stomatitis with this origin of weeks' and even months' duration. Needless to say, from the constant swallowing and inhalation of such poisonous stuff as the mouth is harbouring the patients are often seriously ill. The neighbouring glands are swollen and painful but, curiously, rarely suppurate, and further complications may ensue, such as necrosis of the jaw, while in weakly children cancrum oris is said to follow, but in my experience this has never occurred. Fortunately, as a rule, rational treatment results in a very speedy cure. Short of infective stomatitis the same cause in other children sets up the dyspepsia, with anæmia and general debility in its train, which is the common sequel of inefficient mastication whether due to any dental pain or, as in later life, to the absence of the means essential to its performance.

I must recur here to the question of adenoids, because there is another theory of their causation in which the growths are compared with those of weeds in a stagnant ditch. On this assumption, which is the exact reverse of the one previously mentioned, the vaulted palate is the primary mischief and the adenoids secondary. The etiology of adenoids is a wide subject; it will suffice here to have mentioned the two theories which have a bearing on dentition, with the comment that neither carries conviction to my mind.

Dentigerous cysts and odontomes, the latter a very rare form of tumour occurring only in the lower jaw, are the result of perverted development and need merely be glanced at, while an occasional gumboil is not of much moment.

The diseases actually due to the second dentition we find then are not many. The importance, however, of a sound dentition in after-life has already been mentioned. The moral for us is that, whatever the dentist may accomplish, nature only provides us with one set of teeth for that period, and that it behoves us therefore to do all in our power during its development and eruption to remove any obstructions in the way of nature's satisfactory performance of her task.

3. *The influence of dentition upon concurrent general disease.*—This, which is not very great, is manifested chiefly in the neuroses, where occasionally one comes across cases upon which dentition has an accelerating or aggravating effect. The most obvious example is in epilepsy, in which one finds that the eruption of the teeth at times initiates the onset and at others increases the frequency of the fits. It must be added, however, that in children with unstable nervous systems very slight irritations may upset the balance and convulsions are never produced in healthy children by teething alone. Hysterical conditions and chorea may likewise be aggravated by coincident dentition, especially when the latter is giving rise to any of the troubles indicated in the second section, and in any acute febrile illness I have sometimes seen the symptoms similarly intensified.

Many of the remarks under the last two headings are equally, or even more, applicable to the first dentition and to diseases of the teeth (e.g., caries) when independent of dentition, but I have excluded reference to these as irrelevant to the present discussion.

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TYPHOID FEVER AND PREGNANCY, WITH SPECIAL REFERENCE TO FETAL INFECTION.

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THE number of published cases in which investigation has been made upon the typhoid reaction in the foetus is small. The following case is therefore recorded by the kind permission of Dr. W. Hale White, under whose care in Guy's Hospital the patient was.

The patient, aged 24 years, had had three children and two miscarriages. She was seven and a half months pregnant when she became feverish and complained of headache. The fever increased and at the end of a week she was drowsy, with flushed face and furred tongue. The

pulse-rate was 110 per minute and two typhoid spots were seen on the abdomen. On the eighth day she was delivered of a live foetus. There was no difficulty during the labour and there was no excess of hæmorrhage. The infant weighed four pounds and died three quarters of an hour after delivery. The mother seemed much relieved after her labour; her pulse became slower and her fever ran the ordinary course for nearly a fortnight longer. Her temperature ranged between 103° and 104° F. She was frequently sponged. On the twenty-first day of the fever she was worse, her pulse became weak, and she died on the twenty-fourth day of the disease. At the necropsy there were found typical typhoid ulcers throughout the ileum, cæcum, and ascending colon. Involution of the uterus had taken place normally. The placental site looked natural. The necropsy of the child, performed immediately after death, revealed no pathological changes. Culture tubes were inoculated with blood from the heart, liver, spleen, and kidneys, and remained sterile after 48 hours' incubation at 37° C. Unfortunately no bacteriological examination was made of the maternal blood. Widal's test was carried out on the mother and on the child. Blood taken from the mother at the time of labour gave a positive reaction in 5 per cent. solution, a partial in 0.5 per cent. The foetal serum reaction was negative even at 50 per cent.

Table I. is a summary of the cases of a similar nature that we have found recorded in the literature.

Among the problems which present themselves are the following:—

1. *Are typhoid bacilli transmitted from the mother to the foetus?*—In ten cases (Nos. 5, 10, 11, 14, 22, 23, 24, 26, 27, and 30 in Table I.) typhoid bacilli were found in the foetal organs or blood. In Case 26 it is just possible that the foetus may have been infected after birth. In Bolton's and in Fordyce's cases (Nos. 14 and 5) the foetuses were born dead. The bacilli must therefore have entered the foetuses before birth. In 11 cases (Nos. 1, 12, 13, 15, 16, 18, 19, 25, 28, 29, and our own) the typhoid bacilli were looked for in the foetus and not found. Thus in about half of the published cases of typhoid fever in pregnant women typhoid bacilli have passed into the foetal blood. In such cases they were probably freely circulating in the mother's blood but we have no proof of this. In future cases particular attention should be paid to the bacteriology of the maternal, as well as of the foetal, blood.

It is interesting to note that when bacilli have been found in the foetus delivery has been late in the fever. The times are: Third week, third week, twenty-fourth day, sixth week, fourth week, twenty-ninth day, and twenty-fifth day of a relapse; whereas in those cases in which no bacilli were found the times were comparatively early—viz., tenth day, tenth day, third week, third week, and eighth day from the onset of the mother's fever. It would seem, therefore, that the *duration* of the typhoid fever is an important factor in determining infection of the foetus. This raises the question whether, in cases where the foetus is viable, labour should not be induced as early as possible in order to save the child from infection.

2. *Does the typhoid agglutinin occur in the serum of a foetus born of a mother suffering from typhoid fever?*—That agglutinins do sometimes so occur in the foetal serum is well established. Positive reactions have been found in seven cases (Nos. 1, 5, 6, 8, 9, 14, and 20 in Table I.).

3. *Can the typhoid serum reaction occur in the foetus in which no bacilli have been found?*—The evidence that this can be so is slender. Out of the seven cases in which a positive serum reaction was obtained in the foetus three only were examined for bacteria. In two (Nos. 5 and 14) typhoid bacilli were found. In one (No. 1) bacteria were looked for but not found. This is the only case of the kind. It is so important that we give Etienne's¹⁴ account of it in his own words:—

..... La malade tombe dans le collapsus et elle succombe à 8 heures. A l'autopsie, on constate que les lésions intestinales sont discrètes. L'autopsie du fœtus est pratiquée immédiatement. Nous constatons l'intégrité absolue de tous les organes, notamment des intestins, de la rate et du foie.

Recherches bactériologiques.—Nous ensemencions sur gélose du sang des cavités cardiaques, du sac hépatique et splénique. Tous ces organes fœtaux sont stériles. Nous dosons minutieusement le pouvoir agglutinatif selon la méthode de Courmont, en nous servant d'une culture sur bouillon de bacille d'Eberth ayant pour point de départ un échantillon donné par F. Widal, toujours entretenu et que nous avons toujours employé pour nos recherches antérieures. Chez la mère le sang des cavités cardiaques présente un pouvoir agglutinatif de 150. Chez le fœtus, le sang des cavités cardiaques a un pouvoir agglutinatif de 200. Le liquide amniotique a également un pouvoir de 200.

TABLE I.—TABLE OF RECORDED CASES OF EXAMINATION FOR TYPHOID BACILLI OR FOR WIDAL'S TEST IN FŒTUSES BORN OF MOTHERS SUFFERING FROM TYPHOID FEVER.

Number of case.	Name of observer.	Month of pregnancy.	Fate of mother.	Fate of fœtus.	Widal's reaction in the mother.	In the fœtus.	
						Bacilli in tissues.	Widal's reaction.
1	Etienne, G. ¹⁴	5	Died.	Taken out at necropsy on fifteenth day of fever.	Positive 1 in 150.	Looked for and not found.	Positive 1 in 200.
2	Dogliotti. ⁸	—	—	—	Positive.	Not examined.	Negative
3	Planchu and Gallavardin. ²⁵	8½	Lived.	Born on ninth day of fever; lived.	"	"	"
4	" ²⁶	6	"	Born alive on thirteenth day of fever; died.	"	"	"
5	Fordyce ¹⁵	5	Died.	Born dead in sixth week.	"	Present.	Positive.
6	Chambrelenet. ⁶	8	Lived.	Lived. No record of day of fever when born.	"	Not examined.	"
7	" ⁷	8	"	Born on fourth day of fever; lived.	"	"	Negative.
8	Griffiths. ²⁰	9	"	Born after three weeks' fever; lived.	"	"	Positive.
9	Mosso and Danic. ²⁴	—	"	—	"	"	(?) "
10	Freund and Levi. ¹⁵	5	"	Born alive in fourth week of fever; died.	Not examined.	Present.	Not examined.
11	Etienne, G. ¹³	5	—	Born dead on twenty-ninth day of fever.	—	"	"
12	Bolton. ⁵	3	Died.	Born dead during third week of fever.	Positive.	Looked for and not found.	Negative.
13	" ⁵	8	Lived.	Born alive during third week; died in 12 hours.	"	"	"
14	" ⁵	5	"	Born dead on twenty-fifth day of relapse.	"	Present.	Positive.
15	Rous and Lacroix. ²⁹	8	"	Twins, born alive on tenth day of fever; died in four days.	"	Looked for and not found.	Negative.
16	" ²⁹	8	"	Born alive on tenth day of fever; died in three days.	"	"	"
17	Batty Shaw. ⁴	9	"	The mother had typhoid fever at fourth to fifth month of pregnancy; the pregnancy continued and the child was born alive at term, and was fed upon the breast.	Positive at time of fever; positive at time child was born.	Not examined.	Negative, even after five weeks' feeding on mother's milk.
18	Kirton. ²³	6	—	Dead; no details.	Positive.	Looked for and not found.	Negative.
19	" ²³	9	—	Dead; no details.	"	"	"
20	" ²³	9	—	—	—	Not examined.	Positive.
21	Stengel. ³⁰	—	—	—	—	"	Negative.
Earlier cases in which the details are incomplete; investigated before the days of Widal's serum test.							
22	Eberth. ¹¹	—	—	Born dead, third week of fever.	Not examined.	Present.	Not examined
23	Hildebrandt. ²¹	6½	—	Born dead on twenty-second day of fever.	"	"	"
24	Giglio. ¹⁹	—	—	—	"	"	"
25	Frascani. ¹⁷	—	—	—	"	Looked for and not found.	"
26	Janiszski. ²²	—	—	Infant, premature; lived 15 days.	"	Present after death.	"
27	Durk. ⁹	—	—	—	"	Present.	"
28	Resinelli. ²⁴	—	—	—	"	Looked for and not found.	"
29	Fraenkel and Kiderlein. ¹⁶	5	Died.	Dead; born seventeenth day.	"	"	"
30	Ernst. ¹²	9	Lived.	Date of delivery uncertain. The child developed a spotty rash suggestive of typhoid fever; died on the fourth day after birth. No intestinal lesions.	"	Present.	"

The figures after the observers' names indicate the numbers of the references at the end of the paper.

The occurrence of agglutinins without bacteria in the fœtus appears to us contrary to expectation. It is a point requiring careful and repeated confirmation. If true, the deduction must be that a positive Widal's reaction in the fœtus is no proof that the fœtus has, or has had, typhoid fever. It further raises the question :—
4. *How does the fœtus acquire agglutinin?*—Since it is well established that typhoid bacilli are sometimes found in the fœtus it would be reasonable to expect that the foetal tissues, reacting to the bacillary invasion, would produce their own agglutinins, the fœtus behaving as though it were an independent individual. If bacilli were always found in the foetal tissues when the foetal serum gave a positive reaction, as in Fordyce's and in Bolton's cases (Nos. 5 and 14), there would be ground for presuming that the fœtus always produced its own agglutinins in this way. Etienne's case, if true, seems to support the opposite view—namely, that the serum reaction can occur in the fœtus without bacilli being

present. It is a most important case but it needs confirmation. If confirmed it would show that agglutinin may occur in the fœtus without bacillary infection. If this be the case there are two possibilities: either the fœtus receives the agglutinin directly from the mother across the placenta; or, the fœtus reacts to the maternal bacillary infection, producing its own agglutinins in response to stimulation by maternal toxins.
The passive transmission of the agglutinin from the mother to the fœtus would seem possible, since we know that the virus of measles,¹ of variola,² and of syphilis can pass, and also soluble drugs³ such as mercury, potassium iodide, alcohol, and chloroform. If, however, this be the usual method by which the fœtus obtains its agglutinins it is difficult to explain (1) why the foetal serum reactions should be absent in so many cases (viz., Nos. 2, 3, 4, 7, 12, 13, 15, 16, 17, 18, 19, and our own), in all of which the maternal reactions were positive; (2) why, in a case such

as that given by Batty Shaw (No. 17), the foetus, which remained in utero for four months after the maternal attack of typhoid fever, should give a negative reaction when the mother's serum gave a strong reaction both at the time of the fever and also at the time of the child's birth.

We would further draw attention to the fact that the negative foetal results have nearly all occurred in the cases in which early delivery had taken place. In the negative cases the times were: ninth day, fourth day, thirteenth day, tenth day, tenth day, eighth day, third week, and third week of the fever; whilst positive results were obtained at the sixth week, third week, third month, and twenty-fifth day. The times were appreciably the longer when a positive result was obtained. It is difficult to see why there should be this delay in the passage of agglutinins if the foetus receives them from the mother; unless the placenta can be supposed to exert a temporary "barrier-action" against the passage across it of agglutinins but ultimately allows them to pass. It seems equally reasonable to suppose that the foetus produces its own agglutinins. It is a matter of regret that all the cases of positive serum reaction in the foetus have not been bacteriologically examined.

The effect of pregnancy upon the mother who has typhoid fever.—Typhoid fever occurring during pregnancy does not affect the prognosis or alter the course of the disease. The results in the seven cases that have occurred in Guy's Hospital over a period of 28 years are given in Table II.

TABLE II.

Age of mother.	Month of pregnancy.	Fate of mother.	Fate of foetus.
24	8	Died.	Born alive at eighth day of fever. Died in three-quarters of an hour.
26	5	Recovered.	Went to term. Born alive and lived.
21	2½	"	Abortion on seventeenth day of fever.
24	3½	"	" twenty-sixth " "
24	4	"	" fourteenth " "
20	8½	"	Labour on fourth day of fever. Child lived.
31	4	"	Abortion during fourth week of fever.

The death-rate was 14 per cent. Vinay³¹ gives the mortality at 17 per cent. Duynot¹⁰ gives six deaths in 36 cases, a mortality of 16 per cent. These figures do not differ widely from those given by the Metropolitan Asylums Board for all cases.

The effect of typhoid fever in the mother on the pregnancy.—The effect of enteric fever on the pregnancy is bad. In the majority of the cases abortion or premature labour takes place. This was so in six of the seven cases in Guy's Hospital—i.e., 85 per cent. Vinay gives two-thirds of abortions. Martinet's figures are 66 abortions in 109 cases. Penot²⁵ gives 65 per cent. of abortions. The delivery is most often easy and the patient experiences considerable relief. The uterus involutes just as if there were no maternal illness. The foetus, even if viable, is often born dead or dies soon after birth. As we have suggested, it is possible that this heavy mortality amongst viable foetuses might be reduced by the induction of premature labour in the earliest stage of the fever. Such induction would seem to be justifiable in the interests of the child when the prognosis for the mother is apparently so little influenced by labour.

Our best thanks are due to Dr. Hale White both for leave to publish the case and for his helpful criticism of our paper; we also thank Dr. J. W. H. Eyre heartily for his careful bacteriological examinations.

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THE ACTION OF YEAST IN TUBERCULOSIS AND ITS INFLUENCE ON THE OPSONIC INDEX.

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For the last ten or twelve years yeast and nuclein, which is sometimes held—though without sufficient warrant—to be its active therapeutic constituent, have been employed by many observers in the treatment of various bacterial diseases. The idea at the bottom of this mode of treatment is twofold. Nuclein is a chief constituent of the white blood cells and the administration of nuclein is commonly supposed to be followed, after a preliminary drop, by an increase in the number of these cells. In addition to this, nuclein has a bactericidal action. From these facts the inference was at hand that nuclein would reinforce the leucocytes in number and in activity and so help them in their struggle with invaders and that at the same time it would render the country less suitable for the support of the intruders.

In spite of the seeming soundness of the theory, and in spite of much favourable clinical observation, neither yeast nor nuclein has ever come into general use. Neither yeast nor nuclein is even mentioned in Hale White's admirable "Text-book of Pharmacology and Therapeutics" (1901); and Sir William Whitla,¹ speaking of nuclein, says: "Glowing reports were published of the improvements and even cures of tubercular disease of the lung. Notwithstanding these glowing accounts this drug, which was hailed as an 'essence of life,' is rapidly falling into disuse." In the exaggerated language quoted by Whitla we have doubtless one great reason for the neglect of the drug. Where the expectations are too high disappointment is bound to follow. Pure cultures of yeast administered hypodermically were strongly advocated a few years ago by de Backer of Paris; and his views, more concisely expounded, were put before the profession in England by Dr. H. Manders in his extremely interesting book on "The Ferment Treatment of Cancer and Tuberculosis" (1898).

One of us became acquainted with some of the virtues of yeast nearly 25 years ago. He had been suffering for about a year from successive crops of boils, against which various remedies had been tried in vain, when he was advised by Dr. (now Sir) Stephen Mackenzie to take yeast. He took yeast; a tablespoonful in milk daily. The boils in progress at the time became less severe and were not followed by a fresh crop. From that time on he has used yeast in furunculosis and always with good results. Some of the patients also were suffering from tuberculosis and not uncommonly while taking yeast they appeared to improve generally. From this point of view systematic observations have been made for the last two years on the influence, if any, of yeast taken internally on tuberculosis. The cases at first selected were chronic cases in which the patient had either "stuck in the mud" or was losing ground. Three or four advanced cases which were going downhill were also included in the observations. The results in some cases were striking, in some cases encouraging, in others almost nil. In no case was there any bad effect but some patients left off the drug because they disliked the taste of it or thought that it disagreed with them. All the cases, even those whose downward course was not

¹ Sir William Whitla: Elements of Pharmacy, Materia Medica, and Therapeutics. Eighth edition, 1903, p. 547.