THE PROBLEMS OF PUBERTY*

BY

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Puberty is a period of problems, and the knowledge that most of us have escaped from them without hurt should not make us indifferent to the difficulties, physical and psychological, of the young adolescent. Some doctors are young enough to remember vividly the troubles that beset them in puberty; middle-aged doctors, however, may have observed, occasionally with anxiety or impatience, their own children scrambling over hurdles whose existence they had almost forgotten. There are paediatricians and there are geriatricians in our ranks, but none of us can be described as a specialist in adolescence. Though the public school medical officer has the largest experience of the adolescent (usually limited to one sex), the family doctor is well placed to proffer the youngster the detached but imaginative understanding which his situation so often requires.

Let us first discuss, very briefly, the emotional problems of puberty and the advantages which doctors should have in dealing with them. The essentials of the teenager's situation are well understood—it is a phase of emergence from immaturity to maturity, from dependence to independence, from an asexual existence to a full sexual life. A whole series of conflicts may arise because, as Professor Leslie Banks emphasizes (p. 193), intellectual development lags behind physical development and social maturity takes still longer to achieve. Our economic structure retards the attainment of financial independence, and the conventions of our society would postpone heterosexual fulfilment to a time far beyond the emergence of sexual desire. The pattern of these problems is, then, not concealed: books, plays, and films are to-day occupied with them; parents, teachers, psychiatrists, parsons, and social workers have given much thought to them. Where, then, is the place of the doctor? What is his special function? What are the advantages of his special position?

His advantageous position lies in his remoteness from any disciplinary situation—he speaks with authority, but not for authority, as do parents and teachers. While the "general scandal" of his profession, as Sir Thomas Browne called it, does not proclaim the doctor to be antisocial, yet he cannot be suspected of the wish to proselytize or evangelize, as may the parson. He should be recognized by the young, if he is the family doctor, as a man or woman well accustomed to receive confidences and notably unready to disclose them. He is, above all, the human biologist who understands bodily function, and the young creatures consulting him at this age are very concerned with disturbing physical manifestations in themselves and very interested also in the physical characters of the opposite sex. This, then, I take to be the doctor's proper approach to the problems of puberty—his own bent may be altruistic, idealistic, or religious—but, if he neglects to emphasize the biological nature of his patient's problem, he has missed an opportunity that cannot be as well taken by another.

I turn now to consider the problems of puberty under two headings. Firstly, the abnormal reaction to normal sexual development, and, secondly, the recognition and treatment of abnormal sexual development in males.

Abnormal Reaction to Normal Sexual Development

The great and necessary change in the social attitude towards sexual activity which has occurred in our generation must not deceive the doctor into assuming that the young are now well instructed in sexual matters. This is not so, and many boys are still made anxious by the strength of their sexual impulse, and are worried by the frequency of their nocturnal emissions ("wet dreams"), by the urge to repeated masturbation, which is still too often regarded as an unnatural and noxious practice, and by homosexual activity, which society still considers to be unconventional behaviour at the best and criminal conduct in its most obtrusive forms. Young men are often disturbed, too, by the strange metamorphosis in themselves by which the shy, if aggressive, daytime idealist becomes in his sleep a nocturnal Nero.

Kinsey *et al.* (1948) have provided the evidence on which the doctor-biologist should base his advice to the anxious young men who consult him. Ninety per cent. of American males have masturbated by the time they are 17 years of age. The average frequency is about twice a week, but many adolescent boys masturbate seven times weekly. The abnormal boys, then, are those who do not masturbate, and before we decide that an adolescent is masturbating excessively the frequency of masturbation should surely be more than nightly. If masturbation appears to be excessive, then we have no justification for the suggestion that any physical or mental harm results from it, but we should regard it as evidence either of a strong but frustrated sexual impulse or of insufficient social outlets. The story, probably apocryphal, was told in my student days of a celebrated physician who emerged triumphantly from behind a screen in the out-patient department and announced to his class, "I was quite right; he does masturbate." And the outraged patient shouted, "You liar! You said you wouldn't tell, and, anyway, you said you did it yourself when you were a boy." Thirty years ago we were beginning to recognize the universality

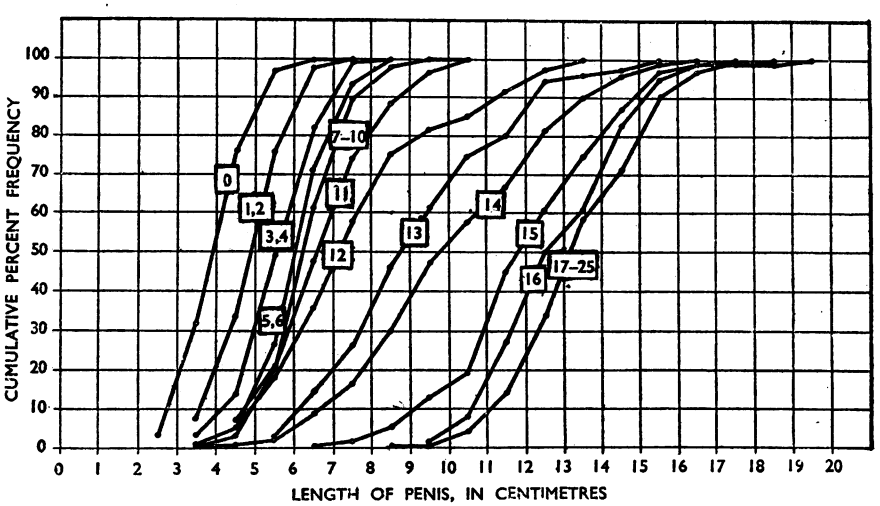

FIG. 1.—Graph of the cumulative frequency curves for length of penis by age. The numbers in the rectangles are the ages of the boys. Reproduced from the paper by Schonfeld and Beebe. *J. Urol. (Baltimore)*, **48**, 769.)

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of masturbation, but we still had a lingering notion that it was a habit both physically and mentally harmful.

Homosexual activity is also common in boys (one in three American adolescents have had some sort of homosexual experience), and if we agree that heterosexual activity is biologically correct should we not then, as doctors, agree that the young of both sexes should not be dissuaded from the adolescent love-making which our American friends have taught us to call "petting"?

Girls are not usually plagued by so strong a sexual impulse as are boys; therefore the first manifestations of the reproductive function in them—the development of the breasts and the onset of menstruation—which should be a source of satisfaction, may find them unprepared, shy, or fastidious, and be, in fact, a cause of discomfort, conflict, or rebellion. Anorexia nervosa in girls ashamed of their breast development is not so common as it was before the day of Diana Dors; the physician of to-day is more likely to be consulted by the flat-chested girl who despairs of achieving the freely displayed curves of the modern film star. Let me say here firmly that there is no justification for the prescription of oestrogens in such a situation. It is surely possible to explain to such girls, whether they complain of poor breast development, of a mildly masculine distribution of hair, or of some menstrual irregularity, that we are all compounded of both male and female characters, and to have a little more of the male in one's make-up than is usual may be no bad constitutional endowment.

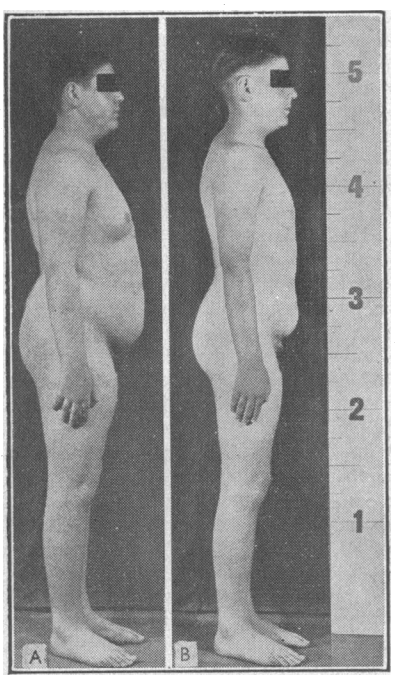

FIG. 2.—A, Chromosomal male aged 17 with hypopituitary hypogonadism, gynaecomastia, and obesity. B, After weight reduction of 24 lb. (11 kg.).

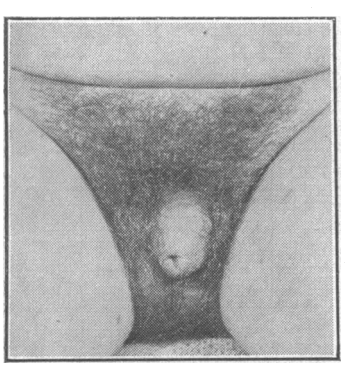

FIG. 3.—Same case as in Fig. 2. Hypogonadism with small penis, tiny testes, and female escutcheon.

Abnormal Sexual Development in Boys

There is a wide variation in the age of puberty, and this is demonstrated in the curves prepared by Schonfeld and Beebe (1942) (Fig. 1). The fifty percentile in the length of the penis in 121 boys aged 14 years was 10 cm., but one in five had a penis 8 cm. or shorter and one in five a penis of 12 cm. or longer. Puberty in boys may occasionally be delayed till 17, and even 18, years of age and yet normal development later occurs without therapeutic intervention. In boys not yet 17 who show delayed sexual development in varying degree, investigations are not as a rule necessary, and parents, although naturally anxious, can usually be persuaded to wait patiently if the probabilities are explained to them. When investigations are required they should include the urinary assay of gonadotrophins and 17-ketosteroids, testicular biopsy, and the determination of chromosomal sex by buccal mucosal biopsy. The results may show a primary gonadal defect, or hypopituitarism with deficient gonadotrophin output, or genetic female cells (chromatin positive, XX).

Even when these facts are elicited, further treatment requires careful consideration, for when treatment is decided upon the therapist, in advising it, is admitting that full reproductive capacity is unlikely to develop. A further period of waiting may well be advised if the results of the gonadotrophin assay and the testicular biopsy indicate hypopituitary hypogonadism, for nature's way of awakening the sleeping pituitary has not yet been revealed. Chorionic gonadotrophin is our only weapon, and this should be used in doses of 3,000 rat units weekly for a few weeks. It may harm the testis, and even if puberty is initiated by this treatment we cannot be surprised if the testis goes to sleep again when treatment ceases. Methyltestosterone is good replacement therapy, in doses of 20 to 30 mg. daily, and it produces a very satisfactory change in the boy's personality, musculature, and sexual development (Wilkins, 1957). It cannot directly stimulate the production of spermatozoa, and after pubertal changes have been achieved the drug should be stopped to see whether gonadotrophin output has been increased, as has occasionally been described.

The problem of diagnosis and treatment may be more complicated, as in the case of a boy, a chromosomal male, of 17 with obesity, hypopituitary hypogonadism, gynaecomastia, and tiny testes and penis (Figs. 2 A and 3). Dieting reduced his obesity and his gynaecomastia (Fig. 2B), but if his testes are not awakened by F.S.H. therapy methyltestosterone will be necessary. Hypogenitalism in boys requires sympathetic consideration, for it often leads to anxiety, and this boy has, in addition to his other troubles, a mild ulcerative colitis. Gynaecomastia is common in boys at puberty—it occurs perhaps in 20–30% of them. It usually requires no treatment, other than the reduction of obesity if this is present, but plastic surgery should be proffered if the enlargement of the breasts creates a social problem.

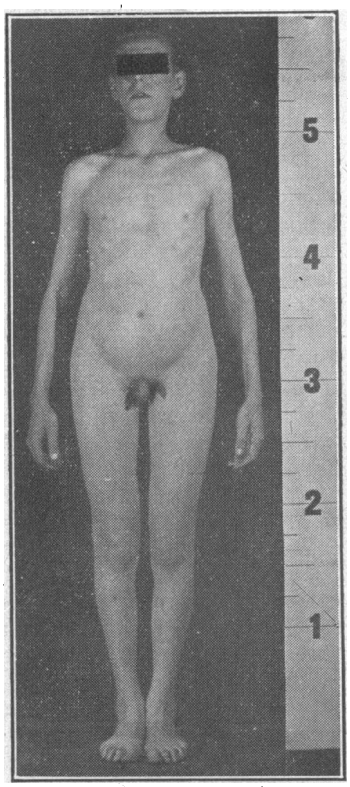

FIG. 4. — Eunuchoid habitus. Hypogonadism.

A youth aged 19 has many neurotic symptoms resulting from his ill-developed testes. He has no seminal emissions, shaves once in three months to demonstrate his manhood, and has engaged himself to be married to a girl who says she "doesn't mind" his sexual deficiencies. His photograph (Fig. 4) shows that hypogonadism is by no means always associated with obesity or with gynaecomastia.

Wolff (1955) has shown that obesity in children is accompanied by maximal height increments and by early pubertal changes. Some fat boys show hypogenitalism, however, and

Simpson (1953) has described a group of obese boys—a syndrome which he has called "adipose gynandrism"—with the features of obesity, skin striae, tall stature, delayed puberty, and feminine habitus. He regards this as due to a *primary* pituitary–adrenal overactivity. I believe it to be due to a *secondary* pituitary–adrenal overactivity—a constitutional and individual reaction to overeating and obesity. There is some evidence that overeating in males encourages an excessive oestrogen/androgen ratio. Men with testicular atrophy, released during the war from prison camps in which they had been starved, developed gynaecomastia in their first period of overeating. Cohen (personal communication) has recently shown that some obese children have evidence of increased adrenocortical activity which is reduced by dieting. Obese boys whose weight is reduced may also show rapid advancement of sexual development.

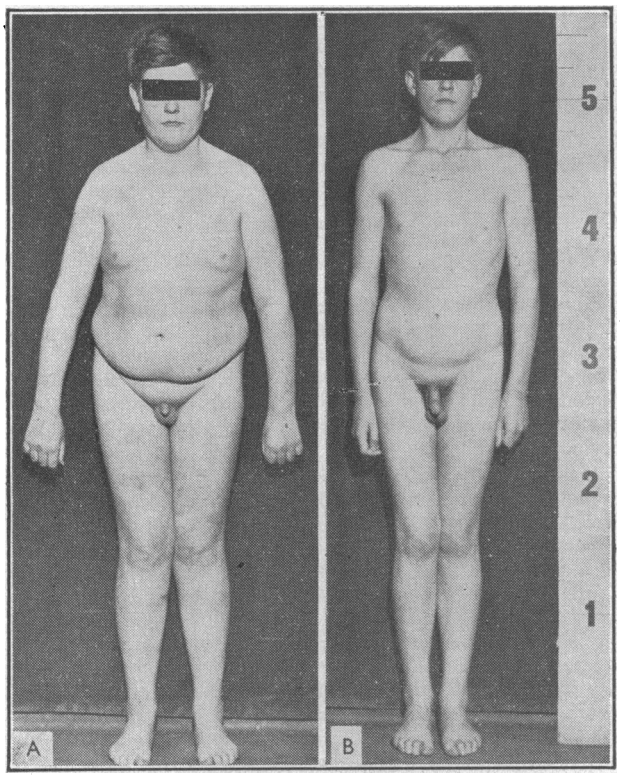

FIG. 5 (A and B).—Showing the genital development in 8 months in an obese diabetic boy following weight reduction.

A boy of 13 weighed 170 lb. (77 kg.), and his obesity precipitated the diabetic state, a very rare result of obesity in childhood. Dieting and diabetes reduced his weight by 50 lb. (22.7 kg.) in 32 weeks (Fig. 5), and during this time his sexual development advanced at a rate which would normally have occupied from one to two years.

Obesity should be regarded, in the young as in adults, as a disease to be cured, and the persistence of obesity to adolescence and beyond represents a failure of paediatric care. Parents and children should be encouraged to join in the crusade against obesity with a simple instruction to restrict carbohydrate intake, and by the use of dexamphetamine. This drug is of great value, and children usually tolerate it well, in doses which may be as large as 20 to 30 mg. daily.

Summary

The family doctor, the school doctor, and the paediatrician should be prepared to give advice, as practical biologists, to the adolescent occupied with the sexual problems of puberty. They should recognize that masturbation is usual in boys and that homosexuality is a common, and often transient, manifestation. There is still much ignorance of the sexual function among adolescents, and the doctor is in an excellent position to provide instruction. Anorexia nervosa does not occur so commonly to-day—girls are now more likely to be ashamed of a failure of breast development than to be shy of a feminine figure.

The wide variation in the age of puberty must be recognized, and treatment should not be undertaken in boys before the age of 17 years. The necessary investigations and modes of treatment are outlined with three illustrative cases. Obesity should be treated, and the persistence of adolescent obesity represents a failure of paediatric care.

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PUBERTY*

BY

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> "I wish you wouldn't squeeze so," said the Dormouse, who was sitting next to her: "I can hardly breathe." "I can't help it," said Alice very meekly: "I'm growing." "You've no right to grow *here*," said the Dormouse. "Don't talk nonsense," said Alice more boldly: "you know you are growing too." "Yes, but *I* grow at a reasonable pace," said the Dormouse, "not in that ridiculous fashion."

I should like first to thank you for the invitation to open this discussion, for it has led me to explore a number of paths along which I had not trodden for a long time, including a re-reading of *Alice in Wonderland*. Indeed, I have now every sympathy with Alice when she said, "I—I'm a little girl," rather doubtfully, as she remembered the number of changes she had gone through.

As authorities differed on the definition of puberty I thought it would be wise to begin with the great lexicographer, nor was I disappointed. Dr. Johnson has the happiest definition that I have found, and one that carefully avoids age of onset. He says, quite simply, that puberty is "the time of life when the two sexes begin to be acquainted." He then quotes Sir Thomas Browne (a quotation which seems to have been repeated in nearly every subsequent dictionary), "That the women are menstruant and the men pubescent at the age of twice seven is accounted a punctual truth."

The word *puberté* first appeared in early French writings and was derived from the Latin *pubertas*, meaning the onset of the signs of maturity.

By Victorian times medical men had come to identify puberty with adolescence, and Quain's *Dictionary of Medicine* of 1894, dealing with the disorders of puberty, said that these changes are not completed until full age is passed, and gives the times of onset as 13 to 15 for a female and 14 to 16 for a male. For our purposes we must, I think, accept a more precise definition, although we cannot ignore the long period of adolescence which follows.

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