

Her age was 31, her complexion dark : she was much emaciated; unmarried. She said that, in 1851-52, she suffered severely from gnawing pain in the left iliac and lumbar regions, accompanied by uncomfortable tightness round the waist, and frequent watery vomiting. She was able, however, to follow her duties as housemaid until October 1853, when she was laid up with inflammation in the right side, of which there was a recurrence in December. After the latter, the abdominal enlargement became general; and, when examined by me, appeared hard, spongy to the touch, without fluctuation, and streaked with distended veins. Her debility was very great; her appetite inconstant; the menses regular; the urine scanty; the tongue red; and the pulse small. There was considerable ante-flexion of the womb. Iodide of potassium, alternately with tincture of muriate of iron, in infusion of calumba, were prescribed; plaster of mercury with ammoniacum was applied over the tumour, and an opiate was given to relieve the pain. In April 1855, she had an attack of peritoneal inflammation, which was ushered in by the loss of nearly two quarts of blood *per vaginam*. This illness confined her to her room for ten weeks. The tumour went on increasing; and, towards the close of the year, although it retained its spongy character and no fluid could be detected by percussion, I proposed to use the exploring needle: but to this she objected, and absented herself till July 1856. Fluctuation was even then indistinct; but her life was so miserable that submission to any measure, calculated to give relief, was cheerfully complied with; certainly her haggard look and emaciated frame held out little encouragement to either.

August 15th. The patient, reclining on her left side, was operated on, as in Case 1. Five gallons and a half of dark coffee-like thick fluid were withdrawn. An ounce and a half of oil of turpentine, with half an ounce of tincture of iodine, were injected, and the trocar was corked; and wine and beef-tea were ordered.

August 16th. She passed a restless night; the urine was more abundant, and dark. The watery vomiting continued. The abdomen was painful on pressure; the tongue red; the pulse 140. Three quarts of tar-like matter were with difficulty pressed out. Turpentine and iodine were again injected, and the trocar was withdrawn. A sinapism was applied to the epigastrium for sickness, and calomel and opium were given every four hours.

August 17th. She had a good night. The skin was moist. She felt less pain over the abdomen; and the sickness was abated. Quinine was substituted for calomel and opium, and ale for the wine. This patient continued to improve steadily. She is gaining flesh, and is able to walk about her room.

REMARKS. There are in these cases many points of interest and resemblance. All were ascribed to cold, commenced with swelling and lancinating pain in the left iliac region, and were attended with dry skin and vomiting. Each presented, subsequently, the vein-streaked abdomen and painful glandular protuberances: whether these were cancerous (colloid) or tubercular, merits inquiry. My impression is, that these, however difficult of detection through life, are always present, and are generally of the latter character, in ovarian disease. They may become quiescent, painless, and interfere but little with life, as in four of these patients; or, influenced by temperament, circumstances, etc., may assume a more complex form, as in Case 3, which was, in its way, a pathological museum. Here there was cretification, as in tuberculosis, coexisting with cancerous deposit in the bladder; and it is possible, if not probable, that the disease, in this instance, originated in the left kidney, was communicated therefrom to the adjoining glands, and protruded in the region of the left ovary—that organ being unaffected: hence the error and difficulty of diagnosis. The enormous size and nature of the cyst, and the quantity and character of its contents are also attractive features. The coincidence of age (38) in three is worthy of notice, as well as the vomiting, which was a distressing symptom in all. With reference to the treatment, bromide of potassium is decidedly beneficial;

bandaging is highly injurious. To assist us, either in diagnosis or operation, Simpson's exploring needle is indispensable; and turpentine injection, after emptying the cyst, is well worthy of trial.

REMARKS UPON THAT PORTION OF DR. ROUTH'S PAPER, "ON FÆCAL FERMENTATION AS A SOURCE OF DISEASE", WHICH REFERS TO CROYDON.

By ALFRED CARPENTER, M.B.Lond., Croydon.

DR. ROUTH, in his paper read before the Medical Society of London, and published in the present volume of the ASSOCIATION MEDICAL JOURNAL, has, at p. 763, fallen into very considerable errors, where he speaks of the typhoid fever which prevailed at Croydon in the winter of 1852-53. One sentence runs thus:—"The Croydon typhoid fever, which proved *so fatal*, was due to water impregnated with drains of a very fœtid character." Then again:—"Croydon, like most country places, abounds with cesspools." And a little further on the author states, that, towards the end of 1852, the water-supply, which was obtained by steam-power from the chalk, was interfered with in the formation of the new drainage works established by the Board of Health, etc. "The result was a virulent epidemic of typhoid fever."

This is nearly all in the paper that refers to Croydon; and is therefore all that will at this time engage my attention.

Now, fortunately for Croydon, and unfortunately for Dr. Routh's conclusions, they are all erroneous; and were such assertions a sample of the whole paper, that which is really valuable would be worse than worthless.

With regard to the first, the fever did not prove *so fatal* at Croydon; in fact, its rate of mortality was excessively low, being scarcely more than 2½ per cent. of the total number of cases. The whole number of deaths from fever during the six months which included the whole period of the epidemic (*i.e.*, from Michaelmas 1852 to Lady-day 1853), was only 69, out of a population of nearly 25,000; and many of these cases occurred in distant parts of the parish. This fact may be easily proved by referring to Mr. Westall's mortality tables, which are compiled from the registrar's books; and also to Mr. Grainger's report to the General Board of Health, and published as a blue book in 1853.

Secondly. There is no proof that the water supplied by the Board of Health was impregnated with fœtid matter of any kind: but there is every argument and every fact to prove the contrary to be the case. This is the first time I have ever seen it so stated by any writer upon the subject. Several analyses of the water have been made by eminent chemists; and all are agreed that the quantity of organic matter in the water is very small—smaller, indeed, than in any water supplied from other sources around London; and that quantity was not greater in 1852-53 than it is at present.

Thirdly. Croydon does not abound in cesspools; there is, comparatively speaking, scarcely a cesspool in the whole town: nearly 2,000 were destroyed before the fever became prevalent; and they are not now allowed, except in places at a distance from the main sewers.

Fourthly. The water supply was not interfered with by the new drainage works of the Local Board of Health. The works for the drainage and those for the water supply were executed about the same period. The new supply could not therefore be interfered with; but the wells and ponds spoken of by Dr. Routh, and from which the inhabitants drew their previous supply of water, were so. They were rendered even more impure by the operations of the Board—*i.e.*, by breaking up the old imperfect drains, destroying the cesspools, and causing the porous gravel to be soaked with water loaded with decomposing animal matter in solution. The Board supplied pure water, and

cautioned the inhabitants to refrain from drinking the impure well water. And, as I have previously stated in an article upon the subject of "Impure Water as a source of Disease", published in the ASSOCIATION JOURNAL two years ago, "those who continued to drink water from shallow wells, were liable to diarrhoea of a very obstinate character, which, in many cases was at once remedied by a change to the water supplied by the Local Board of Health."

Croydon has been so completely purified from filth and the effects of bad drainage, or rather of none at all, and the results which have followed the operations of the Local Board of Health are so satisfactory and so beneficial, that preventable disease seems nearly banished, and every other form of disease puts on a different type; a nearer approach, in fact, to an active inflammatory condition than in days gone by, when every case had a tendency to degenerate into typhoid. The character of the town for salubrity and general healthiness is daily becoming more and more recognised; so that, with a freedom from local causes of disease, and a water supply which cannot be surpassed, the town can now very well afford to have the events of 1852 fully inquired into, and the saddle placed upon the right horse: and it is as well for the success of sanitary science, as for the sake of truth, that such errors as those into which Dr. Routh has fallen, but which do not in the least invalidate his ultimate deductions, should not be at once accepted as truths, or passed over in silence. Dr. Routh has evidently been misinformed as to the absolute causes of our epidemic. Many people have been misled by the assertions of the anti-sanitary party on the one side, and of antiquated prejudice on the other; and their search for truth would scarcely be more satisfactory, even if all the blue books which have been issued upon the subject were carefully examined. They abound with contradictions and positive assertions, which distract the mind, instead of satisfactorily explaining the causes of that disease which they were intended to elucidate.

I will endeavour to explain in a few words the main points upon which (to my mind) the origin of that epidemic depended, keeping in view only those which were undoubted and general in their effects, and leaving out of the account many little evils, certainly helping to swell the list of sufferers, but not being themselves the prime movers of the disease.

The great rain-fall of 1852, caused the water line to rise to the very surface of the gravel upon which Croydon is built. The rain-fall reached the large amount of 22.7 inches of rain in the last six months of the year, which is nearly nine inches more than the average. The total amount for the year, according to Mr. Glaisher, was 34.2. It appears that whenever the rain-fall reaches the sum of 30 inches, a stream bursts forth a few miles above Croydon, and continues to run for a time more or less long, according to the quantity of rain which has fallen. This stream, which is called the Bourne, is merely a continuation of the river Wandle above the surface of the ground; whilst usually the Wandle has its origin in the lower part of the town of Croydon. It is an evidence of the surcharge of the gravel with water percolating from the chalk range of hills to the south of the town. Mr. C. W. Johnson, in a very interesting paper published in 1853, has fully explained its cause, and drawn attention to the legend which has always been attached to it—viz., of its being a woe water, and presaging mischief to Croydon.

"The Bourne water of Croydon", says Mr. Johnson, "is also alluded to by John of Wirkworth in his Chronicle, written in the reign of Edward IV. He explains that—'Englyshmen whenne thei dyd fyrst inhabyde this land, as soone as thei see this watere renne thei knewe welle it was a tokene of derthe or of pestylence, or of grate batayle. For all that tyme thei saw it renne thei knewe welle that woo was comynge to Englande.'

"The same popular superstition of there being a connexion between the appearance of the Bourne, and the ill health of the district, evidently existed when Camden

wrote. The author of the *Britannia*, who resided at Chiselhurst, about seven or eight miles from Croydon, observes, when speaking of this town (*Edition by Gibson, 1695, p. 159*)—"For the torrent that the vulgar affirm to rise here sometimes, and to presage derthe and pestilence, it seems hardly worth so much as the mentioning, tho perhaps it may have something of truth in it."

"There is to this day an opinion very common amongst the labouring population of Croydon, that the water of the Bourne is unwholesome; and equally common is the undefinable notion, that 'when the Bourne is out, something will happen to Croydon.'"

I only adduce these authors as evidences of former visitations in connexion with a heavy rain-fall; and I do not require any further value to be attached to them than as corroborative of the fact of a district proverbially healthy and dry, being occasionally inundated with water and converted into something like a swamp. This must have been the case in those early periods when John of Wirkworth and Camden wrote; and it actually did happen in 1852. Whilst upon this subject, I may remark that such a condition can never arise again: an enormous culvert has been constructed to carry off all water coming from the source of the Bourne, before the gravel beneath the town becomes saturated with it; in fact, it has been effectually drained.

Now, one of the first operations of the Local Board of Health was to lower the water line of the whole of the lower part of the town by some six or seven feet. This was effected in a dry season, by destroying a mill dam upon the river Wandle below St. John's church, and removing the mill altogether. By this means a very large area was drained; so that after the removal of the dam, graves could be dug in the churchyard to the depth of seven feet without meeting with water; while previously, water was met with at less than two feet below the surface of the ground. This drainage was not permanent. The Bourne water, after a time, occupied the space which was previously filled up by the mill water; and as the water line rose, displaced upwards all air which had permeated the gravel and taken the position formerly occupied by the mill water. It must be remembered that this action was going on over a very large area of the town of Croydon. At this juncture, the Local Board of Health were actively pushing forward their operations. They were rapidly destroying the cesspools with which the gravel was everywhere drilled; the soil was everywhere becoming impregnated with decomposing animal matter; they were filling up all the ponds, which could only be regarded as open cesspools. They laid down miles of pipe drainage in a stratum of gravel—occasionally of sand—which was far from solid, and fully surcharged with water. The ground was turned up in every direction; and as the disturbed soil settled down again, it carried with it the pipe sewer, so that the sewer no longer presented a straight line. The pipes frequently became fractured, or their junctions imperfect, allowing the entrance of sand, gravel, and especially of Bourne water, quickly leading to a stoppage to all flow of sewerage from above the place of injury; whilst an unaccountable neglect of ventilation allowed the regurgitation of foul gases back into the houses of those who had made their connexions with the sewers. Thus, then, in addition to a preternaturally moist ground, there was superadded the actual presence of foul air escaping from the sewers, and finding admission into our houses in the most concentrated form. The first cause was present in every part of the place; and, assisted as it was by an atmosphere many degrees warmer than the average temperature of the season, and also by the presence of decaying animal and vegetable matter, was the one great agent in lowering the standard of health in the inhabitants, and gave rise to a large amount of remittent fever, especially in children. These cases were generally mild; they occurred everywhere, in every part of the parish. Not so another form, which was also present, and which only occurred in houses connected with the sewers. These were cases of pure typhus, and, as far as my experience went, were few and

far between. Those affected were not subject to diarrhoea; they had a mottled eruption upon all parts of the body, at times simulating that peculiar to scarlatina, at others being merely mulberry coloured spots. They presented a considerable degree of severity from the first; but the danger subsided early, the convalescence was rapid, and the case was not liable to relapse. If fatal, this event occurred at an early day.

There was also a third form of fever, one which was very much more prevalent than the typhus, and fully equal in numbers to the remittent variety. It was always attended with diarrhoea, sometimes preceded by it. This symptom was occasionally excessively obstinate, and often attended by hæmorrhage from the bowels. It frequently continued long after the fever had subsided, and rendered the convalescent stage very tedious. The cases generally presented an eruption of pink spots upon the body, especially the abdomen, some time during the second week; they disappeared upon pressure, but immediately returned when the pressure was removed, and were easily overlooked by a superficial observer. These attacks were tedious, and were especially liable to relapse; lasting, in several instances, ten or twelve weeks. They occurred more generally among water drinkers, especially those who would continue to drink the water from wells contaminated with foul animal matter, instead of the pure water of the Local Board of Health. Many persons continued to do so from prejudice, and others because the town water was frequently stained with iron rust from the conveying pipes. They occurred in houses connected with the sewers, as well as those which were unconnected; but those in unconnected houses were possibly milder than the others.

There were also many cases of choleraic diarrhoea. I had two under my care with temporary suppression of urine, and I believe several passed on into typhoid fever. I cannot call to recollection the situations in which these occurred, as at that time I had not learned to look upon choleraic diarrhoea as allied to the fever, and therefore did not note the separate cases.

These, then, were the main causes of the Croydon epidemic, viz.—

1. Excessive moisture;
2. Warmth;
3. The presence of decaying vegetable and animal matter;
4. Impure water from wells and other sources;
5. Want of ventilation in the sewers.

Tending, by themselves or in combination, to produce the several varieties of fever which presented themselves, viz.—

1. Remittent fever;
2. Typhus;
3. Typhoid fever;
4. Choleraic diarrhoea.

The fifth cause was fortunately rendered apparent at an early period by the innumerable stoppages which occurred by reason of the dislocation of the pipes, or by their fracture, as well as by the many substances which were obligingly introduced by persons gratifying their resentment at the proceedings of the Board by making the works of the Board useless. A frequent argument against the ill effect of the first three causes is, that such were common to all England, yet that no great epidemic of fever prevailed. In answer to that, I would beg to remark, that very few places existed under similar circumstances, viz., a dry bed of gravel, in some parts recently drained, becoming rapidly infiltrated with water, even to the filling of the cellars and basement stories of numbers of houses, and thus exposing the inhabitants to marshy exhalations, to which they were totally unaccustomed. In corroboration of this view, I may mention that, at the end of 1853, after the last fever had subsided, a large number of cases of ague came under my notice (large, I mean, for one individual in private practice); and, curiously enough, most of these had formerly inhabited marshy districts of the country.

Such are the main points upon which our illness depended, without going into many particulars deemed highly important by partisans, but which, I am convinced, had

very little to do with the origin or extensive spread of the disease. It will be best to look upon that illness as the result of a state of transition from filth to cleanliness, at an unfortunate period as far as Croydon is concerned, but perhaps fortunate for other towns. And, notwithstanding all Croydon has suffered in reality, as well as from exaggeration, notwithstanding all the expense the inhabitants have been put to, the town has cheaply obtained a state of salubrity which is daily more and more evidenced by the increased value of property, by the great increase in the number of new houses built for the residence of the city merchant, as well as by the demand from every part of the outskirts of the town, to become connected with our present system of drainage and water supply. The success of sanitary measures at Croydon is as great as the most ardent lover of cleanliness can wish for, or the most enthusiastic supporter of science dream of; and, if it be not spoilt by parish parsimony and half measures, will be of incalculable benefit to our town. The errors which were made in carrying out the works, were not greater than were certain to happen in the working of any new scheme. They will serve as beacons for other Boards to avoid; and, if viewed in the proper light, will be of great benefit to the inhabitants of the metropolis itself. The mistakes which have been made are remedied, and, as time passes over, the works will be rendered more and more perfect. Notwithstanding the predictions which have been made, and the outcry which has been raised against the Board of Health, I do not believe there is one man of positive intelligence in the town, who would raise his hand in favour of a return to the old system.

In conclusion, I feel assured that, considering me as a resident in Croydon, Dr. Routh will look upon my corrections of his paper in the proper light; and I would at the same time thank him for the many interesting and convincing particulars which he has brought together.

ILLUSTRATIONS OF THE PATHOLOGY OF CANCER.

By J. ZACHARIAH LAURENCE, Esq., F.R.C.S.

PART IV.

ON THE RELATION OF THE SECONDARY TO THE PRIMARY DEPOSITS OF CANCER.

THE words "primary" and "secondary" are, in the doctrine of cancer, used in the same sense as in the science of geology, to indicate merely a question of *time*—that one tumour was deposited before the other—without reference to any further relationship they may bear to each other. This is necessary to observe, inasmuch as the predominating idea in the words "primary" and "secondary" would, in the language of the day, appear to be one rather of rank and importance than of simple ordinality. Perhaps the least objectionable designations would be "original" and "consecutive" deposits—terms in which the relations of time overbalance those of comparative rank.

Given an original deposit of cancerous material, the *loci* of the consecutive deposits may be, either singly or conjoined—

- (1) The lymphatic glands;
- (2) The vital organs (the viscera);
- (3) The organs of external relation (organs of locomotion and special sense).

No set of organs is so constantly the seat of consecutive infiltrations as the *lymphatic glands*. Most authors, whilst admitting the great practical significance of this fact, have underrated its pathological distinctiveness by referring to other specific diseases (as syphilis) and non-specific inflammations, of which engorgement of the adjacent lymphatic glands is a concomitant. We are, however, of the opinion that this symptom is in a degree quite peculiar to cancerous disease.* Upon what other supposition can the well known

* The tuberculous deposits of lymphatic glands cannot be regarded as "consecutive" deposits.