Axe mildly puts it. A cow suffering from mammitis must surely be apparent even to an experienced milker, and yet we hear that this condition had existed for several days prior to the inspection by a veterinary expert. A few notes on the epidemic at Finchley may be interesting.

SYMPTOMS.

The disease was generally ushered in with chilliness and *malaise* about twenty-four hours after infection, and the throat felt sore. Its appearance was generally one of follicular tonsillitis or commencing quinsy. In no cases were any patches resembling diphtheria. In one or two instances the throat seemed to have escaped, and the infected milk produced

an intense attack of diarrhoea. As the throat grew worse the glands of the neck became enlarged and matted together, and felt very hard and very painful. In rare instances suppuration occurred, but this was not the rule. At the same time the temperature rose to 103° or thereabouts, and in one instance I was able to record 107°. Neuralgia was a common symptom, and no nerve seemed exempt. One patient suffered from very acute neuralgia of the ophthalmic division of the fifth left cranial nerve, followed by herpes of those parts supplied by it. This was one of the cases complicated with erysipelas as hereafter described. Other complications arose, such as oedematous swellings of the limbs, swellings of the joints resembling rheumatism, and occasionally erysipelas of the face and head, and a rash resembling measles on other cutaneous parts. A fatal termination was rare, but was generally due to some complication, and in one instance in this epidemic cerebral toxication producing Bell's mania proved fatal. A recrudescence of the symptoms was a very common factor.

TREATMENT.

I was particularly struck with the fact that the usual remedies for follicular tonsillitis, for enlargement of the glands of the neck, and for all other symptoms caused by this infected milk were not at all amenable to treatment and it was not until I had had a case of severe facial erysipelas complicating the disease, in which I used the antistreptococcus serum (B. W. and Co.) that I noticed all other symptoms abate, as well as the marked effect on the erysipelas itself.

I was thus induced to try the same treatment in other severe cases of the epidemic. Without exception the disease began to abate immediately, the temperature fell to normal within 12 hours, and the patient made rapid progress towards recovery. This treatment suggested to me that the cause of the disease was undoubtedly the streptococcus mammitis bovi and should I ever be called upon to treat similar cases, I should at once adopt the serum treatment.

Dr. Eastes of the Laboratories of Pathology and Public Health, Queen Anne Street, very kindly examined some of the pus which I took from a suppurating mass of glands in a child, and I am much indebted to him for the following report:—

In cover-smear preparations of this pus numerous streptococci were seen and a very few bacilli. These bacilli were short and comparatively stout, not at all fine and thin like the *B. mallei*. Cultures were made in various media, but only the streptococcus has grown. Some of the pus was also examined for tubercle bacilli, but none were discovered. It is interesting to see that the bacteriological finding coincides with your diagnosis of an "erysipelatos character of infection."

CONCLUSIONS.

The conclusions I formed upon the nature and cause of this disease were that it is of an erysipelatos infection of the throat caused by these micro-organisms, which find their way into the glands of the neck and occasionally spread to the skin, causing a typical erysipelas of the face and head. They eventually find their way into the blood, causing a general septic infection, making their appearance in colonies under the skin and infecting the synovial membranes of the joints. They also attack the neurilemma of nerves, accounting for the acute pains in various parts. The case of neuralgia of the ophthalmic division of the fifth cranial appeared to me very interesting. The micro-organisms apparently attacked this nerve, and herpes followed its course. One morning when I arrived I was astonished to find erysipelas had supervened without any other apparent reason. I am now inclined to think that the streptococci found a suitable soil in the herpes to increase and multiply. The clear fluid in the herpetic vesicles became sanguineous and the vesicles much enlarged. The whole disturbance quickly subsided under the serum treatment. The oedematous swellings of the limbs were apparently due to phlebitis.

INFECTION.

It was not common to find the infection to spread from one member of a family to another; but unless due care be taken—as we should do in dealing with erysipelas—the disease may be contracted without ever having drunk any infected milk. I can recall one instance which would absolutely prove this statement. The husband drank some of the infected milk on his way to business. His own milkman had not called when he left home. The same evening he had a shiver, and passed through the course of the disease in the usual way. His wife, who had not drunk the infected milk, duly became a martyr to an attack typical of the disease.