place in the blood as it is in the living body, the fact being that there is no true analogy between the cases, as the experiments are conducted under totally different conditions. Even where we follow the diseases to which I have referred under this head to the dissecting-room, the blood presents no sensible difference from that which it does in death from other diseases; whereas, if those processes were going on, they must become sensible.

In proof of this, I would call particular attention to that awful disease named by Stokes "Acute Purpuric Fever", and aptly compared by Dr. Lyons to the "Black Death" of the middle ages. In this disease, the truth, that "a little leaven leaveneth the whole lump", is painfully exhibited. According to my observation of it, putrefaction of all the tissues sets in with such appalling rapidity that it may be said that the person attacked by it has scarce time to die before his whole body has become sensibly putrid. Yet I believe that, had we the means of ascertaining the fact, the blood would be found the last thing to putrefy, and then not till after death. I have adduced this case, in contrast to the illustration from gangrene, in further proof that, where putrefaction actually does take place, the part is already dead.

III. I come now to state, in conclusion, the doctrine that I hold myself upon the subject.

I hold life in the individual organism to be an unit, one and indivisible, wholly present in every part—recipient, percipient, of every impression, whether it be from within or from without, healthy or morbid. Where disease or injury is inflicted on the living body, its organic life is assailed, and its vital susceptibility recognises, resents, and resists the assailant. Thus, according to my belief, disease is not the consequence of organic changes; but these changes themselves result from a primary injurious impression made upon the life, which in each individual is an indivisible unit, the whole of which is present in every part of the organism. From this primary injurious impression thus made upon the life-unit, result secondarily the various changes in the organic solids and fluids of the body which take place in disease.

According to this view, it is as erroneous to attribute one disease, say, to shocks received by the nervous system, as to attribute another to blood-poisoning; the effects upon the nervous system and the blood being in each case secondary, the shock being primarily sustained by the life-unit, and resulting in the changes whether in the nerves or blood. The nerves and blood must both be alive; dead nerves do not receive impressions any more than dead blood circulates. Thus life is the great antiseptic which prevents or resists death; when it can resist no longer, it departs. The integral changes which take place in the blood in disease are not of the nature of true fermentation or putrefaction. Such changes are, as I contend, vital. They never take place except in the living tissues, while true fermentation and putrefaction can only arise in the dead. Every disease to which flesh is heir results from noxious or morbid influences communicated from without, or generated within the organism, but affecting the life-unit primarily; and, therefore, while it may be quite proper to consider these influences as poisons, yet they ought, as I believe, to be considered as life-poisons, and their action upon the constituents of the organism as altogether secondary.

In accordance with this, instead of attributing the power of producing disease to poison received by the blood, and carried and distributed through the body by a sort of hydraulic action, I ascribe the communication of disease to the affection of the whole vital susceptibility. When, for example, I vaccinate a child, the effect is produced not by the blood distributing the vaccine poison mechanically through the system, but by the impression made upon the life-unit producing those results upon the whole organism, by which is conferred immunity from the infection afterwards.

Similarly, when a man takes a fever, he has not to wait for the disease until the blood has carried it to each part of his frame; but the whole man, by a simultaneous shock, has received it through the affection of vital susceptibility.

The conclusion at which I arrive is that the terms zymosis and septicæmia, applied to disease, imply that which is not the fact, and lead to erroneous practice on the false supposition that there is a condition of fermentation or putridity in blood in circulation; and I would maintain that where disease or injury is inflicted upon the body, the organic life is assailed, and the susceptible life-unit recognises, resents, and resists the assailant. The questions with which I began these remarks are fundamental to this discussion, and must and will be answered. I have endeavoured to deal with them here, not from a speculative, but from a clinical standpoint, on the ground of experience and observation by the sick bed.

And it is in the twofold hope that an incorrect use of terms may be checked, and that the truth, whatever it is, may be discovered by observation and discussion, that I have ventured to press this matter upon attention.

NOTES ON SEWER-GAS POISONING.

By J. BROWN, L.R.C.P.Lond., etc.,
Medical Officer of Health to the Bacup Local Board.

IN the JOURNAL for November 16th there was an interesting paper, by Mr. Trend, on sewer-gas poisoning. During the past few months, I have made a number of observations on the same subject, as they confirm his opinion, and also give other effects of sewer-gas poisoning. I have notes of thirteen houses, in which there were grave sanitary defects. In seven houses, the slop-stone pipe was untrapped, and went straight into the drain, and from which there arose bad smells, especially in the hot weather. In the remaining six, there were untrapped and rubble drains, which were close to the door of the house, or passed beneath the floor.

1. *Submaxillary abscess*, and *enlarged cervical glands*, in children aged two and five years respectively. There were untrapped slop-stone, and bad smells from a rubble drain.—2. *Cervical abscess* in a child, aged nine years, probably due to bad smell from defective drain.—3. *Axillary abscess* and "*summer-diarrhoea*". The child, aged five years, also had other enlarged glands in the axilla and elbow. Diarrhoea occurred in a patient aged six weeks. Another child had recovered from a submaxillary abscess. There were bad smells from untrapped slop-stone and defective drains.—4. *Two cases of inguinal abscess* and *summer-diarrhoea*. One of twins died from exhaustion, due to inguinal abscess, and the other from diarrhoea. The mother recovered from *inguinal abscess*, the cause being an untrapped slop-stone pipe.—5. *Facial abscess* in a girl, aged nine years. This was probably due to sewer-gas from an untrapped slop-stone pipe.—6. *Pelvic abscess*, and three cases of "*summer-diarrhoea*". A patient had been confined six weeks. She was very anæmic, and had no appetite. This was due, undoubtedly, to the bad smell in the house. She was taken ill with an abscess in the pelvis. Just at the same time there were three other cases of summer-diarrhoea in the house. The infant died. For the sake of the woman, I recommended that the family should remove at once, which they did, and the patient made a good recovery. The abscess discharged itself *per vaginam*. The cause was a defective privy, from which there was a continual leakage of faecal matter into the house.—7. *Multiple abscesses*. A baby, aged six months, had twenty abscesses, scattered on its legs, arms, and body. This state was due to bad emanations from a defective privy. The privy was at once altered at my suggestion, and the patient speedily recovered.—8. *Temporal abscess* in a patient aged eleven years. The cause was foul emanation from a defective drain.—9. *Typhoid Fever*. A death from typhoid fever being reported to me, I inspected the house, and found that bad smells came from the untrapped slop-stone pipe.—10. *Typhoid Fever*. Another death from typhoid fever was reported. On inspection, I found the slop-stone untrapped, and an untrapped drain close to the door.—11. *Typhoid Fever*. This was a case of typhoid fever in a gentleman living in a new, well-built house. On inspection, I found the drains and slop-stone trapped. The wife, however, complained of bad smells coming from the water-closet, which was on the first floor. The water-supply in the summer being limited, the drain would not be well flushed. The mephitic gases, generated in large quantities in hot weather, would soon saturate the water in the pan of the water-closet, and pass into the house. The drain was long and unventilated; and the sewer-gases, being of lighter specific gravity than the air, would seek an outlet at the highest elevation, which would be the water-closets. The drain has since been ventilated. The patient died.—12. *Diphtheria*, and three cases of *Sore throat*. A child, aged three years, had diphtheria, and died in three days. In the same house, there were three adults suffering from sore throats, all of whom recovered. I found that there was a bad smell from untrapped slop-stone.—13. *Puerperal Septicæmia*. The third day after confinement, the patient had usual symptoms of septicæmia. She nearly succumbed two or three times. After about five weeks, she had a relapse, which proved fatal. In this case there was a foul smell from an untrapped drain, within a few feet of the door where the patient was confined.

REMARKS.—It is difficult to state definitely the cause of many diseases. In some of the cases given above, it may be a coincidence, and sewer-gas may not have been the cause. Though I think in most, if not in all, sewer-gas was the chief factor, I would not say positively typhoid fever can be generated *de novo* from sewer-gas; yet my experience goes to prove that much may be said in favour of it.

Summer-diarrhoea, especially in infants and young children, I believe, is often due to sewer-gas. In the summer, decomposition of sewage is very rapid. Infants who are nearly all day indoors in houses in which sewer-gas exists (and there are, unfortunately, a large number among the poor) soon get diarrhoea. Of course, there are other things to produce it.

Diphtheria and sore throats are often due to sewer-gas. House No. 12 seems to prove that the poison which generated diphtheria in the child, in the three adults caused bad sore throats. Several cases of death from puerperal fever have occurred, generally in houses which are subject to bad sanitary arrangements, especially as it regards drainage and ventilation. I have had a large number of abscesses in children during the past summer. In nearly every instance there were strong reasons to believe it to be due to sewer-gas. As a rule, if two or more persons in a house are suffering from summer-diarrhoea, or abscesses, we may suspect sewer-gas. Sewer-gas is especially dangerous to children. Older persons may resist its influence; but in them it will probably be the cause of anæmia, nausea, and headache. In the winter, when the decomposition of sewage-matter is far less active than in the summer, I have found that infantile diarrhoea and abscesses are very few when compared with the number of cases occurring in the summer months.

ENTERIC FEVER IN A CHILD FIFTEEN MONTHS OLD.

By A. DUNBAR WALKER, M.D.,

Medical Officer to the North Kensington and Kensal Town Provident Dispensary.

NOVEMBER 1ST. The child looked pale and out of sorts, though nothing particular appeared the matter, with the exception that he had had four motions during the day, which looked healthy.

November 2nd. The little patient was languid and fretful. Four motions were passed in the day.

November 3rd. Symptoms of fever were manifest, and the little patient was disinclined to play with his toys. The bowels were still relaxed. Cerebral disturbance was great; sleep was interrupted by frequent startings of the whole body.

November 4th. The child passed a fair night, but appeared this morning to have no inclination to move, lying in an almost insensible state; from which, however, he could be easily aroused. There was frequent and severe twitching of the muscles of the forearms. The thumbs were drawn inwards. The little patient seemed every few minutes to be on the verge of general convulsions, though no actual convulsion took place. One of the cheeks was flushed. On examining the body, erythematous patches were found over the ankles, knees, elbows, and wrists; these were very evanescent, and moved from joint to joint. The diarrhoea had increased, the motions being very watery and of a greenish colour.

November 5th. The symptoms of yesterday were all exaggerated. The pupils were dilated, and the child seemed to be unconscious. Up to this time, food by the bottle had been taken; but it was difficult now to induce the child to have it. The lips were parched and cracked.

November 6th. This was the first day any attempt had been made to take the temperature of the body, which was found in the evening to be 102.5 deg. During the day, nine motions had been passed, now of a yellow colour. The head-symptoms were better, though the child still lay very quiet.

November 7th. Dr. West saw the child, as I was unable to decide the exact nature of the case, and, from the various symptoms that had appeared, was inclined to look upon it as a case of enteric fever. Throughout the day, the child remained very quiet, and appeared weaker than on the previous day. He had passed four motions; two were yellow in colour; the other two were greenish. The temperature in the morning was 100 deg.; evening, 102 deg. The abdomen was slightly tympanitic.

November 8th. An increasing desire for food was manifested. The temperature in the morning was 99.8 deg.; evening, 102 deg. Tympanites was increased. He had four motions.

November 9th. Great prostration was seen in the patient. The abdomen was very much distended. Temperature, morning 101 deg., evening 102.4 deg. He had two motions.

November 10th. The temperature was considerably lower, being 98.6 deg. in the morning and 101 deg. in the evening. The child appeared better. He had two motions.

November 11th. The child passed a good night and took his food well. Morning temperature 98.6 deg.; evening 102.2 deg. He had two motions.

November 12th. To-day there were many signs of improvement. There was less tympanites. He had only one motion in the twenty-four hours. Morning temperature 97.4 deg.; evening 101 deg.

November 13th. The little patient was gradually getting better, though the number of the motions had increased to six. Morning temperature 99.4 deg.; evening 99.8 deg.

November 14th. Morning temperature 97.2 deg.; evening 99.6 deg. He had four motions.

November 15th. The strength was improving. Morning temperature 97.2 deg.; evening 97.8 deg. He had two motions.

November 16th. From this day, convalescence progressed favourably, and the child gradually regained his usual strength. The only sequelæ that appeared were a few boils.

REMARKS.—About the diagnosis of the case there can be no doubt, for it was suspected by Dr. West, whom all will acknowledge to be our best authority on children's complaints; and his suspicion was confirmed by the mother of the child being seized with the same fever a week afterwards, in which the eruption and other characteristic symptoms of the disease were fully developed. The temperature was never very high; but I am inclined to think that the normal temperature was a degree less than the average—namely, 97.4 deg.; for, when the child recovered, that was the uniform temperature obtained. Great care was exercised in taking the temperature, the thermometer being placed both in the groin and in the axilla.

POISONING BY PHOSPHORUS: POST MORTEM EXAMINATION.*

By ALFRED SHEEN, M.D., Cardiff.

ELIZABETH A. L., aged 27, a prostitute, was admitted into the Union Hospital, on the afternoon of June 24th (Monday), said to be suffering from the "effects of poison", as certified by the district medical officer; but as to when the poison was administered, or what it was, there was no reliable evidence. Some said she had taken it on the previous Wednesday; others on the Wednesday week; and that it was "rat-poison". She was sent to the hospital in a cab; and, when helped out, walked between two women to the ward, and was put to bed. She was continually retching, but did not vomit.

When I saw her, about 6 P.M., she was in bed, tossing about, and behaving exactly like a drunken woman, taking no notice of what was said to her, but alternately groaning and retching, and making use of such expressions as, "Lord, have mercy". Her pupils were dilated, but not fixed. Pulse and temperature were normal. I was satisfied she had been recently drinking, whatever else was the matter with her.

She took small quantities of milk from time to time. The retching continued; no vomiting. The bowels were moved two or three times; she continued groaning and tossing about; and she died next day (25th) at noon.

A *post mortem* examination was made at 6 P.M. on Thursday, June 26th. The weather was very hot. There was no cadaveric smell. The body was in very good condition. The expression of face was calm. Bloody fluid was oozing from the mouth and nostrils. The thumbs were turned to the palm, and the fingers flexed. The elbows rested on the table, so that the hands were six inches from the table. There were no marks of violence on any part of the body. The subcutaneous fat of the abdomen and chest was one and a half to two inches thick. In the *left pleural cavity* were a few old adhesions towards the liver, and about an ounce of blood-tinged fluid. In the *right pleural cavity* were recent adhesions anteriorly. The *lungs* were both deeply congested throughout; they were crepitant, and floated in water. The *heart* was pale, flabby, fatty. The left ventricle contained a pale-coloured clot (*ante mortem*). The right ventricular wall and chordæ tendinæ were much congested. The valves were healthy. The *liver* was smaller than normal, and its surface was somewhat uneven; it was cirrhotic in a marked manner throughout. The *stomach* was distended with gas, containing about an ounce of thick dark grumous-looking fluid. The internal surface was of a dirty-grey colour, apparently thickened; there was no softening. The oesophageal end was congested; near it, a surface of about four inches square was covered with bright red ecchymosis, in spots of various size. The internal surface of the *intestines* throughout was of a dirty-grey colour, on washing which, similar spots, but smaller, to those in the stomach were seen here and there. They contained semi-fluid substance, evidently milk, etc. The *spleen* was normal. The *kidneys* were enlarged and fatty. The *brain* was not examined.

The poison swallowed was "Steiner's vermin-killer". A similar bottle to the one the deceased had was shown at the inquest; it was an ounce bottle, containing a light blue-coloured paste, which smelt of phosphorus, and which probably contained it, mixed with flour or some such substance, and coloured with Prussian blue; but how much phosphorus it contained, or how much of it was taken by the deceased, there was no evidence to show. Some of the witnesses who saw her on the Thursday or Friday, stated that what they called "smoke" occasionally

* Read before the South Wales and Monmouthshire Branch.