disease, but might eradicate it altogether if the persons evicted were sent sufficiently far inland to be out of reach of the tsetse, and prevented from returning for a period of seven years at least, by which time all those with sleeping sickness would probably have died off.

This measure, however, could not be carried out until all the areas of distribution of the different species of tsetse flies in the two Protectorates had been precisely mapped. The mapping of these areas I believe to be the first step in combating the spread of sleeping sickness. With such a map before one, it would be easy to determine the direction of spread most likely to occur from any given infective area, and what measures of prevention, such as the closing of certain routes, or the evacuation of certain districts, promised the best hope of success.

If two or three competent inspectors were appointed by the Governments of the Protectorates to investigate and report upon the exact distribution of the "fly,"—a work which could be completed in a few months—a great step in advance would be made, and if evacuation were not insisted upon prophylactic measures within the dangerous zones might then be elaborated with a prospect of success. Habitations, rest-houses, or even stations might be moved to more healthy sites; watering and washing places might be screened, or cleared of all forest and bush; horses and cattle, supposing these to be a possible source of danger to human beings, might be protected when obliged to pass through the areas; crews and passengers of steamers on rivers and lakes might be safeguarded in some way when stopping at dangerous wood posts; white men obliged to live at those posts might be provided with wire net verandahs; and any case of sleeping sickness that was detected would, of course, be carefully segregated or deported inland. Inspectors could study the habits of the "flies," of which at present we know comparatively little. They would investigate the question of whether the fly areas were permanent, or tended to vary in position, and whether the flies were dangerous all the year round, or bit only during two or three months in the year, which is probable. They would soon be in a position to suggest means for the protection of the natives from bites by the use of some ammoniacal or other strong smelling substance smeared on their bodies, or to devise methods which would enable the flies themselves or their pupae to be effectually destroyed. Prevention is better than cure, and it seems to me that the former is not receiving the attention that it deserves in view of the gravity of the disease and the great probability of its breaking out in other "fly" infested regions.

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SCIENTIFIC GRANTS COMMITTEE

OF THE

British Medical Association.

REPORT LXXXVIII.

THE BACTERIOLOGY OF CERTAIN PARTS OF THE HUMAN ALIMENTARY CANAL AND OF THE INFLAMMATORY PROCESSES ARISING THEREFROM.

BY JOHN T. HEWETSON, M.D., M.CH., F.R.C.S.,

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THE following abstract represents the basis of my results up to date. As it is my intention to continue the research for another two years, I have drawn only such conclusions as this early stage of the investigation will warrant. The literature of the subject has been purposely avoided, owing to the fact that it will be more convenient to deal with it at the end of my research.

In view of the great importance attached to anaërobic growths by many French bacteriologists—notably, Rist, Veillon, Faber, Cortret, Halle, Tresser, and others—I determined from the outset to make both aërobic and anaërobic cultivations from each specimen of pus or other substance examined. The anaërobic inoculations were made in deep glucose agar, deep glucose gelatine, and similar stabs kept in Buchner's tubes in atmospheres of nitrogen. The pathogenicity of organisms has been ascertained only since the beginning of the present year, owing to the fact that the University of Birmingham has possessed licensed premises only during that time.

APPENDIX AND APPENDICITIS.

In cases of non-suppurative appendicitis aërobic and anaërobic cultivations were made from the proximal end of the excised appendix, and also from the cavity of the appendix near the tip. The appendix was then carefully investigated to determine whether its lumen was at any point interrupted or completely stenosed. In cases of suppurative appendicitis the pus was collected into sterile pipettes, from which films and aërobic and anaërobic cultivations were made.

Appendix in Non-suppurative Appendicitis.—In 44 cases the appendix was completely stenosed in 25, and was open throughout its entire length in 19. Of the 25 cases of stenosis, the contents of the distal chamber were sterile in 11 and gave a growth in 14. In the 14 giving a growth the following organisms were found:

Bacillus coli alone in 11.
Bacillus coli and a torula in 1.
Staphylococcus pyogenes aureus in 1.
A streptobacillus in 1.

The proximal side of the stenosis was examined in 4 cases. Of these, bacillus coli was found in 3 and 1 was sterile. Of the 19 cases showing no stenosis, 18 gave a growth and one was sterile. In the 18 showing a growth the following organisms were found:

Bacillus coli alone in 16.
Bacillus coli and staphylococcus albus in 1.
Streptococcus pyogenes in 1.

On eight occasions a pure growth of bacillus coli found in the appendix was injected into the peritoneal cavity of rats, and was very pathogenic in 6 cases, and produced little or no effect in 2. In the 44 appendices 4 concretions were found.

Appendix in Suppurative Appendicitis.—It is quite impossible to form any idea of the nature of the organisms present by means of films of the pus alone. Streptococci, micrococci, and even staphylococci are very prone to appear in pus films as almost pure diplococci, and may even appear to be encapsuled. The value of films, though considerably limited, generally tells you whether you are dealing with a pure or a mixed infection. You can, as a rule, readily distinguish between cocci and bacilli. One of the objects of my research has been to see how far the appearances, as shown by films, are borne out by the revelation of the cultivation methods. This leads me to speak of the importance attached to anaërobic cultures by the French bacteriologists. Rist, in a paper published in the BRITISH MEDICAL JOURNAL of October 12th, 1901, claims that many organisms in suppurative appendicitis are overlooked if aërobic cultivations alone are made. He draws attention to the fact that many varieties of organisms are seen in the films of pus which cannot be grown on aërobic cultures, and he concludes that these can only be obtained by anaërobic methods. My investigations lead me to a very different conclusion. In all my 44 cases of suppurative appendicitis I only once found the anaërobic cultures to reveal organisms that the aërobic cultures did not; that was in Case VI, where a diplococcus was found in the glucose agar stab along with bacillus coli, whereas the aërobic culture showed bacillus coli only. This one instance might easily be explained by supposing that the bacillus coli had overgrown the diplococcus in the aërobic cultivations. There can be little doubt that bacillus coli grows much more vigorously aërobically than anaërobically; for this reason, if a film is made from an anaërobic stab, or if subcultures are made on agar slopes from such a stab, there is much less likelihood of missing the mixed growth than if the aërobic cultures only are used.

During the whole of my investigation upon suppuration I have been profoundly disappointed that the results of Rist, Veillon, and others have not been confirmed in my hands. I had hoped for great results from the anaërobic cultures, but, after a careful trial, I have come to the conclusion that the great majority of organisms found in suppuration or in the human body are facultative anaërobes, and that if a sufficient number of strokes are made there will be little difficulty in

isolating the organisms and in preventing—in appendicitis, at least—the overgrowth of other organisms by the almost ever-present bacillus coli. This matter of anaërobic cultures requires further investigation on my part, but I already feel justified in dissenting from the view expressed by the Paris school.

In reviewing the films of pus that were made in suppurative appendicitis, I find that, out of 42 cases, the films in 29 showed bacilli and cocci. In these 29 cases, I find that the cultivations of 22 showed a mixed growth of bacilli and cocci. In the remaining 7 cases, one organism alone appeared in cultivation. In 5 of them it was coccal, whilst in the remaining two it was a bacillary growth. Seeing that I made careful aërobic and anaërobic growths of each specimen of pus, I feel that I am justified in assuming that in these 7 cases one of the organisms had died out before the abscess cavity was opened. This death of the organism in its own pus is further borne out by following up cases of suppurative appendicitis for some time after operation, as I have done in several of my cases. I found in those cases where the pus at the operation gave a mixed growth of bacilli and cocci, when the discharge from the wound was examined some days after operation, that it gave a pure coccal growth, even when aërobic and anaërobic cultivations were made. Furthermore, in two of my cases of appendicitis, it was found that the pus around the appendix was perfectly sterile; neither of these two cases could be regarded clinically as tuberculous. These facts present strong evidence in favour of the view that organisms not infrequently die in an abscess cavity previous to its evacuation.

The following summary shows the relative frequency of each organism found by cultivation in my 44 cases of suppurative appendicitis:

Bacillus coli was present in	34
Micrococci in pairs, chains and groups ...	18
Streptococcus pyogenes	7
Diplococci	5
Bacillus pyocyaneus	5
Pneumococci (Fraenkel)	2
Diplobacillus	1
Actinomycosis	1

It will be seen that bacillus coli is by far the most common organism found. It grows very readily anaërobically, though its morphological characters are somewhat different from those found in aërobic growths. Anaërobically, the bacilli are much larger and more irregular in size; they tend to form chains; are much more sluggishly motile and retain aniline gentian violet stain much more tenaciously in Gram's method than in aërobic growths. When aërobic subcultures are made from anaërobic growths, of bacillus coli, it quickly assumes its usual morphological characters. I have only been able to test the pathogenicity of bacillus coli found in suppurative appendicitis on five occasions. It was in all the five cases so violently pathogenic when injected intraperitoneally that it caused the death of rats in an average of ten hours.

The micrococcus which occurred in 18 cases, generally associated with bacillus coli, and only once alone, needs a short description. It scarcely forms a haze in broth, but appears as a flocculent scaly precipitate which tends to settle to the bottom. On agar, in twenty-four hours, it appears as minute pin-point colonies raised above the surface with well-defined sinuous margins. In the course of three or four days the colonies enlarge somewhat and become less defined in outline. In deep gelatine and agar stabs it grows as a fine granular pillar with minute colonies appearing at the side. It does not form gas nor acid. It neither liquefies gelatine nor coagulates milk. It grows very readily anaërobically; it dies out on ordinary media in five or six days. I have injected this organism from three cases of appendical pus into rats, both intraperitoneally and subcutaneously, on many occasions without the slightest result. Under the microscope it appears as a small coccus slightly elongated, arranged in pairs, in chains, and in groups. The coccus is much smaller than a staphylococcus pyogenes or streptococcus pyogenes, and retains aniline gentian violet stain in Gram's method much less tenaciously than either of them.

Bacillus pyocyaneus was found in five cases—in one as the only organism present, in the other four it was associated with other organisms. It was found to be very pathogenic to rats when injected peritoneally. Fraenkel's pneumococcus was found in three cases and was verified by experimental inoculation.

Actinomycosis was found in one of my cases, not only in the pus around the appendix, but also in the liver *post mortem*.

Abdominal Suppuration of Doubtful Origin.

The following organisms were found in 6 cases:

Bacillus coli in	2
Streptococcus pyogenes in	2
Fraenkel's pneumococcus in	1
Staphylococcus pyogenes aureus in ...	1
Actinomycosis in	1
Micrococci in	1
An unknown coccus in pairs and chains in	1

Biliary Passages.

Cultivations were invariably made in the operating theatre. A quantity of bile was taken by means of sterilized blunt spoons from the gall bladder, cystic duct or common bile duct, and smeared over agar, made into glucose agar stabs and mixed with peptone broth. In collecting human bile, in order to test its antiseptic properties, one end of a sterile rubber catheter was inserted down the cystic duct, whilst the other passed through a cotton wool plug into a sterilized beaker.

In practically all the 19 cases in which the biliary passages were opened, the operation was performed during a quiescent period. Out of the 19, 3 alone were sterile. One of the 3 was a case of malignant disease of the liver, and the other 2 showed nothing of an inflammatory nature. In the remaining 16 cases the following organisms were found:

	Times.
Bacillus coli	8
Micrococci	5
Streptococcus pyogenes	4
Cocci of unknown type	3
Bacillus subtilis	2
Bacillus typhosus	1
Staphylococcus aureus	1
Torula	1
Minute bacillus	1

In all the 16 cases a large number of gall stones were present. It is quite certain that the biliary passages, after attacks of biliary colic, in which gall stones exist, are rarely sterile. The following organisms were inoculated into test tubes containing a quantity of pure sterile human bile—namely, staphylococcus pyogenes aureus, streptococcus pyogenes, pneumo-bacillus, diphtheria bacillus, bacillus pyocyaneus, bacillus coli, bacillus typhosus, bacillus anthracis, and bacillus subtilis. Control inoculations were made of the same organisms in peptone broth. It was found that each of the above organisms grew as profusely in human bile as they did in peptone broth. In my case of malignant disease, the bile of which was sterile at the time of the operation, it was found, seven days after the operation, that the bile, discharging through the fistula, gave a rich growth of bacillus pyocyaneus. All these facts convince me that the supposed antiseptic properties of human bile have been greatly exaggerated, and that it possesses no bactericidal property whatever.

Stomach and Jejunum.

Contents of these viscera have been examined during operations upon the stomach in cases of (1) cancer of the oesophagus (6 cases); (2) the stomach and jejunum, with or without ulceration, during gastro-jejunostomy (36 cases); (3) the stomach in newly-slaughtered animals (22 cases).

The cultivations in the above cases were made direct from the open viscus during operation by means of large sterile blunt spoons. By this means a considerable quantity of the contents could be obtained. The contents were immediately used for making agar strokes, glucose agar stabs, and inoculations into peptone broth. Films were generally made on glass slides at the same time.

In cancer of the oesophagus:
The stomach was sterile in 50 per cent. of cases.
In gastric dilatation without ulceration:
The stomach was sterile in 83 per cent. of cases.
The jejunum ,, 82 ,, ,,
In gastric dilatation with ulceration:
The stomach was sterile in 28 per cent. of cases.
The jejunum ,, 40 ,, ,,
In cultivations from the stomachs of newly-slaughtered ruminants:
The first stomach was sterile in 12 per cent.
The fourth stomach ,, 44 ,,
Lorrain-Smith and Tennant[1] found in healthy rabbits that:
The stomach showed 22 per cent. of sterile plates.
The jejunum ,, 62 ,, ,, ,,
In healthy dogs:
The jejunum showed 50 per cent. of sterile plates.
In dogs with worms:
The jejunum showed 30 per cent. of sterile plates.

In reviewing the above-stated facts, it must be remembered that all the cultivations upon the human subject were made when the stomach was in a state of prolonged fast (from five

to eighteen hours), and practically empty. In the case of the cultivations made from newly-slaughtered animals, although they have fasted eighteen and twenty-four hours, the stomach contained in all cases a large quantity of undigested food, and the animals were ruminants. Hitherto cultivations from the stomach have been made by means of stomach tubes, which must of necessity pass over the septic mouth, throat, and oesophagus, and thus a very fruitful source of infection has been introduced into the test.

My own cultivations in the human subject, and in animals, as well as those by Lorrain-Smith and Tennant in animals, have been made direct from the various viscera under the strictest aseptic precautions. The results obtained are thus much more free from error than those obtained through the stomach tube by such workers as Gillespie, Macfadyen, and others.

It will be seen that the percentage of sterile stomachs bears a very striking relation to the question of ulceration. Where no ulceration is present, even in a dilated stomach, the great majority of stomachs are sterile after fasting, whereas, when ulceration is present, the degree of sterility is comparatively low, even after a long fast. It is of interest to observe that Lorrain-Smith and Tennant found that where worms existed in the dog's intestine the degree of sterility of the jejunum was considerably less than it was in health.

This would suggest that ulceration allows the organisms to gain a firm hold in one part of the stomach, so that it is difficult to rid that organ of germs, even by long fasting, or else it means that the ulcerated area is accompanied by a quality of gastric juice which is not sufficiently bactericidal to destroy the organisms present, or as they fall from the oesophagus during deglutition of the mouth secretions. It must be quite certain that we are swallowing, from moment to moment, large quantities of active bacteria, which live quite easily in the mouth, throat, and oesophagus. These organisms falling into the stomach are readily extinguished by healthy gastric juice, less readily if there be any degree of ulceration present, or if the gastric juice is impaired from any cause whatever.

In taking all my cases of operation upon the human stomach, without regard to any special divisions, I find that I took cultivations from 36 cases, and of these exactly 18 were sterile.

Of the remaining 18 which showed a growth of organisms the following germs were found:

Stomach.	Times.
Torula	7
Streptobacilli	3
Bacillus coli	3
Micrococci	3
Streptococcus pyogenes	2
Bacillus subtilis	2
Staphylococcus albus	2
Sarcinae	2
Bacillus proteus	1
A minute bacillus	1

I was able to take cultivations from the human jejunum on 29 occasions, and of these 16 were sterile. Of the remaining 13 which gave a growth, the following organisms were found:

Jejunum.	Times.
Staphylococci	5
Bacillus coli	3
Torula	2
Streptococcus pyogenes	1
Sarcinae...	1
Streptobacilli	1
Bacillus subtilis	1
Bacillus proteus	1

I injected cultures of 12 separate organisms found in the stomach and jejunum into the peritoneal cavity of rodents, in each case three or four times, without producing the slightest effect. The pathogenicity, therefore, of these organisms which I have found in the human stomach and jejunum has been, as far as I have investigated the matter, *nil*.

The experiments which I conducted upon myself and afterwards upon gastrostomy patients were performed with the view of testing the rapidity of the bactericidal action of healthy gastric juice. In testing my own gastric juice large quantities of peptone broth containing a rich growth of known organisms were introduced into my empty stomach through a stomach tube. The stomach tube was passed every fifteen minutes for two hours, and a small quantity of the stomach contents was removed. From each quantity films were made and culture media inoculated. In the case of gastrostomy patients rich broth cultures were introduced into the empty stomach through the healthy gastrostomy wound, and films were made and culture media inoculated every five minutes for two hours. No discomfort was ever experienced either by myself or by any of the gastrostomy patients after taking rich growths of such organisms as staphylococcus pyogenes aureus, staphylococcus pyogenes citreus, and bacillus pyocyaneus. I used on myself virulent cultures from cases of acute osteomyelitis and pyaemia. Although the organisms could be found in the films of the stomach contents up to the end of two hours, it was ascertained that the ordinary pyogenic cocci were killed in from thirty to forty-five minutes, whilst bacilli were killed in from sixty to ninety minutes. These figures represent the average of a large number of tests performed upon myself and upon gastrostomy patients.

Of course it might be said that the organisms, after passing into the duodenum, revive and become active again. The results of my cultivations from the human jejunum would suggest that such a revival is very unlikely. What is certain, however, is that the organisms become so altered by the gastric juice that they will not grow upon artificial media, such as peptone broth, and if this is the case there is little to fear from their pathogenicity. It is, of course, obvious that sporulating organisms stand a much better chance of successfully running the gauntlet of the gastric juice than those organisms that do not form spores. Nevertheless, I am of the opinion that our gastric juice is our great sheet anchor of defence against those organisms which are swallowed constantly in sputum and during meals. Such a degree of sterility of the stomach and jejunum considerably diminishes the danger of sepsis during operations upon this portion of the alimentary canal. If general peritonitis follows operation upon the stomach and jejunum, it will almost always be due to infection from without and not from those viscera themselves. It is, therefore, important for surgeons to realize that the success of the operation of gastric jejunostomy or similar operations on this part of the alimentary canal depends more upon such factors as constitutional strength of the patient, the mechanics of their mode of union, and upon the prevention of sepsis from without than upon the liability of general peritoneal infection from the opened viscera.

The results of cultivations from the stomach would also suggest that those elaborate methods of stomach lavage adopted by some surgeons prior to operation are quite unnecessary in the great majority of cases. The procedure is not without great discomfort to the patient, and if there is ulceration present it is not without its dangers, and will be of little avail in removing organisms from the ulcerated gastric mucosa. This degree of sterility of the stomach and jejunum further enables us to explain why so many of those cases of gunshot wounds or stabs in the region of the upper abdomen get perfectly well without the aid of surgical measures.

Perforations of the Stomach and Duodenum.

The fluid in the general peritoneal cavity was collected at the operation and used for the purpose of cultivations upon various culture media as well as for the making of films and glass slides. In the case of localized abscesses arising from these organs the pus was treated in a similar manner. Of the acute perforations of the stomach and duodenum there were 10 cases. Of these 10, in no less than 4 cases the peritoneal contents were sterile, no organisms being seen either by film or by cultivation methods. These 4 cases had perforated respectively twenty-four, twenty-eight, two, and seven and a half hours previous to operation. If we follow up these 4 cases, we find that two of them got quite well, the third lived for two weeks, then died of a double pneumonia with a peritoneal cavity that was perfectly healthy; whilst the fourth sterile case died in twenty-four hours, and it was found that, although the gastric perforation had been securely stitched, a traumatic perforation had been made into the lower part of the jejunum, through which intestinal contents were pouring into the peritoneal cavity. It is therefore probable that, had no complication followed in 2 of these 4 cases, they would all have recovered.

Of the remaining 6 cases in which organisms were found in the peritoneal cavity, 4 died and 2 recovered. The 2 that recovered had both been perforated exactly five hours. In one of the cases which recovered, my cultivation was taken, not at the operation, but on the following day, from the bottom of the drainage tube leading into the peritoneal cavity. I found on this occasion a growth of a minute micrococcus and of a bacillus arranged in Chinese figures like diphtheria.

In the second successful case I found at the operation that the peritoneal contents showed no organisms by film, and only two colonies of a large sarcina. The following organisms have been found in the 6 cases which gave a growth from the peritoneal contents:

	Times.
Large cocci	3
Micrococci	2
Torula	1
Bacillus coli	1
Sarcina	1
Other bacilli	2

I have not as yet been able to test the pathogenicity of the various organisms found in the peritoneal cavity in cases of perforated gastric ulcer. It seems to me that the initial pain and collapse of perforation of the stomach is, in all probability, due to the outpouring of a quantity of highly-irritating gastric juice, which has a chemical action on the sensitive peritoneal surface. Subsequently, as organisms are swallowed from the mouth, either in sputum or in food, these pass through the stomach wall at once before they can be acted upon by the gastric juice. It is more than likely that directly after perforation of a gastric ulcer occurs the stomach ceases to secrete gastric juice, as was seen in one of my cases in which, forty-eight hours after perforation, the stomach still contained undigested pork and potatoes that had been swallowed before perforation. The question of cure after operation depends largely upon the extent to which the peritoneal cavity has been invaded by organisms, rather than upon the length of time that has elapsed since perforation. Of course this question of time is important, in that it corresponds roughly to the extent of peritoneal infection. It will be seen, however, that in one of the cases which gave sterile growths from the peritoneal contents, the stomach had been perforated twenty-eight hours. Such a length of time might be considered to indicate almost certain death, yet the case recovered and the absence of organisms serves to explain the result.

As a matter of experience, we know that if a meal has just been taken prior to perforation, the prognosis is less favourable, owing, as we suppose, to the fact that peritoneal infection is more likely to follow. The comparative degree of sterility of the human stomach, and the non-pathogenicity of organisms found in that viscus serve to convince me that a general infection of the peritoneal cavity does not take place for some time after perforation occurs, unless a meal has just been taken. If the patient could be prevented from swallowing sputum or food, whenever the symptoms of perforated gastric ulcer occur, the risk of peritoneal infection would be delayed and perhaps obviated. This question of bacterial invasion of the peritoneum will receive more careful investigation on my part, especially in respect to the pathogenicity of the organisms found. The four cases of perigastric and periduodenal suppuration reveal the following organisms:

	Occasions.
Bacillus coli	2
Micrococci	2
Streptococcus pyogenes	1
A large coccus	1
Bacillus subtilis	1
Actinomycosis	1

In conclusion, I wish to thank Professor Leith for placing his laboratory so willingly at my disposal, Professor Barling for the large quantity of clinical material from his private and hospital practice, and all my senior colleagues at the General Hospital for their courtesy in furthering my research.

REFERENCE.
[1] BRITISH MEDICAL JOURNAL, December, 1902.

BEQUESTS TO HOSPITALS.—Under the will of the late Mrs. Esther Sarah Burnes, of Ladbroke Square, Notting Hill, £5,000 is bequeathed to the Samaritan Hospital for Women, £3,000 to the British Home and Hospital for Incurables, Streatham, and £2,000 to the Hospital for Incurables, Putney. The late Miss Mary Ann Young, of South Shields, left £11,000 to the Ingham Infirmary, a part for the endowment of a ward and the remainder for general purposes. The late Mrs. Elizabeth Peacock, of Pendleton, Salford, bequeathed £1,000 each to the Hospital for Sick Children, Pendlebury, to endow a cot in memory of her daughter, and to the Cancer Pavilion and Home, Manchester; £500 each to St. Mary's Hospital, Manchester, and the Northern Counties Hospital, and, subject to a life interest, £1,000 to the Salford and Pendleton Hospital.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, ETC.

A CASE OF TETANUS TREATED BY CHLORAL HYDRATE: RECOVERY.

ON July 9th a man, aged 52, was admitted to the Union Infirmary suffering from inability to open his mouth. He was in a filthy state, and after being sponged was examined for bruises or wounds, tetanus having been suspected. Several old bruises were found on the legs, and were dressed with a lotion of biniodide of mercury (1 in 1,000), although none showed any signs of active inflammatory mischief. The next morning, however, he was groaning with pain, and had well-marked symptoms of tetanus. His jaws were tightly closed and he had great difficulty in swallowing fluids, which were given through a space left by a decayed tooth. His head could not be moved on his body, there was marked arching of the back, the legs were rigid and widely separated, and he was seized with painful spasms every two or three minutes, affecting chiefly the lower part of the trunk and legs. His heart was normal and his pulse full and regular. I ordered him chloral hydrate ℥j in water as a draught. This lessened the number and severity of the spasms and made little change in the pulse. The drug was then given in gr. xx doses every four hours, with an occasional dose at the end of two hours when the spasms were severe (he had four such extra doses in all). This treatment reduced the number of spasms to about eighteen in the day, and by the fifth night the patient slept for several hours, while by the ninth day the spasms had ceased. Up to this time distinct relief from pain followed every dose of the drug, the patient often appealing for an extra dose. At the end of ten days the lower limbs were relaxed, but the abdominal wall was still rigid and the back arched, although not nearly so painful. About this time a scarlatiniform rash appeared on the back and front of the trunk, due to the administration of the chloral, and as the symptoms were much relieved the chloral was ordered to be given every six hours, but when this was done several spasms took place, and the drug was again given every four hours until the twelfth day. On that day the abdominal rigidity and arching of the back having disappeared, the drug was stopped; but a dose had to be administered every morning for the next five days, as without it the patient was unable to open his mouth for food. He had no such trouble in the latter part of the day. The treatment with chloral caused no bad symptoms, except the rash, which disappeared in four days. All through the illness the patient took nourishment well, although he was not able to get out of bed before the end of a month. His convalescence was aided by massage of all the muscles.

Hatfield. ALEXANDER BINNING, M.B.

THE PROTECTIVE POWER OF VACCINATION.

RECORDS of single cases are not worth much, and fortunately the value of vaccination is based on very extensive evidence, but to instance how effectual efficient vaccination is in protecting from small-pox I cite the following. A patient admitted to hospital under my care in 1902 was a visitor, a young woman who had come to Southend with the incipient symptoms of small-pox. She had a baby aged 6 months with her. As no proper provision could be made for the baby outside, and an examination of its arm revealed three typical full-sized vaccination scars of a satisfactory nature, I took the baby into hospital with its mother. In spite of its tender age, and the concentrated poison of small-pox in which it lived at the hospital, it remained perfectly well—a striking testimony to the efficacy of vaccination in affording protection against small-pox during a most susceptible time of life.

J. T. C. NASH, M.D.,
Medical Officer of Health, Southend-on-Sea.

COLCHICUM CORM IN ACUTE GOUT.

SHOULD any one be dissatisfied with the action of colchicum wine or tincture, let him try the corm itself powdered, and far better results will be obtained. Larger equivalent doses can be given without the undesirable effects, whilst with an equal amount the improvement in the condition will be much accelerated.

London, S.W. D. DUNCAN.