blood-poisoning from noxious air or some other matter. For example, I had two cases of illness in the same house; one was typhoid fever, which ran its ordinary course, and the other one of high febrile character, lacking many of the peculiarities of true typhoid; in it the temperature of the body returned to normal on the ninth day, in the other on the 22nd. I am not in a position to say how far this parallelism may be sustained. That certain things in chemistry take nine days to nitrify, while others take less, is in this connection only an additional fact, suggestive of thought and, of course, further inquiry.

All the serious cases of bleeding hæmorrhoids I have had to deal with have been cases of persons living in unhealthy dwellings. I am, of course, aware that in all such cases there is a more or less disordered condition of the liver and digestive organs; but there is just as good reason for ascribing the disordered state of the liver to piles, as piles to disordered liver. As a matter of fact, in very many instances, they are both only features of the one complaint, dependent on some form of malsany.

It would be too severe a tax upon your time, I fear, if I were to continue this discourse much further. I have noted what seemed to me good cases of hæmaturia resulting from protracted imbibition of noxious air and impure water, which, when the offending elements were removed, began to improve, and ultimately recovered. The bleeding in scurvy, purpura, and some other disorders as well, are all of a similar nature, and only too familiar. The common saying that any spontaneous or passive hæmorrhage is only an effort of Nature to right itself may be very true, but what is the cause of the wrong that has to be righted? And then, what is the wrong itself? It strikes me we must pay closer attention than ever to what has aptly been said to account for the progress of modern engineering, and that is to "the next to nothings" in investigating the causes of diseases.

ON LEAD-POISONING FROM SERVICE PIPES, IN RELATION TO STERILITY AND ABORTION.

By ALFRED SWANN, M.D., M.R.C.S.,

Surgeon to the Batley and District Cottage Hospital; Medical Officer of Health for the Borough of Batley.

THE following cases are of interest, inasmuch as they suggest, if nothing more, a possible danger arising from the supply of water through leaden piping for domestic purposes.

CASE I.—Mrs. T., aged about 32 years, was confined in 1882. Since then she has had progressive ill-health, with constipation, digestive disturbances, frequent colic, rheumatic pains, and irregular menstruation, with now and then severe menstrual hæmorrhage. After cessation of menses for eight weeks an abortion occurred on March 17th, 1884. After cessation of menses for seven weeks, another abortion took place on September 10th, 1884.

Colic continued to be frequent, and severe constipation remained obstinate, and recurrent attacks of metrorrhagia became alarming. I had for a long time been of opinion that the water-supply, which came through lead piping of some length, was the cause of all the foregoing symptoms, and in the early part of 1887, my patient having been confined to bed for some months, iron piping was substituted. After this there was only one attack of colic, and no severe hæmorrhage. The bowels became regular, and menstruation became normal for a time. Pregnancy ensued, and my patient was confined of a healthy child on March 2nd, 1888. Since then she has remained in good health.

CASE II.—Mrs. C., aged about 30 years, has had one child some seven years ago, in 1882. She came under my care in 1885, suffering from constipation, indigestion and colic. She has irregular and frequently profuse menstruation. She aborted after suspecting pregnancy for eight weeks, on January 6th, 1886. She has a blue line on the gums. I ascribed her abortion and previous illness to lead piping, and these were removed and iron pipes substituted. Colic became less severe and disappeared; the bowels became regular; menstruation became normal; then pregnancy ensued. On October 22nd, 1887, she was confined of a healthy child, and has since remained in good health. In the same house the servant suffered from rheumatic pains, colic, and constipation, until the removal of the lead piping, after which she regained her wonted health.

CASE III.—Mrs. F., aged about 30 years, has two children. The last was born on September 7th, 1884. After this her health became seriously impaired; she had severe digestive disturbances, rheumatic pains in the limbs and loins, constipation, colic, and very irregular menstruation. Her life became a burden to her, no treatment being of any avail. I told her husband that I believed all her symptoms were due to the water-supply, but he ridiculed the idea. I referred him to Cases I and II. Even after receiving their evidence, his scepticism remained, but he removed the lead piping, and substituted iron. The result was as remarkable as in Cases I and II; all the symptoms disappeared and menstruation became regular. Then pregnancy ensued, and on May 11th, 1887, my patient was delivered of a healthy child, and has since remained in good health.

I do not record these cases in a dogmatic spirit, nor do I aspire to scientific accuracy in my deductions from them, but there can be little doubt that in Cases I and II the cause of abortion and hæmorrhage was water contamination by lead, and in Case III one may reasonably suspect lead as being the cause of all the symptoms.

It has fallen to my lot to observe many cases of plumbism, and its relation to sterility and abortion only touches the very fringe of a vast subject. The influence of lead on the nervous, vascular, muscular, lymphatic, and digestive systems merits greater consideration than has hitherto been devoted to it.

To suppose that plumbism means only wrist-drop and paralysis of the extensors of the forearms seems to me to be illogical. I believe that in plumbism, neuritis is not confined to any particular set of nerves. Is not lead colic due to paralysis of the nerves regulating the muscular coats of the intestines? What is the meaning in cases of lead-poisoning of the tense pulse, the liability to epileptiform seizure, to cerebral and other hæmorrhages, to gout and uric acid, and to albuminuria and rheumatic pains? Surely these point to both nervous, vascular, and metabolic derangements which open up a wide field of inquiry for those who are interested in our food and water supply, and in public health generally.

This paper is written only to suggest grave possibilities to those who at present barely recognise a serious source of danger, and although I personally am satisfied of the far-reaching and lethal influences of lead in relation to many conditions not generally regarded as having any connection with it, yet I would prefer that those with more opportunities at their disposal than I possess would follow out a line of investigation which I have merely indicated. I am satisfied that they will find a fertile field for research.

NOTES ON AN EPIDEMIC OF SMALL-POX AMONG KAFIRS IN THE TRANSKEI.

By H. HAVELOCK STURGE, M.R.C.S., ETC.,

Late District Surgeon, Xalanga, Cape Colony.

IN the JOURNAL of August 25th, 1888, appears a very interesting communication from Surgeon-Major Pringle on vaccination, and its efficiency, when properly carried out, as a preventive against small-pox. Read in conjunction with the above-mentioned article, the following notes may be of value. The district in which the experiences to be related were gained was a very large one, about 80 miles across, and contained a black population of several thousands. Practically the inhabitants were unvaccinated. In September, 1884, the first cases of variola occurred among the community. Four natives, who had been working at the diamond fields, where the disease had been prevalent for twelve months,¹ started from Kimberley to return to their home in the Xalanga district. After a journey on foot of one month they arrived within 20 miles of their destination, when one of the number became ill, and remained at a kraal (village),² while his companions

¹ At this centre of industry the nature of the disease had been variously diagnosed by the medical men, some of whom eventually carried their differences to the law courts. The BRITISH MEDICAL JOURNAL, when referred to as arbitrator, decided in favour of the disease being specific (see JOURNAL, 1884; South African Medical Journal, 1884).

² In South Africa the term "village" can hardly be used strictly; the huts are usually placed in groups wherever water is convenient and pasture and arable land obtainable. In thickly peopled parts huts occur every few hundred yards.

went on to their home to obtain a horse on which to deliver the patient to his friends. By these arrangements small-pox commenced its ravages at two centres at the same time. On visiting the home of the importer of the disease shortly after his arrival, seventeen individuals were found affected,³ occupying ten huts, all within a radius of 100 yards. In order to limit the spread of the contagion, sentinels were posted in a ring around the area in which those suffering were residing, so as to prevent ingress and egress. In assisting me to appoint men for such duty, the petty chief showed ingenuity in picking out only those who were young, handsome, and unmarried, remarking that such would be least likely to sleep at their posts.

More to be relied on than quarantine we urged on the neighbours the importance of vaccination, and accordingly a few children just outside the cordon were operated on; from these on the eighth day more could be protected, and by the third week there was sufficient virus at hand for the needed purpose. By these means the outbreak did not spread beyond its original limits. With the same malady epidemic in various parts of the adjacent territories, and the natives constantly moving about, it was not to be wondered at that in several quarters the contagion was repeatedly reintroduced into our district. In all cases the precautionary measures mentioned were adopted. Sometimes one was fortunate enough to check an eruption at its birth by timely vaccination of those in immediate contact with the victim of the disease. Now and then both vaccination and small-pox ran their course together in the same individual, the former having been administered too many days after exposure to the germs of the disease.

Those who, inside quarantine limits, were successfully vaccinated were able to stand as severe a test as could be devised, as they lived in the same huts as the patients, and nursed and tended them. I have no single note of any unvaccinated person enclosed in a quarantine line escaping the disease; while, on the other hand, the numerous instances occurring during many months of vaccinated people being enclosed with those dying of the pest, and yet escaping all illness, opened the eyes of the savages to the value of Jenner's discovery.

Within twelve months from September 1884 I had personally visited and dealt with twenty separate epidemics in our district, affecting in all 370 people, and causing 118 deaths. Though during this period endeavours were made to establish general vaccination through our territory it was found impossible to do so, owing to the selfishness of those operated on in not returning on the eighth day, their idea being, "I am safe, let others look out for themselves," and hundreds had to be sent away on the vaccination day dissatisfied. It is noteworthy that while in some civilised communities the aversion is to have any virus inserted, among these savages the aversion was to have any virus extracted from them.³ In the difficulty of obtaining a constant arm-to-arm supply of virus, stored lymph was repeatedly obtained from the Local Government Board and from private agencies in London. Good results were obtained from both calf and human vaccine when used directly after receipt.

Here and there, in exceptional cases, the tribesmen quite close to a small-pox centre would refuse vaccination. In one instance, with the disease raging only forty yards away, a large family preferred the witch doctor's remedy to mine. It was thought quite safe to predict for this household small-pox for a companion; but the course of events proved the unwisdom of prophecy, for although remaining all the time on their original ground⁶ until the quarantine was relaxed, the plague never touched them.

The witch-doctors, at the commencement of the panic, visited all villages, and, in return for sheep and oxen, gave the inhabitants decoctions to drink to avert the calamity. Some of them went into small-pox centres to treat the sick, and, returning to their homes, in two instances lighted up the flame of contagion in their own families, and died themselves.⁷

³ The locality where the epidemic was started by the sojourn of the patient while his friends left him was too far away for one to be able to visit it, and accordingly directions were sent to fix a quarantine and the neighbours advised to get themselves vaccinated.

⁴ The Government, when advised to proclaim a Public Health Act to enforce such to return, replied that they had no machinery to carry out such a provision. See Blue-book Reports of District Surgeons (Author). 1885. Cape Colony.

⁵ The prisoners, of whom we sometimes had fifty or more at the Residency, became unwilling aids during the year in the spread of lymph.

⁶ In this instance they could not have moved, for they were included inside the quarantine line as part of a contagious community.

⁷ The white doctor could point to such instances as the consecutive deaths of

Finding their patients' faith in swallowing a pint or two of stewed roots as a charm against the disease waning, the native healers gave up their original practice, and paid vaccination a compliment by imitating its operation in their practice of preventive medicine.⁸

In addition to breaking the cuticle over the deltoids, they performed the operation over both wrists, on the chest, in the back between the shoulders, and over both ankles; in the abraded spots roots were rubbed.

The natives, in the later stage, when the crusts were falling off, made a general custom of smearing the whole body with a compound made of grease, and clay obtained from the soil. This practice they considered of therapeutic value in preventing pitting.

Among the sequelæ, one case only, and that in an infant, was noted of total blindness.

The mortality was greater, perhaps, than it would otherwise have been, owing to the insufficient care the people had. The lot of the unfortunates shut in the quarantine was pitiable in the extreme. In one instance, out of more than thirty enclosed every male died; and the girls, while themselves stricken, had to dig the graves and bury their relations.⁹ In addition to the terror shut in with them, the helpless victims during the night remained in fear lest they should see their hut in flames, as neighbours sometimes endeavoured to burn out the pestilence by thrusting a lighted brand into thatch. Hunger had also to be endured, as friends around, taking advantage of the adversity of the sufferers, were apt to steal any stock that strayed to the boundary line.

In January, 1885, the author resigned his appointment. The after-history of the disorder, obtained from reliable sources in the colony, is as follows: After a brief pause the disease broke out again in the district in 1886, and caused great havoc.¹⁰ During 1887 only four doubtful cases were observed by the district surgeon, and the epidemic finished.

The noteworthy points in the history of this epidemic are:

1. Of the premonitory symptoms usually given as distinctive of small-pox, only headache was complained of by the Kafirs.
2. Vaccination was absolutely protective. I have no single note of any person bearing a good vaccination mark (no matter when performed) having taken the disease, either inside or outside the cordons, although such a case was looked for.
3. The disease was extremely contagious, but people (unvaccinated) lived within forty yards of active confluent small-pox without suffering.
4. Stored lymph, when recent, was capable of producing good protective vesicles.
5. By general vaccination in a circle round an infective centre the spread of the complaint could be stayed locally.
6. Quarantine and partial vaccination were inefficacious to preserve the district from fresh inroads.

CASE OF GANGRENE OF THE LOWER EXTREMITIES FOLLOWING A BLOW ON THE EPIGASTRIUM: DOUBLE AMPUTATION AND REMARKS.

By GEORGE CURTIS,

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[Communicated by the Director-General of the Medical Department of the Navy.]

A KROOMAN, aged 28, was received into this hospital on August 4th, 1888, suffering from gangrene of the lower extremities, the line of demarcation being well formed in each in an irregular ring from four to six inches above the malleoli: pulse 80, weak; body temperature ranging from 100.4° to 103° F.; gangrenous parts very fetid, covered with bullæ, swollen and crepitant to touch.

native physicians, while he, on the other hand, repeatedly visited the infected kraals, as a proof of the powerlessness of Kafir skill. With their logical instinct all acknowledged that their "own men were no good at small-pox."

⁸ After the deaths mentioned, they declined treating the disease itself.

⁹ In one spot five were shut in by cordon. Every one of these succumbed, and the writer, with the help of a native policeman, buried the last to perish, who had already been partially eaten by wild dogs.

¹⁰ It is difficult to estimate the number of people who suffered during the epidemic; my numbers refer to those actually seen by myself.