that infection could be caused from the bite of lice apart from excreta. Dried deposit from the urine of three trench fever cases had been rubbed into a scarified place on the arm, the patient developing trench fever in consequence.

Deputy Surgeon-General T. W. BASSETT-SMITH, C.B., R.N., said that the French had inoculated guinea-pigs with blood taken during the pyrexial period. A form of fever similar to that of trench fever was noticed, and spirochaetes had been found in blood taken from the heart during a period of slight rise of temperature. The spirochaetosis was allied to other forms; the immunity reaction was not the same as that of ictero-haemorrhagic fever.

Colonel G. SIMS WOODHEAD, R.A.M.C., asked how long the food material in the blood took to pass through the alimentary canal of the louse, and whether any experiments had been carried out by injecting bone marrow or fluids from it. The organism appeared to carry on its pathological work in the blood, bone marrow, spleen, and sheaths of blood vessels. There seemed to be evidence that the sympathetic system was especially involved, as evidenced by the vomiting, disordered action of the heart, and pyrexia. The myalgia appeared to be referred pain due to excitation of nerve cells in the spinal cord.

Captain ARNOLD RENSHAW, R.A.M.C., said that in twenty cases the bone marrow had been examined but no spirochaetes or any parasites had been found. The hole drilled in the bone marrow promptly relieved pain, which was probably due to pressure.

Major BYAM, in reply, said that food took about three hours to pass through the alimentary canal of the louse and was excreted at the next feed. Experiments showed that the poison appeared to affect the vagus system, and later the sympathetic system. "Referred pain" had been relieved by tapping the spine.

Reviews.

POLIOMYELITIS.

THE prevalence of acute poliomyelitis in America, and especially the great epidemic of 1916 in New York, has stimulated much investigation into the epidemiology and etiology of this disease. Flexner and Noguchi's description of globoid bodies as the causal factor was received with some doubt, and Rosenow and others argue in favour of a streptococcic origin. With this conflict of opinion in mind, it is interesting to compare the views expressed by RUHRÄH and MAYER[1] in their recent work on poliomyelitis in all its aspects with those of Draper of the Rockefeller Institute for Medical Research, whose monograph on the subject was reviewed in our issue of February 2nd, 1918 (p. 152). The two works were published almost simultaneously, and agree on the important etiological questions that the globoid bodies are the most probable causal factor, and that the disease is primarily a general infection which may, but often does not, attack the central nervous system. Ruhräh and Mayer make full use of the work of the Rockefeller Institute, and quote the results of the inquiry made into the epidemic of 1916. The object of the authors, indeed, has been to collect into one volume, from the enormous and ever-growing literature of the subject, the information they themselves wanted. In the chapter on the history of the disease the title-page and a number of figures from Jacob von Heine's monograph of 1840 are reproduced; the earliest mention of the disease as now understood is given from Underwood's *Diseases of Children* in 1784.

The authors adopt the classification of the scheme of the New York Health Department, distinguishing the abortive or non-paralytic, the rare ataxic group, the cortical, and the ordinary spinal form, the last including the meningitic, bulbar, bulbo-spinal, polyneuritic, and ascending varieties. The question of the relation of Landry's ascending paralysis to poliomyelitis is well considered; the conclusion reached is that most of the cases regarded as Landry's disease are poliomyelitis, although other conditions may possibly give rise to the same clinical picture. A special feature of this valuable handbook is the detailed account of the treatment, especially of the exercises; this part is successfully illustrated by numerous photographs. The authors have certainly produced a most useful work.

[1] *Poliomyelitis in all its Aspects.* By John Ruhräh, M.D., and Erwin E. Mayer, M.D. Philadelphia and New York: Lea and Febiger. 1917 (Med. 8vo, pp. viii + 297; 118 figures and 2 coloured plates. 5.25 dols.)

APPLIED BACTERIOLOGY.

DR. BROWNING and his collaborators of the Bland-Sutton Institute of Pathology have gathered a fund of useful and original information in the realms of present-day bacteriology within the pages of a small volume with the title *Applied Bacteriology*.[2] Perhaps the most important single subject dealt with is the brilliant-green-telluric-acid method for isolating organisms of the enterica group, a method resting upon a firm basis of experiment, and adopted with success by other bacteriologists. Dr. Browning quotes an instance in which this method yielded a pure culture of typhoid bacilli from a mixture of two typhoid bacilli with 2,800 other viable organisms. The brilliant-green inhibits the ordinary colon bacilli and the telluric acid the inosite-fermenting group of organisms, both of which are bugbears of the bacteriologist when making examinations for organisms of the enteric group. It is a pity that Ehrlich's rosindol reaction has not been more widely applied to save both time and expense in the differentiation of lactose non-fermenting organisms. It is, however, quite likely that the brilliant-green method is the best for its purpose; it has been worked out with meticulous accuracy by Dr. Browning and his collaborators. The Widal reaction after inoculation, upon which Mackie and H. G. Wiltshire did invaluable work, is relegated to a minor position in the recognition of enterica organisms, partly on the ground that inoculation agglutinins largely overshadow pathological agglutinins. The "absorption" method is recommended as being more accurate. Accurate measurement is preferred to Dreyer's method of counting drops, and the calibration of pipettes is carefully described.

Dr. J. F. Smith of Glasgow contributes two useful chapters, one on the bacteriological identification of diphtheria, and the other upon the uses of telluric acid in isolating diphtheroid germs and streptococci. The suppression of the *Bacillus pyocyaneus* and the *Urobacillus septicus* by thallium acetate is likewise a discovery of considerable practical value. The chapter on coloured antiseptics strikes new ground. Proflavine and acriflavine are held to be the most effective antiseptics *in the presence of serum*, and thus to be more powerful than the halogen group, such as chloramine-T. Their use is recommended both generally in sepsis and for turning the scale in early septic peritonitis. The Rideal-Walker antiseptic coefficient is deprecated on the valid ground that it holds good only for short periods of time. Ultra-violet radiation has not been found by Russ and others to possess a practical differential antiseptic value, as Dreyer formerly believed. The Abderhalden reaction in pregnancy is also discredited.

The antibody content of the blood, it is maintained, is not necessarily a gauge of the degree of immunity; this view is at first sight a trifle disconcerting, but it may conceivably be due rather to failure to detect the antibodies than to their absence. The specificity of antibodies of the colon group of organisms, a fact inferred by Emery and other workers in vaccine-therapy, is here established by the result of careful experiments.

The final chapter, on tetanus, contains much of clinical interest, and is very complete. The remainder of the book is purely bacteriological. We rather deplore Dr. Browning's poor opinion of the "crude mass of British (tetanus) statistics," amongst which, in point of fact, Golla's are a model of careful analysis. Dr. Browning wisely emphasizes the importance of giving antitetanic serum *intravenously* as well as intraspinally in early developed tetanus, the subcutaneous route being too slow in these cases to be effective. That certain horses may be "carriers" of tetanus is a fact which will be novel to many.

This book will be of great practical value to the bacteriologist, but is rather beyond most clinicians or administrators, to whom it is also inscribed. It is based upon a rich fund of well-digested facts.

[2] *Applied Bacteriology: Studies and Reviews of Some Present-day Problems for the Laboratory Worker, the Clinician, and the Administrator.* Edited by C. H Browning, M.D., D.P.H., with contributions also by W. Gilmour, R. Gulbransen, T. J. Mackie, S. Russ, J. F. Smith, and L. H. D. Thornton. London: Henry Frowde, and Hodder and Stoughton. 1918. (Cr. 8vo, 291 pp.: 4 illustrations. 7s. 6d. net.)

RADIOGRAPHY OF THE SKULL.

IN his *X-Ray Atlas of the Skull*,[3] Dr. RUSSELL GREEN points out that bony landmarks are so numerous, and vary so much according to the angle at which a radiograph is taken, that the correct interpretation of skull radiographs is a very difficult matter. To overcome these difficulties of reading he has made radiographs of a dry skull from various angles, and has increased the opacity of certain parts by devices such as outlining sections with wire, covering structures with tinfoil, injecting sinuses with bismuth paste, and so on. Confining these processes to one side and then making a radiograph, the result affords a definite elucidation of the meaning and cause of the radiographic appearances.

The *Atlas* consists of a large number of very beautiful plates of these radiographs, showing on the one side the usual *x*-ray shadows and on the other side the various areas differently coloured. Across each coloured area is printed the name of the bone responsible for the shadow. Each plate shows also a photograph of the head, and of a skull, in the position in which the radiograph is taken.

The work is the result of the author's difficulties whilst attached as an *x*-ray expert to a large military hospital; and it was undertaken in order to make the localization of foreign bodies in and about the skull a certain and easy proceeding. He claims that the only additional apparatus required is a pair of compasses and a millimetre rule; and that, given good lateral and antero-posterior skiagrams, it is possible to give a definite opinion as to the relation of a foreign body to some salient bony point. In addition to a full description of each plate, the *Atlas* contains a short but concise description of the special radiographic apparatus required, and the author's method of marking the skin spots, as well as a table for reading off the distance of foreign bodies from the plates where a constant distance of 50 cm. from target to plate and a constant tube shift of 10 cm., are used.

Apart altogether from the mere localization of foreign bodies, the series of diagrams set out in this manner should be a valuable addition to the library of every expert *x*-ray worker, as affording an easy and rapid means of reading off the various shadows and areas in any given radiograph of a head.

"NEWEST TREATMENT."

THE *Handbook of Practical Treatment*,[4] described as a volume on "the newest treatment," is supplementary to the work which began to appear in 1911 under the guidance of the late Drs. J. H. MUSSER, sen., and A. O. J. KELLY, two enthusiastic physicians who unfortunately rest from their labours, though the editorial names remain the same. The reader is here presented with accounts of new developments in treatment since the original articles were written, and as a natural result some of the articles are quite short. Others, however, have been rewritten or are quite new, and special mention may be made of Surgeon-General W. C. Gorgas's contribution on yellow fever, Drs. R. Cole and Chickering's account of typhoid fever, Dr. T. Janeway's review of the modern treatment of diabetes, Dr. Rowntree's description of renal therapeutics, and of Dr. Homer F. Swift's account of auto-salvarsanized serum in cerebro-spinal syphilis. Drs. W. H. Park and C. Krumwiede, jun., have written a clear and sane article on vaccines and serums, and there is an admirable account of the specific therapy of pneumococcus infections by Dr. A. R. Dochez, dealing with antipneumococcus serum, the result of vaccines which he finds do not carry conviction, and ethylhydrocuprein, called optochin for short and trade purposes, which has an encouraging future but the drawback that it may cause temporary blindness and deafness. The only British contributors are the late Sir Lauder Brunton and Sir Clifford Allbutt, who from his ripe experience pleasantly discusses the present state of our knowledge about digitalis, summarizes his experience of the soldier's heart, and says of angina pectoris that, whatever view be taken of its nature, it should be treated on the lines of aortic aneurysm, by complete rest in bed for some weeks or months. In conclusion, it may confidently be said that this work fulfils its promise.

[3] *X-Ray Atlas of the Skull.* By A. Russell Green, M.B., B.S.Lond., M.R.C.S.Eng. London: Longmans, Green, and Co. 1918. (Med. 4to, pp. 27; 5 coloured plates. 10s. 6d. net.)

[4] *A Handbook of Practical Treatment.* By many writers. Edited by John H. Musser, jun., B.S., M.D., and Thomas C. Kelly, A.M., M.D. Vol. iv. Philadelphia and London: W. B. Saunders Co. 1917. (Roy. 8vo, pp. 1000. 30s. net.)

NOTES ON BOOKS.

WE have received the thirty-fourth issue of the *Year Book of the Scientific and Learned Societies*[5]—a most useful work of reference compiled from official sources. While a few scientific societies have been in abeyance during the past year of war, others have come into being, and the number of papers read fell little short of the average of recent years. As usual, a section is devoted to the principal medical societies. We cannot find any reference to the Medical Research Committee, though a list is given of the medical staff of the Local Government Board.

We have inadvertently omitted to mention that the sixteenth edition of Dr. HALE WHITE'S *Materia Medica*[6] has been published and has undergone various modifications to meet new conditions; in particular, it now contains an appendix setting out the various regulations affecting prescribing that have been issued as a result of the war, and attention is very emphatically drawn to the necessity of the reader making himself acquainted with them. The first edition appeared in 1892; the numerous editions that have been called for since then are convincing proof of the practical merits of the book.

Dr. LESLIE THORNE THORNE has issued a new, fifth, edition of his small handbook on *Nauheim Treatment in England*.[7] The text has been rewritten, and the book enlarged by the addition of chapters on arterio-sclerosis and high blood pressure, angina pectoris, heart strain, irritable heart and Graves's disease, and one or two other topics. The book is of a practical character, and includes descriptions of the exercises recommended as well as of the baths.

The pictures for Part II of *British Artists at the Front*[8] are provided by Sir John Lavery, A.R.A., and are chiefly concerned with the naval bases. They include striking sketches in colours of the shipyards and the big ships and the mine sweepers in harbour, but there are some notes of aerodromes and one of tanks in the making, all done with the artist's strong feeling for form.

[5] *Official Year Book of the Scientific and Learned Societies of Great Britain and Ireland.* Thirty-fourth annual issue. London: C. Griffin and Co., Ltd. 1917. (Demy 8vo, pp 342. 9s. net.)

[6] *Materia Medica: Pharmacy, Pharmacology, and Therapeutics.* Sixteenth edition. By W. Hale White, M.D.Lond., Lieut.-Colonel R.A.M.C.(T.). 1918. London: J. and A. Churchill. (Fcap. 8vo, pp. xii + 716. 7s. 6d.)

[7] *The "Nauheim" Treatment, in England, of Diseases of the Heart and Circulation.* Fifth edition. By Leslie Thorne Thorne, M.D. 1918. London: Baillière, Tindall, and Cox. (Cr. 8vo, pp. vii + 160; 92 figures. 5s.)

[8] London: *Country Life*, Ltd. 1918. 5s. net.

BRITISH EQUIVALENTS FOR GERMAN MEDICAL SUPPLIES.

I.

THE outbreak of war stopped the ordinary sources of supply of some of the material and appliances used in medicine. The principal disturbance was among the synthetic products derived directly or indirectly from coal-tar. Before the war what are termed "fine" chemicals were largely of German origin, "heavy" chemicals were largely British, though not to the same preponderating extent. Whatever shortage has arisen in "heavy" chemicals has been due principally to Government demands, not to the lack of normally sufficient supplies. In soda salts, for example, which are products of the "heavy" chemical trade, there has been nothing like famine. So far as "fine" chemicals are concerned, the German share in the preparations used in medicine amounted almost to a monopoly, as it did also in photographic developing agents and in many dyes. Even such substances as iron salts, iodine, and cyanide were supplied in part by Continental houses, but in the case of these articles after the outbreak of war the British manufacturers were able to meet demands from their own resources. It was different with some of the very complex compounds. A few synthetic drugs, such as chlorbutol, had been made by British houses in pre-war days, and France produced synthetic adrenalin, but among the more important drugs which were, we believe, not manufactured in this country were antipyrin, aspirin, salicylic acid, phenacetin, chloral hydrate, phenolphthalein, saccharin,