are accepted as evidence of eligibility for fellowship in the European colleges of surgeons would prove only his theoretical knowledge of the subject." This criticism is not entirely just, for in most of the higher surgical examinations in Great Britain the candidates must have filled at least one surgical appointment in an approved hospital; nevertheless, it is probably true that none of the higher British surgical qualifications sufficiently insists upon supervised practical experience as an essential preliminary. Some of the higher surgical degrees indeed seem more in the nature of competitive examinations than tests of the candidate's skill and experience.

SOME SPECIAL PROBLEMS

The general level of surgery in this country, however, is high, and the position of the surgeon in the community probably higher than it has ever been. The surgeon has gained the confidence of his fellow citizens to such an extent that he is often expected to do the impossible. The public seem to think that if only the surgeon will do something then good is almost sure to result. Some of the most difficult moments of the conscientious surgeon are those when he must advise against operation in cases where the anxious relatives are clamouring for something to be done.

The life of a surgeon is of absorbing interest. Whether considered from the humanitarian standpoint of serving his fellow creatures or from the scientific aspect of opportunities for research, or even from that less praiseworthy but common desire which mortals have of obtaining benevolent power to control the destinies of others, the life of a surgeon can give great satisfaction. To no man is the destiny of human life so often delivered, to no man's single responsibility does the decision so often rest for action which may make or mar a human life. He has not only to give judgment but must himself carry out the sentence. His power of speedy diagnosis and decisive action in a crisis is of the greatest value, and its exercise brings a sense of self-reliance which has to be curbed lest it develop into intolerance. As the clever physician-dramatist has written (probably with his tongue in his cheek):

"He is surrounded by respectful and even adoring acolytes, and he holds the power of life and death over helpless persons. . . . If he is to avoid madness he must stand aside from the business from time to time and deride himself and his colleagues."

One might be satisfied if each surgeon were content to limit his criticism and derision to his own failings. As a fact there is much less intolerance now than in former times. Most surgeons are moderate in the advocacy of their own methods and eager to gather information and new technical methods from their colleagues. The various surgical clubs and associations are sufficient evidence of this. Yet in some respects the surgeon of today is more isolated than his forerunner of fifty years ago. At the beginning of the modern era it was customary to have regular consultations between all the members of the staff at the large hospitals, and each senior surgeon was actually assisted by his junior at operations. The increase in the amount of work falling to the lot of junior surgeons has caused this practice to fall into disuse. Each member of the staff works on his own and may seldom see his colleagues operate. However, there are welcome signs that a different kind of coöperation will soon be general. The advantage of the group-system of examination is too great to be neglected; in future we think the physician will be more regularly called in to give his opinion as to the risks of operation and the advisability of performing it; the pathologist will be asked not only to pass an opinion on a section cut from a piece of tissue sent to him without sufficient details as to the clinical features of the case, but will come and consult with the surgeon at the bedside; the radiologist will in like manner take an active part in clinical diagnosis. By these means the diagnosis made by the surgeon will be discussed, challenged or confirmed and all to the benefit of the patient.

REWARDS

The competent surgeon is assured of an honoured place in the community. He does not seek and seldom gains much public recognition, but with him the gaining of the high regard of his fellow-surgeons counts for more than social distinction. If opportunity offers he may have the extra happiness which comes from pursuing some useful work of research. In material rewards there is great variation. We have travelled far from the time of Ambroise Paré who wrote of one of his distinguished patients: "He was cured by the grace of God and he made me a handsome present, of such sort that I was well contented with him and he with me, as he has shown ever since."

The young surgeon who follows the orthodox path of preparation for the staff of a voluntary hospital often has many lean years before him. Though well qualified and spending nearly all his time for the benefit of the community he may receive a bare subsistence. Even when elected to the staff of a hospital he may find it hard to make ends meet. This unsatisfactory state of affairs is likely to find its own remedy. The average surgeon ought to and usually will receive adequate pecuniary reward, though, owing to the decentralisation of surgery, it is unlikely, and perhaps undesirable, that the rewards will ever be as great as they were in the opening days of the new era; for the man who enters the surgical profession chiefly to make a fortune has already made a mistake in that he falls short of the ideal which ought to inspire him. The best reward of the surgeon must always be the satisfaction of knowing that interesting, useful and skilful work has been faithfully performed.

ANTITUMORIGENIC ACTION OF TESTOSTERONE

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IT has been shown that the development of the uterine and extra-uterine fibroids produced experimentally by a prolonged course of injections of the monobenzoate ester of œstradiol can be partly inhibited by the simultaneous injection of progesterone (Lipschütz, Murillo, and Vargas 1939). We now describe the control of experimentally produced fibroids by injection of testosterone propionate. Our experiments are still in progress; but, since the experimental production and inhibition of fibroids (Lipschütz and Vargas 1939; see also the pioneer work of Nelson, and of Moricard and Cauchoix, Lipschütz and Iglesias) bear directly on the possibility of finding a suitable hormone therapy for uterine fibroids in women (*Lancet* 1939, Todd 1939), we

Expt.	Animals	Duration of expt. (days)	Treatment: Œstradiol weekly (mg.)	Treatment: Testosterone weekly (mg.)	Proportion of œstradiol to testosterone[3]	Fibroids and macroscop. fibrosis: total mark	Animals with some tumoral or fibrous reaction	Animals with individual tumours of mark not less than 1
I	10	103	0	1·25	0·1	0	None	None
II	38	47–84	0·24	0	1·0	more than 5	All	34 out of 38
III	8	84–120	0·12	0	1·0	2	All	4 out of 8
IV	2	104	0·24	1·25	1·5	more than 4	All	All
V	4	105–111[1]	0·12	1·25	1·10	5·5	All	All } out of 8
VI	2	104	0·24	1·25[2]–5·0	1·12·6	6·5	All	1
VII	3	108–122	0·12	1·25[2]–5·0	1·22	0·7	2	None
VIII	2	137–158[1]	0·12	6·25	1·52	0·5	1 } out of 7	None } out of 7
IX	2	122–137	0·12	10·0	1·88	0·5	1	None

1. One animal with œstradiol only during the first three weeks and then with both hormones.
2. For the first 53 days, then increased. 3. For simplification the total quantities of the hormones are compared.

communicate our results, though still indefinite because of the rather small number of experiments.

It is known since the work of Zuckerman and Parkes (1936) and of De Jongh et al. (1938) that male hormones may counteract the stimulating effect of the follicular hormone on the epithelial and fibrous parts of the prostate. This led us to try testosterone propionate as an antidote against experimentally produced fibroids. Further, the male hormone has already been used in the clinical treatment not only of uterine epithelial proliferation but also of fibroids (Loeser 1938).

EXPERIMENTS AND RESULTS

To 15 castrated female guineapigs, weighing 360–750 g., three subcutaneous injections of 40 μg. and in some cases 80 μg. of œstradiol monobenzoate were given weekly. Simultaneously various quantities of testosterone propionate* were injected thrice weekly. The results are given in the accompanying table. The number of animals escaping some macroscopically visible fibrous reaction or development of individual tumours (of mark not less than 1) is nil or insignificant when 80 μg. of œstradiol monobenzoate is injected thrice weekly for seven to twelve weeks (experiment II). The number of animals without individual tumours increases when only 40 μg. is given per injection (expt. III); but tumorigenesis is still considerable with this quantity of œstradiol. No change is induced when 5–13 parts of testosterone is injected simultaneously with 1 part of œstradiol (expts. IV–VI); but the whole situation seems to change when the proportion of testosterone is raised to more than 22 parts (expts. VII–IX). Out of seven animals (expts. VII–IX) there were three without any visible fibrous or tumoral reaction, and not a single animal developed tumours of mark not less than 1. There was only fibrosis or a tumoral seed characteristic of a weak tumoral reaction (Vargas and Lipschütz 1939). The difference between the eight animals receiving 1 part of œstradiol to 5, 10, and 13 parts of testosterone (expts. IV–VI) as compared with the seven animals receiving 22–88 parts of testosterone (expts. VII–IX) is striking.

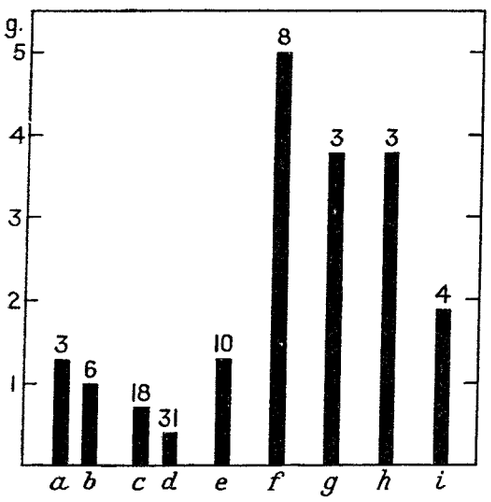

FIG. 1—Diagram showing stimulating and inhibiting action of testosterone on the weight of the guineapig's uterus: (*a*) normal adult females treated for five months with olive oil 0·4 c.cm. injected subcutaneously thrice weekly; (*b*) virginal females more than a year old; (*c*) castrated females treated with injections of olive oil; (*d*) castrated females not treated with olive oil; (*e*)–(*i*) castrated females treated with: (*e*) testosterone propionate (expt. II in table); (*f*) œstradiol monobenzoate (expt. III); (*g*)–(*i*) testosterone and œstradiol simultaneously (expts. V, VII, VIII, and IX) in the following proportions of œstradiol to testosterone: (*g*) 1 to 10; (*h*) 1 to 22; and (*i*) 1 to 52–88. The numerals at the tops of the columns indicate the number of guineapigs in each group.

* Supplied by the courtesy of Dr. Carl Miescher, of Messrs. Ciba, Basle.

DISCUSSION

There is, however, a weak point in our experiments. In order to avoid using large quantities of testosterone we used 40 μg. of œstradiol per injection instead of 80 μg. This has the disadvantage that some animals receiving 40 μg. per injection will not develop any individual tumours of appreciable size (expt. III). Thus the objection can be raised that the lack of tumours of appreciable size (of mark not less than 1) in all the animals in expts. VII–IX was not due to the inhibiting action of testosterone but rather to an experimental hazard. It is for this reason that we hesitated to report these results of our experiments with testosterone. Dr. J. Luco is now carrying out in this department an experimental investigation on a greater number of animals; so in about three months we hope to have more convincing results.

On the other hand, certain observations of ours speak in a striking manner in favour of an inhibiting action of testosterone against the stimulating action of œstradiol on smooth muscle-fibres and on the uterine mucosa. The stimulating influence of testosterone on the uterus is well known, thanks to the extensive work of Korenchevsky, Dennison, and Hall (Korenchevsky 1939), Courrier and Gros (1938), and others (Varangot 1939). In our experiments we succeeded in maintaining with testosterone propionate the uterine weight of castrated animals on the level of a normal adult virginal female. When œstradiol monobenzoate is given in sufficient quantities, the uterine weight increases enormously. When both

hormones are given simultaneously, a considerable decrease is obtained as compared with the benzoic ester of œstradiol alone (Ruz 1939) (see fig. 1). The increase of uterine weight caused by œstradiol is due partly to the growth of the myometrium and partly to epithelial growth, which, as is well known, can become enormous under similar experimental conditions. This atypical tumoral growth of the endometrium due to œstradiol is also inhibited when sufficient quantities of testosterone are given (figs. 2 and 3).

Since testosterone has already been used in the treatment of epithelial uterine growth (Loeser 1938, Foss 1938) and of uterine fibromyoma, apparently with a satisfactory result (Loeser 1938, Turppault 1938), it may be useful to emphasise that, so far as the inhibiting action of testosterone is concerned, the conditions in the woman are probably more complicated than in our experiments with exogenous œstradiol. In the woman the source of the tumorigenic œstradiol is the ovary; testosterone, given to a patient with epithelial or fibrous growth, will probably act not only on the tumour (as in our experiments) but also on the gonadotrophic complex of the anterior lobe of the pituitary and thus also on the ovary, interfering with the production of œstradiol. Indeed it cannot be excluded that, even in our experiments, the inhibiting action of testosterone is partly brought about through the anterior lobe, which seems to play a part in the tumoral reaction of our experimental animals. It is probably by a sex-specific difference in the endocrine function of the anterior lobe that the striking sexual specificity in their fibrous tumoral reaction may be explained which male and female guinea-pigs, even when castrated, show when injected with follicular hormone (Koref, Lipschütz, and Vargas 1939, Jedlicky, Lipschütz, and Vargas 1939, Chaume).

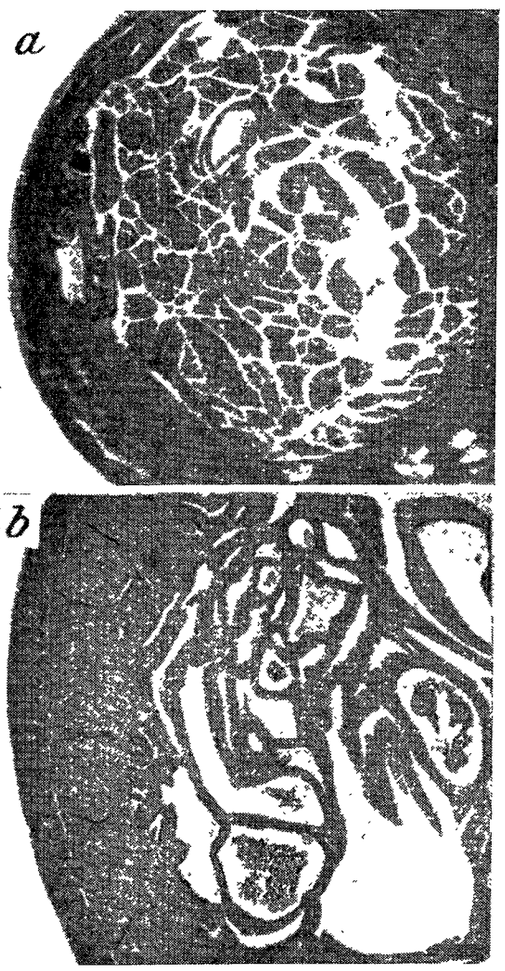

FIG. 2—Sections of uteri of two castrated female guineapigs treated with œstradiol monobenzoate 40 μg. injected subcutaneously thrice weekly for 122 and 102 days (expt. III), showing (*a*) polypous development of uterine mucosa and (*b*) cystic development of uterine glands. (× 12.)

SUMMARY

When the monobenzoate ester of œstradiol was given to castrated guinea-pigs simultaneously with testosterone propionate up to the proportion of 1 : 13 uterine and extra-uterine fibroids developed in the usual manner as with similar quantities of the ester of œstradiol alone.

When the proportion of œstradiol to testosterone was raised to 1 : 22 or more, no fibroids of appreciable size developed, only some fibrous reaction or tumoral seed being produced, which seems to be characteristic of a diminished tumoral sensibility.

The objection can be raised that the individual variations, so far as the tumoral reaction is concerned, are so great that the apparent inhibiting action of testosterone may be due to an experimental hazard; but the inhibiting action of testosterone against the stimulating action of œstradiol is revealed also by the following experimental findings: (1) though the uterine weight is maintained by testosterone alone in a castrated animal on a normal level, the male hormone will suppress the increase of the uterine weight due to œstradiol, especially when the hormones are given in a proportion of more than 1 : 22; and (2) the atypical growth of the endometrium and its glands due to œstradiol is partly inhibited by testosterone.

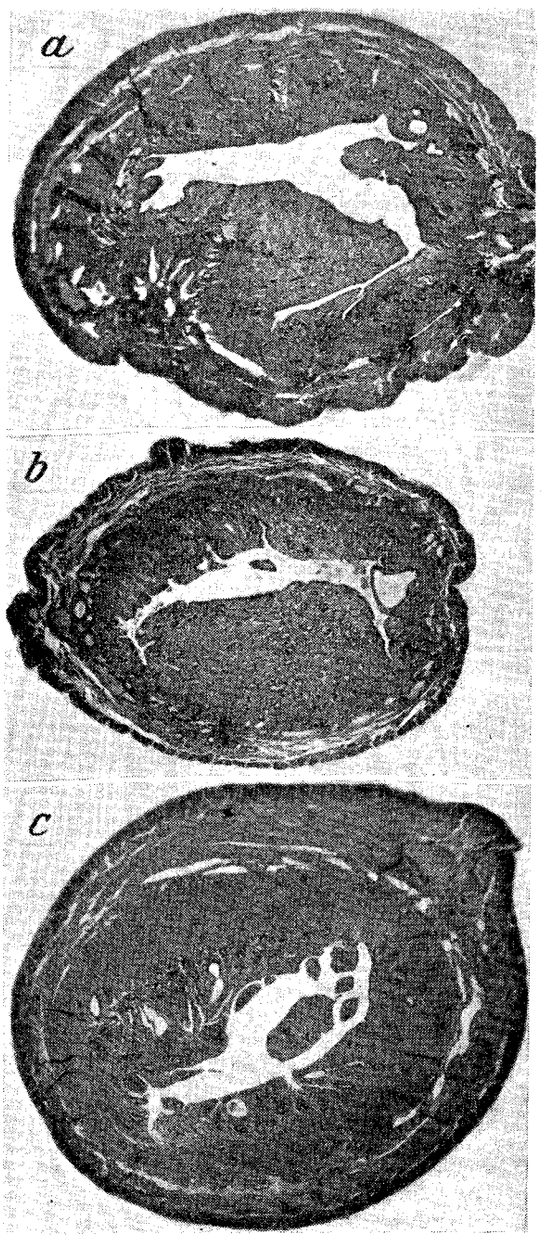

FIG. 3—Sections of uteri of three castrated female guineapigs treated simultaneously with three subcutaneous injections of œstradiol monobenzoate 40 μg. and one injection of (*a*) 6·3 mg. and (*b* and *c*) 10 mg. of testosterone propionate weekly for 158, 122, and 137 days respectively. Uteri weigh 2, 1·8, and 1·7 g. respectively. Note inhibition by testosterone of stimulant action of œstradiol on the uterine mucosa. (× 12.)

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PATHOGENIC STAPHYLOCOCCI

THEIR INCIDENCE IN THE NOSE AND ON THE SKIN

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DURING an investigation of an outbreak of septic infections in operation wounds Devenish and Miles (1939) found that three of four surgeons tested were nasal carriers of *Staphylococcus aureus*. One of these three was a persistent skin carrier of a strain of *Staph. aureus* identical with the nasal strain. The *Staph. aureus* carrier state in the nose is relatively common. It is obviously of surgical importance to know the incidence of the *Staph. aureus* carrier state in the skin, and its connexion with infestation of the nose. Hart (1937) found that the nasal-carrier state in an operating-theatre staff was intermittent. Hallman (1937) and McFarlan (1938) determined the nasal-carrier-rate of potential pathogenic staphylococci in students and in hospital patients. McFarlan found no direct relationship between staphylococcal nasal carriage and staphylococcal infections.

There appears to be no record of any survey of the incidence of staphylococci both in the nose and on the skin in which the cocci were identified as potentially pathogenic. We have determined the nasal- and skin-carrier-rates in medical students and compared them with the incidence of nasal and skin infections, and we have attempted to show the relation between infestation of the nose and of the skin. Two surveys were made. In the first, 159 students were swabbed; in the second, 40 students selected from the first group were swabbed again, and stringent tests were made for the skin-carrier state under conditions comparable with those in an operation theatre.

First Survey

During the eight weeks from Oct. 19 to Dec. 16, 1938, nasal and skin swabs were taken from 159 healthy medical students and recently qualified assistants, whose ages ranged from 19 to 30. Swabs were taken from 66 per cent. of the students of University College Hospital; the volunteers were representative of the total student population, though first-year students predominated slightly. During the survey there was no noticeable outbreak of colds or influenza in the students or in the general population. The past history with regard to acute and chronic infections of the skin, nasal cavities, and nasal sinuses was obtained from each volunteer.

Both nostrils were sampled with one cotton-wool swab. For the skin sampling an area about 2 in. in diameter on the back of each wrist was rubbed about twenty times with a swab moistened in broth, a separate swab being used for each wrist. Swabs were cultured on Fildes's peptic-digest-blood-agar plates, incubated at 37° C. for twenty-four hours and then in moderate daylight at room temperature for forty-eight hours to facilitate production of pigment.

Likely colonies of golden staphylococci and, in their absence, white staphylococci were examined as regards their morphology, fermentation of mannitol, and production of pigment, coagulase, and α-hæmolysin. The production of pigment by all the cocci isolated was determined by a simultaneous seeding on to segments of blood-agar plates, which were incubated for twenty-four hours at 37° C. and examined after standing three and seven days in moderate daylight at 18° C.

The methods for testing the production of α-hæmolysin and coagulase closely resembled those used by McFarlan (1938). Subcultures in 0·5 c.cm. nutrient broth (in 3 by $\frac{3}{16}$ in. tubes) were incubated at 37° C. for forty-eight hours in air containing 30 per cent. of carbon dioxide. The cultures were centrifuged, and 0·1 c.cm. of the supernatant fluid was tested for α-hæmolysin against a 2 per cent. suspension of rabbit red corpuscles. A control tube containing one unit of staphylococcal α-antitoxin was set up for each strain. Readings were made after an hour at 37° C. and eighteen hours on the bench. To the remaining 0·3 c.cm. of culture an equal quantity of a 50 per cent. solution of citrated human plasma in saline was added. The test was read after three hours at 37° C. and after eighteen hours at 18° C.

Since differences in the specimens of plasma may cause variations in the coagulase test (McFarlan 1938), plasma from two persons only was used exclusively throughout the investigation. While testing strains isolated in the second survey, it was found that either incubation in air containing 30 per cent. of carbon dioxide or growth in the 3 by $\frac{5}{16}$ in. tubes in air inhibited the production of coagulase. Tests of media and plasma did not reveal any reason for the sudden appearance of this inhibition by carbon dioxide. A similar observation has recently been made by Di-Rocco and Fulton (1939). For coagulase tests in the second survey a large loopful of a 24-hour blood-agar plate culture was added to 0·2 c.cm. of plasma, shaken well, and the result read after incubation as above.

Strains of staphylococci with the following characters were labelled "potentially pathogenic": monomorphic gram-positive cocci producing α-hæmolysin and human-plasma coagulase. According to Cruickshank (1937) and Chapman et al. (1938) coagulase is the simplest reliable test for potential pathogenicity. Since pigmentation is by itself of limited value, Bigger (1937) and Cowan (1938) suggested the name of "*Staph. pyogenes*" for all potentially pathogenic staphylococci. The name has been adopted in this paper.

All typing was performed by one of us (S. T. C.) with the slide-agglutination method (Cowan 1939), dividing the strains into the three main types I, II, and III, and into six additional subtypes according to the reactions of the strains with absorbed sera. All strains of *Staph. pyogenes* isolated from any one individual at one or both surveys were typed and compared at the same time.

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