ment paper. This will account for absorption in the first part of the duodenum. Lower down, where the reaction once more becomes acid, absorption ceases. It is well known in many animals that the reaction of the intestinal contents becomes alkaline owing to ammonia formation in the large bowel, but in the rat I found that the contents of the caecum and first part of the colon were still acid. Alkalinity does not occur till the last part of the colon is reached.

NOTES AND REFERENCES.

¹ *Journal of Physiology*, xvii, p. 415. ² In spite of Gherardini's statement that blood in the stomach is converted into haemin (*Bull. dell. Sci. Med.*, 1890, p. 456). ³ *Du Bois-Reymond's Archiv* 1896; *Physiol. Abth.*, p. 142. ⁴ *Loc. cit.* On account of the incompleteness of my work I have not attempted to enumerate the very numerous published papers on iron absorption. A recent paper by Tartakowsky (*Physiol. Archiv*, 1903, vol. c, p. 586) gives reference to the most important. Hall holds that the re-appearance of the iron reaction in the beginning of the large intestine, and to a certain extent in the kidney, is an indication that iron is excreted here. I have not pursued this line of inquiry, but see no reason to doubt the grounds on which this hypothesis is founded. I find, however, that Tartakowsky, whose experiments were made with inorganic iron compounds principally, regards the caecum and colon as situations where absorption and not excretion occurs.

NOTES ON RECENT CANCER MORTALITY IN THE THAMES VALLEY.

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THE south-eastern division of England has long been regarded as showing a high death-rate from cancer, and the Thames valley in particular has had this unenviable reputation. Many years ago Haviland, in an investigation into the matter, stated that the high cancer mortality and the Thames floods were closely related to each other. In the Thames counties, where there are frequent floods over considerable areas, the alluvium is deposited on what is for the most part a clayey, tenacious soil; and a clay soil has been regarded by some as more favourable to the growth of parasites, which may have a connexion with cancer, than carboniferous or chalky soil. It is doubtful, however, whether much influence is exerted on the cancer death-rate in England by the geological formation, as, in the low mortality areas, strata are found similar to those existing in the counties and districts showing the highest rates. I have recently collected certain statistics of cancer mortality in the Thames valley with the view of ascertaining whether it still maintains its reputation as a high cancer mortality area. The statistics are taken from the annual and decennial reports of the Registrar-General for England, and I have more especially compared the decennium 1881-90 with 1891-1900.

The Thames riparial districts (by which is meant those which immediately skirt the river or are traversed by its head waters), have been divided into groups, each of which comprises a number of registration districts. The groups which form the Thames valley are roughly:

1. From Oxford to Wokingham.
2. " Cookham (Maidenhead) to Wycombe.
3. " Eton to Kingston.

The counties in which the various riparial districts in the Thames valley are situated are Middlesex, Bucks, Oxford, Surrey, and Berkshire.

Comparing the decennia 1881-90 and 1891-1900 in these counties in relation to cancer mortality, I find the following:

TABLE I.
1881-1890.

	Total Deaths from all Causes, at all Ages.	Cancer Deaths, all Ages.	Percentage of Cancer Deaths to Total Deaths.
England and Wales ...	5,244,771	161,000	3.16
Surrey ...	79,002	3,115	3.94
Berks ...	41,736	1,604	4.05
Middlesex (Ex. Met.)...	77,089	2,616	3.39
Bucks ...	26,874	932	3.46
Oxfordshire ...	31,081	1,238	3.98
1891-1900.			
England and Wales ...	5,575,374	332,178	4.16
Surrey ...	92,639	4,846	5.23
Berks ...	42,005	2,361	5.62
Middlesex (Ex. Met.)...	100,872	4,611	4.57
Bucks ...	25,611	1,307	5.10
Oxfordshire ...	29,792	1,663	5.58

All the counties show a cancer death-rate higher than for England as a whole in each decennium. In all the counties also there is an increase in the latter decennium over the former varying from 1.64 per cent. in Buckinghamshire to 1.18 per cent. in Middlesex (Ex. Met.).

TABLE II.

Surrey	= 1.29 per cent. increase
Berks	= 1.57 " "
Middlesex (Ex. Met.)	= 1.18 " "
Bucks	= 1.64 " "
Oxfordshire	= 1.60 " "

For registration purposes each county is divided into a number of registration districts. Of these districts I have taken first those which are riparial (as defined above). The cancer mortality occurring in these in the two decennia 1881-1890 and 1891-1900 has been summed up and compared.

Following the course of the river upwards, the riparial districts in the Thames valley on the south bank are Richmond, Kingston, and Chertsey in the county of Surrey; Windsor, Maidenhead, Reading, Bradfield, Newbury, Wallingford, Abingdon, and Faringdon in the county of Berkshire.

On the north bank of the river the districts which are riparial are Brentford and Staines in the County of Middlesex; Eton and Wycombe in Buckinghamshire; Henley, Thame, Headington, Oxford, and Witney in Oxfordshire.

The results arrived at, put in tabular form, are the following:

TABLE III.

Registration District.	Per Cent. Cancer Mortality. 1881-1890.	1891-1900.	Increase Per Cent.
SURREY:			
Richmond ...	3.89	5.81	1.92
Kingston ...	4.72	5.76	1.04
Chertsey ...	4.50	5.56	1.06
BERKSHIRE:			
Windsor ...	4.59	5.52	0.93
Maidenhead ...	4.51	6.22	1.71
Reading ...	4.51	5.96	1.45
Bradfield ...	4.03	6.69	2.66
Wallingford ...	3.57	5.34	1.77
Abingdon ...	4.30	4.64	0.34
Newbury ...	4.59	5.63	1.04
Faringdon ...	3.24	5.72	2.48
MIDDLESEX (EX. MET.):			
Brentford ...	3.43	4.83	1.40
Staines ...	4.10	4.33	0.23
BUCKS:			
Eton ...	3.68	5.34	1.66
Wycombe ...	2.72	4.74	2.02
OXFORDSHIRE:			
Henley ...	4.16	5.81	1.65
Thame ...	3.90	5.00	1.10
Headington ...	4.72	6.60	1.88
Oxford ...	3.51	4.48	0.97
Witney ...	3.33	4.70	1.37

When the cancer mortality in the riparial districts is contrasted with that in the non-riparial districts in each of the above counties, it is found that the average cancer mortality-rate to total mortality from all causes was:

TABLE IV.
1881-1890.

	Riparial Districts.	Non-riparial Districts.
	Per Cent.	Per Cent.
Surrey ...	4.37	3.51
Berks ...	4.16	3.94
Middlesex (Ex. Met.) ...	3.76	3.02
Bucks ...	3.20	3.72
Oxfordshire ...	3.92	4.04
1891-1900.		
Surrey ...	5.71	4.75
Berks ...	5.72	5.53
Middlesex (Ex. Met.) ...	4.58	4.56
Bucks ...	5.04	5.16
Oxfordshire ...	5.30	5.85

It will be seen that the average cancer mortality-rate has increased in the latter decennium in all the riparial and non-riparial districts; also that in both decennia in the counties of Bucks and Oxford the non-riparial districts show a slightly higher rate than the riparial. With these exceptions the rate in the riparial districts is higher than in the non-riparial.

I have compared the cancer mortality in the two decennia in each of the above registration districts with a view to

ascertaining (1) whether there has been an increase or a decrease during these periods; (2) what proportion the increase or decrease bears to other districts in the Thames valley similarly compared. The result shows that the cancer mortality has increased in all the districts, the increase varying from 0.23 per cent. (Staines) to 2.66 per cent. (Bradfield).

In each of the counties and districts the total deaths from all causes at all ages have been taken, and the total number of deaths from cancer at all ages occurring in each decennium. The figures are computed from the annual reports of the Registrar-General for England during the twenty years. The percentage of cancer deaths to total deaths is thus obtained. This is naturally a crude method and can give only approximately accurate results, but the conditions in regard to age and sex distribution in a given district vary but slowly, and there is less liability to error in comparing the cancer death-rates of the same district or town at the different periods.

The above statistics seem to justify the conclusion that the Thames valley is still associated with a relatively high mortality from cancer. All the districts immediately bordering on the river show a rate in the decennium 1891-1900 above the average rate for the whole of England, the excess varying from 0.15 to 2.53 per cent. This uniform high rate along both banks of the river suggests that there may be a connexion between the river floods and the incidence of cancer, but what that connexion is it is not easy to explain. If we presume that cancer is a parasitic disease, the drying vegetation on the river banks after the floods have gone down may form a favouring nidus for the growth of the parasite. The fact that the majority of the riparial districts show a higher cancer mortality than the non-riparial seems to support this view of probable parasitic infection, seeing that districts nearest the river are most prone to suffer from cancer. This, however, does not explain the cause of the increase of cancer which is everywhere apparent, but given the other unknown predisposing factors which lower the vitality of the human organism to a non-resistant degree, we may have along the banks of the river a more or less constant manufactory of the *materies morbi*, ready to attack the already weakened host, and thus, with the additional risk of infection, there is higher mortality.

The above facts and figures taken as a whole and collectively are not only not inconsistent with the parasitic theory, but they seem to find their best explanation on this hypothesis. They are a contribution to the statistics of the disease whose etiology is at present the vexed question of medicine.

ON THE ACTION OF THE BLOOD SERUM FROM CASES OF ACUTE MENTAL DISORDER ON *B. COLI COMMUNIS*.

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At the meeting of the British Medical Association at Swansea in 1903 we made a preliminary communication upon the agglutinating power of the blood serum from 25 cases of mental disease upon *B. coli*. Having since examined a further series of cases, raising the number to 100, we now give the results obtained and the conclusions drawn.

TABLE I.—Showing the Agglutinative Power of Serum from 100 Cases of various Acute Forms of Insanity upon 25 Mixed and 75 Single Strains of *B. Coli Communis*:

Form of Insanity.	No. of Cases.	Good Agglutination.	Partial Agglutination.	No Agglutination.
		Per Ct.	Per Ct.	Per Ct.
Acute melancholia	29	5 = 17.2	12 = 41.3	12 = 41.3
Acute mania	53	2 = 3.7	22 = 41.5	29 = 54.7
Delusional Insanity	9	2	2	5
General paralysis	6	1	1	4
Alcoholic insanity	2	0	2	—
Acute dementia	1	1	0	—
Total	100	11.0 per cent.	39.0 per cent.	50.0 per cent.

90 dilutions of 1-100 were used, 7 of 1-30, and 3 of 1-50.

39 controls were made, of which
 1 gave a good agglutination = 2.5 p.c.
 5 gave a partial agglutination = 13.0 p.c.
 33 gave no agglutination = 84.6 p.c.

TABLE II.—Showing Duration of Disease, Degree of Dilution of Serum Used, and Agglutination Results in 29 Cases of Acute Melancholia.

No. of Case.	Duration.	Dilution.	Result.
1	1 month	1-30	Good agglutination.
2	1 month	1-100	
3	6 months	1-100	
4	8 months	1-100	
5	2 years	1-100	
1	2 weeks	1-100	Partial agglutination.
2	1 month	1-100	
3	2 months	1-100	
4	2 months	1-100	
5	3 months	1-100	
6	4 months	1-100	
7	4 months	1-100	
8	7 months	1-100	
9	7 months	1-100	
10	8 months	1-100	
11	9 months	1-100	
12	10 months	1-100	
1	1 week	1-100	No agglutination.
2	4 weeks	1-100	
3	5 weeks	1-100	
4	6 weeks	1-100	
5	2 months	1-100	
6	2 months	1-100	
7	2 months	1-100	
8	3 months	1-100	
9	4 months	1-100	
10	4 months	1-100	
11	6 months	1-100	
12	2 years	1-100	

TABLE III.—Showing Duration of Disease, Degree of Dilution of Serum Used, and Agglutination Results in 53 Cases of Acute Mania.

No. of Case.	Duration.	Dilution.	Result.
1	2 weeks	1-100	Good agglutination.
2	10 weeks	1-100	
1	3 days	1-100	Partial agglutination.
2	10 days	1-100	
3	3 weeks	1-100	
4	3 weeks	1-100	
5	3 weeks	1-100	
6	4 weeks	1-100	
7	4 weeks	1-100	
8	4 weeks	1-30	
9	6 weeks	1-100	
10	7 weeks	1-100	
11	8 weeks	1-100	
12	8 weeks	1-100	
13	8 weeks	1-100	
14	9 weeks	1-100	
15	9 weeks	1-100	
16	10 weeks	1-100	
17	10 weeks	1-100	
18	10 weeks	1-50	
19	12 weeks	1-100	No agglutination.
20	14 weeks	1-100	
21	5 months	1-100	
22	5½ months	1-100	
1	3 days	1-100	No agglutination.
2	1 week	1-30	
3	1 week	1-100	
4	3 weeks	1-100	
5	3 weeks	1-100	
6	3 weeks	1-100	
7	4 weeks	1-100	
8	4 weeks	1-30	
9	5 weeks	1-100	
10	5 weeks	1-100	
11	6 weeks	1-30	
12	6 weeks	1-100	
13	8 weeks	1-100	
14	9 weeks	1-100	
15	10 weeks	1-50	
16	10 weeks	1-100	
17	10 weeks	1-100	
18	11 weeks	1-100	
19	12 weeks	1-100	No agglutination.
20	12 weeks	1-100	
21	12 weeks	1-100	
22	16 weeks	1-100	
23	16 weeks	1-100	
24	17 weeks	1-100	
25	5 months	1-100	
26	6 months	1-100	
27	6 months	1-100	
28	11 months	1-100	
29	20 years	1-100	