very large subject, I cannot help thoroughly and cordially agreeing with Dr. Henry Davy in his Presidential Address to the British Medical Association at Exeter in 1907, when he pleaded for more drastic treatment as regards the infectiousness of tuberculous disease, likening the sputum of a phthisical patient to the stools of one suffering from enteric fever. So long as no more radical steps are taken to disinfect the sputum of such patients, either in this country or in Britain, so long will phthisis stalk a gaunt spectre in our midst.

REFERENCE.

¹ Report of Medical Officer of Health for the Colony of the Cape of Good Hope, p. 30. Capetown: Cape Times, Limited. 1907.

THE PREVENTION OF TUBERCULOSIS: A SUGGESTION.

By A. R. GUNN, M.B., CH.B. EDIN.

THE object of this communication is to suggest a method by which it is believed that the problem of the supply of tubercle-free milk can be satisfactorily solved. That infection through the alimentary tract plays a considerable part in the etiology of tuberculosis is now admitted by the majority of observers, among whom Shennan¹ and Still² may be cited as obtaining 28 and 29 per cent. respectively of primary intestinal lesions in the *post-mortem* examination of tuberculous children. The question of the essential similarity of bovine and human tuberculosis need not be discussed; but on account of their bearing on the possibility of milk as a not uncommon source of infection, reference may be made to the investigations of Dr. James Niven,³ who found that 18.5 per cent. of the samples of milk intended for the city of Manchester gave evidence of tuberculosis on bacteriological examination, and that on the farms from which the milk had come 14 out of 16 herds were found to contain at least one infected individual. The necessity for the adoption of stringent and reliable measures will be at once apparent.

The method of inspection, even in conjunction with the use of the tuberculin test, is generally admitted to be far from perfect. Even when carried out according to the letter and spirit of the law, detection is, I believe, often evaded by the simple precautionary measure of giving the suspected animal a dose of tuberculin such time before the visit of the inspector is due as will give space for the reaction to occur and be recovered from, but not for its protective properties against a subsequent and official injection to disappear. The method here proposed is founded on the fact, first pointed out by Archdall Reid,⁴ that in every population certain members are to be found who possess an inborn degree of immunity against tuberculosis which renders them less susceptible to its onslaughts than their less fortunate fellows. Just as we find during an epidemic, say of scarlet fever, that some there are who escape infection owing to this inherited trait, going to and fro in its midst as if proof against the disease, though not in a state of protection in virtue of a previous attack, so in tuberculosis certain strains possess this specific inborn and therefore transmissible immunity and even in the most unfavourable hygienic conditions escape infection from what is almost a universal disease. As time goes on, this selective death-rate affects the characters of the race. The susceptible or predisposed—a condition, by the way, which is thus shown to be purely negative, indicating rather a lack of inherited immunity than any positive predisposition to the disease—become gradually eliminated, even although their fertility has almost become a byword, and the more immune only are left to carry on the race. The fit in the struggle against this tuberculous menace to existence survive; the less fit gradually contribute smaller and smaller amounts to the maintenance of the race, and in the end almost wholly disappear, leaving a people which for all practical purposes is as immune to tubercle as the Central Africans, from a like cause, now are to malarial disease.

Now, if we assume the identity of bovine and human tuberculosis, we should expect to find that among cattle, also, there are certain individuals which, under ordinary circumstances, are proof to the disease. My proposal, then, is to take these immune individuals and breed from

them a strain which would remain absolutely free from any taint of disease. That this is far from being impracticable is demonstrated by the fact that something similar has already been achieved in other forms of life. Biffen⁵ of Cambridge has shown that susceptibility and immunity are definite Mendelian characters, the latter being recessive; and that, by cross-breeding an inferior yet immune type of wheat—immune, that is, to the rust fungus—with a superior yet highly susceptible variety, certain of their offspring are capable of producing a strain which is possessed both of the immunity of the one parent and of the other desirable features of the other.

And the same thing is undoubtedly possible in cows. All that is required is to bring the idea before the notice of some enterprising cattle breeders who are willing to spend the little time and money that is necessary to carry it out. Very little observation and experiment would be required to indicate whether a given stock was susceptible or immune, and afterwards from the knowledge we now possess of the laws of hereditary transmission, the raising of a pure breed possessed of this quality would be merely a matter of time. That this suggestion is well worthy of the attention of practical breeders, and of the consideration of medical men, must now be apparent. As regards the former, there is the commercial value which would undoubtedly be attached to such a stock as I have indicated. The possession of a sire of known purity as regards this character would of itself be no mean money asset, while the demand for milk and stock from such a source would increase as the knowledge of their existence became more widely diffused. While to medical men it has the interest of being a practical and possible means of eradicating at least one source of tuberculous infection. If we can rear a breed of cattle which is practically immune to tuberculous disease, then, by attention to the ordinary requirements of hygienic science as regards cleanliness of housing and cleanliness of milking, the danger from infected food, whether in the shape of meat or milk, to which we are at present subjected, ought to be capable of almost complete removal.

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THE TREATMENT OF EPIDEMIC CEREBRO- SPINAL FEVER BY INTRASPINAL INJECTIONS OF FLEXNER AND JOBBLING'S ANTIMENINGITIS SERUM.*

By A. GARDNER ROBB, M.B., D.P.H.,

PHYSICIAN IN CHARGE OF BELFAST CITY FEVER HOSPITAL,
PURDYSBURN, AND OF BELFAST UNION FEVER HOSPITAL.

IN the outbreaks of cerebro-spinal fever which have recently occurred in America, in Scotland, and in Ireland attempts at treatment have proved most unsatisfactory, and the death-rates have been remarkably uniform. In the recent extensive epidemic in New York 75 per cent. of those attacked died. Ker states¹ that the mortality in Edinburgh and Glasgow reached "over 70 per cent." Robertson² gives the rate in the 62 cases he reports from Leith as 74.7 per cent. In a paper which I read at the annual meeting of the British Medical Association at Exeter³ I gave the results of 230 cases coming under my care in the fever hospitals in Belfast during the first five months of the present outbreak—namely, to the end of last May. In these 230 cases the mortality was 70.4 per cent. It thus appears that the death-rate has been practically identical in these places. In our 230 cases almost every form of treatment which has been suggested was tried, including the use of three varieties of antimeningitic serum by hypodermic injections. The varieties of antiserum used were Kolle and Wassermann's, Ruppel's, and Burroughs and Wellcome's. The results in the cases treated with these antisera were not more satisfactory than those given by other means of treatment—79 cases were so treated, with a mortality of 74 per cent.—and their use was discontinued.

* A paper read before the Ulster Medical Society.

In America it had been found that there was usually a falling off in the number of cases occurring and also in the virulence of the type during the summer months, and it was hoped that with the advent of our so-called summer similar improvement would take place. A considerable fall in the number of cases attacked did take place, but there was no improvement in the type of the disease—in fact, the mortality-rate in the hospital cases rose. During the months of June, July, and August 45 cases were admitted to the fever hospitals, and of these 37 died, giving a death-rate of 82 per cent.; so that in the first eight months of the outbreak—that is, to the end of last August—275 cases were admitted to the fever hospitals, and of these 199 died, giving a case mortality of 72 per cent.

Such was the state of affairs before we began to use Flexner and Jobling's antimeningitis serum by intraspinal injections.

During the past four months every case of cerebro-spinal fever admitted to either of the fever hospitals has been treated in this way. The results obtained in these cases have been very remarkable.

In this time—September 1st to December 31st—32 cases have come under treatment. (Through the kindness of Professor Symmers and Dr. Wilson, and of Drs. Houston and Rankin, the diagnosis in all these cases has been confirmed in the bacteriological laboratory of Queen's College.) Of these 32 cases 22 have recovered, 8 have died, and 2 are still ill.

Of the 2 still ill I believe one will recover, the other is

Case No. 15.—M. H., aged 27. Type "ordinary." Usual onset. Admitted on 4th day; then marked rigidity, Kernig, headache. L.P. and 30 c.cm. on 6th day, repeated on 7th day; rapid general improvement; temperature normal on 8th day; rigidity quickly passed off. Complete recovery. (December 19th, 6th day, L.P., meningococcus isolated; 7th day, opsonic index "positive.") A, L.P. and 30 c.cm. F. and J. serum. B, L.P. and 30 c.cm. F. and J. serum.

still doubtful, but as the prognosis in these cases is proverbially uncertain it will be better to confine our attention to the cases treated to a conclusion; therefore, if the 2 cases "still ill" are excluded from the list we have 30 cases treated, with 22 recoveries and 8 deaths, a case mortality of 26.6 per cent.

In considering this great change in the results obtained the question at once occurs to one, Are we dealing with a milder type? Are the cases occurring now in Belfast of a comparatively benign variety? In order to arrive at a conclusion on this point I obtained from the medical officer of health a list of the cases notified as occurring in the city during the same period (September 1st to December 31st) and not sent into hospital. Rather less than 50 per cent. of the cases in Belfast are sent to hospital, the others being treated in their own homes. From this return I find that 37 cases were notified and were treated at home, and through the kindness of the doctors in attendance I am able to give the results obtained in them. Of the 37 cases 5 have recovered, 29 have died, 3 are still ill.

Excluding from this list also the cases "still ill," we have 34 cases treated to a conclusion, with 29 deaths—a case mortality of 85.2 per cent.—practically the same as the mortality recorded (82 per cent.) in the 45 cases treated in hospitals in the previous three months. So that it seems quite clear that the mortality in those cases now

occurring in the city and not treated with serum has not shown any improvement. Therefore, I think that the figures of (1) the cases treated in hospital up to the end of August; (2) the cases treated in their own homes without Flexner and Jobling's antiserum during the past four months, and (3) the cases treated in hospital with this antiserum during the same four months are fairly comparable. They are—

	Cases.	Deaths.	Mortality.
Cases treated in hospital up to August 31st	275	199	72.3 %
Cases treated at home without serum, September 1st to December 31st	34	29	85.2 %
Cases treated in hospital with serum, September 1st to December 31st	30	8	26.6 %

I give a table (p. 384) showing the age, type of attack, the days of disease when injections were given, the total amount of antiserum given, and the result in each case.

Of the 8 fatal cases in the list, 3 (Nos. 5, 8, and 13) were of the "fulminant" type. One of these (No. 8) received serum on the second day, showed no improvement, and died thirty hours later. Two were admitted

Case No. 30.—S. G., aged 22. Usual onset. Admitted on 12th day (continuous fever from onset) unconscious, very rigid, Kernig, herpes. L.P. and 30 c.cm. on 13th day; temperature fell 2°, but rose again; rigidity remained same, and still unconscious. On 17th day L.P. and 30 c.cm.; temperature fell to normal following morning; regained consciousness; rigidity very rapidly passed off. Convalescence was very rapid and recovery complete. A, L.P. and 30 c.cm. F. and J. serum. B, L.P. and 30 c.cm. F. and J. serum. (December 6th, meningococcus isolated.)

early on the third day of the disease, and were immediately given injections of 30 c.cm. One died five hours, and the other nine hours after injection. In all three lumbar puncture gave quite purulent fluid.

Four cases (Nos. 17, 22, 26, and 32) were of the "ordinary" type. All showed very severe symptoms on admission. No. 17 was injected on the fifth and on the sixth days with 30 c.cm. Thick ropy yellowish pus was obtained from the canal at the first puncture. This case showed no improvement, and died three hours after the second injection. No. 22 was injected on the fourth and tenth days, showed no improvement, and died on the eleventh day. No. 26 was desperate on admission, showing cyanosis of extremities, petechial rash, and pus in each anterior chamber. It received injections on the sixth, tenth, and sixteenth days; it showed slight improvement at first, but died immediately after the third injection. Case No. 32, a man of 36 years, was admitted with high fever (which had been present from the onset) and wild delirium on the tenth day of the disease. He was given 30 c.cm. on the twelfth day, but showed no improvement, and died thirty hours later.

The other fatal case (No. 2) was already "chronic" when first injected on the twenty-third day. It was a child of eight months, and had been unconscious for two weeks; only a few drops of thick pus were obtained by lumbar puncture.

CASES OF CEREBRO-SPINAL FEVER TREATED WITH FLEXNER AND JOBLING'S ANTIMENINGITIS SERUM IN THE BELFAST FEVER HOSPITALS FROM SEPTEMBER TO DECEMBER, 1907.
I.—*Purdysburn Fever Hospital.*

No.	Name.	Sex.	Age.	Type of Disease.	Date of First Injection of Serum.	Day of Disease when Injected.	Total Amount of Serum.	Result.	Remarks.
1	J. P.	M.	22 yrs.	Ordinary (severe)	Sept. 3rd, 1907	3rd, 6th, and 9th	90 c.cm.	Recovery	Very severe initial symptoms. Rapid recovery.
2	R. J. B.	M.	8 mos.	Semi-chronic	Sept. 16th, 1907	23rd and 28th	45 c.cm.	Died	Completely unconscious for ten days before injection. A few drops of thick pus only obtained by lumbar puncture on 23rd day.
3	E. S.	F.	12 yrs.	Ordinary	Sept. 18th, 1907	2nd and 4th	60 c.cm.	Recovered	Recovery complete.
4	C. W. (Mrs.)	F.	31 yrs.	Ordinary (severe)	Oct. 6th, 1907	16th, 19th, and 23rd	90 c.cm.	Recovered	Severe attack with continuous high fever until after second injection. Slow, but good recovery.
5	M. Q.	M.	19 yrs.	Fulminant	Oct. 21st, 1907	3rd	30 c.cm.	Died	Fulminant attack. Injected on admission. Died nine hours later of cardiac failure. Thin greenish-yellow pus was obtained from canal.
6	M. M. G.	M.	22 yrs.	Ordinary	Nov. 3rd, 1907	8th and 11th	61 c.cm.	Recovered	Severe initial symptoms. Complete and rapid recovery.
7	J. C.	M.	20 yrs.	Ordinary (severe)	Nov. 11th, 1907	6th, 11th, 22nd, 28th, and 52nd	{ 181 c.cm. 30 c.cm. hypoderm.	Still ill	Now convalescent after very severe and tedious attack. Not passed danger of relapse.
8	P. H.	M.	13 yrs.	Fulminant	Nov. 22nd, 1907	2nd	31 c.cm.	Died	No effect from serum. Died thirty hours after injection.
9	D. M. I.	M.	11 yrs.	Ordinary	Nov. 23rd, 1907	7th and 18th	{ 60 c.cm. 15 c.cm. hypoderm.	Recovered	High fever. Drop to normal after each intraspinal injection, no similar drop after hypodermic injection of 15 c.cm. (see chart).
10	J. B.	M.	19 yrs.	Ordinary (severe)	Nov. 25th, 1907	6th, 8th, and 13th	80 c.cm.	Recovered	Complete recovery.
11	E. M.	F.	8 yrs.	Ordinary (severe)	Nov. 29th, 1907	6th, 13th, 17th, 19th, 22nd, 31st, and 43rd	210 c.cm.	Recovered	Severe attack. No loss of consciousness. Stringy pus obtained at first lumbar puncture. Long intermittent fever. Case closely resembles No. 1.
12	E. K.	F.	4 yrs.	Ordinary	Dec. 4th, 1907	22nd, 31st, and 43rd	60 c.cm.	Recovered	Complete recovery. Two weeks ill when admitted. Semi-conscious and greatly emaciated.
13	P. S.	M.	4 yrs.	Fulminant	Dec. 8th, 1907	3rd	30 c.cm.	Died	Admitted completely collapsed and comatose. Died five hours after injection. Thin greenish-yellow pus was obtained at lumbar puncture.
14	C. S.	M.	13 yrs.	Fulminant	Dec. 18th, 1907	2nd and 3rd	65 c.cm.	Recovered	Fulminating onset. Rapid and complete recovery.
15	M. H.	M.	27 yrs.	Ordinary	Dec. 19th, 1907	6th and 7th	60 c.cm.	Recovered	Complete recovery.
16	J. C.	F.	8 yrs.	Chronic	Dec. 20th, 1907	34th	180 c.cm.	Still ill	Admitted at 31st day, completely unconscious, opisthotonos, deaf, great emaciation. Slight improvement since. Still under treatment; prognosis not hopeful.
17	P. D.	F.	4 yrs.	Ordinary (very severe)	Dec. 26th, 1907	5th and 6th	60 c.cm.	Died	Thick,ropy, yellow pus from canal. No improvement shown. Died three hours after 2nd injection.
II— <i>Union Fever Hospital.</i>									
18	R. C.	M.	14 yrs.	"Semi-chronic"	Sept. 9th, 1907	3th	30 c.cm.	Recovered	Continuous fever with frequent very severe headache for thirty-five days. Rapid recovery after one injection.
19	F. McC.	M.	17 yrs.	"Semi-chronic"	Sept. 15th, 1907	25th and 32nd	60 c.cm.	Recovered	This case was considered quite hopeless. Semicomatose for days, not relieved by earlier repeated lumbar puncture. Improvement commenced thirty hours after 1st injection and continued steadily. Complete recovery.
20	P. O. H.	M.	40 yrs.	"Semi-chronic"	Sept. 23rd, 1907	52nd	31 c.cm.	Recovered	Steady improvement with no further headache after serum.
21	W. H. G.	M.	29 yrs.	"Semi-chronic"	Oct. 16th, 1907	57th	30 c.cm.	Recovered	Complete recovery.
22	T. D.	M.	14 yrs.	Ordinary (severe)	Oct. 31st, 1907	4th and 10th	60 c.cm.	Died	No improvement followed injections. Died on 11th day.
23	M. K.	F.	21 yrs.	Ordinary	Nov. 3rd, 1907	7th	20 c.cm.	Recovered	Initial symptoms severe. Complete and rapid recovery.
24	S. K.	M.	20 yrs.	Ordinary (severe)	Nov. 14th, 1907	2rd and 11th	60 c.cm.	Recovered	A very severe attack. Wild delirium and high fever. Recovered with complete loss of hearing.
25	H. J.	M.	24 yrs.	Ordinary	Nov. 16th, 1907	17th and 24th	60 c.cm.	Recovered	Complete recovery.
26	M. McC.	F.	3 yrs.	Ordinary (very severe)	Nov. 17th, 1907	6th, 10th, and 16th	75 c.cm.	Died	A very severe type. Pus in each anterior chamber on admission. Died immediately after 3rd injection.
27	D. S.	M.	7 yrs.	Ordinary	Nov. 22nd, 1907	8th	30 c.cm.	Recovered	A mild case.
28	S. D.	F.	14 yrs.	Semi-chronic	Nov. 21th, 1907	23th and 4th	60 c.cm.	Recovered	An intermittent type, with complete recovery.
29	F. B.	M.	5 yrs.	Ordinary	Dec. 5th, 1907	7th	30 c.cm.	Recovered	A comparatively mild case. Complete and rapid recovery.
30	S. G.	F.	22 yrs.	Ordinary (severe)	Dec. 6th, 1907	13th and 17th	60 c.cm.	Recovered	A severe case, with recovery by sharp crisis after 2nd injection.
31	H. W.	M.	10 yrs.	Ordinary (very severe)	Dec. 22nd, 1907	2nd, 7rd, 6th, and 10th	120 c.cm.	Recovered	A very severe case. Completely unconscious from 2nd to 7th day. Recovery by sharp crisis after 4th injection given on 10th day.
32	J. L.	M.	36 yrs.	Ordinary (very severe)	Dec. 24th, 1907	12th	30 c.cm.	Died	Admitted on 12th day with wild delirium and high temperature. No effect from injection. Died 30 hours after serum.
Thirty-two cases.								Recovered 22.	Still ill 2.
								Died 8.	Still ill 2.

Of the 22 cases which recovered, recovery was complete in all but one, in which there was complete loss of hearing. This case (No. 24) was a man of 20 years with a very severe attack of the "ordinary" type. He received injections of 30 c.cm. on the third and eleventh days. His recovery was rapid, but his deafness was still absolute at

good results). In cases not so urgent I think it better not to repeat the injection until after a lapse of forty-eight hours. In this way only can the effect of the smaller dose be estimated, as the full effect of a single injection is not always apparent until after forty-eight hours or longer. Some of our results have been very good after a single injection of 30 c.cm.; in other cases improvement has only been observed after repeated doses. The largest amount yet given in a single case with us has been 210 c.cm. intraspinally. I have not as yet seen any undesirable symptoms follow the use of the serum.

In several cases the serum was also injected hypodermically, but in none did any marked effect appear to follow. This is well shown in the chart of case No. 9. In this case the injection on the seventh day of 30 c.cm. into the spinal canal was followed by a definite drop in temperature to normal, and this continued for forty-eight hours; it then rose again, and having remained about 101° to 102° for several days, 15 c.cm. were injected hypodermically on the fifteenth day; this appeared to have little, if any, effect. On the eighteenth day 30 c.cm. were injected into the canal, with results on temperature exactly similar to those noticed after the same treatment on the seventh day. The temperature fell to normal on the nineteenth day, and there was no further fever (see chart).

Flexner and Jobling, of the Rockefeller Institute for Medical Research, New York, who have prepared this antiserum, have published a first list of 47 cases treated in this way in widely separated districts, including the first 7 of our cases here. In that series the mortality was 27.6 per cent., practically the same as we have obtained. In their paper also some account is given of the method of preparation of the serum.

A horse was inoculated with cultures of the diplococcus, of which many strains were used; the injections were

Case No. 9.—D. M. L., aged 11. Type "ordinary." Usual onset; admitted on 6th day. Then marked rigidity, Kernig, squint, mind clear. On 7th day L.P. and 30 c.cm.; temperature rose for some hours, fell to normal next day; rose again on 10th day. On 15th day 15 c.cm. hypodermically: no effect. On 18th day L.P. and 30 c.cm., again followed by rise for a few hours, with drop to normal and general improvement on the following day. Improvement steady. Recovery complete. (It will be noted that no improvement appeared to follow the hypodermic injection of 15 c.cm.) A, L.P. and 30 c.cm. F. and J. serum. B, 15 c.cm. F. and J. serum hypodermically. C, L.P. and 30 c.cm. F. and J. serum. (November 24th, meningococcus isolated. December 2nd, opsonic index "positive.")

the time of his discharge from hospital on the fifty-fifth day, and will probably be permanent.

I show temperature and pulse charts of some cases which will serve to show the effects generally observed after the injections.

Method of Injection.

The antiserum is supplied in 15 c.cm. bottles. Before use it is brought approximately to the temperature shown by the patient by allowing the bottles to stand for a sufficient time in water at, or a little above, that temperature. Chloroform has been given in all cases. A rigid and comparatively large trocar is used—one of medium size from a Potain's aspirator answers very well; to the effluent pipe of this a short rubber tube is attached. The puncture is made and as much fluid as will is allowed to drain off; suction is very seldom necessary; if the amount of fluid obtained is not great, it can often be increased by raising the patient's head and shoulders. The barrel of a Roux serum syringe is then attached to the rubber tube and held upright, and the serum is slowly poured into it from the bottle. Occasionally the 30 c.cm. will flow in without pressure; more commonly about 20 c.cm. will flow in in this way, the remaining 10 c.cm. being slowly injected by means of the piston. I have not so far seen any symptoms which would indicate undue pressure follow.

Dose.

Much further experience will be necessary before any definite statement on this head can be made. Flexner and Jobling recommend that in severe cases 30 c.cm. should be given every twenty-four hours for three days, and then, if further injections appear necessary, that they should be given as the symptoms seem to demand. In our earlier cases we used the serum more sparingly, two or three days or more being allowed to elapse between the injections. At present I am inclined to adopt the following plan: If the case is very severe, and especially if pus is found in the fluid obtained by lumbar puncture, to give 30 c.cm. or larger doses every day for three days; (in one of our recent cases 70 c.cm. were injected within the first twenty hours after admission, with apparently

Case No. 31.—H. W., aged 10. Type "ordinary" very severe: usual onset; admitted when 26 hours ill; then cyanosed, unconscious, restless delirium, head retracted, marked rigidity and Kernig. L.P. on 2nd and 3rd days and 30 c.cm. doses; colour somewhat improved; still unconscious and delirious; swallowing difficult; temperature rising again; on 6th day injection was repeated; on 7th day became partially conscious and answered loud questions; temperature continued high and rigidity remained, and on 10th day injection was repeated. General and marked improvement on 11th day, which continued. Recovery was then rapid and complete. A, L.P. and 30 c.cm. F. and J. serum. B, L.P. and 30 c.cm. F. and J. serum. C, L.P. and 30 c.cm. F. and J. serum. D, L.P. and 30 c.cm. F. and J. serum. (December 22nd, meningococcus isolated.)

given hypodermically, in gradually increased amounts. Later, intravenous inoculation was substituted for subcutaneous; then subcutaneous and intravenous injections of an autolysate were used. The intravenous injections were discontinued, and now subcutaneous injections of the living diplococci and of the autolysate are alternately given at seven-day intervals, many different strains of the diplococcus being used in the preparation of the living cultures and the autolysate.

I am greatly indebted to Dr. Flexner for supplying me with the antiserum for use in our cases.

I fully appreciate how dangerous it would be to attempt to draw conclusions from a small number of cases, and I quite recognize that an estimate of the value of this treatment can only be made after prolonged trial and testing by many observers and under varying conditions. In first sending me the serum, Dr. Flexner stated that "he did not claim that it was of great, or even of any, value," and I think it will be well not to go beyond that position at present; but from the impressions I have formed from an examination of these figures, and from watching the course run by cases treated in this way, I considered I was justified in placing these results before you.

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- ¹ *The Practitioner*, January, 1908. ² *BRITISH MEDICAL JOURNAL*, July 27th, 1907. ³ *BRITISH MEDICAL JOURNAL*, October 26th, 1907. ⁴ *Journal of Experimental Medicine*, January, 1908.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL.

A NOTE ON CALMETTE'S OPHTHALMO-REACTION FOR TUBERCULOSIS.

EXCEPTIONS are said to prove a rule, but the exceptions in regard to the ophthalmalmo-reaction seem sufficiently numerous and striking to greatly impair its value as a clinical test for tuberculosis. Since Wolff-Eisner and Calmette introduced this modification of the tuberculin test for the clinical diagnosis of tuberculosis it has been tried in many thousands of patients suffering from tuberculosis and other diseases, but comparatively seldom in apparently healthy persons engaged in their ordinary daily occupations. From the numerous published papers on the subject it is evident, in the first place, that a positive result of the test is not always obtained in cases of active tuberculous disease. Patients have failed to react in whom a subsequent *post-mortem* examination has demonstrated the presence of miliary tuberculosis of the cerebral meninges, etc., and the result has sometimes been found to be completely negative in cachectic or dying persons with undoubted advanced tuberculosis of the lungs. Moreover, by some observers, in about 10 per cent. or more of apparently non-tuberculous hospital patients a positive reaction has been recorded, and I believe this percentage would have been much higher if the test had been tried, not on non-tuberculous hospital patients suffering from various complaints, but on apparently healthy persons who have to irritate their eyes by sitting up late every night to read and write by artificial light. I know unfortunately only five medical men who have tried this test or had it tried on themselves, but in all these apparently healthy doctors a positive result was obtained; in three the reaction was violent, and in the other two it was relatively slight, and occurred only after a second instillation of Calmette's tuberculin, the result of the first test (in the other eye) having been negative. I should mention that one of these five medical men had a small tuberculous nodule (resulting from an accidental rather deep inoculation at a *post-mortem* examination on a case of advanced pulmonary tuberculosis) removed from a finger seventeen years ago, but he has had no symptoms of any form of tuberculosis since then, and Calmette's test has been proved to give a negative result in cases of old, obsolete, and "cured" tuberculous lesions. In regard to the strength of the tuberculin fluid used for the test in these cases, it was either the 1 per cent. strength recommended by Calmette or considerably weaker. In one instance another drop of the same tuberculin fluid which excited a violent ophthalmalmo-reaction in a medical man failed to produce any reaction whatever in the eye of a man (a patient of my own) with the characteristic clinical signs of active tuberculosis of the upper part of one lung, whose sputum, moreover, contained tubercle bacilli. I think results of this kind are worth recording, however exceptional they may turn out to be, since I believe that there has been a tendency to magnify the value of the Calmette ophthalmalmo-reaction as a clinical diagnostic test for tuberculosis. Much light is thrown on such anomalous results of the test by a recent communication of Waldstein to a meeting of the *Wissenschaftl. Gesellschaft deutscher*

Aerzte in Böhmen on January 15th. He has observed violent reactions as a result of the test in some cases of follicular conjunctivitis, and even in ordinary chronic conjunctival catarrh, whereas the result of the test has been completely negative in some other affections of the eye, notably in tuberculosis of the iris.

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London, W.

PHTHISIS TREATED BY BOVINE TUBERCULIN.

THE following are notes of a case of phthisis treated by hypodermic injections of bovine tuberculin as recommended by Dr. Nathan Raw and manufactured and supplied to me by the Clinical Research Association. The opsonic index has not been taken, the patient being in too weak a condition, but Calmette's ophthalmalmo-reaction was tried on January 21st with negative results.

The patient, a lady aged 30 years, has been under my treatment for the past eighteen months suffering from tuberculosis of the apices of both lungs with cavities. Previous to coming under my care she had been treated by some well-known physician, also in sanatoriums abroad and at home, when her sputum had been frequently examined and tubercle bacilli always found. Her weight in January, 1907, was 8 st. 12 lb., which gradually decreased to 7½ st. in September, after which it was not taken, as the disease was advancing so rapidly, extending in the left lung down by the vertebra and outwards to the angle of the scapula and forwards to the apex of the heart, with large crepitations and râles. She suffered severely from dyspepsia, almost all food being vomited. She had to take to bed and was panting for breath. On November 17th her pulse was 130, and had been so for a week previous; now it varies from 72 to 80. Her digestion has vastly improved, in fact it is almost as good as ever it has been. She can take full quantities of ordinary solid food, meat and vegetables, and at Christmas partook of the regulation pudding in good quantities without the least ill effect. She gets up daily and goes out for drives. The lungs at the apices and the one at the back have dried up, and there is not a single moist sound to be heard; the intercostal spaces after a fortnight's treatment seemed to fall in, due, I considered, to the lung contracting, as there have been considerable pleural adhesions, but now the spaces between the ribs are filling out and the chest getting nicely covered with fat. She sleeps well and has practically no cough or night sweats.

I commenced the tuberculin injections on November 16th and continued them weekly to January 20th. The evening temperature when the treatment was commenced varied from 100° to 102°. This has gradually subsided and has now been normal for the past four weeks, with the exception of three days when it went up to 99° and 100°, but this was easily accounted for by a slight attack of influenza.

Of course it is too early to call this a cure, but the effects so far have been, to say the least, marvellous, and I wish to report the case in hopes that we may hear the results of the treatment in other hands. I do not propose to give any more tuberculin until I see how the case proceeds, especially as there has been no reddening or injection of the conjunctiva by Calmette's tuberculin test.

Tadworth, Epsom.

A. CUFFE, M.D.

REPORTS

ON MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF THE BRITISH EMPIRE.

JOHANNESBURG HOSPITAL.

A CASE OF RESECTION OF THE RIGHT VAGUS NERVE FOR MALIGNANT DISEASE.

(Reported by H. TEMPLE MURSELL, M.B., M.C., F.R.C.S.E., Assistant Surgeon.)

THE interest of the following case lies not so much in the earlier operations carried out as in the later, where, the right vagus being involved, resection of 2 in. of the nerve was demanded if complete removal of the growth was to be attained.