failure, and, as the Greeks advised the making of a will before purgation with the hellebore, were it not well to advocate this procedure before diuresis with the mercury?—I am, etc.,

Stratford-on-Avon.

PETER PARRY.

Sympathetic Disorders in Poliomyelitis

SIR,—Following the annotation on "Sympathetic Disorders in Poliomyelitis" (Oct. 11, p. 579) might I make a few observations on muscle pain? It is a well-known fact that normal muscle, if exercised to excess, becomes painful and tender—presumably a defence mechanism to prevent a repetition of abuse before recovery has taken place. Everyone knows the "first game of the season" stiffness and tenderness, which may be excruciating and persist for several days. To turn to the abnormal: having slept beneath a ship's blower in the Tropics and awoken with a "stiff neck," one's conclusions are as follows. The reaction to the fall in temperature of the exposed part was that of local shivering or fibrillary twitchings of the muscles in question—in this case the trapezius and sternomastoid of the affected side—summing over a prolonged period to produce the same phenomena as of excessive general contraction—i.e., pain and tenderness.

From the electromyographic findings in poliomyelitis can one postulate an initial pathological stimulation from the diseased anterior horn cells invoking the protective mechanism described above?—I am, etc.,

Twickenham, Middlesex.

D. F. REES.

BAL in the Treatment of Gold Dermatitis

SIR,—In view of the articles which appeared in the *Journal* of Oct. 4 concerning the therapeutic uses of British anti-lewisite, the following case report may be of interest.

CASE REPORT

The patient was a woman of 56 who for six months had complained of increasing pain in both wrists, hands, and fingers. A clinical diagnosis of early rheumatoid arthritis was made and intramuscular injections of "myocrisin" were commenced. The E.S.R. had not been done, but the urine had been carefully examined and was repeatedly checked.

A system of increasing dosage at weekly intervals was employed, and at the end of eight weeks a total of 0.4 g. had been given. The day following the last injection an irritating erythema appeared, which quickly changed to a macular rash, and after a week the typical appearances of an exfoliative dermatitis due to gold were evident. The condition was severe and resisted every method of treatment.

After eight weeks of trial and error injections of BAL were commenced. The preparation used was a 5% solution in 10% benzyl benzoate in peanut oil. Daily injections of 2 ml. were given for five days, with immediate amelioration of the symptoms. The dermatitis, however, did not completely disappear, and after a period of four weeks of comparative comfort for the patient the condition recurred. Further daily injections of BAL 2 ml. were given for seven days, and the dermatitis once more subsided, the improvement this time being maintained. The injections produced two large abscesses in the buttocks which had to be drained. The arthritis, which responded well to the gold therapy, has so far showed no signs of recurrence.

—I am, etc.,

Tenbury Wells, Worcs.

J. A. BURNETT.

The Weil-Felix-Wilson Reaction

SIR,—What is commonly called the Felix-Weil reaction is in reality the Felix-Weil modification (or variation) of the Wilson typhus reaction, for Wilson's (now Prof. W. James Wilson, of the Queen's University, Belfast) discovery of the agglutination of organisms of the *B. coli* and *Proteus* type was made in 1908 and 1909, whereas it was not until the first world war that Felix and Weil carried out their work, publication regarding which was made in 1916. Personally I have every reason to remember the discovery, as I was the first human being on whom it was tried for diagnostic purposes—in March, 1908.

The following is a brief outline of the genesis: From the end of December, 1906, for several years Belfast was visited by a very severe epidemic of cerebrospinal fever, and a considerable amount of work was carried out at Queen's College (now University) on the bacteriology of the meningococcus. While this epidemic was in progress I happened to be R.M.O. in the City Isolation Hospital at Purdysburn, where in my time (about

one year eight months) about 360 cases of the disease were treated (a paper by me describing the outbreak was published in the *Practitioner*, 1915, 94, 831).

Wilson during this period had been making investigations at Queen's regarding the bacteriology of cerebrospinal fever and had been struck by the heterologous agglutination effect of the blood serum of patients suffering from the disease (see *Journal of Hygiene*, 1909, 9, 316). While the epidemic was in progress an outbreak of typhus fever occurred in the city, and almost forty of the cases were admitted to Purdysburn during my residence there, and I suggested to Wilson that if he would care to make investigations about the disease I would try and get him as much material as possible. Wilson then started his investigation, and samples of blood, faeces, urine, etc., were taken by us from patients who, we considered, were suffering from undoubted typhus. Wilson found before long, as in cerebrospinal fever, that there were heterologous agglutinations in this disease also. He found that the serum of typhus agglutinated *B. typhosus* and also bacilli obtained from the faeces and urine of typhus patients. Wilson's first publication on this matter appeared in the *Transactions of the Ulster Medical Society*, session 1908-9, in a joint paper by Wilson and myself (but I must state here clearly that it was Wilson who was entirely responsible for the discovery of the agglutination effect).

Near the end of my residence time in the hospital I developed an acute febrile condition which resembled typhus. There was doubt at first, and my serum was tested. An agglutination reaction was found. This condition began very suddenly, without preliminary catarrhal symptoms, and was accompanied by a rash that was a cross between that of measles and typhus. It ended with a sudden drop of temperature on the twelfth day. Wilson's next paper was published in the *Journal of Hygiene*, 1909, 9, 316. In the *Journal of Hygiene*, 1910, 10, 155, a further paper entitled "The Etiology of Typhus Fever" was published by him. Among his conclusions are the following:

"(4) From the faeces of one case a variant form of *B. coli communis* was cultivated on which the blood serum of 17 typhus fever cases was found to have three to ten times the agglutinating effect of normal serum.

"(5) From the urine of two cases a bacillus resembling *B. coli communis* but having no action on lactose was cultivated. This bacillus was agglutinated in dilutions of 1:50 and 1:100 by the serum of the cases but not by normal serum."

This bacillus from the urine Wilson regarded later as a urinary variety of *B. proteus* ("The Wilson-Weil-Felix Reaction in Typhus Fever," *Journal of Hygiene*, 1920, 19, 115), and pointed out that it is probably similar to the X2 strain of *B. proteus* first used by Weil and Felix. Weil and Felix in "X19" obtained a more sensitive organism for the typhus reaction than X2; Wilson also, in U2, a bacillus of the colon-paratyphoid group, obtained an organism not only more sensitive than his original one but as sensitive as X19 of Weil and Felix in certain cases of typhus fever. Comparisons are given regarding this in Wilson's paper "A Further Contribution to the Serology of Typhus Fever" (*Journal of Hygiene*, 1927, 26, 213). This bacillus U2 is named so on account of its similarity to the original U discovered by Wilson in 1908, which was found to be agglutinated by the serum of typhus fever patients with three to ten times the effect of normal serum ("Bacteriological and Cytological Investigations of the Blood in Typhus Fever Cases," by W. J. Wilson and E. H. M. Milligan, *Transactions of the Ulster Medical Society*, Session 1908-9).

It should be remembered that in addition to the Felix-Weil modification of Wilson's typhus reaction there are other modifications such as those using *B. pyocyaneus* (Kreuschen, 1918; Neukarsch and Kreuschen, 1919; Sampietro, 1920; Wilson 1922), and the *Coccobacillus byzantinus* (Beguet, 1921).

In view of the above observations I think it will be admitted that it is reasonable and right to suggest that in future the Felix-Weil reaction should be called the Felix-Weil modification of the Wilson typhus reaction, or, more shortly, the Weil-Felix-Wilson reaction (W.-F.-W. reaction). Wilson was undoubtedly its discoverer; Felix and Weil have the credit of developing it, expanding it, and getting it more widely used during the first world war.—I am, etc.,

Glossop, Derbyshire.

E. H. M. MILLIGAN.