originates, transmits, or intensifies nervous currents. If its possible modification of this disease is advantageously affected by thorium hydroxide the benefit may thus be explained. Possibly no direct effect is obtained, but at any rate it is worth a trial, and something is being done for this hitherto incurable condition. In the congestive vertigo of this disease the fluid extract of ergot has been tried, upon the theory that it acts as a vascular stimulant upon the vaso-motor centre, causing a contraction of the cerebral arterioles. It has been recommended to be given every few hours during the day, and alternating with bromide at night. For the seizures occurring in epilepsy, general paralysis, and puerperal insanity I have used chloroform inhalation and chloral, but prefer the latter.

I have used ergot for insanity about the climacteric period associated with menorrhagia. There are certain headaches and neuralgias about the "change of life" which almost incapacitate the sufferer from social and domestic duties. Those so-called lancinating pains may be associated with mental restlessness and actual insanity, and no remedy seems to be of permanently good effect. I have used antipyrin as an analgesic in such cases in doses from gr. v to gr. xx, but care is needed from the depressing cardiac effect, and antipyrin always needs a stimulant to follow. Phenacetin gr. x with quinae sulph. gr. j has proved a useful remedy, as also the citrate of caffeine in gr. ij doses. The peculiar restlessness of mental depression in regard to which there is no definite pathology, other than that it appears to have its basis in a summation of the organic sensations—and presumably caused by pneumogastric enervation—is often benefited by citrate of caffeine associated with small repeated doses of opium. It is in such cases that erythroxylon coca has been so much used, possibly also it is in similar cases that alcohol fulfils a definite therapeutic rôle, but it is necessary to beware of initiating a pernicious habit. As to alcohol, in the great majority of cases of insanity it is not essential, but I do not hesitate to use it in small doses every few hours in the exhaustion of acute mania, more especially in the puerperal form of insanity. It often interferes with digestion, and it is always best administered with liquid nourishment—either with milk, soup, beef tea, or broth. In acute insanity it is often difficult to get the patient to take solid food, but by coaxing he may be persuaded to take fluids, and alcohol may thus be effectively combined with it. The physiological effects of alcohol can be demonstrated by the sphygmograph. Alcohol increases the force and frequency of the heart's action and stimulates vascular tone, but in large doses alcohol acts as a definite depressant. Owing to this physiological action it is a dangerous remedy in the various forms of mental depression, for it gives the feeling of buoyancy and stimulation without any lasting benefit and without the sustaining action of food. In the excitement of mania the skin acts more freely as an eliminating organ than it does in depressed mental states, and more alcohol can therefore be tolerated in cases of mania. Strychnine gr. $\frac{3}{16}$ subcutaneously injected and digitalis in m x doses every hour for three hours and then stopping are useful in cases of exhaustion from acute insanity, also in cases of cerebral anaemia as a cardiac stimulant, especially when forced feeding is being adopted. Strychnine affects the whole nervous centres and not the spinal cord only. Nux vomica m v may be used with much good effect in the convalescing stages as a general tonic. The prolonged use of strychnine or nux vomica is ineffective, and they are better given alternately for a few weeks and with about one week's interval.

In the earlier part of my paper I have referred to eliminating medicines. The chief eliminating organs are the skin, the lungs, the kidneys, and the bowels. In no morbid condition is it more important to clear the *prima via* than it is in insanity. Laxatives and purgatives are absolutely necessary, and in free doses—usually twice the amount required by a healthy person. Depressed mental states, irritability, and even the convulsive seizures in cases of general paralysis or epilepsy are often due to auto-intoxication caused by constipation, and consequent absorption of poisons from the alimentary canal. Constipation, indeed, is the bane of insane persons, and podophyllin, elaterium, colocynth, calomel, and at times even croton oil, are necessary in full doses to cause a free action of the bowels.

The hydragogue cathartics can be freely administered in cases of insanity, and "house mixture"—the pharmacopoeial hst. sennae co.—is a safe and salutary corrective in such cases, and may be systematically administered once or twice

a week with much benefit. The action of the skin and kidneys is assisted by the administration of diuretics and diaphoretics, but the best of medicines is exercise out of doors, which causes the lungs and skin to act freely and naturally, and which facilitates the exudation of substances noxious to healthy mental action.

It is hardly necessary in such a paper as this, and in addressing such readers, to emphasize the study of the various diatheses, to know our patient with his various idiosyncrasies—namely, his tendency to gout, rheumatism, anaemia, renal or cardiac disease, phthisis, myxoedema, ague, or syphilitic lesions, which all require special treatment. The question of organo-therapy and serum-therapeutics is also too wide to be discussed within the compass of a lecture such as this, but I will summarize my suggestions by recommending in cases of sudden or acute insanity: first, the isolation of the patient in a quiet or darkened room; forced alimentation; the control of motor excitement; reducing febrile states by tepid baths; sustaining the strength; and above all the inducing of sleep—these to be the cardinal lines of our treatment.

In conclusion, I may add that insanity may be modified in a community by the inspiration of high ideals, by agencies which are beneficial to sobriety and self-respect. I mean spiritual or moral agencies. These kindle a spirit of fervour, sympathy, and right-mindedness among the roughest characters, and in the most crowded areas of our cities. They are means which are peculiarly within the reach of medical men, who have opportunities of furthering them such as are afforded to no other profession.

AN INQUIRY INTO THE EXISTENCE OF TYPHOID FEVER IN BERMUDA.

BY

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[Communicated by the DIRECTOR-GENERAL, R.N.]

THE following paper represents the results of an investigation carried out to determine a question of considerable general interest, namely, whether cases of locally-acquired typhoid fever ever occur in Bermuda. Medical officers, both of the army and navy, stationed in Bermuda often have occasion to enter cases as typhoid fever in their returns, but it is common in the island to take the view that the disease does not exist. This opinion many officers of both services have been inclined to accept, and hence to regard the cases encountered as paratyphoid and not true typhoid.

In order, therefore, to settle the question, a series of tests were carried out in the naval laboratory at Bermuda, and to ensure thorough control three strains of undoubted Eberth and a pure culture of bacillus coli communis were obtained and put through the subjoined series of tests side by side with three strains of organism obtained from the spleens of three fatal cases of this disease dying in the Royal Naval Hospital at Bermuda. Details of *post-mortem* examinations, etc., are purposely given fairly fully.

The histories of all three cases show that their disease must have been contracted in Bermuda. One case died from toxæmia, one from perforation, and one from hæmorrhage.

Sources of Cultures Tested.

Strain A—Bacillus coli communis	Supplied from laboratory of R.N. Hospital, Haslar, by the courtesy of Fleet-Surgeon Bassett-Smith.
Strain D—Bacillus typhosus	
Strain B—Bacillus typhosus from New York	Supplied from military laboratory, Bermuda, by the courtesy of Captain Wanhill, R.A.M.C.
Strain C—Bacillus typhosus from England	
Strain F	Obtained as stated in the text
Strain G	
Strain E	

Strain F was obtained from spleen of J. O., aged 47 years, joiner, H.M. Dockyard, Bermuda.

Clinical History.—This man had lived in Bermuda nine months before falling sick on October 19th, 1904. He had been ailing about 14 days; his temperature was 100° F.; he complained of headache and general malaise; he had a strong alcoholic history. October 21st. Found to be delirious at his residence at Somerset, Bermuda; temperature 103°; removed

to Royal Naval Hospital. October 22nd. No delirium. Tongue furred. Morning temperature 101.6° F.; evening temperature 103° F. Signs of fluid in abdomen. Patient very fat. Liver enlarged. October 23rd. Morning temperature 102.4° F.; evening temperature 103.2° F. Bowels confined. October 24th. Morning temperature 102.2° F.; evening temperature 103° F. Bowels opened twice. Widal's reaction, positive (dilution 1 in 80). October 25th. Morning temperature 100.4° F.; evening temperature 104.2° F. October 26th. Morning temperature 101.4° F. 7 p.m. vomited; patient delirious. 8 p.m., temperature 103.4° F. in axilla. Pulse thready, 120 per minute. Abdomen distended with gas. Vomited again, and rapidly sank, dying at 9.50 p.m. Fifteen minutes before death temperature was 105° F.

Post-mortem Examination.—October 27th. Rigor mortis well marked. Old adhesions in right pleura; lungs otherwise normal. Liver weight 700z. Heart 150z.; valves normal; very little fat. Abdomen: recent peritonitis general. Local older peritonitis in right iliac region. Appendix normal. One perforated typhoid ulcer found in ileum 8 in. above ileo-

caecal valve which had allowed intestinal contents to escape into peritoneal cavity, which was full of gas. No other typhoid ulcers present. Few Peyer's patches inflamed. Spleen soft and friable; weight 13½ oz. Spleen removed and seared with a hot iron. Seared portion cut through with a sterile knife, and platinum loop thrust into spleen pulp.

Cultures were made on MacConkey's medium, neutral-red agar, lactose agar, and broth.

Growths were obtained in each case. From that on MacConkey's medium plate cultures were made on Conradi and Drigalski's medium and bacillus typhosus (Strain F) was isolated. (Strain F is here called bacillus typhosus as the tests applied have proved it to be such. The same applies to Strains E and G.)

Strain G was obtained from spleen of R. H., aged 38, chief stoker H.M.S. *Terror*, married, and living at Somerset. He had lived in Bermuda since July, 1904.

Nature and Source of Micro-organism.	A. B. Coli Com. from R.N. Hospital, Haslar.	B. B. Typhosus E. from New York, per Military Laboratory, Bermuda.	C. B. Typhosus E., from England, per Military Laboratory, Bermuda.	D. B. Typhosus E., from R.N. Hospital, Haslar.	E. B. isolated from Spleen of J. L., R.N. Hospital, Bermuda.	F. B. isolated from Spleen of O., R.N. Hospital, Bermuda.	G. B. isolated from Spleen of H., R.N. Hospital, Bermuda.
1 Character of micro-organism	Short rods and thread forms	Short rods and thread forms	Short rods and thread forms	Short rods and thread forms	Short rods and thread forms	Short rods and thread forms	Short rods and thread forms
2 Motility	Sluggish	Active	Active	Active	Active	Active	Active
3 Spores	Absent	Absent	Absent	Absent	Absent	Absent	Absent
4 Flagella	Short, slender, Nos. 3-4, peritrichous	Long, wavy, Nos. 9-12, peritrichous	Long, wavy, Nos. 8-13, peritrichous	Long, wavy, Nos. 9-14, peritrichous	Long, wavy, Nos. 8-11, peritrichous	Long, wavy, Nos. 8-12, peritrichous	Long, wavy, Nos. 7-11, peritrichous
5 Agglutination with serum from local cases of "typhoid"	—	+	+	+	+	+	+
6 Gram staining	—	—	—	—	—	—	—
7 Anaërobiosis	+	+	+	+	+	+	+
8 Conradi and Drigalski medium	Vigorous red growth visible after 24 hours	Blue colonies, visible after 3 days	Blue colonies, visible after 3 days	Blue colonies, visible after 3 days	Blue colonies, visible after 2 days	Blue colonies, visible after 2 days	Blue colonies, visible after 3 days
9 MacConkey's medium (modified)	Vigorous growth, medium turned reddish	Growth, medium unaltered	Growth, medium unaltered	Growth, medium unaltered	Growth, medium unaltered	Growth, medium unaltered	Growth, medium unaltered
10 Potato	Thick brownish-yellow growth	Light brownish-yellow growth	Light brownish-yellow growth	Light brownish-yellow growth	Light brownish-yellow growth	Light brownish-yellow growth	Light brownish-yellow growth
11 Gelatine streak	Non-liquefying vigorous, fairly opaque growth	Non-liquefying delicate transparent growth	Non-liquefying delicate transparent growth	Non-liquefying delicate transparent growth	Non-liquefying delicate transparent growth	Non-liquefying delicate transparent growth	Non-liquefying delicate transparent growth
12 Neutral red lactose agar	Magenta red	Orange	Orange	Orange	Orange	Orange	Orange
13 Agar, plain	Very vigorous well-raised growth, smooth grey	Vigorous, slightly-raised, smooth, grey growth	Vigorous, slightly-raised, smooth, grey growth	Vigorous, slightly-raised, smooth, grey growth	Vigorous, slightly-raised, smooth, grey growth	Vigorous, slightly-raised, smooth, grey growth	Vigorous, slightly-raised, smooth, grey growth
14 Milk	Coagulated in 24 hours	Unaltered after 10 days	Unaltered after 10 days	Unaltered after 10 days	Unaltered after 10 days	Unaltered after 10 days	Unaltered after 10 days
15 Whey neutral to phenolphthalein. Amount of acid produced in 10 c.cm. of whey in 48 hours at 37° C., expressed in c.cm. deci-normal acid	2.80	0.56	0.45	0.40	0.40	0.45	0.40
16 2 per cent. lactose broth	Acid and gas in 24 hours	No acid or gas after 7 days	No acid or gas after 7 days	No acid or gas after 7 days	No acid or gas after 7 days	No acid or gas after 7 days	No acid or gas after 7 days
17 2 per cent. lactose peptone salt solution							
18 2 per cent. cane sugar peptone salt solution							
19 2 per cent. glucose broth							
20 Bile salt broth	Acid and gas in 24 hours	Acid in 24 hours. No gas after 7 days	Acid in 24 hours. No gas after 7 days	Acid in 24 hours. No gas after 7 days	Acid in 24 hours. No gas after 7 days	Acid in 24 hours. No gas after 7 days	Acid in 24 hours. No gas after 7 days
21 2 per cent. galactose peptone salt solution							
22 2 per cent. maltose peptone salt solution							
23 2 per cent. glucose peptone salt solution							
24 2 per cent. mannite peptone salt solution	Well marked	Nil	Nil	Nil	Nil	Nil	Nil
25 Indol production in peptone salt solution in 7 days							

REMARKS.—Most of the agglutination tests were made for clinical purposes, the usual dilution being 1 in 80. If a positive reaction were obtained, generally no higher dilution was tried, but in several cases dilutions up to 1 in 600 gave vigorous reactions. Conradi and Drigalski's medium: (A) *Fleischwasser* 2 litres; boil for one hour, filter, and add peptone (Witte) 20 grams, nutrose 20 grams, salt 10 grams; boil again for one hour, filter, and add agar 40 grams; boil for three hours and make slightly alkaline to litmus, filter, and boil again for half an hour. (B) Neutral litmus solution 260 c.cm.; boil for ten minutes, and add pure sugar of milk 30 grams; boil again for ten minutes. (C) Now add hot litmus-milk-sugar solution to hot fluid agar; shake well and make slightly alkaline with caustic soda. To every 2 litres of the above add of 10 per cent. solution of water-free soda 4 c.cm. (to hyper-alkalinize). Finally add 20 c.cm. of a fresh-prepared solution of crystal violet (B. Höchst), made by dissolving 0.1 gram in 100 c.cm. warm distilled water (*Journal R.A.M.C.*, p. 397, vol. 1, No. 5). MacConkey's medium C (modified): Agar 2 grams, peptone (Witte) 2 grams, water 100 c.cm. Boil until dissolved; strain and neutralize to phenolphthalein; boil, filter, and sterilize. Add—of ½ per cent. crystal violet solution 0.2 c.cm., ½ per cent. neutral red solution 1 c.cm., lactose (pure) 1 gram. Heat fifteen minutes in Koch's sterilizer.

Clinical History.—On October 24th, 1904, was visited at Somerset by Surgeon of Terror. Temperature was 104° ; diarrhoea; lumbar pains; intense headache; had been feeling ill for ten days; tongue furred; no abdominal physical signs; heart and lungs normal; pulse, 100; respirations, 18. Removed to Royal Naval Hospital. Widal's reaction, positive (dilution, 1 in 80). Bowels opened twice; evening temperature, 103.2° . October 25th. Evening temperature, 103.6° ; bowels opened three times (liquid, light). October 26th. Bowels opened twice (loose, light yellow). October 27th. Bowels opened three times (liquid, dark). October 28th. Rose spots on abdomen. October 29th. Fresh rose spots; bowels opened four times (liquid, light); evening temperature, 103.2° . October 30th. Bowels opened once; evening temperature, 103.2° . October 31st. Bowels opened three times (light); evening temperature, 103.8° . November 1st. Two pea-soup stools. November 2nd. Two pea-soup stools; some abdominal distension. Noticed that most of the flies in the ward were collected round patient's bed. November 3rd. Three pea-soup stools. November 4th. Four pea-soup stools. November 5th. Twelve noon, slight haemorrhage per rectum; 4 p.m., slight haemorrhage per rectum; 6 p.m., severe haemorrhage per rectum, about two pints; pulse very bad; 9.30 p.m., haemorrhage continued; 11.45 p.m., more haemorrhage; patient semi-conscious; pulse hardly perceptible. November 6th. 12.30 a.m., haemorrhage continued; 1.15 a.m., pulse sinking; died at 2 a.m.

Post-mortem Examination (10 a.m.)—Patient very thin. Rigor mortis well marked. Heart, lungs, kidney, and liver normal. Spleen $2\frac{1}{2}$ oz., soft and friable. Abdomen: No peritonitis; colon and ileum distended with blood. On slitting up bowel innumerable typhoid ulcers were found in ileum and large intestine. Peyer's patches much inflamed. Large mass of typhoid ulcers at ileo-caecal valve, probably the main source of haemorrhage, but ulceration very deep in many of the ulcers of ileum. Ulcers in colon very numerous, but smaller and more superficial; extended into rectum. Appendix not inflamed, 4 in. long. Spleen removed and cultures made with same precautions as in last case on Drigalski and Conradi's medium, MacConkey's medium, and lactose agar. Growth occurred on all three. By plate cultures on Conradi and Drigalski's medium bacillus typhosus (Strain G) was isolated.

Strain E was obtained from the spleen of J. L., aged 26, Petty Officer 1st Class, H.M.S. *Rocket*, who had been living in Bermuda for several months:

Clinical History.—Went sick August 24th, 1902, with headache, vertigo, and general malaise. Had felt ill four days; temperature, 103° ; abdominal tenderness. August 25th. Sent to Royal Naval Hospital, Bermuda. Severe diarrhoea after purge given day before; evening temperature, 103° . August 26th. Morning temperature, 103.6° ; headache better; bowels opened once; stool like curdled milk. Tongue dry and caked. No rose spots. August 27th. Morning temperature, 101.2° ; severe headache and pain in abdomen. Transverse and descending colon dull, ascending tympanitic. Enema brought away large stool. Tongue dry and brown in centre. Evening temperature, 101.6° . August 28th. Morning temperature, 101° ; patient unconscious; low muttering delirium. Urine passed twice involuntarily. Picking at bedclothes. 8.30 p.m.: Temperature, 103° in axilla; patient rapidly sank; pulse uncountable; rapid breathing; profuse sweating; incontinence of urine. 12 midnight: Temperature, 104° in axilla. August 29th, 9 a.m., died.

Post-mortem Examination (10.30 a.m., August 29th).—Heart large, firm, with dark soft clot in pulmonary artery; 2 oz. of serous fluid in pericardium; lungs congested at both bases; liver nutmeg; spleen not enlarged; considerable erosion of mucous membrane of greater curvature of stomach with punctate haemorrhages. Bowel: In ileum patches of acute congestion with punctiform haemorrhages; in caecum, and extending a little way into colon, acute congestion with one ulcer $\frac{3}{4}$ in. long. Several whitish sloughs were found on surface of mucous membrane which could be picked off and left tiny punched-out cavities. Near caecum mesentery showed marked redness. Spleen was seared and punctured with a sterile needle and a streak culture made on agar. After twenty-four hours a grey growth was visible which was the original source, after various platings and subcultures, of bacillus typhosus, Strain E.

This Strain E had been in use for two years as the stock laboratory culture of bacillus typhosus, and was used for Widal reactions. No case presenting well-defined clinical symptoms of typhoid tested by this strain between August, 1902, and August, 1904, failed to give a reaction at one or other period of the disease.

The notes of this last fatal case are taken from the hospital records; the case was Staff-Surgeon Phillip's.

Reference to the attached tabular statement of tests shows that each strain of organism tested (except the bacillus coli) exhibited identical characteristics, and in no single test did Strains E, F, and G show any different reaction whatever to that shown by B, C, and D,

all of which latter strains were true Eberth's bacilli used as controls.

We therefore consider it justifiable to state definitely that Strains E, F, and G are all three specimens of Eberth's bacillus; and, seeing that they were isolated from fatal cases of fever contracted in Bermuda, and having the clinical and *post-mortem* macroscopic appearances of typhoid fever, it is necessary to conclude that this disease exists in the island.

THE CORNEAL REFLEX IN ANAESTHESIA.

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FROM a practical point of view it is of the utmost importance for the administrator to be able to judge how far he can "push" the anaesthetic for the proper performance of the operation in hand.

In the BRITISH MEDICAL JOURNAL of February 4th, 1905, Mr. H. Bellamy Gardner dogmatically lays down his two principles for safety in the administration of anaesthetics. These are: (1) Keep the airway clear; (2) never completely abolish the corneal reflex.

I quite agree with Mr. Gardner as to (1), and do not consider its importance can ever be over-estimated; and I cannot help thinking that if it were kept more prominently in view we should have fewer anaesthetic deaths to deplore.

Mr. Gardner's second principle, however, cannot in my experience be accepted unconditionally. After giving between one and two thousand anaesthetics for gynaecological operations with an average anaesthesia of forty-five minutes, and including some six hundred abdominal sections, I am convinced that while there is any trace of corneal reflex the general anaesthesia is not deep enough to prevent some straining should an extra nervous influence come into play; as, for instance, when the ovaries or uterus are pulled upon during the course of the operation. This straining may not only hamper the surgeon, but may lead to serious after-results, such as the slipping of the ligature of an ovarian stump, which, owing to the straining, could not perhaps be drawn tightly enough.

I therefore find it necessary to push the anaesthetic in these cases till secondary dilatation of the pupil begins, in order to get the complete relaxation required, and, if the breathing and pulse-rate remain good, I see no objection to so doing. After all, the fact of the existence of the corneal and conjunctival reflexes simply indicates that certain muscles still react to stimuli, and it appears to me not illogical to suppose that other muscles may be stimulated by suitable means while these remain active. Furthermore, my experience leads me to conclude:

1. That there is, *caeteris paribus*, a much greater interval of safety between the loss of the corneal reflex and the failure of respiration and heart than is generally admitted.

2. That the reaction to corneal stimulation varies enormously in individuals.

In conclusion, then, I believe that the corneal reflex cannot be depended upon as a guide in the administration of anaesthetics in cases requiring complete muscular relaxation, especially in abdominal and haemorrhoidal operations, in which, I think, moderate secondary dilatation of the pupil, while keeping a careful watch on the respiration and pulse, is the best guide to complete success.

A TESTIMONIAL, accompanied by a silver salver, was presented recently to Dr. Deas, of Thorndale, Merton Park, as a token of the high appreciation the members of the Wimbledon and District Medical Society had for his kindly services as honorary secretary from its birth and during its early infancy. The presentation was made by the President, who referred to the great pleasure the members experienced in welcoming Dr. Deas back after his severe attack of scarlet fever, and spoke in highly eulogistic terms of the services he had rendered to the Society. Dr. Deas, in reply, said that he had had already three surprises this year—the first when he found that he had scarlet fever; the second that so many of his professional brethren offered their services to him and visited him at the Isolation Hospital, Mitcham; while that the members should have presented him with this testimonial for the slight services he had rendered to the Society was the greatest surprise of all. The presentation was followed by a smoking concert, in which Messrs. Bishop, Clapham, Hill, Hemingway, Robertson, and Spurgin took part.