were encouraged to shoot. This, again, is no argument against the policy suggested, but merely a confession that the experiment was not efficiently performed.

Such experiments as these are unsatisfactory and do not yield any definite results. For reliable information to be obtained it is necessary that the work should be done in a scientific manner, and on a sufficiently large scale in some particular district. A locality which is fairly well populated, and which contains plenty of tsetse fly and game should be chosen. An exact census of the population should be made, and the proportion suffering from trypanosomiasis determined. The same must be done in the case of the domestic animals, if such exist. An index of the percentage of infective tsetse fly must be ascertained. This is most important, as it gives a definite idea of the potential danger of the district. Finally, the game must be completely eradicated, and at the same time the percentage infected with the human and cattle trypanosomes determined, and when once the game has been driven out it must be kept back by vigorous action and not allowed to return. After an interval of some years the population, domestic stock, and tsetse fly must again be carefully examined. Then we should be in a position to decide definitely whether or not driving the wild fauna back from the sites of human habitations in fly areas would be advantageous on a general scale in tropical Africa. As such an experiment as this would take some years to accomplish, I consider that for the present the game laws should be removed in fly areas, and that Europeans and natives should be allowed to kill what they like, especially in the inhabited portions of these areas.

Recently sleeping sickness was discovered in a certain isolated fly belt—the Sebungwe district of Southern Rhodesia—which is roughly about 2,500 square miles in size. On a hurried survey some twelve cases of the disease were found, including one European. The human trypanosome was also found in certain of the antelope in the area. It has been said that the proper way to deal with the situation is to remove the entire population from the fly belt. This at first sight appears an admirable plan, and will certainly save the inhabitants. Is there, however, not another side to the question? When the population is withdrawn there will be established all the conditions of a game reserve. The wild animals will increase and gradually spread and probably with them the fly, until the invasion of surrounding districts demands further removals. Surely it is preferable to make a reasonable attempt to stamp out the disease than at the first alarm to abandon such regions to the game and fly without even attempting to dispute the ground with them.

It is for such reasons as these that I venture to suggest the desirability of undertaking the decisive experiment which I have outlined, as it is only by this means that the exact knowledge necessary for our future guidance can be acquired.

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A BILL, making insurance against disease and invalidity compulsory in Belgium, was presented to the Chamber some time ago by the Government. The organization of the service will be confided to the mutual aid societies, to recognized federations, and to mutualist local committees. The State and the employers will contribute, but in a less proportion than those directly interested. The insured will have a right to medical treatment and to a supply of such medicines as may be required; they will also receive one franc a day, starting from the tenth day of illness onwards. Permanent invalids will be pensioned. The maternity benefit will be thirty francs. The annual tax for non-members of mutual aid societies will be eighteen francs, of which twelve will be allocated for disease, and six for invalidity.

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PRELIMINARY REPORT ON AN OUTBREAK OF FEBRILE DISEASE IN AN INDUSTRIAL SCHOOL.

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THE cases which form the subject of this communication occurred during the years 1910 and 1911 in St. Thomas's Industrial School, Preston. I have not been able, so far, to complete the investigation to my satisfaction, and hence have delayed recording the cases. At the time when the epidemic terminated I had the strong suspicion that there was a "carrier" in the school. There has not been a chance of clearing up this point since 1911, but on reading the full and careful report by Drs. McGowan and McNeil on a somewhat similar epidemic which occurred in Tranent Industrial School, and was referred to in a note in the *BRITISH MEDICAL JOURNAL* of May 31st, p. 1178, I thought I might place my experience of an unusual series of cases before the profession.

Clinical Description.

The clinical description of the epidemic in the Preston school tallies exactly with that in the Tranent and other schools, noted in the report mentioned. To put it as briefly as possible, we had to deal with an illness of sudden onset, marked by headache, epigastric pain, vomiting in mild cases of undigested food, but in severe cases of large quantities of a distinctly greenish or yellowish fluid, accompanied in some cases by intense prostration, a temperature varying from normal to 105°, by herpes labialis in a certain proportion, and in 5 cases by definite consolidation at the base of the lungs. In the very worst cases there was a true septicaemic condition. Three of the boys were found dead in bed, having retired apparently well the previous evening; four others died within twenty-four hours of the onset of headache or vomiting. It will be noticed that only five of my cases developed any definite pneumonic condition, although over 80 boys attacked were carefully examined by me.

Post-mortem Findings.

At the first *post-mortem* examination made the thyroid and thymus were greatly enlarged, the spleen was slightly enlarged but otherwise normal, and Peyer's patches and mesenteric glands were very pronounced. The lungs were congested but crepitant. Dr. Delépine examined the stomach contents for traces of poison, with a negative result. In the second *post-mortem* examination a similar enlargement of the lymphoid structures was found, with marked congestion at the bases of both lungs, but no actual hepatization. At the third and fourth *post-mortem* examinations similar appearances were found. In neither case could I definitely make up my mind that the lungs showed anything beyond hypostatic congestion, nor were the thyroid and thymus so much enlarged as in the first two cases.

I was able to satisfy the coroner's jury in each case by declaring that I considered the deaths due to a pneumococcal or influenzal poison epidemic in the school, and acting virulently on boys suffering from status lymphaticus. I did not feel satisfied, though I thought I was on pretty good ground, as I knew that three of my teachers—the late Sir William Gairdner, the late Dr. Finlayson, and the late Professor Gemmell—had reported on what seemed to be an exactly similar series of cases occurring in a school in Glasgow in 1888, when the diagnoses severally made were malignant influenza, abortive pneumonia, and pneumonia complicating some unknown intoxication.

At the next *post-mortem* examination the findings were so like what I have seen in an early case of enteric fever that I thought it probable there might be some intestinal poison at work. The Peyer's patches and solitary follicles were distinctly congested and enlarged, and the corresponding mesenteric glands varied from the size of a bean to the size of a walnut and were much congested. The spleen was enlarged and soft. The thymus was only slightly enlarged. The thyroid was enlarged and dotted with pin-point abscesses. Loops of bile, punctures from the spleen, scrapings from the mesenteric glands and

Peyer's patches and from the pin-point abscesses in the thyroid were inoculated into bouillon. I consulted my friend, Dr. J. J. Buchan, M.O.H. St. Helens, who suggested to me that I should try the agglutinating reactions of serum from boys suffering from the disease with the different strains of intestinal bacilli which he had in his laboratory. Dr. Buchan has my sincerest thanks, as, but for the use of his laboratory and materials and the fact that he corroborated and checked my results, I could not have continued the investigations.

Bacteriological Results.

From the spleen, Peyer's patches, mesenteric glands, abscesses in the thyroid, and from the faeces in two cases, a bacillus was obtained which was actively motile. The growth on agar gave the usual *coli*-typhoid appearance. The bacillus was negative to Gram, did not produce indol, did not clot litmus milk. On Conradi-Drigalski plates bluish colonies, much smaller than the red colonies of *Bacillus coli* used as a control, and on picric acid green and McConkey's bile salt media colonies quite distinct from the *Bacillus coli* colonies were grown.

Agglutination Results.

Briefly, the *Bacillus coli*, typhoid bacillus, and Gaertner's bacillus were excluded at once, as even after two hours in a dilution of 1 to 50 there was no agglutination with blood taken from boys who were ill. The laboratory paratyphoid B and the laboratory aertrycke bacillus agglutinated the same serum in dilutions of 1 to 50 almost immediately and 1 to 100 in a few minutes. Some of the specimens taken from boys who had recovered from the disease for some time agglutinated the laboratory paratyphoid B bacillus, but not the laboratory aertrycke bacillus. The bacillus cultivated from the *post-mortem* examination was negative to a case of typhoid, but agglutinated each blood that was positive to the laboratory paratyphoid B.

Whether the bacillus isolated is actually the paratyphoid B or not, there can be no doubt it is closely related to that organism, as it gave similar cultural reactions, and agglutinated the same bloods. Each boy who was ill was positive both to the paratyphoid B and the bacillus isolated. Some of the boys who had not been ill gave negative reactions to both, though some gave positive reactions. Some of these latter admitted having had "the headache," which even in the case of boys who had been evidently affected was almost all that could be obtained in the way of complaint.

The question of the presence of a "carrier" in the school was considered seriously, but the demands of a general practice debarred me from systematically testing the blood of each boy. However, the last *post-mortem* examination I did inclined me more than ever to this idea, though I was not, unfortunately, able to make any further progress in the investigation. The liver in this case was a beautiful specimen of hobnailed cirrhosis. The boy was aged 12, there was no history or suspicion of syphilis. He died after a few hours' illness, but had had an attack of great severity about six months before. It seemed quite a plausible inference that there had been some chronic absorption from the bowel producing cirrhosis of the liver.

I think, then, that this epidemic deserves to be placed alongside of the other recorded epidemics. The descriptions of these resemble the Preston epidemic just as closely as they resemble the Tranent one; and the mere fact that in this latter epidemic the infective agent was the pneumococcus, in view of the atypical form of pneumonia that is present in these epidemics, does not warrant the conclusion that all such outbreaks are due to abortive pneumonia. The diagnosis of the late Professor Gemmell showed his superlative powers as a clinician when he wrote in 1888, "They seemed all to be victims of the same poison, although, in some, owing probably to personal idiosyncrasy, aided by favourable atmospheric conditions, it issued in pneumonia."

The epidemic at Birkdale Farm School, reported on by Dr. Coupland, though diagnosed as pneumonia, was not due to the pneumococcus. It is over two years since I read the report, and I am writing from memory, but I think the organism was said to be a motile bacillus. In this connexion it is interesting to recall the epidemic of

pneumonia in Middlesbrough in 1888, investigated by Dr. Ballard and Professor Klein. There were over 1,600 cases, with more than 300 deaths. According to Professor Klein, the germ at work was a motile bacillus, and from the description of the cultural appearances of this organism on gelatine, given in the *Treatise on Hygiene*, by Stevenson and Murphy, the appearances resembled more those of the *coli*-typhoid group than the pneumococcus. It is also of interest to recall the observation that bacon bought in the infected districts gave rise to pneumonia in mice fed upon it. Considering that paratyphoid B belongs to the meat-poisoning group, this fact may be of importance. However, I made nothing of my investigations in this direction in the Preston cases.

In view of the positive finding of the pneumococcus in the Tranent epidemic and the positive finding of a bacillus of the *coli*-typhoid group in the Preston epidemic, I think the search for a solution of the problem may well continue. It is only too likely that a chance for further investigation will present itself before long, considering the histories of the industrial schools of the country. I am, however, not sure that this type of disease is limited to the inmates of these institutions, as I cannot help being struck with the frequency with which at coroners' inquiries, deaths from acute conditions of a few hours' duration are returned as deaths from acute pneumonia. It seems to me possible that there are toxæmias of alimentary origin masquerading up and down the country as malignant influenza, gastric influenza, and fulminant pneumonia, in addition to the undoubted diseases of these names. It is in the hope that some one with sufficient time, and the fortune to meet cases of this class, may still further investigate the subject, and to keep the question of the naming of the disease open till we have further knowledge, that I have written this communication.

NOTES OF A CASE OF "NODULAR LEUKAEMIA."

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G. M., a boy aged 10, was seen by Dr. Reid, on November 2nd, 1912, for pain in his right hip and leg. As no improvement followed rest in bed, Dr. Reid admitted him to the Throne Children's Hospital on November 13th. The pain closely resembled that of right hip-joint disease, and splints were applied; but the pain soon developed in the other side. On December 8th enlarged glands were found below the left lower jaw; some teeth were loose and were removed. Within a few days a swelling appeared above the right zygoma, and subsequently above the left, and later in the groins. He was rapidly losing flesh, but there were as yet no head symptoms.

On December 15th there was loss of vision in the right eye and later in the left, and slight proptosis. Some spinal fluid was withdrawn by Mr. Stevenson and examined by Dr. Thomson. On December 27th he was seen also by Dr. Calwell and Dr. Thomson, and at this date his condition was much worse; he was only partially conscious; he did what he was told if he was given time; his answers were fairly intelligent, but delayed, and were chiefly in monosyllables; there were large symmetrical swellings above each zygoma, and the proptosis was more marked; there were sordes on the lips; the abdomen was full and tender; it was examined with difficulty, but no enlargement of liver, spleen, or kidney was detected; all the lymphatic glands—cervical, axillary, inguinal—were enlarged and shotty; on the skin generally, and on that of the abdomen in particular, there were palpable minute millet-seed-like nodules; there was some head retraction, well-marked Kernig's sign, and priapism; he was now blind, and later became deaf; there was also paralysis of