of the soundness of his teaching. Many more ambitious works dealing with this subject supply pounds of theoretical knowledge to one ounce of practice. In sympathy with the greater part of the rest of the community, Dr. Reid does not approve of the "demon plumber," and there is small doubt that many well thought out sanitary schemes would prove far more efficient in the working were the standards of skill and conscientiousness higher among all members of this trade. We are glad to learn from the author's preface that plumbers were to be found among those who attended his lectures, and cannot but hope that when the competence of both public and plumber in sanitary matters is greater the lamentable faults of the latter will be decreased. In fine, this is a valuable handbook, written with the pen of first-hand experience, and guided by a mind well trained in scientific thought.

BIOLOGICAL CHEMISTRY.

Professor Halliburton's *Essentials of Chemical Physiology*[6] is a practical manual that has been well known to medical students for the last quarter of a century, and is now in its tenth edition. The present issue has been brought well up to date yet remains a reasonably slim volume. Its author is to be congratulated upon the unusual skill he has shown in satisfying the two main requirements of students—fullness without overgrowth. More than two-thirds of the text are devoted to an elementary course of practical work in the physiological laboratory; the remainder is occupied with an advanced course and a number of appendices designed for the instruction of inquirers who wish to go further, and desire to learn the use of more complex experimental methods such as those for the determination of hydrogen ion concentration, or the use of Barcroft's differential apparatus for the analysis of the gases in the blood. The book is well produced and illustrated, and may fairly be regarded as indispensable by the medical student.

The continued progress of knowledge about the chemistry of the carbohydrates is well shown in the third edition of Dr. E. F. Armstrong's book on *The Simple Carbohydrates and Glucosides*.[7] It is written for chemists, chemical students, and general readers who have both a fairly up-to-date knowledge of organic chemistry and a keen interest in its advances. The chemistry of the carbohydrates comes into close touch with other sciences—physiology, botany, and zoology in particular—and Dr. Armstrong gives due weight to the connexions that have recently been made here by British, American, and Continental workers. The first and longest chapter in the volume deals with glucose, a third isomeric form of which has recently been recognized; while the last chapter, discussing the function of carbohydrates and glucosides in plants, is full of facts giving suggestive hints in a subject of the greatest practical as well as theoretical importance. The book is well written, and provides an excellent introduction to the study of the chemistry of the carbohydrates.

PROBLEMS OF FERTILIZATION.

Primarily a book for the zoologist, Professor F. R. Lillie's *Problems of Fertilization*[8] is a well written essay on a subject that should interest a far wider circle of readers, including physiologists and medical men. Beginning with a historical account of the subject, the author goes on to chapters dealing with the place of fertilization in the life-history, and its morphology, physiology, and specificity; he concludes that "while it is by no means certain that specificity in fertilization depends upon specific agglutination of the spermatozoön to the egg . . . the latter phenomenon furnishes an important clue for the further analysis of the problem of specificity in animals."

The last chapter deals with the problem of activation of the egg, whereby it is caused to develop; and here is developed a theory that some diffusible chemical "fertilizin" may be necessary for the process of activation, possibly identical with the agglutinating substance mentioned above. Professor Lillie includes and criticizes in his pages the work of many other experimenters in this field, notably that of Jacques Loeb; the little book forms most interesting reading, and may be warmly recommended to readers of the classes indicated above.

[6] *The Essentials of Chemical Physiology*. For the use of students. By W. D. Halliburton, M.D., LL.D., F.R.S. Tenth edition. London: Longmans, Green and Co. 1919. (Med. 8vo, pp. xi+324. 7s. 6d. net.)

[7] *The Simple Carbohydrates and Glucosides*. By E. Frankland Armstrong, D.Sc., Ph.D., F.I.C. Third edition. 1919. London: Longmans, Green and Co. (Roy. 8vo, pp. ix+239. 12s. net.)

[8] *Problems of Fertilization*. By Frank Rattray Lillie, Professor of Embryology, University of Chicago. Chicago: University of Chicago Press. 1919. (Cr. 8vo, pp. xii+278; 18 figures. 1.75 dols.)

NOTES ON BOOKS.

Dr. A. E. Collie's *Aids to Materia Medica*[9] is a little book in which the often perfunctory nature of the medical student's knowledge of drugs and doses is fully recognized, and an attempt is made to help him through the examinations of various British examining bodies by means of tabulation and mnemonic rhymes. It is divided into five parts, dealing with the examinations held by the Conjoint Boards in England, Scotland, and Ireland, the Society of Apothecaries of London, and the Apothecaries' Hall of Ireland, the bulk of the volume being based on the schedule of the first of these. It is well arranged and printed, and the mnemonic rhymes are average specimens of their class. On the one hand, such books as this may be regarded as the *reductio ad absurdum* of pharmacology; on the other, it may be argued with perfect justice that they supply a want felt by certain medical students. Their defects are really matters for the consideration of the framers of schedules and of examiners, rather than of the reviewer.

The fourth edition of Dr. Cumberbatch's *Essentials of Medical Electricity*,[10] revised and enlarged, gives the medical student and practitioner an excellent practical handbook dealing with a subject of no little importance. The volume has been enriched by a good account of diathermal treatment, and the chapter on the electrical testing of muscle and nerve has been reconstructed. The book may be warmly recommended to those in search of a trustworthy and intelligible introduction to a somewhat mysterious branch of therapeutics.

The fifth volume of the *British Journal of Surgery*[11] contains a number of interesting papers dealing chiefly with the surgery of war. The Editorial Committee is to be congratulated upon the success with which they have selected their contributors; a special word of praise may be given to the publishers for the number and excellence of the illustrations in this handsome volume.

Dr. F. Brett Young's novel, *The Young Physician*,[12] the work of a skilled novelist, describes the school days and professional education of a dreamy boy turned, willy-nilly, into a medical man, with grateful interludes of descriptive writing. The hero becomes qualified in the last chapter, and, thanks to the intervention of a hazel-eyed Rosie, signs on next day as a ship's doctor on the last page. We rather hope that he subsequently gave up medicine for some more congenial and less utilitarian occupation.

[9] *Aids to Materia Medica*. By Arnold E. Collie, M.A.Cantab., L.M.S.S.A.Lond. London: Baillière, Tindall, and Cox. 1919. (Fcap. 8vo, pp. viii + 116. 3s. net.)

[10] *Essentials of Medical Electricity*. By Elkin P. Cumberbatch, M.A., B.M., B.Ch.Oxon., M.R.C.P. Fourth edition, revised and enlarged. London: Henry Kimpton. 1919. (Cr. 8vo, pp. xv + 368; 76 figures, 11 plates. 7s. 6d. net.)

[11] *The British Journal of Surgery*. Vol. V. July, 1917, to April, 1918. Numbers 17 to 20. Bristol: John Wright and Sons, Ltd. 1918. (Sup. roy. 8vo, pp. 714; 687 figures. 36s. 6d.)

[12] *The Young Physician*. By Francis Brett Young. London: W. Collins Sons and Co., Ltd. 1919. (Cr. 8vo, pp. viii + 485. 7s. net.)

INFLUENZA IN SAMOA.

Value of Vaccines.

In a note published in the *Medical Journal of Australia* (1919, vol. i, p. 359) Surgeon Lieutenant Francis Temple Grey, R.N., M.B.Syd., who was the officer commanding the Samoa relief expedition, 1918, states that the epidemic arrived from New Zealand on November 7th, 1918, when natives from different parts of the group had assembled in Apia to meet friends coming from New Zealand; they went on board and carried infection to the most distant parts of the group. The incubation period was two days; the scourge reached its height on the tenth day. The ages most affected were from 18 to 35 and the old. The mortality was greater among men than women—in the proportion of 15 to 13. The incidence among the

natives was 80 per cent. Out of a population of 36,405 the deaths numbered 7,264. Surgeon Lieutenant Grey attributes the high mortality partly to the fact that natives, although apparently of fine physique, have generally a poor chest expansion, and to their habits. The native house has a raised floor of coral and lava pebbles, a thatched roof supported on poles, and no walls, but at the beginning of the epidemic, when a native fell ill he lay down in his hut, and his family, having pulled down the blinds, which are usually lowered only in wet weather, lay down with him in sympathy. When the fever was at its height, on the third day, the natives cast off their clothes, pulled the blinds up, and many of the men went into the sea to cool themselves. This was often followed by pneumonia, although, except in children, few cases, even with precautions, escaped bronchopneumonia. At the height of the epidemic many lives were lost owing to want of food consequent on the cessation of its collection. On December 8th, 1918, food collecting was resumed, and the decline of the epidemic was popularly dated from that. Bronchopneumonia and pneumonia were considered to be rather a part of the disease than complications, for only 5 per cent. adults escaped the one or the other. Bronchopneumonia usually set in on the fourth day, and in fatal cases there was marked dyspnoea, cyanosis, and delirium. Among the whites the incidence was put at 60 per cent., and the case mortality at 2 per cent.

We have received from Surgeon Captain E. T. P. Eames, R.N., Director of Naval Medical Services, Australia, a copy of a note by Surgeon Lieutenant Grey on compulsory inoculation against Spanish influenza. The writer, as stated above, was in charge of the expedition sent to combat an epidemic in British Samoa, where he had an opportunity of witnessing the behaviour of the disease on virgin soil. The full dose of the vaccine used by him contained 125 millions of *Micrococcus catarrhalis*, and 50 million each of pneumococcus, streptococcus, and a Gram-positive diplococcus. His experience showed Pfeiffer's bacillus to be unnecessary as a constituent of a vaccine directed against the epidemic. Immunity begins to "peter out" after the fifth week, and he gave a full dose (50 million each pneumococcus and streptococcus) every five or six weeks. Only the mildest reaction was observed. He did not inoculate children or the old, unless requested, as they appeared to have relative immunity.

He recommends compulsory inoculation on the first signs of the appearance of epidemic influenza, and that the inoculation should be repeated every month or six weeks. He claims that this will decrease the incidence of the disease, mitigate its severity, and reduce the mortality to a low figure. He advances the following evidence:

1. The entire ship's company of the man-o'-war which took my expedition to the islands was inoculated. Communication with the shore at the various ports was, as far as possible, avoided, but this ideal was not entirely attained. Not one case developed.

[The ship returned to Australia in February, 1919, and in the middle of March an epidemic broke out, producing by the end of the month about 100 cases, without any deaths. He considers that this is evidence that inoculations made at the end of November and end of December gave immunity up to the middle of March and rendered the disease when it broke out non-fatal.]

2. Every member of my expedition was inoculated at least four times in three months. Not a single case developed, although the risk of infection was no small one, when it is remembered that in Samoa alone one-fifth of the entire population was wiped out by the scourge. Two officers had an illness of four to five days not as severe as the so-called influenza of normal times.

3. An interesting experiment to test the efficacy of the vaccine was provided by the Governor of American Samoa, who sent, against the wishes of British Samoa, forty natives from Pago Pago (a clean port) to Apia during the progress of the epidemic. These were isolated, inoculated, and not released until judged to be in a positive phase. Not one contracted the disease, and the Secretary of Native Affairs, who knew their names and villages, reported all clear after a lapse of one month.

4. Ship's company and passengers of the steamer which brought the expedition from Suva to Sydney were inoculated without exception. We anchored in quarantine in Sydney, and on the second day a case was taken ashore. We remained on board, quarantined another week. Although the ship was very overcrowded, not another case developed.

5. The naval dépôt at Williamstown contains a floating population of about five hundred, half of whom live on shore, and the rest, of course, have a fair amount of shore leave. All hands have been inoculated twice in the last three months. Down to March there had been only fifteen cases, all mild except two, and no deaths. In March an influenzal epidemic broke out in the naval dépôt characterized by high infectivity, extraordinary mildness, and an average age incidence of 18.5; it caused 100 cases within a fortnight, but it was not clear that it was true influenza.

From the beginning of the year to the date of the note (June 20th, 1919) 2,875 ratings were victualled at the dépôt. There were 345 cases of influenza, five with pneumonic signs, but no deaths.

MEDICAL SERVICES IN INDIA.

THE Indian Medical Service, as is well known, is primarily a military service. At the time when the Royal Commission on the Public Services in India was taking evidence in that country the Service had a strength of 772 officers, of whom 475, or 62 per cent., were engaged on civil duties. Down to the beginning of April, 1915, 286 officers of the Service had been recalled from civil to military duty. The officers of the Service are partly European, partly Indian.

In addition to the Indian Medical Service other medical services are maintained in India by the Government. There is a service of Military Assistant Surgeons, which is recruited in India under the directions of the Director-General, I.M.S. Candidates are admitted on the result of an examination in general knowledge; those successful pass through a four years' course at an Indian medical college, the Government defraying the cost of their education and maintenance. Having passed the final examination they are placed for duty with British troops in station hospitals; eventually they may obtain employment as civil surgeons in certain stations. The pay began at Rs. 85 a month, rising according to rank and length of service, with a maximum of Rs. 400 a month. Recently the position of Military Assistant Surgeons has been improved and the pay increased in all ranks. At the present time the pay of Military Assistant Surgeons is as follows: 4th class (1st to 7th year) Rs. 100; 3rd class (8th to 12th year) Rs. 150; 2nd class (13th to 17th year) Rs. 200; 1st class (from 18th year to selection for promotion to senior grade) Rs. 250; a senior Military Assistant Surgeon with honorary rank of lieutenant, Rs. 350; with honorary rank of captain or major, Rs. 450. Military Assistant Surgeons in civil employ, whose duties relate to hospitals, sanitary and gaol work, can rise to civil surgeoncies, and after thirty years' service may receive as much as Rs. 800 a month. At the time of the Royal Commission the cadre of the Military Assistant Surgeons was 713, 424 of whom were on the military and 289 on the civil side.

In addition, there is a class of Sub-Assistant Surgeons, formerly called "Hospital Assistants," who also have a four years' course, their education being subsidized by the Government. According to the evidence given to the Royal Commission by the Bombay Medical Union in February, 1914, there were then 820 appointments, of which 135 were civil posts, but there were also other posts in the civil branch, the number of which is not stated. The salaries range from Rs. 35 to Rs. 110 a month after thirty years' service. Those on the military side serve with the Indian troops, those on the civil side in civil hospitals or dispensaries, in subordinate positions, their duties being of a minor nature. It is understood that the Government of India intends shortly to improve the position and pay of the Sub-Assistant Surgeons.

Finally, there are Civil Assistant Surgeons, who are medical graduates of Indian universities. Their curriculum lasts six years and its cost is defrayed by the student himself, although Government gives many scholarships. It is from this body that the resident house-surgeons and physicians of the principal Indian civil hospitals in presidency towns are chosen. A graduate of distinction of an Indian university may become an assistant surgeon when a vacancy occurs; he will be placed for duty in a subordinate position in a civil hospital, and may eventually obtain charge himself. From the body of Civil Assistant Surgeons are recruited the teachers and lecturers in many of the medical schools in India, appointments much sought after in India as in this country. In the Bombay Presidency in 1914 there were fifty-five appointments open to Civil Assistant Surgeons, all held by Indians. The salaries range from Rs. 100 a month to Rs. 300 at the end of thirty years' service, and they have the right of private practice.