

## THE NORMAL AND PATHOLOGICAL HISTOLOGY OF THE KIDNEYS.

By V. RASMUSSEN.

PASSING over the normal histology, which the author goes into at considerable length, of the renal vessels, the renal parenchyma, and the interstitial connective tissue, we proceed to notice the pathological changes in the kidneys referable to the term "*Morbus Brightii*," as they are described.

The author prefaces his remarks on this subject by observing—"In studying renal diseases, the object of our investigation is to establish the three following points:—1. What tissue or tissues are affected (vessels, parenchyma, or interstitial connective tissue); 2. Whether only the cortical substance or the pyramids are attacked, or both together; and, lastly, 3. Whether the affection is partial or diffused. In the commencement a definite tissue can always be indicated as the starting-point of the affection; later this is most frequently not possible; the several tissues are dependent on each other, so that they are often consecutively attacked; but, on the other hand, the several lobuli possess also independence of each other, and we have already seen that the vascular system of the cortical substance and that of the pyramids are to a certain extent independent of one another. It is especially chronic affections of the kidney which will be the subject of our consideration in an anatomico-pathological point of view. Formerly these were comprised under the name of '*Morbus Brightii*,' but this is a very inaccurate denomination, and one which conveys but little information. The older investigators properly included under this term only what we now call parenchymatous nephritis, whose terminal stage is the characteristic and striking granular atrophy. Although this form is by far the most frequent, modern researches have revealed other pathological changes in the kidneys, which clinical physicians have not yet succeeded in definitely diagnosing from the parenchymatous nephritis; and it becomes, therefore, necessary to refer to these also the designation '*Morbus Brightii*,' so far as such a name shall be retained as a common denomination for these extremely different conditions. The essential symptoms are the albuminuria and the diminished secretion of urine, while the so-called fibrin cylinders have not the signification which Frerichs ascribes to them; they occur, at all events, only in the parenchymatous nephritis, and not even constantly in that. Here are three essentially different affections to be considered, each occupying its own tissue—1. The amyloid degeneration of the kidney; 2. The parenchymatous; and 3. The interstitial nephritis. They may complicate one another; nay, all three may be present at once; sometimes one, sometimes another occurs first, but the parenchymatous is most frequently the primary affection.

Rasmussen then proceeds to consider the above-named three affections.

The amyloid degeneration can only *very rarely* be recognized without having recourse to the chemical reaction (*i. e.*, by the microscope alone), owing to the limitation of the disease to the vessels, to the exclusion of the parenchyma, and also to the fact that the disease is most frequently combined with parenchymatous or interstitial nephritis, or the interstitial fatty kidney, especially in people who have died from the discrasia of syphilis or of the mercury by which it may have been treated. The author observes, that in the amyloid kidney we may or may not have a lardaceous or waxy appearance, that in very extreme cases of degeneration we may almost certainly detect this amyloid condition by the glomeruli assuming a whitish-grey, shining, enlarged, and prominent character, which appearance is also assumed by the "vasa afferentia," and other neighboring arteries. As regards the vessels which are affected, it is asserted to be the small vessels, and in this order: "first and foremost, the glomeruli and vasa afferentia, next the vasa efferentia and the capillaries in the cortical part, and, finally, the 'arterioli rectæ'"; rarely are the large vessels affected, and it is long before other tissues become so.

Owing to the peculiar deposit affecting the vessels and glomeruli, the supply of blood becomes diminished, the cortical substance anæmic, while the hyperæmia increases in the pyramids, and hæmorrhage occurs at times, owing to increased pressure on the inelastic vascular walls, giving rise to reddish or brownish streaks or spots. This thickening of the vessels, &c., from amyloid, is not to be confounded with the thickening which results from a change corresponding to the "so-called end-arteritis," by which organization of newly-formed elements and subsequent atheromatous and fatty degeneration is produced, chiefly, indeed, in the larger vessels, but at times affecting the glomeruli. This fatty degeneration commences with an increase of nuclei of the capillaries, which divide, become separated, and thus elongate the loops in the glomeruli without increasing their calibre. If the process advances, small fatty particles accumulate around the nuclei, and increase with disappearance of the nuclei. Thus a whole glomerulus may degenerate, and the same result be produced as if we had amyloid degeneration. Such a fatty degeneration of the glomeruli may, microscopically, simulate amyloid, but the reaction and microscopic appearances soon discover the difference. The author gives in detail the best method of obtaining the chemical reaction of amyloid.

As respects the "*parenchymatous nephritis*," the author, after alluding to the relation of the epithelium of the renal canals to the urine, and to the fact that the cells in the convoluted tubes are larger and richer in albumen than those in the straight ones, points out that any disease of the former rendering them inactive will be of more serious import than disease of the latter, producing an actual change in the urine; and in consequence of this distinction he

establishes two forms of parenchymatous nephritis, the "papillary catarrh," or catarrhal nephritis, and the *proper* parenchymatous nephritis.

The *Papillary Catarrh*, situated in the straight canals and papillæ, and comparable to the bronchial catarrh, is often continued from the bladder or urethra, but may be caused by external agents, as the use of cantharides, acid diuretics, and alcoholic drinks. It is often complicated with parenchymatous nephritis, and may be the starting-point for it. *Post-mortem* examination shows the affected canals and papillæ to be attended by a whitish or yellowish striation, with hyperæmia of intervening vessels; and when the disease is owing to internal remedies, hyperæmia and bloody ecchymosis over the whole kidney exist. If the disease continues long, the distended urinary canals press on the bloodvessels, and thus the hyperæmia ceases. The disease is mostly limited to an abundant and varied production of cell-growth (nucleated, club-shaped, or fusiform, and, it may be, ramifying), mixed with mucous catarrhal products; but a process may exist, as in the acute forms, like that of the proper parenchymatous nephritis, with fatty metamorphosis and destruction of epithelium.

The *proper Parenchymatous Nephritis* is described (after Virchow) as an hypertrophy of the cells of the convoluted canals, which take up large quantities of the albuminates, become distended, turbid, granular, and adhere closely together; subsequently the cells vanish, and the granular fatty mass becomes free, forming the "inflammatory globules." The author describes three stages of the affection (which he parallels with pneumonia), which may all be going on simultaneously, and delineates the anatomical characteristics of each one. This affection often co-exists at a later stage with intestinal nephritis. In the second stage (that which, when papillary catarrh exists, as nearly as possible constitutes "Bright's kidney"), the retardation of the venous blood is described, and the consequent thrombus, and the continuation thereof to the vena cava and heart, and also transmission into the lungs. The third stage described is, in fact, a resolution or recovery, and corresponds to the complete fatty metamorphosis of the cells, generally, but not always, with loss of substance, induration, granulation, and formation of cysts in connection with the urinary canals. The interspaces between the granular elevations of the surface are ascribed to the empty collapsed canals, which, owing to their pressure on the vessels having ceased, are often of a reddish color; and the author points out that this granular atrophy is not analogous to cirrhosis of the liver, inasmuch as it is the parenchyma itself which is first affected, and only subsequently complicated with intestinal nephritis; whereas in the case of the liver it is not the hepatic cells which are first affected, but the inter-acinous connective-tissue. In the third stage the glomeruli are described as generally small, corru-

gated, surrounded by thickened capsules of connective-tissue, and possibly (as also the epithelium) in a fatty state, sometimes amyloid, and sometimes calcareous.

In the *interstitial nephritis*, the change in the interstitial connective-tissue may preferentially affect the intercellular substance, which becomes hypertrophied, whilst the cells only become slightly increased in number, though they become larger, or the cells may multiply by frequent subdivision, whilst the intercellular substance is not much increased; and if this condition is very extreme, suppuration is the consequence. A third but rarer result is the interstitial fatty kidney, when the newly-formed connective-tissue passes into fatty degeneration. In the first and lower degrees of the second form, the connective-tissue contracts around the canals and glomeruli, and the circulation is more or less obstructed; the interspaces become increased, the urinary canals slender and sometimes constricted in a bead-like manner, and the tunica propria is often thickened and streaked; and the glomeruli are seen small, homogeneous, and in a more or less fatty state. Other interstitial changes, which might be mistaken for the above, may arise from venous stages in the kidneys, in diseases of the heart, or from increase of the capillary nuclei, which may be mistaken for the nuclei of connective-tissue. The author specially mentions a form of interstitial nephritis affecting the pyramids, or circumscribed (syphilitic), in which depressions and cicatrices form not unlike those from hæmorrhagic infarctions.

In the *interstitial fatty kidney* (which is rare) the organ is large and flaccid, and is full of yellowish or whitish striæ and marks, and there is often amyloid or parenchymatous nephritis; the urinary canals are of diminished calibre, and separated far by fatty masses; the glomeruli, and generally the walls of the vascular cells are fatty or amyloid.

As respects the albuminuria of chronic renal affections, the author supposes that the albumen is transuded from the intestinal capillary net-work, owing to the increased lateral pressure, as especially when the afflux of blood is arrested; for example, when the renal vein is tied. He supposes, however, that to a certain degree the albumen may be eliminated in the glomeruli or from the large albumen-holding epithelial cells.

Other so-called *fibrin cylinders* are not to be looked on as an inflammatory product. Their origin is obscure, being found chiefly in the straight tubes and the pyramids, more rarely in those of the cortex, and scarcely at all in its convoluted tubes; also often in the constrictions and small cysts. They scarcely ever consist of fibrin, but are analogous to the so-called colloid mass. Those occurring in papillary catarrhs are formed of mucin. The author seems inclined to look on these cylinders (with Key and Virchow) as depend-

ent on changes in the albumen of the epithelial cells.—*Edinburgh Med. Journal*, from *British and Foreign Medico-Chirurgical Review*.

# THE LATE PROF. CHARLES HOOKER, OF NEW HAVEN, ON DIET.

[From an Inaugural Address by Prof. LEONARD J. SANFORD, M.D.]

It was our friend's custom to devote a few lectures of each recurring course to the consideration of certain topics in medicine and surgery, upon which he entertained peculiar views; and to some of these, on account of their value, as also to show the working of his mind, we shall now refer.

The subject of diet was foremost amongst them, and, in discoursing upon it, he maintained that everybody, whether well or sick, should eat three meals a day, which should be about six hours apart, and taken at corresponding hours, daily; the food to be plain, nutritious, mainly solid, and to some extent consisting of fat meat. In sickness, if the stomach was irritable or the disease under which the patient was suffering was of a sthenic type, he would perhaps omit the use of meat and allow a less quantity of the unstimulating articles of food than the person was accustomed to use in health, but the regular intervals must still be adhered to, and the food must always be mainly solid. A sloppy diet he regarded as bad for a well person, and much worse for one who is sick. In a case where most physicians would direct gruel, animal extracts and jellies, to be used in small quantities at short intervals, he would order crackers or crusts and meat, which were only allowed at the regular meal times, and then, in such quantity as could be conveniently borne. If this allowance did not at once supply all the support which the patient required, he would make up the deficiency by a more bracing medication; but he contended that, by perseverance, a healthy appetite could ordinarily be soon reëstablished, which would render an entire discontinuance of medicine safe at an earlier period than would be possible under the other system of dietetics—in other words, the case would be sooner and more perfectly cured, and with less medicine, with the solid diet, than it could be if slops were fed to the patient. This regimen, it must be admitted, proved very successful in Dr. Hooker's hands; his best results from it were in cases of typhoid fever.

But, in the use of aliments, his strongest leanings were towards fat meat; he recommended it to all well persons, as being indispensable to the preservation of health, and insisted on its employment, as the stomach would bear, in all chronic cachectic cases. In the latter, it was a *sine qua non* to recovery, and so he was inflexible in directing its use. A question which he was sure to put to every walking case of sickness that applied for his assistance was,