which it denotes is probably due to reflex paresis of the splanchnic vaso-constrictors in the abdominal cavity.

(e) The frontal headache of ingravescens typhoid is not referred intestinal pain. Dr. Head has found that frontal headache of visceral origin arises from disorder of thoracic viscera, and he does not mention the headache of typhoid in his enumeration of visceral headaches and other pains referred to the distribution of the cranial nerves. The frequent occurrence of epistaxis during the onset of the fever suggests that the headache is congestive; and its automatic subsidence in the second week of the fever agrees in point of time with the appearance of dirotism in the pulse.

The *tache cérébrale* reaches its greatest intensity about the beginning of the second week, and continues in that phase during the eruptive period. As the rose spots cease to appear, the *tache cérébrale* becomes less vivid; during the decline of the fever it tends to disappear. It can, however, often be elicited in a modified degree after the temperature has become normal.

In his Croonian Lectures,¹³ Dr. Cayley says that he has "long looked on the persistence of the *tache cérébrale* as indicating that the intestinal lesions have not yet healed;" which is tantamount to what I wish to maintain—that the inhibition of the vaso-constrictor and other nerves in the reflex zone in typhoid fever is due to the reflex incidence on them of specific impulses originating in the small intestine, mesenteric glands, and spleen. The bearing of this proposition on the production of the rose spots may be briefly discussed.

The rose spots do not appear until the depression of the vaso-constrictor fibres has become well established, and the specific agglutinins in the blood have become demonstrable by the Gruber-Widal reaction. As the arterioles relax, the blood pressure in the terminal capillaries becomes increased, and the circulation retarded. It is also possible that, the endothelial cells of the capillaries being weakened by the depression in function of their intrinsic nerves, the increase in blood pressure brings about some passive dilatation.

The influx of a greater volume of blood to the skin in the reflex zone brings a correspondingly greater number of bacilli to the cutaneous capillaries, where the sluggish flow of blood, and the impaired resistance of the endothelial cells, permit them to loiter in the capillary network. There they are joined by others; the agglomeration being due partly to the inherent tendency of the bacilli to compose themselves into groups whenever possible, but chiefly to the clumping power of the blood as the agglutinins come to be liberated therein. The assembly of bacilli thus formed sets up inflammation, which becomes visible as the circular, slightly raised rose spot, fading on pressure. Bacteriolysins continue the work begun by the agglutinins, and, in a little time, the assembled bacilli are devitalized, dispersed, and disintegrated; the point of inflammation subsides, and the rose spot fades.

REFERENCES.

- ¹ Goulstonian Lectures, i, March, 1853. ² *Journ. Physiol.*, vol. vii, No. 1, January, 1886. ³ Langley, Schäfer's *Textbook of Physiology*, vol. ii, 1900, p. 688. ⁴ *Brain*, vol. x, 1888. ⁵ *Brain*, vol. xvi, Parts I and II, 1893; vol. xvii, Part III, 1894. ⁶ *Med. Chron.*, August, 1892. ⁷ Bechterew and Mislavsky, *Arch. de physiol. norm. et path.*, 1889, Supplement, p. 243. ⁸ François-Franck and Hallion, *Arch. de physiol. norm. et path.*, 1896, pp. 478 and 921. ⁹ Schäfer and Moore, *Journ. Physiol.*, vol. xx, 1896, p. 1. ¹⁰ Shepherd, *Montreal Med. Journ.*, January, 1903. ¹¹ *Brain*, vol. xvi, 1893, p. 129. ¹² *Typhoid and Typhus Fevers*, 1902. ¹³ On Some Points in the Pathology and Treatment of Typhoid Fever, 1880.

THE American Association for the Study and Prevention of Infant Mortality, organized at the convention recently held in New Haven, Connecticut, has established permanent headquarters at the Medical and Surgical Faculty Building in Baltimore, where it will begin active work. We learn from the *Boston Medical and Surgical Journal* that the president of the association is Dr. J. H. M. Knox, of Baltimore. Dr. William H. Welch, of Baltimore, is chairman of the section on federal, State, and municipal prevention; Dr. L. Emmet Holt, of New York, chairman of the medical section; Dr. Helen C. Putnam, of Providence, of the educational section; and Dr. Hastings H. Hart of the section on philanthropic prevention. Membership in the association is not limited to doctors, but will be open to teachers, publicists, philanthropists, and sociologists.

A NOTE ON THE VALUE OF BALL'S OPERATION FOR PRURITUS ANI.

By PATRICK LEIGHTON, M.D.,

HONORARY MEDICAL OFFICER, ELTHAM COTTAGE HOSPITAL.

I VENTURE to record the following two cases, on which I operated this year, as since endless remedies have been tried for this horrid affection none are a certain cure.

Before recommending the operation devised by Ball, I take it for granted that any local cause has been excluded, such as eczema, paralysis, etc. It is just those cases, as we all know, where we can find no local cause, that are the most difficult to cure. I am aware that there are some surgeons who maintain that there is a cause in every case, and that we have overlooked it in our examination.

The malady is looked on as a neurosis, and the interesting point is that if we give the nerve terminations in the skin a rest by dividing the trunks, the vicious circle is broken, and the itching does not come back even after sensation is re-established.

Some authors state that the operation should not be lightly undertaken, and it is to encourage other men in general practice like myself to cure their patients by it that this note is written.

The two main complications that may follow the operation are sloughing of the flaps and sepsis. The first may with care be avoided; the second is difficult to prevent, but does not in any way interfere with the result.

The cases were prepared as for a pile operation. The first came into hospital four days, and the second two days, before operation. Frequent bathing of the anal region in weak Jeyes' fluid was used in both cases. The parts were shaved, and 2 grains of opium given the night before. The rectum was washed out with boric lotion the following morning. In Case II there were some cracks and excoriations which I think had something to do with the sepsis that followed, even though pure carbolic acid was applied to them when the patient was on the table. Sir Charles Ball's method was followed, as is described in his book on the rectum.

The following details seemed to be of value:

(a) After putting the patient in the exaggerated lithotomy position, the covering of the table was folded so as to raise the pelvis, the end of the table being also a little raised. This position was a great help in undercutting the posterior pedicle (the only difficult part of the operation).

(b) A plug of gauze on a string in the rectum to prevent soiling if the patient strained, as they both did, the anaesthetic, C.E., being badly taken by both.

(c) In cutting the flaps care should be taken to include a layer of subcutaneous tissue in order to ensure the vitality of the skin, and thus avoid sloughing; button-holing the anal canal leading to fistula is also avoided. The sutures of fishing gut were left long and twisted in a bunch on each side to prevent pricking.

The dressing was cyanide gauze. I intend in my next case to use a picric acid dressing to dry up the skin, as I am sure the moisture of the region encourages sepsis. The bowels were kept confined for four days, and not much food given.

In one case the wounds healed by first intention, the sutures were taken out in a week, and at the end of a fortnight he was able to sit. Considerable ecchymosis appeared on the third day over both buttocks, but in no way interfered with the healing. In the second case suppuration occurred in both wounds, but was healed in three weeks.

Both were men about 40 years of age, and the itching had persisted for three years. One had had his sphincter overstretched, with no benefit. They were unable to sleep at night, and were looking wretched in consequence.

One man is a harness maker, of a very placid disposition; the other has a good position in a bank, as well as being a tenor of no mean ability, but, like many tenors, very neurotic. He was losing his memory and completely demoralized by his complaint.

The result in both cases was more than gratifying—immediate relief. The second patient told me that the night after the operation was the first peaceful one he had

had for two years. Both told me the parts felt quite numb when I last saw them.

In conclusion, I wish to thank Drs. Sandford Smith and Milton, who kindly gave the anaesthetics, also the Matron (Miss Fry) and the nursing staff, for their able assistance at the time and in after-treatment, which is most important.

THE USE OF ADRENALIN IN ACUTE ASTHMA.

BY

CRAUFURD MATTHEWS, M.B., CH.B. VICT. AND LEEDS,
COLWYN BAY.

In the *BRITISH MEDICAL JOURNAL*, October 1909, I wrote, in answer to a query by a correspondent, giving shortly my experience of the uses of adrenalin in asthma. Since that date I have had further opportunities for observing the effects of this treatment, and I now feel justified in writing a short account embodying the results I have obtained.

In October, 1907, my attention was first directed to the possible value of adrenalin in acute asthma by the relief quickly afforded by cocaine in this condition; and arguing from the similarity of effect produced by the application of adrenalin solution and that of cocaine on the nasal mucous membrane, I decided to give adrenalin a trial in a very acute case which I then had under treatment.

CASE I.

A young man, aged 23, had been suffering from asthma for several years, and had been in the habit of cutting short the attacks by the use of a preparation containing cocaine, which never failed to afford him instant, though temporary, relief.

On examination I found the heart very much weakened by the repeated attacks, and there was a considerable degree of dilatation; the slightest exertion brought on palpitation and shortness of breath, and he could only with the greatest difficulty get upstairs.

Considering the further use of the preparation to be contra-indicated by the relatively large amount of cocaine contained, I ordered him, during his first acute attack after coming under my care, to spray into the nose a solution of adrenalin chloride, 1 in 2,000. Within ten minutes of the first application of the adrenalin he was completely eased, and remained so for the remainder of the day. Subsequently, during each attack, he used the spray with complete success. If the attack threatened to be exceptionally severe the solution used was of the strength of 1 in 1,000, or if milder, 1 in 4,000 was sufficient. The patient quickly learnt by experience what strength would be needed, and when I last saw him he informed me that he was carrying about with him a bottle of adrenalin solution, 1 in 1,000, in case of further attacks.

CASE II.

Shortly after this I was called to a lady, aged 48, who was in the throes of a very acute attack. I had taken with me a bottle of adrenalin solution and a small spray, and promptly applied the adrenalin in the strength of 1 in 1,000, with the result that the attack, which had been continuous for several hours, was at an end in ten minutes; in a few more minutes the patient was sleeping comfortably. Subsequently this patient informed me that she had on several occasions repeated the spray, and in each case the results had been equally satisfactory.

From that time until the present I have used the adrenalin solution in every case of acute asthma which has come under my care; and in every case, now 13 in all, the results have been immediate relief, lasting for longer or shorter periods. In none of these patients have I observed any undesirable after-effects.

The last two patients on whom I have used the solution have had to continue the treatment at shorter intervals than in any previous instance.

CASE III.

Miss M., aged 21, had suffered from acute asthmatic attacks for fifteen years. The attacks came on nightly, lasting four or five hours, but every fourteen days the attack was of much greater severity and continued for twenty-four hours or longer. The heart was dilated and feeble, and when I first saw her she was very ill. The attack had then lasted from 1 a.m. until 4 p.m., but within five minutes of spraying the nose with a solution of 1 in 2,000 she was much more comfortable, and within fifteen minutes the attack had absolutely passed off.

Subsequently this patient had attacks nightly, which regularly woke her between 1 a.m. and 2 a.m. Dieting and the

usual remedies produced no effect, and she used to have within reach a spray ready charged with 1 in 2,000 adrenalin solution, with which she cut short each attack at its commencement and was assured of a good night's sleep. After some weeks the attacks, which had been becoming gradually less severe, ceased entirely.

CASE IV.

Mrs. H., aged 55, a highly-strung gouty and neurasthenic patient, had suffered for years from repeated attacks of acute asthma. She could not take belladonna, and no other drug seemed to produce any effect on the condition, though she obtained some relief from burning ozone papers. Unfortunately the effort of sitting up in bed and lighting the paper made the attack much more severe.

After a very acute attack, during which I used the spray with instant relief, this patient has always slept with a small nebulizer ready charged with the solution. When roused by an attack she immediately uses the spray, and after a few minutes is able to sleep again. She is frequently roused in damp weather three times during the night, but in spite of the frequent use of the adrenalin solution I have observed no ill effects therefrom.

I have never used the spray in any other form of asthma but that which I should call acute spasmodic asthma, but my friend, Dr. W. B. Russell, to whom I mentioned the treatment, informs me that he has employed it in the case of an elderly gentleman in whom the attack was undoubtedly uraemic in origin. In this case also complete, though only temporary, relief resulted.

As to the mode of action of adrenalin in these cases, I must confess that I have so far not arrived at any conclusion. My first two patients both showed some degree of hypertrophic rhinitis, and I was inclined to think that the temporary relief of the local engorgement of the nasal mucous membrane might have caused the sudden termination of the attack by doing away with a source of peripheral irritation. None, however, of my later patients have shown any signs of nasal trouble, so that this theory has had to be abandoned.

In a condition of this sort suggestion undoubtedly plays a considerable part, and I formed the opinion that in a certain number of the cases this might account for the results obtained. This was more especially my view with regard to the last patient, but on one occasion when she complained of pain and irritation arising from haemorrhoids I gave her some adrenalin suppositories; it had escaped my memory that she was in the habit of using adrenalin for her asthma, but at my next visit she informed me that she inserted the first suppository during a mild attack of asthma, and to her surprise not only was the rectal irritation removed, but the asthma abruptly terminated. As the patient had no idea of the nature of the suppository, and as she frequently suffers from rectal irritation without any traces of asthma, there seems to me to be little doubt that in this instance adrenalin absorbed by the rectal mucous membrane acted in the same manner as when absorbed by the nasal mucosa.

In the *Medical Review*, June, 1909, there appear extracts from an article by N. V. Jagic embodying the results obtained by the subcutaneous injection of adrenalin solution in acute asthma, as practised also in America. He suggests that adrenalin may act by causing a temporary depression of the vagus, whilst stimulating at the same time the sympathetic nervous system. The results obtained by Jagic seem to be very similar to those which I have observed from the nasal spray; and considering the dislike that most patients not unnaturally have for subcutaneous medication, I think the method I employ is less likely to be resented.

At the meeting of the Zoological Society of London on February 1st, the Secretary read a letter from Captain J. A. M. Vipan, F.Z.S., which suggested that the probable cause of the immense numbers of the freshwater Cyprinodont fishes known as "Millions" (*Girardinus poeciloides*) in Barbados, and their consequent agency in suppressing malaria by destroying mosquito larvae, was the absence of other freshwater fishes in that island. The writer added that in his opinion there was no specific distinction between *G. poeciloides* and *G. guppi* of Trinidad, and that *Poecilia reticulata* (Peters), of Venezuela, was the same fish. The presence of other freshwater fishes in these localities prevented extensive multiplication of these small fishes, with the result that they had no effective action in keeping down mosquitos.