

The condition of the testes and prostate gland in eunuchoid persons / by Joseph Griffiths.

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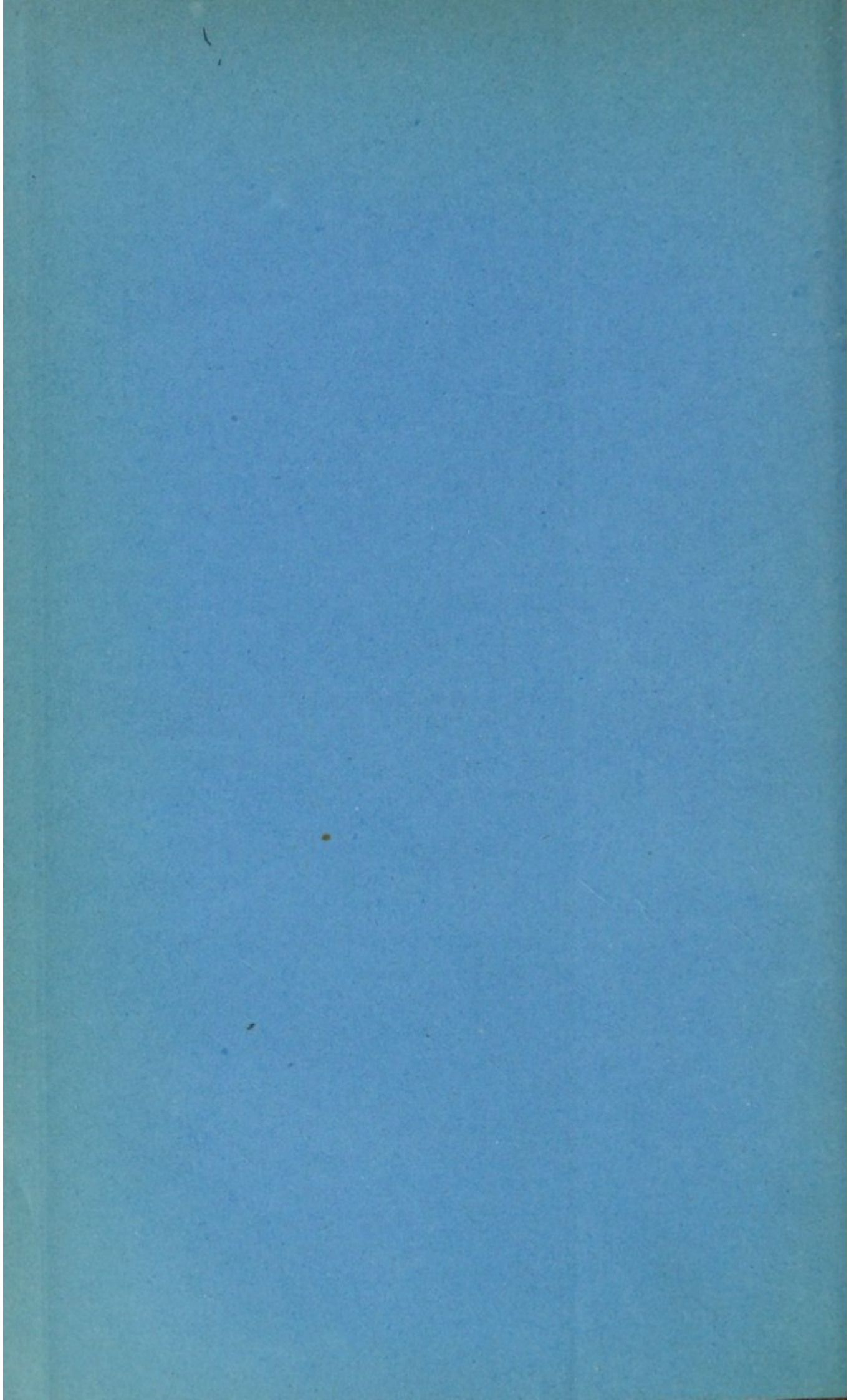
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Griffiths

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THE CONDITION OF THE TESTES AND PROSTATE
GLAND IN EUNUCHOID PERSONS. By JOSEPH
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of Surgery in the University of Cambridge, and Patho-
logist at Addenbrooke's Hospital.* (PLATE VIII.)

I HAVE lately had an opportunity of examining two *Eunuchoid* persons; I mean persons in all respects like eunuchs except that in them the testes, though small, are in the scrotum. In eunuchoid persons the frame is usually big, the shoulders narrow, and the pelvis broad; the face beardless, the neck round and plump, and the voice often high pitched; the breasts large; the penis and scrotum small, being not larger than they are in a boy eight to ten years of age.

The first case I saw presented all the above features; and, on examining his prostate gland through the rectum with the finger, I could discern hardly any gland substance, but simply some thickening behind the urethra in the natural situation of the gland. This man was about thirty, married, but without issue. I ascertained that he was in the habit of having connection, but could obtain no further particulars.

The second case I examined *post-mortem*. In this also the eunuch-like features were well marked, and the testes, which I removed together with the rest of the genital apparatus, were small and undeveloped. He died at the age of twenty-one years from pulmonary phthisis.

The bodies of both testes were of natural shape, but measured only 18 mm. in length by 10 mm. in breadth, the body of a normal testis being about 40 mm. in length by 30 mm. in breadth. The epididymes were also small, but large in proportion to the bodies of the testes (see figs. 1 and 2). The vasa deferentia, vesiculæ seminales, and prostate gland were also small; the last being hardly more than a third of its natural size.

Above each testis and occupying the lower part of the spermatic cord, where the pampiniform plexus of veins is most

marked in a healthy testis, was a large, ovoid, compact mass of fat. Such an abnormal accumulation of fat has been present in all the specimens of like kind that I have seen. Curling notes a similar condition in undeveloped testes.

To the naked eye a section of the TESTIS shows a compact and fibrous structure which is not at first sight unlike that of the testis of a young boy; but, under the microscope, the seminal tubules are seen to be little more than solid rods of fibrous connective tissue, there being in the middle of each only a narrow fissure occupied by atrophied epithelial cells, or cell-débris (see fig. 3). The tunica propria of each tubule, thus altered, consists of two layers, an *outer* and an *inner*. The *outer* thin layer or tunic is composed of a single layer of flattened connective tissue cells with but little matrix; this layer being both in position and structure like the tunica propria of the natural tubule. The *inner* and thicker layer is composed of an almost transparent fibrous tissue with slightly fibrillated matrix and but few connective tissue cells; this occupies the place of and would seem, as in other cases of atrophy, to have been formed at the expense of the receding and dwindling epithelium. Here and there are a few tubules in which the centre is seen to be occupied by a number of large closely-packed polygonal cells with round nuclei containing small granules. In these, however, the transparent fibrous formation within the tunica propria is pronounced and like that in the tubules the epithelial cells of which are more nearly absent. These altered tubules are closely packed and bound together by fibrous connective tissue in which there are many spindle-shaped cells with a few large blood-vessels. In the corpus Highmorianum the tubules and channels of the *rête* are embedded in fibrous connective tissue as in the normal testis; but the ducts connecting the seminal tubules with the *rête* are more separate, and therefore more obvious, than natural (see fig. 4). These connecting ducts are lined by a single layer of sub-columnar epithelial cells which are continuous with the cubical cells lining the channels of the *rête* on the one side and with the cells of the seminal tubules on the other. Here there are numerous large venous channels.

The EPIDIDYMIS was naturally formed, and large in proportion

to the body of the testis. Under the microscope some lobules in the globus major appear natural, and the individual tubules, though small and contracted, are lined by a single layer of tall, ciliated, columnar cells, the lumen being small and empty. Whereas in other lobules they are much altered, the tubules being small and the epithelial-lining consisting only of a single layer of sub-columnar non-ciliated cells, and the muscular coat thin and in some places absent, being replaced by fibrous connective tissue which passes without any line of demarcation into the surrounding inter-tubular connective tissue. This inter-tubular connective tissue is large in amount, dense and fibrous, binding the altered tubules firmly together (see fig. 5). In none of the tubules can any spermatozoa be seen. The abnormal lobules much resemble lobules which have undergone the changes consequent on the inflammatory process.

The PROSTATE was small, tough, and fibrous. With the naked eye it could be seen that it contained some gland tubules, though they were few and scanty. The glandular tubules, as seen under the microscope, resemble the normal lobules, except that they are more *en evidence*, being few, and that the epithelial cells lining them are small and in two or three layers, the cells in a normal tubule being in a single layer and long and slender. The inter-tubular connective tissue was much more fibrous than natural, and the unstriped muscle-fibres were less developed.

The VESICULÆ SEMINALES were also small, being not larger than those of a young boy.

I have examined a similar specimen (of testes) in the collection of the Cambridge Pathological Museum, and found that they present the same structure as those I have described above. Other specimens, which are evidently of the same nature, may be seen in other museums.

I may here add that this state of the testes and sexual organs is not unfrequently met with in idiots, as Curling points out. I have seen it only in one case, but the number of idiots examined by me was very small.

This condition of the testes has hitherto been regarded as the result of simple arrest of growth, the organs retaining their pre-puberty structure. To the naked eye the body of the testis is indeed very like that of the testis of a boy both on the

exterior and on section; but in internal structure the two are very different. In a boy the seminal tubules are solid rods of small polygonal cells, lying within a thin tunica propria; whereas in the eunuchoid person the seminal tubules are solid rods of fibrous connective tissue, with only a narrow fissure in the centre, occupied by a few epithelial cells, with débris. Besides, the epididymis in the eunuchoid persons is actually much larger than in the child, and in the latter the tubules are lined by small, cubical, non-ciliated epithelial cells, whereas in the eunuchoid some are natural and others altered. These peculiarities, therefore, in the structure of the body of the testes and the epididymis in the eunuchoid show that the condition is distinct from that of the young boy.

Further, the state of the body of the testis in eunuchoid persons is different not only from that of the testis of a boy, but also from that of the undescended or imperfectly descended organ. For in the testis of the eunuchoid the seminal tubules are almost solid rods of fibrous connective tissue, having usually a fissure-like lumen, containing atrophied epithelial cells or only debris of cells; whereas in the undescended organ, or, indeed, in the organ replaced from the scrotum in the abdominal cavity, the seminal tubules are lined by rods of epithelial cells which are in a single layer, numerous, long, and tapering, with their broad ends at the periphery of the tubule, and their narrow ends projecting into and almost filling the lumen.

The testes in the eunuchoid do in many respects, however, resemble very closely the testes which have suffered from attacks of inflammation in early life or even at puberty, inasmuch as the bodies of the testes are small, the seminal tubules are represented by almost solid rods of fibrous tissue, and the inter-tubular connective tissue is increased in amount and is fibrous. Besides, an almost identical state of the testes may be produced in puppies by tying the spermatic artery and veins in the groin.¹

With regard to the manner in which this eunuchoid condition arises, it may be asked whether it is due (1) to an inherent want of growing power in the seminal tubules, (2) to interference with

¹ I propose shortly to publish some experiments on interference with the vascular supply of the testes, which illustrate these and other points.

the normal growth of the tubules from the result of some changes in the nerves or blood-vessels of the organ, or (3) to the destructive influence of some morbid process in the organ itself.

It is true that in many idiots this condition of the testes is met with, and it is interesting to make a sort of comparison between the structure of the seminal tubules and that of the grey matter of the cerebral hemispheres of such persons. In each organ the special cells of the part are few in number and but ill developed, while the neuroglia in the one and the inter-tubular connective tissue in the other are abundant. The condition of parts in both organs seems to favour the view that the changes result primarily from an inherent want of advancing (growing) power, and consequent degeneration in the special cells, which, of course, dominate growth; and coincident with the want of growing power in them is an excessive growth in the lower, or connective tissue. Thus we may suppose that the testes are during early life of natural structure, and that some time before puberty the cells of the seminal tubules come to the end of their growing power. After this the cells would dwindle rather than maintain their ground, and in time disappear, the connective tissue at the same time increasing. It is obvious that this arrest or failure of growth in the seminal tubules takes place before puberty, from the fact that the individual in his growth acquires the characteristics of that of the eunuch who had been deprived of his testes while young. But how early it may occur, whether before or after birth, remains as yet obscure.

It may, however, be held that the failure results from some disturbance in the central nervous system, or some failure of the arteries to grow at puberty. It is only when the condition occurs in idiots that it may, with some show of reason, be held that this arrest of growth is due to any nervous lesion; but as the condition is met with in otherwise healthy persons, we are scarcely warranted in referring it to a defect in the nervous system. Failure in the due development of the arteries during childhood is not, perhaps, an unlikely cause, seeing that a similar condition is producible, with great certainty, by interfering with the vascular supply of the organ through ligation of both spermatic artery and veins in the groin.

Again, though this condition is like that induced after an attack of inflammation in the body of the testes of a boy, or even in a young man during puberty, yet the affection is always bilateral, whereas inflammation is usually unilateral, one testis only being thus affected. For example, in case of mumps followed by orchitis, the inflammation is usually confined to one side, and only in a small minority of cases is the change so profound as to produce destruction more or less complete of all the seminal tubules.

Before concluding I would refer to the virile power of eunuchoid persons. No doubt they have erection of the penis, which function, as is well known, is ordinarily in all persons present at birth, and does not depend upon the full growth of the testes. No doubt, also, during connection a certain amount, though small, of secretion, derived probably from the urethra and its glands, is expelled. It is, however, not augmented by a supply from the testes where none is formed. Therefore the secretion is devoid of spermatozoa, and the individual is sterile.

Conclusions.

1. In eunuchoid persons the testes are of small size and almost entirely composed of fibrous tissue, the seminal tubules being represented by fibrous rods with fissure-like lumina containing atrophied epithelial cells. Although thus altered, the testes retain their normal shape and form.

2. The epididymes are large relatively to the bodies of the testes, and the tubules in most of the lobules of the globus major are natural, the tubules in some few lobules being altered as if by chronic inflammation.

3. The prostate gland is small, tough, and fibrous, and the glandular tubules are but few in number and but imperfectly developed. The vesiculæ seminales are also of small size, and devoid of any secretion in their interior.

4. Where the testes lose their power of growth, from whatever cause, the individual develops at puberty like a eunuch deprived of his testes in early life. Such a person I have, therefore, called *eunuchoid*.

DESCRIPTION OF PLATE VIII.

Figs. 1 and 2. Diagrammatic representation of testes and epididymes of a eunuchoid person. (*a*) Body of testis; (*b*) epididymis; (*c*) mass of fat in lower part of spermatic cord. Natural size.

Fig. 3. A section of the seminal tubules, showing their transformation into rods of fibrous tissue with fibrillated matrix. The narrow fissure-like lumen is occupied with atrophied epithelial cells. $\times 250$.

Fig. 4. Section of straight ducts with their branches at the junction of the tissue of the corpus Highmorianum with that of the body of the testis. The ducts are lined by sub-columnar epithelial cells, but their branches are filled with smaller polygonal-shaped cells.

Fig. 5. Section of natural tubules in lobule of the epididymis, showing columnar epithelial cells bearing cilia.

Fig. 6. Sections of altered tubules in epididymis. They are much reduced in size, and lined by sub-columnar non-ciliated epithelial cells.

The first part of the book is devoted to a general history of the United States from its discovery by Columbus in 1492 to the present time. It covers the early years of settlement, the struggle for independence, the formation of the Constitution, and the growth of the nation to its present position. The second part of the book is devoted to a detailed history of the United States from 1789 to the present time. It covers the early years of the Republic, the struggle for the abolition of slavery, the Civil War, and the Reconstruction period. The third part of the book is devoted to a detailed history of the United States from 1865 to the present time. It covers the Reconstruction period, the Gilded Age, the Progressive Era, and the modern history of the United States.

The book is written in a clear and concise style, and is suitable for use in schools and colleges. It is a valuable source of information for anyone interested in the history of the United States. The book is divided into three parts, each of which covers a different period of American history. The first part covers the early years of settlement and the struggle for independence. The second part covers the early years of the Republic and the struggle for the abolition of slavery. The third part covers the Reconstruction period and the modern history of the United States. The book is written in a clear and concise style, and is suitable for use in schools and colleges. It is a valuable source of information for anyone interested in the history of the United States.

Fig. 1.



Fig. 3.



Fig. 5.

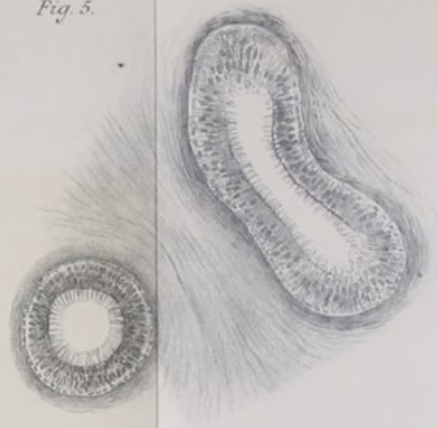


Fig. 2.

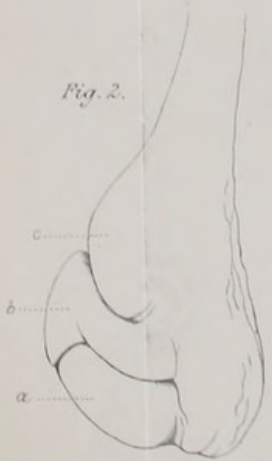
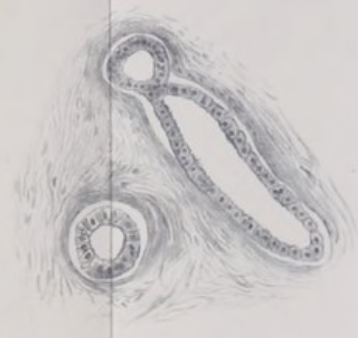


Fig. 4.



Fig. 6.



J. Griffiths del.

TESTIS IN EUNUCHOIDS.

F. Rabl, Lith. Edin.

