certain terms of the curriculum, but should be spread over most, if not all, the terms of that curriculum, and should be directly linked up in the form of team work with other subjects such as medicine, surgery, obstetrics, neurology, and the special senses. The actual dissecting can be completed in the earlier years of the curriculum with the elimination of much of the useless detail with which it is now encumbered. The supervision of this earlier part of the work can be safely entrusted to junior surgeons and recent graduates. Its higher and later study should be in the hands of the professional anatomist, who should himself be a member of the staff of the hospital in which his teaching and researches will be conducted. Under such conditions—which are not so Utopian as to be impossible of realization—the subject, the profession, and the patient would benefit enormously.

It may be argued that the extended field of observation which is here urged as being the province of the anatomist is altogether too large. That this is not so is shown by the number of living men who, in both their teachings and their writings, very efficiently cover this wider domain. What is more to the point is where such men are coming from in the near future. The social outlook has been so profoundly modified by the economic consequences of the Peace as to make it certain that no young medical man of promise and ability will nowadays wilfully or deliberately choose the life of denial which, on existing salaries, will be his only reward as an academic teacher of medical science. Neither the universities nor the profession need expect the advancement of medicine by research if the emoluments of such research are to compare none too favourably with the daily wage of the manual labourer. The caustic critic—himself possibly paying supertax—need not regard this as a personal "grouse." It is a very genuine fear for the future of a branch of medical science to which every practitioner owes so much.

To many the ideas herein expressed will doubtless appear heterodox and revolutionary. On the other hand, a recent visit to England has convinced me that there is a much larger number who are very cordially in agreement with the main conception of this paper, which is that anatomy is a study of the living, and that its methods require modification. It is perhaps unnecessary to adduce evidence of the thesis, but it may be well to point out that the pages of *Medical Education in Europe*, published in 1912 by the Carnegie Foundation for the Advancement of Teaching, contain ample evidence of the fact that an anatomical institute should be in close co-operation with a hospital. The recently published report on the medical curriculum by the Edinburgh Pathological Club is similarly convincing as to the impossibility of teaching human anatomy in a water-tight compartment of that curriculum. The discussion at Cambridge in June, 1920, on the preliminary medical sciences—and particularly the eloquent words of Sir George Newman and Professor Arthur Keith—intensifies the necessity for change in the relations of the ancillary sciences to medicine. As Osler remarked, "Biology teaches the problem of life at every point, and may claim, as no other science, completeness of view and a comprehension which pertains to it alone." This is verily the living anatomy herein advocated, as is also Keith's dictum that "Anatomy could be made a living practical part of medicine." Why is it not?

A NOTE ON THE USE OF ANTIGONOCOCCAL SERUM.*

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THE prevalence of gonorrhoea in young and otherwise healthy married women¹ makes it peculiarly necessary not only to improve technique but to utilize all available means to make conservative gynaecological surgery a success in the presence of this infection. Until the last few years antigonococcal serum therapy has not been generally employed, although as early as 1895 de Christmas² experimented with it in guinea-pigs and rabbits. Wassermann and Wertheim confirmed his

experiments, the former showing that the poison was contained in the body of the microbe, which did not belong to a diffusible group. These results were applied by Rogers and Tory³ in 1906, and Parke Davis's antigonococcal serum was used successfully in the treatment of gonorrhoeal rheumatism. Recently Paraf⁴ pointed out the points of resemblance between the meningococcus and the gonococcus, and urged the necessity for methods of local application of the serum to bring it into immediate contact with the microbe, as is done in the treatment of cerebro-spinal meningitis by intrathecal injections. Paraf supported his views by inoculation experiments in the anterior chambers of rabbit's eyes, and by intrathecal injections into monkeys. With Nicolle's serum he cured 14 out of 16 cases of arthritis by the intra-articular injection of serum. This serum is active, possessing agglutinating, bacteriolytic, and bactericidal qualities, and is endowed with therapeutic properties against different strains of gonococci.

Encouraged by the results obtained during the war by the use of specific serums in wound infection, and more especially in gas gangrene,⁵ I determined a year ago to experiment with antigonococcal serum in the treatment of some of the cases of gonococcal infection coming under my care. I employed serum in about 30 cases, in 22 of which tubal infection was the most marked feature. Endocervicitis was present in three, and in three cases of arthritis one had occurred during pregnancy, another in the puerperium.

I adopted three methods of application. In one series I gave the serum subcutaneously diluted in normal saline, usually in a dose of 20 c.cm., repeated at intervals of a couple of days, every three days, or occasionally a week, giving in all from 20 to 200 c.cm.

In another series, on the supposition that the toxin is not diffusible, I tried the intraperitoneal method. Where there were dripping pus tubes or a pyosalpinx the tube was washed out with normal saline, after being, if necessary, opened up. Conservative surgery was adopted when possible, both tubes, or at any rate one, being left. With a syringe 20 c.cm. of serum was injected into the tubes, sometimes into the ovary, and the residue left in the pouch of Douglas. The abdomen was then closed without drainage, and the Fowler position adopted. To avert anaphylactic shock a subcutaneous or rectal saline was given simultaneously. This method, which we employed empirically during the war, has been shown by Richet⁶ to have a scientific basis—namely, that sodium chloride has a protecting action against the assaulting infection. Lumière and Chevrotier⁷ have recently shown that other sodium salts act as well.

Thirdly, in a few cases of endocervicitis with profuse leucorrhoea I tried serum packs in the vagina, alternating daily with packs moistened with equal parts of 10 per cent. salt solution and 5 per cent. carbolic acid. In one case 200 c.cm. of serum were used, but my limited supply did not permit me to utilize this method as frequently as I wished. The after-history of these local cases has been peculiarly good—one has recently become pregnant, another, who had had previous ineffective treatment extending over a couple of years, got quite well, all trace of gonococci disappearing.

In no case have I used serum intravenously, as it is the only method in which I have seen fatal anaphylactic shock supervene after the use of serum. With repeated doses there is little doubt that it is safest to use the fractional method, and not to allow more than seven or eight days to intervene between the first and second doses.

With two exceptions all these patients were married women. Thirteen had no children, and nine one only—a striking percentage of sterility. All but three were between 20 and 30 years of age.

Every effort was made to confirm the diagnosis by bacteriological findings. The history and physical signs were generally clear, and I have not included doubtful cases. The existence of purulent vaginitis and of ophthalmia neonatorum in the children was of diagnostic value. Of the 30 cases subcutaneous injections were used in 19, in 6 intratubal and peritoneal, in 3 vaginal packs, and in 2 cases of Bartholinitis, serum dressings.

RESULTS.

All the cases have made a good immediate recovery. In nearly all, either by personal investigation or through

* Read at a clinical meeting of the Liverpool Medical Institution, December 16th, 1920.

their medical advisers, I have made myself acquainted with their after-histories, which have been on the whole extremely satisfactory. There have been three definite failures—one an acute case, where an insufficient quantity of serum was perhaps responsible, and two which relapsed after a period of some months' good health, and where there was every possibility of reinfection. Further operation had to be undertaken in all three cases, otherwise the results have been good. In spite of their dislike of subcutaneous injections many of the women have said they were glad to have them, as they felt the benefit. In nearly every case relief of pain was a marked feature. Seen after varying intervals of months the patients described themselves as feeling splendid, being fit for anything, and able to do their own washing—in fact, they form a marked contrast to many other cases of gonorrhoeal infection where no serum had been given at operation, and where the presence of peritoneal adhesions causes so much pain and disability. In one case pregnancy was apparently proceeding normally. Discharges had stopped, and it was difficult to collect enough for bacteriological examinations, all of which were negative.

SPECIAL CASES.

Case 1.

A good result was obtained by the intraperitoneal use of serum in the case of Mrs. B., the mother of two children, one a girl suffering from gonorrhoeal vaginitis, while the baby had ophthalmia neonatorum. There was a left-sided pyosalpinx and an abscess in the pouch of Douglas. One tube and ovary were removed, and 20 c.cm. of serum were left in the pelvis, the abdomen being closed without drainage. There was a very slight febrile reaction the night of operation; temperature 100°, pulse 90. The patient made a good recovery. When seen eight months later she looked fit and well, and declared that she had never been in better health.

Case 2.

Mrs. V. was a case of acute salpingitis, associated with metrorrhagia. The abdomen was opened, sero-pus mopped out of the pelvis, and the tubes washed with saline solution, but not removed. Serum was administered subcutaneously in saline. There was no febrile reaction. The result was excellent, and her doctor reports that her pelvic condition ten months after operation is most satisfactory.

Case 3.

Mrs. P. was a case of arthritis of the wrist occurring about the seventh month of pregnancy (primipara). There was a profuse cervical discharge. The patient was taken into hospital and 20 c.cm. of serum were given every few days subcutaneously in saline until 150 c.cm. had been given. One injection was made into the tissues round the wrist-joint and caused a marked local reaction, with redness and swelling of the limb. This passed off, and both discharge and pain ceased. The baby was born in the maternity hospital and was quite healthy. Both mother and baby were seen some months later in the out-patient department in excellent condition; wrist movements were normal and leucorrhoea had ceased. In this case the patient had left her husband.

Case 4.

Another favourable result was in the case of Mrs. J., where there was a history of leucorrhoea extending over two years. After the birth of a child arthritis of the left hip developed and the patient was confined to bed. She was taken into the maternity rest home for treatment, with her baby, aged 9 weeks. No gonococci were present, but her husband was also suffering from joint pains. Two subcutaneous injections of serum were given at an interval of eight days, each producing a very marked febrile reaction the same evening. The breast-fed baby also developed a serum rash. In this case the result was excellent. Pain ceased and the patient was able to leave the home in about three weeks. When seen in the out-patient department three months later she could walk well, had no pain, and was very pleased with herself.

Case 5.

In a chronic case of hydrosalpinx (Mrs. N., married six years, husband a sailor, no children) both tubes were opened up. Three doses of serum were given subcutaneously at intervals of forty-eight hours. There was a marked febrile reaction each evening, the pulse being 116 and temperature 104.6° on one occasion. This patient was seen nine months later—fornices clear, no discharge. She said she was in excellent health.

Case 6.

Another case, Mrs. T., is interesting for the light it throws on obscure causes of puerperal infection. This patient had been under treatment during pregnancy for both gonorrhoea and syphilis in the venereal disease department.

Before admission to the maternity home discharge had ceased for some weeks, and the Wassermann test was negative. The confinement was normal and was conducted under the strictest

aseptic conditions, which include the shaving of the vulva and the wearing of gloves by all associated with the conduct of the labour. On the fifth day a rigor occurred, and the temperature rose to 102.8°, pulse 120. The patient was anaesthetized and thoroughly examined, the uterus being curetted and douched. It seemed so probable that the case was one of latent gonococcal infection lighting up in the puerperium that at the same time I gave 10 c.cm. antigonococcal serum with 10 c.cm. antistreptococcal serum. The latter was given not because the case was believed to be one of streptococcal infection, but as a prophylactic against a secondary infection. Temperature and pulse dropped to normal, and the patient made a good recovery.

The diagnosis was confirmed by the presence of gonococci in the uterine discharge. There were no streptococci.

From such a limited number of cases I do not presume to draw any definite conclusions, but I think these favourable after-histories warrant further experiment and study. I am hoping also to receive some assistance from bacteriological and immunity experts respecting the best method of administration of the serum, with regard to the site of the injections, their incidence, and the amount to be given. On theoretical grounds it is surprising that subcutaneous injections have been so successful, bearing in mind the nature of the microbe. Can one expect to reach an organism secreting an endotoxin by the blood stream, or must some other method be found by which it can be attacked locally?

Also, what is the explanation of the vigorous febrile reaction in chronic cases where subcutaneous injections have been used, while in the acute infections, where the tubes are pouring out pus, there is practically no febrile reaction either with the subcutaneous or intraperitoneal method?

In conclusion, I should like to take this opportunity of thanking Professor Nicolle of the Pasteur Institute for his kindness in placing so much valuable serum at my disposal; to Professor Beattie and his staff for numerous bacteriological examinations; and to Dr. Ruth Nicholson and my house-surgeons and sisters for their assistance with the notes and observations.

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ALBUMINURIA IN RELATION TO LIFE ASSURANCE.*

BY

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In the following remarks I shall deal only with albuminuria in youth and early adult life. From the point of view of prognosis and examinations for life assurance and appointments for clerkships, etc., I prefer to divide the subject under four main headings.

I.—Albuminuria Connected with Definite Nephritis, Chronic Heart Disease, Acute Febrile Diseases, Amyloid Disease, and other Conditions, such as are met with in Hospital Wards and Ordinary Medical Practice.

These cases are well known, and in the present discussion we are not concerned with them, excepting in regard to so-called "residual albuminuria" following an attack of acute nephritis. As long as there is albuminuria of this "residual" kind a life cannot be regarded as up to the normal standard; there may still be a slumbering inflammatory process in the kidneys (one or both). Mere functional recovery in the general condition of a patient, with persistence of albuminuria, does not mean that the life is a first class one any more than does functional recovery in a case of cardiac valvular disease with the persistence of a valvular murmur and cardiac hypertrophy. The extra amount to be placed on the life should depend on a variety of circumstances—for instance, the presence or absence of tube-casts, the amount of the leakage of albumin, the results of various tests as to efficient

* Read at a discussion on the subject at the Assurance Medical Society, January 5th, 1921.