There were no marked nervous symptoms, although mild delirium occurred in some of the children during the pyrexia, and in one the disease commenced with a convulsion. There was no evidence of nephritis, as out of twenty-five urines examined two alone showed albumin, and then only as a trace.

The duration of the disease was most variable. In a few it was hardly an illness, and patients went about their work, the farmers even attending the markets. Several of the patients were in bed for three weeks and felt ill for two months. The usual period of invalidity in insured patients was three to four weeks. There was no fatal case.

The Ministry of Health was informed of the epidemic, and by the courtesy of Dr. W. A. Lethem, an officer of the Ministry, who came into the district on two occasions (and incidentally gave me the greatest help and encouragement), various examinations were made of nasopharyngeal swabs, the blood, and urine, but with negative results.

Summary.

The epidemic under observation was one of epidemic catarrhal jaundice.

The method of spread was respiratory.

The incubation period varied from twenty-six to thirty-five days, and the period of infectivity was probably short.

The condition was, on the whole, free from danger, and no fatal case occurred, but in some instances serious acute abdominal disease was simulated, and the invalidity in many was prolonged.

In conclusion, I wish to acknowledge the stimulus I received from Professor C. W. Vining to write this paper; I wish also to express my thanks to him for kindly criticism and suggestions, and to my partner, Dr. Dean Dunbar, who saw all the patients, and gave me the full benefit of his observations and great help in compiling the report.

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TREATMENT OF PULMONARY TUBERCULOSIS ON THE LINES OF MINERAL DEFICIENCY.

BY

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THE treatment of pulmonary tuberculosis on the assumption that mineral deficiency is a basic factor is no new thing. Various observers, chiefly in America, France, and India, have reported beneficial results from the use of iodine, and others, including observers in this country, have made similar claims for calcium. I have not been able to trace any reference to results obtained by a combination of these two minerals.

There seems to be little reason to doubt that mineral deficiency is a factor of the utmost importance in determining the resistance of the body to tuberculosis. Those periods which are known to be periods of mineral drain—for example, lactation (as pointed out by Orr at the British Association meeting at Southampton in 1925)—are definitely known to be periods of lowered resistance to tuberculosis. Investigations in Cumberland, carried out over a period of about five years, chiefly among school children, have demonstrated that iodine, and to a lesser extent calcium, are of great value as factors in the prevention and treatment of disease. Iodine proved to be particularly valuable in the case of pre-tuberculous children, and in due course, as the investigation was extended, the treatment of pulmonary tuberculosis by means of iodine came under consideration.

Three years ago I began to use intramuscular injections of iodine in sesame oil in advanced cases of pulmonary

tuberculosis, cases so advanced, in fact, that if the treatment did no good it could not very well do much harm. The results in general were a decided fall in temperature, a marked diminution in cough and sputum, a definite, though temporary, improvement in general health, and a gain in weight. One patient, a woman aged 25, was practically moribund at the commencement of the injections, having a temperature fluctuating between 104° and 96° F., with very extensive disease of both lungs. She responded immediately, and in six weeks her temperature was practically normal. Her improvement throughout has been steady, and although her sputum is still positive the area of active disease is steadily clearing up; she is up and about daily, able to go for walks, and to attend for examination in Carlisle (a distance of eight miles) without any ill effects. After some months calcium was introduced into her treatment, and the improvement has been quite definitely more marked than when she was treated with iodine alone. Encouraged by these results in advanced cases, variable and sometimes transient though they admittedly were, I decided early in 1929 to try the effect of calcium and iodine in four cases. Three were early cases with positive sputum, but with limited lesions in the lungs; the fourth was an advanced case with extensive lesions in both lungs, including cavitation in one of them. This patient was included at the request of one of my colleagues, and against my own judgement. Two of the cases were markedly febrile, two were afebrile.

Details of Treatment.

Two patients (Nos. 1 and 2) received weekly intramuscular injections of 0.5 c.cm. collosol calcium and 3 minims of tincture of iodine (without potassium iodide) in a dessertspoonful of cod-liver oil cream thrice daily throughout, and are still continuing with this treatment. Patient No. 3 received iodine in cod-liver oil cream as above, and calcium lactate (5 grains daily) by the mouth. Patient No. 4 has received iodine in cod-liver oil cream throughout and intramuscular calcium as above for the first six months. The cod-liver oil cream with iodine is prepared for me by Thomson of Elgin.

Results.

The results in all four cases have been remarkable; infinitely better, in fact, than one could possibly have expected.

The Sputum Count.—The most striking result in each case has been the diminution in the number of tubercle bacilli present in the sputum. The sputum counts have been conducted by the Clinical Research Association, and the results given are the average count of forty fields. Experts in tuberculosis have told me that the number of tubercle bacilli in the sputum is not a matter of prime importance; that may be true in a general way—I do not know—but it cannot possibly be when a sputum becomes negative.

The sputum counts in the four cases are shown in the accompanying table.

Average Number of Tubercle Bacilli per Microscopic Field.

Case No.	Before Treatment began.	After being under Treatment for :							
		Two mths	Four mths	Five mths	Six mths	Eight mths	Nine mths	Ten mths	Subsequent Reports.
1	11		1		1 in 40 fields		Negative		Two: negative.
2	3	3	4		1		Negative		One: 1 in 10 fields.
3	23	5		Negative.					Not due.
4	11	7		3		5		1 in 3 fields	Not due.

It will be seen that three of the four cases became negative in nine months or less, while in the fourth case

the number has fallen to one in three fields in ten months. In this case the calcium injections were stopped at the sixth month, which may account for the interruption in the fall.

Weight.—All four patients showed a rapid and marked increase in weight. In Case 1 the weight has been irregular, chiefly because of the patient's total disregard for some months of the elementary hygienic requirements of a tuberculous person.

The accompanying charts show the fall in bacilli and the gain in weight in the four cases.

Temperature.—The fall in the extreme temperatures recorded in the original case to normal within six weeks has already been noted. Of the four 1929 cases two were afebrile and two were febrile. In Case 1 an irregular temperature fluctuated for the most part between 97° and 101° F., and after seventeen days became almost normal, though there were occasional rises to 99° F. for a further three weeks; since then this patient has been afebrile. The fourth patient had a very similar tempera-

ture of both lungs with one large cavity and coarse crepitations general—an old-standing case with acute exacerbation. After four months all moist sounds had disappeared. The fourth patient had active disease over practically the whole of the right lung and part of the left. After eleven months only a small and steadily diminishing area at the right base shows evidence of active disease.

General Health.—Each of the patients has shown marked improvement in general health. No. 2 has resumed work as an insurance agent, and after twelve months reports that he is very fit. The reappearance of bacilli in the sputum—one in ten fields—is the only point causing anxiety. No. 1 is absolutely fit for work, but has no work to go to. No. 3, who worked as a clerk in a sanatorium until 1925, is precluded by a spinal deformity from obtaining ordinary employment, but within the limitations of his deformity he is leading an ordinary life. No. 4 —to use her own doctor's words—"is very much better in every way."

CHART 1.—Case 1.—A, Cod-liver oil cream stopped here. B, Cod-liver oil cream resumed here.

CHART 2.—Case 2.

CHART 3.—Case 3.

CHART 4.—Case 4.

ture, which fell to normal in twenty-one days; since then, with rare exceptions, her temperature has been normal. The temperature of this patient in the early days of treatment is shown in Chart 5.

Physical Signs.—The physical signs in all five cases (including the original case) have improved concurrently with the fall in the sputum count and temperature, and the gain in weight. Each patient has been seen by at least two medical practitioners: two patients have been seen by three, and one by four. Sputum counts and temperature and weight charts are records of facts, but the interpretation of physical signs may differ considerably. My object in obtaining other opinions was to remove the possibility of an unduly optimistic interpretation on my own part.

To summarize briefly: The patients in Cases 1 and 2 had active disease at both apices; in Case 2 coarse crepitations were also present at the left base. After seven and nine months respectively no abnormal signs could be detected in either case. The third patient had extensive disease

CHART 5.—Early chart of Case 4.—A, Calcium and iodine begun here.

Summary.

It is, I think, a fair inference from the data given above, as illustrated by the accompanying charts, that this line of treatment is worth further investigation. The number of patients treated is so small that any further inference must of course be extremely guarded; but the results of this small investigation are at least suggestive. It is probably justifiable at this stage to claim that this line of treatment appears likely to benefit very materially a proportion, possibly a fairly large proportion, of early cases of pulmonary tuberculosis, and may even effect a definite cure in such cases. Apart from the question of benefit to the patient personally the reduction in the sputum counts suggests that this line of treatment may be of definite use in reducing the danger of infection being transmitted by tuberculous patients to those who come in contact with them.

As one whose chief duties are administrative and not clinical I am glad to be able to add that independent investigation of this line of treatment is now being or is

about to be carried out by more capable hands, through the kindness of Dr. Burrell at the Brompton Hospital, Dr. Goodechild at Blencathra Sanatorium, Dr. Peill at The Sanatorium, Bridge-of-Weir, Dr. Varrier Jones at Papworth, Dr. Dickinson at Newcastle, and possibly also in Lancashire.

A CASE OF AORTIC STENOSIS.

BY

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THE patient whose case is here recorded was a married woman, aged 53; she had had one child, which died in infancy. She gave a history of being a normal child till

Pulsus alternans, August 7th, 1929.

Auricular fibrillation, August 8th, 1929.

Anachrotic and coupling of beats, August 16th, 1929.

she was 7 years of age, when she had a slow fever with extreme weakness and purpura; she was confined to bed for many weeks, and she never completely recovered her strength, though her general health was good and no medical attention was required till she was about 35 years of age, when increasing shortness of breath compelled her to seek advice. She was then told that she had a very loud murmur, was advised to rest and not in any way to exert herself or hurry—that there was no danger in her

condition provided she avoided strain. The doctor kept her under observation till he died.

She first consulted me in 1926, complaining of breathlessness, dyspepsia, and insomnia. The pulse was 100, with occasional intermission. The area of cardiac dullness extended 5 inches to the left and 2 inches to the right of the mid-sternal line; the apex beat was heaving and well outside the nipple line. A loud aortic systolic with thrill and double mitral murmurs were present.

The dyspepsia and insomnia were relieved by bismuth, magnesia, and bromides. Calcium seemed to relieve the breathlessness, and she continued to take tablets of calcium lactate, 5 grains, daily for about three years, as when she discontinued them she always felt worse.

On June 10th, 1929, the pulse was 84, and there was an increase in the frequency of intermission. She complained of breathlessness, a done feeling in the abdomen, and loss of appetite. The liver was enlarged 2 inches. Digitalis, sp. aether. sulph. co., and tr. card. co. relieved the distress and she went to the seaside for rest and change of air. At the end of a week she returned home, much worse, with pleural effusions reaching symmetrically to the angles of the scapulae, and went to bed for complete rest. She became orthopnoeic; the temperature was raised intermittently to about 100°. The pulse was anachrotic with intermissions—partial heart-block. Pulsus alternans and then auricular fibrillation developed, as shown in the tracings. There was coupling of the beats after digitalis in small doses, but after fibrillating for one week the pulse dropped from 130 to 80. The blood pressure was 140 systolic and 90 diastolic.

On August 8th there was evidently infarction of the right lung, as effusion increased on that side, and blood was found mixed with the fluid when 30 oz. were removed, giving some relief to the dyspnoea. The urine also contained blood at about that time.

Death occurred from cardiac failure on August 22nd, and, though a private patient, I was able to obtain the heart for examination.

The heart weighed 17 oz. The aortic valves were calcified and admitted a finger-tip. Ulceration and vegetations were present on the cusps. The mitral ring admitted two fingers; the valves were thickened but not deformed; there was a deposit of calcium at the base of the anterior curtain. The extent of calcification is shown in the radiogram.

In this case evidently a rheumatic infection in childhood had caused changes in the valves—especially the aortic—which steadily progressed during forty-six years to calcification, and ended in ulcerative endocarditis with infarction of lung and kidneys.

One is in doubt as to the advisability of administering calcium in such cases. The association of auricular fibrillation with infective endocarditis is said to be rare, and is worthy of note.

VALUE OF THE BROMINE TEST FOR DIAGNOSIS OF PREGNANCY.

BY

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In the *British Medical Journal* of November 2nd, 1929 (p. 829), C. I. B. Voge described a new test for pregnancy. The test, which is simple and inexpensive, can be carried out by any practitioner and an immediate result obtained. Voge correlated his findings with those of the Zondek-Aschheim test and found a very close relation between the two. The drawback to the general use of the Zondek-Aschheim test is that it is expensive and requires a laboratory with a supply of immature female mice.

The reaction consists in the detection of the presence in the urine of compounds of the β -iminazolyl type by means of bromine water. Bromine water of ordinary laboratory strength (2 per cent.) is used and diluted with twice its volume of tap water; 1 c.cm. of this solution is added to 2.5 c.cm. of urine in a test tube and the mixture is brought to boiling point. A positive reaction is indicated by the presence of a pink or pinkish-brown coloration, which rapidly fades. In a negative reaction the original yellow colour remains. The reaction of the urine requires to be observed because in acid urine the coloration of the positive test is pinkish-brown, while in alkaline urine it is pink.