

dies, will here find ample varieties of these therapeutical appliances, whether administered in the form of baths, douches, or taken internally as beverages.

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#### REVIEW VII.

*Kidney Diseases, Urinary Deposits, and Calculous Disorders; their Nature and Treatment.* Containing Seventy Plates and Tables for the Clinical Examination of Urine. By LIONEL S. BEALE, M.B., F.R.S., &c. Third edition, much enlarged, 8vo, pp. 472.

THE profession is greatly indebted to Dr. Beale for his persevering researches into the histology both of healthy and diseased tissue, and for the indomitable industry which he exhibits in discussing, publishing, and illustrating the facts he arrives at from his own investigations, as well as those communicated by other original workers. The present volume, both in its text and in its illustrations, is a proof of this. The text displays his wide acquaintance with the views and experiments of others, as well his own countrymen as foreigners, whilst nearly all the analyses have been made by himself, and the drawings from preparations have, in most cases, been copied by him on the blocks, which were afterwards engraved. At the same time it is right, in dealing with this book as a new edition, to notice that much of its contents have appeared in previous publications of the author, and that it may be in great measure regarded as a collected edition of his several treatises on renal diseases and urinary deposits. The ground-plan or basis of the volume is to be found in the lectures on the urine, delivered in 1852, and subsequently published in the 'British Medical Journal,' and again in 1861 collected and re-edited by the lecturer himself in a separate volume. Of this work, the present is professedly an enlarged edition, in which several of the articles have been rewritten, and the more recent facts and hypotheses, physiological and pathological, introduced, illustrated, and discussed.

But throughout, the original plan of dealing with the subject-matter of the treatise has been preserved, a fact thus referred to in the preface to the first edition, which is still retained as declaratory of the scope of the present work.

"The course on urine included oral lectures and practical demon-

strations, in which every pupil performed the experiments with his own hands, according to the directions given in the tables (found at p. 440 of the present work). . . . I have endeavoured (in these lectures) to restrict myself, as far as possible, to those parts of the subject which are of practical importance in investigating the nature of a case. It must be borne in mind that the lectures were given to practitioners, most of whom had far larger experience in practice than myself. Little advantage, therefore, could have resulted under these circumstances from discussing special questions connected with the treatment of disease, and almost the whole time was devoted to the practical examination of the urine and urinary deposits by the microscope, and by applying the appropriate tests. I have thought it right to retain this character in the present work, and only a few general remarks will be found with reference to the treatment of urinary diseases."

Since Dr. Beale lectured as a chemist and microscopist on the urine in 1852, and diffidently referred to his position as a youthful practitioner, he has enjoyed, as an hospital physician, wide opportunities for observing the history and treatment of urinary diseases, and consequently his remarks upon treatment, although still not extensive and too general, must bespeak attentive consideration.

It will, indeed, be generally regretted that the pathological portion of the treatise does not more thoroughly represent the experience of the author; or, in other words, that it does not partake in a larger degree of a clinical character, and so address itself to the wants of the busy practitioner in search of the wherewith to enlighten him in the understanding of the often complicated case before him, and in the best methods of dealing with it. To such individuals the accurately drawn pictures of disease in systematic works are but like the lay-figures of artists—artificial, rigid, lifeless—that can never be substituted for the study of the living reality, nor ever make the individual who relies upon them a successful worker.

In another direction, again, and even to a much greater extent, the original plan of the work has been enlarged. We allude to the physiological portion, which here assumes considerable importance, and is largely occupied with the enunciation of those views of minute structure and function with which Dr. Beale's reputation as a physiologist is so much identified.

To complete this general sketch of the characteristics of this new edition, one more quotation from the preface will suffice.

"The usefulness of the book has been increased by the addition of nearly one hundred new drawings, and as many more have been re-arranged in order in order to render them more truthful representations of nature; as in my other works, scales have been ap-

pended to the illustrations by the aid of which every object represented can be accurately measured without difficulty."

The work is divided into four parts:—(1) The kidney and its diseases; (2) Healthy urine and its examination; (3) Urine in disease and its examination; (4) Urinary deposits and calculous disorders.

With respect to the minute structure of the kidney, Dr. Beale considers Bowman's views to have been in all essential particulars confirmed by recent observations. He admits, with Virchow, the existence of *vasa recta* coming directly from arteries, but cannot accept Henle's statement of the presence of a distinct system of closed tubes connected with the Malpighian bodies. These canals are, indeed, nothing else than convolutions of the urinary tubes, so curved as to be reversed in direction relatively to the cortex for a certain length.

In controverting Henle's views, Prof. Beale administers correction to reviewers and writers in periodicals as a wrong-headed race, given to propagate histological and physiological heresies; complaining that they promulgate the theories of observers without first examining them for themselves in detail by preparing the necessary specimens, and carrying out the requisite experiments. But after the castigation we confess to not feeling very guilty, believing the periodical press to be well employed in giving currency to the observations and hypotheses of distinguished observers, whether such be opposed to, or in accordance with, received opinion. Indeed, in one important part of their functions, the recording and analysing of researches and hypotheses, their usefulness would be sacrificed by the waiting for time and opportunity to test for themselves the truth and groundwork of facts and opinions promulgated unceasingly. Their first duty is, we take it, to place all such before the scientific world as problems to be proved or disproved, and to await the results of inquiry. At the same time the journalist may find occasion to criticise views advanced, even when occasion is not afforded him to verify his objections, or he may happily be in a position at once to demonstrate their error. But enough of digression.

Dr. Beale uses very dexterously his ingenious hypothesis of *germinal* and *formed material* in place of the old cell-doctrine, in explaining the minute anatomy and physiology of the kidney. It is an hypothesis which is available for the elucidation of many intricate histological questions, and derives support from the study of the lowest animal and vegetable organisms. In the normal epithelial cell, says the author, both of the liver and of the kidney, there is no such

thing as a cell-wall. There is nothing more than a central germinal mass surrounded by granular *formed* material, the former constantly reproducing itself and being transformed into the latter, which, on its part, is kept from accumulating indefinitely by the disintegrating process involved in the act of nutrition, with the activity of which, consequently, it stands in inverse ratio.

This doctrine of cell nature and growth has an important bearing upon the question of the presence and extent of connective tissue. As is well known, the connective tissue has been held by Virchow, and by many subsequent disciples of that eminent pathologist, to play a most important part in the history of disease. In Dr. Beale's conception, however, this tissue is of small account pathologically. All such in the kidney, where it constitutes the matrix, is represented by a very small amount of perfectly transparent tissue, which connects together the tubes and vessels. These last, indeed, are so disposed as not to need a supporting tissue, and in the embryonic state, when the tissues are softest and support most needed, no fibrous matrix is discoverable.

Moreover, the little interstitial tissue present in mature life is not active in disease—*e. g.* as in inflammation, but only passive; the active phenomena attributed to it being—

“Really due to the presence of particles of germinal matter which have been detached from the white blood-corpuses, and have passed through the vascular walls into the meshes of the connective tissue, where they grow and multiply very quickly,”

and give rise to granular or pus-corpuses, or allied morbid products, as the case may be.

The section on “The Growth of the Renal Apparatus and of the Changes occurring in it,” illustrated, as it is, by reference to comparative physiology, throws great light on the formation of connective tissue, and on the reason of its increase as age advances.

Holding these opinions respecting connective tissue and its rôle in disease, Dr. Beale is placed in opposition to the many modern pathologists who describe granular contracted kidney, and its analogue in the liver—cirrhosis, to be dependent on a parenchymatous inflammation pervading the glands by the medium of the interstitial tissue. The connective tissue described as present in abnormal quantity and position in contracted kidneys “is really composed principally of altered vessels and wasted secreting structure” (p. 23). This opinion he reiterates at p. 52, and there adds that the contraction and wast-

ing of glandular texture may occur at an early period of development, when scarcely a trace of connective tissue can be discerned, and, consequently, when such wasting cannot be attributed to a tissue not in existence at the commencement of the morbid process inducing it.

“The morbid changes may originate in the cells themselves primarily, or the cells may be affected secondarily through altered blood, or by an irregular, insufficient, or too abundant supply of blood. Morbid changes may first appear in the vessels; and there is reason to think that some renal diseases are of nervous origin. It is quite certain that some forms of renal disease originate at a very early period of the development of the gland, even during intra-uterine life. Some of these may, perhaps, be due to defective nutrition; while others are ‘developmental’ in their origin, being due to some defect in the changes which succeed one another during the evolution of the elements of gland-structure.”—Pp. 511, 52.

The supply and mode of distribution of the nerves of the kidney has received much elucidation from the author’s minute researches. The nerves, derived chiefly from the sympathetic, have their fibres connected with numerous ganglia and ganglion-cells, and are distributed, not only to the renal blood-vessels, to both the intertubular and the Malpighian capillaries, but also to the uriniferous tubes. The nerves supplying these tubes may be regarded as constituting an afferent system, capable of influencing, through the nerve centre, the efferent fibres distributed to the arteries. Thus they govern the calibre of the arteries, and necessarily regulate the proportion of blood flowing through the capillary vessels. The ganglia referred to are, without doubt, special nerve-ganglia of the kidney, and bear the same relations to this organ that the little ganglia, in connection with the cardiac nerves, bear to the heart.

The development of the Malpighian bodies is another physiological problem to which Dr. Beale has devoted much attention. His conviction is—

“That a fully formed vessel does not approach the blind extremity of a developing tube, and penetrate into its interior, pushing before it the wall of the tube; nor, on the other hand, does the terminal extremity of the uriniferous tube approach and ultimately enclose the vascular tuft; but the blind end of the tube and the capillary vessels, which are ultimately found in its interior, are developed and grow *pari passu*.”—P. 29.

This conviction is based on direct observation, carried out most successfully in the kidney of the newt; and it is worthy of remark that, in this animal, Dr. Beale has portrayed a short blind tube or diverticulum attached to each uriniferous tube,

which he surmises may become occupied with a Malpighian body in the progress of development, and at length assume the place and function of the perfect tube adjoining, when this latter has completed its functional existence and wasted.

The notion that the Malpighian bodies are covered with an epithelium which serves to separate the solid matters of the urine, and that the watery portion is derived from the straight uriniferous tubes, is entirely discarded, as opposed to the results of direct research and of arguments deducible from both human and comparative physiology.

The mode of operation of diuretics and the rationale of deranged action are treated of by the author; but, as our space forbids a notice of both those subjects, we must content ourselves with quoting a few observations on some forms of morbid action, in the explanation of which the hypothesis of germinal matter is significantly resorted to. In all cases of inflammation there is an increase of the cellular elements, or rather of the masses of germinal matter of a tissue; and in the instance of organs like the liver and kidneys, not only is there this sort of increase, but there also occurs a passage through the walls of the blood vessels of materials derived from the blood, including much living germinal matter, which become mixed with the glandular elements, and accumulate between the tubes and capillaries. Moreover, the germinal matter, being freely supplied with nutrient pabulum, increases and multiplies rapidly, and seriously interferes with the action of all neighbouring textures. Pathologists have, for the most part, assumed the fact of the accumulation of epithelium as the starting-point of their inquiry relative to the phenomena of congestion and inflammation; but Dr. Beale proceeds a stage further in the inquiry, and seeks to explain why such accumulation takes place, or, in other words, "the circumstances under which the formation of the very permeable substances which accumulate in the blood, and which form the ordinary pabulum of the cells concerned in excretion occurs." Now, the first circumstance in the chain of causation is, in the author's opinion, an altered state of blood affecting the nutrition and action of the nerve-structures, and so giving rise to those nervous phenomena expressed by chilliness, a feeling of malaise, and shivering.

"Perhaps insufficient oxidation lies at the root of the matter, and materials resulting from disintegration in an imperfectly oxidized state may be the substances which, perhaps, under the form of 'extractive matters,' permeate the capillary walls, and supply nourishment to the germinal matter of the blood and tissues, instead of being fully oxidized and very soon removed in the form of carbonic

acid, urea, &c. If such materials accumulate unduly in the blood, the capillary circulation will everywhere be retarded, although to the greatest extent in those organs which are concerned in elimination."

Hence dilatation of capillaries, arrested depuration, and, if accumulation goes on, eventually stagnation and rupture.

Yet that something more than increased pressure on the capillary walls subsists is rendered probable by the fact that the albumen in the urine often differs chemically from that present in the blood, and has, moreover, now and then been found to possess very peculiar chemical properties. The inference therefrom is that albumen of a particular kind may be actually *formed* in the kidney. Lastly, according to the author's views, the albumen in the urine percolates directly through the Malpighian vessels under the influence of increased pressure; whilst in other cases it seems to be formed by the epithelial cells, or rather by their germinal matter, as in that peculiar modification of this substance of which casts consist.

Recently pathologists have largely concurred in defining the morbid states of the kidneys associated with albuminuria, as comprised under the three conditions of tubal, intertubal, and vascular disease—a division illustrated and enforced by Dr. Dickinson, in his lately published work on Bright's disease. But, as already indicated, an intertubal morbid process, seated in an interstitial connective tissue, finds no place in Dr. Beale's category of renal lesions; and, indeed, disease originating in the blood-vessels is not admitted to be an independent condition. The lesions recognised are—the contracted and wasted kidney, the enlarged kidney, the fatty enlarged kidney, the fatty contracting kidney, the amyloid or waxy kidney, and renal alterations connected with cancer, tubercle, and cysts. In this list it will be perceived there are two forms of fatty kidney enumerated as distinct pathological conditions. Herein Dr. Beale revives the views of Johnson and others, and places himself in opposition to Dr. Dickinson, who has taken much pains to prove that the presence of fat in renal lesions has no special pathological significance, but may be an attribute of any one among them, dependent rather upon chronicity than any other circumstance.

Enlargement of the kidney, again, is treated of as a substantive lesion, and not only as a primary stage of some further morbid action. Simple congestion may be a cause of enlargement operating temporarily, or congestion may become so aggravated that exudation follows, and then the increased size "is due, 1, to vascular distension; 2, to multiplication of cells in the uriniferous tubes; and, 3, to the formation and growth

of a new material, which is formed external to the capillaries in the seat of the supposed matrix." Hence the increased weight and size of inflamed kidneys. As a rule, these phenomena give place to others, which end in producing the contracted kidney. The damaged secreting function of the tubes and cells and vessels involves a thickening of the vascular walls, shrinking and wasting of the capillaries, and wasting of the previously enlarged secreting cells. There are, however, forms of chronic enlargement, proceeding during months and years, in which the cells are much increased in number, though often reduced in size, and the tubes in places appear completely choked with them. Such increase is incompatible with the discharge of normal function.

"In enlargement of the kidney [remarks Dr. Beale], I have seen numerous diverticula growing from the tubes at short intervals amongst the tubes already existing, not only discharging no office themselves, but interfering with the action of adjacent secreting structure which yet remains capable of activity. . . . Such diverticula may become detached from the tube from which they were offsets, and still continuing to increase in consequence of the growth and multiplication of the masses of germinal matter within them, at length become small cysts. This is probably one way in which cysts of the kidney originate."—P. 56.

The other modes in which cysts originate are, according to the author, by the bulging of tubes above an obstruction, and further by the wasting of a circumscribed portion of renal structure and the formation of a cavity. At the same time, he regards the pathology of cysts as yet undetermined; for he cannot accept the hypothesis of Mr. J. Simon, of the development of such structures to any considerable extent by the growth of a single cell.

As already noted, the writer of this treatise holds that the large white fatty kidney exhibiting stellate veins on the surface is a distinct lesion—

"In no way related to other forms of renal disease. It seems to be connected with that habit of body which is associated with the development of tubercle. It may be traced, at least in some instances, to changes occurring in the kidney at a very early period of life. This is a form of chronic renal disease which is not uncommon in young people, and it is frequently met with in children."

Though differing from several pathologists in the matter of the existence and relations of the large fatty kidney as a substantive lesion, Dr. Beale is of the number of those who deny its being an early stage of the contracted kidney, a doctrine



especially upheld by some foreign physicians. Moreover, he goes farther than most in acknowledging a distinct variety in "the fatty contracting kidney," in the production of which the deposit of fatty matter, the shrinking and wasting, proceed simultaneously. The following is the sketch given of the symptoms presented by those suffering from this lesion :

"I have known cases of this condition occurring in young healthy looking men, who, although they would not be called intemperate, had, nevertheless, lived far too freely during several years. The attack may come on as one of slight acute dropsy, the urine containing a large quantity of albumen and being of fair specific gravity, about 1020 or higher. There is usually little œdema, and for some time the case appears likely to progress favorably. But the albumen does not diminish. In some instances vomiting and head symptoms come on after two or three months, and the patient soon dies. The symptoms may not have been at all urgent, and up to within a week or two of the patient's death there may have been nothing in his appearance to lead us to suspect the extremely fatal form of disease from which he was suffering. Even a careful examination of the urine does not always enable us to discover the nature of the disease. . . . In some rapidly fatal cases of this form of renal disease I have noticed that the heart's action was feeble, and, at the post-mortem examination, the heart was found to be much smaller than natural. . . . I have seen cases in which nausea and headache were the only symptoms complained of."—P. 62.

A case is detailed by way of illustrating the symptoms, course, and post-mortem appearances in this variety of kidney disease, and the practical corollary is deduced that, as such cases are so obscure often, it is desirable, when called upon to examine individuals for life insurance, to investigate the chemical and microscopical character of the urine. Dr. Beale has very fully detailed the minute anatomy of this form of diseased kidney, which, as he remarks—

"Is doubtless the one which has led Frerichs and others to conclude that the large white kidney is but an early stage of the small contracted kidney ; and the view is, perhaps, correct as regards some cases of this particular form of enlarged kidney, but it has no wider or more general application. This disease is quite distinct from the large, pale, fatty kidney of scrofulous persons."—P. 66.

Amyloid, waxy, or albuminous degeneration, the depurative disease of Dickinson, is described with much minuteness. It is curious to notice the diversity of statement that may arise between observers respecting simple matters apparently determinable readily enough by any one possessing eyes. For instance, Dr. Dickinson speaks of the transparent material occu-

pying the renal tubes as presenting the characteristic reaction with iodine, whereby the existence of the so-called amyloid substance may be predicated in any tissue or organ; whereas, on the contrary, Drs. Beale and Grainger Stewart find no such constancy in applying this test. So, again, in the matter of the solubility of "amyloid" substance in hydrochloric acid, Kühne and Roudneff, on the one hand, assert its insolubility in that acid, whilst Dickinson affirms the contrary. Such discrepancies must, as Dr. Beale suggests, arise from want of concurrence among observers as to what is to be regarded as amyloid, and he proceeds to take exception to some of Dr. Dickinson's recorded illustrations of "depurative" disease, and, in general, objects altogether positively to his hypothesis of the production of such disease. Indeed, Dr. Beale does not allow himself to be carried away by attractive chemical theories of disease; on the contrary, we find him protesting against the brilliant hypotheses of Dr. Bence Jones, and likewise against the ingenious views of Dr. Dickinson respecting the nature of amyloid. He is satisfied that neither long-continued purulent discharge nor the withdrawal of alkalis from the system explains the production of amyloid; but, to his mind—

"It seems more reasonable to consider the waxy disease, the purulent discharge, the disease of bone, or tubercle, where it exists, as the result of some cause or condition common to them all, than to look upon the first as the consequence of one or other of the latter morbid states. Much stronger evidence than has yet been advanced need be adduced to justify the conclusion that any disease results from the withdrawal of so much potash and soda from the system, and that the amyloid deposit is of the nature of a residuum. . . . These purely chemical theories of great pathological changes are generally very disappointing."—P. 70.

In waxy kidney the Malpighian capillaries are the first to undergo thickening. This thickening of the capillaries and of the minute arteries is not a peculiarity of "amyloid" degeneration, but prevails also in many chronic renal diseases. Dr. G. Johnson has termed the process hypertrophy; but Dr. Beale justly repudiates this term as improperly applied, inasmuch as the increased thickening is not due to a simple addition of so much homologous tissue, as in true hypertrophy, but to a deposit differing in nature from the material of the arterial coats, both in microscopical and chemical affinities.

Cancer and tubercle of the kidney are rather summarily dealt with in about a page, and the first part of the work is brought to a conclusion by a short chapter setting forth the general principles of treatment of renal disease.

As we have made it our object in this review chiefly to set

forth the views of the author regarding renal pathology, we shall pass over the next section of the work, "on healthy urine and its examination," and take up certain subjects treated in the third part, which is devoted to the "urine in disease and its examination."

In the opening remarks of his essay upon morbid states of the urine Dr. Beale makes an onslaught on the use of the word diathesis, employed in connection with some of those states. We cannot fully appreciate the objections urged by him against such use, nor are we prepared to go with him in surrendering it altogether. Such expressions as the "uric acid diathesis" and the "oxalic acid diathesis" certainly express but half truths, and are misapplied and mischievous when assumed to represent ultimate and entire pathological facts. Nevertheless, in practical medicine, they may be usefully employed as collective terms, conveying to the mind a collection of morbid phenomena distinguished by some one prevailing condition of the urine.

Dr. Beale proceeds to consider the urine as altered by a deficiency or redundancy of its normal constituents, or by the superaddition of some abnormal material. He has collected cases and given full analyses of the urine of diabetes insipidus, a disorder of more serious moment than generally supposed. When noticing urea in excess he takes occasion to combat the chemical theory of fever as a peroxidizing process, and in so doing exhibits, as a chemist, much disgust at the misapplication or misinterpretation of his favorite science.

"The large proportion of urea excreted in fevers and inflammations," he writes, "has been supposed by some authorities to be proof of excessive oxidation, and necessarily connected with the high temperature of the body; and in spite of the blood being stagnant in the vessels, and the lungs choked up, this ill-considered theory has been so forced upon us that it will probably be some time before any view more in accordance with well-known facts will be accepted. It need scarcely be said that a rise in temperature may be brought about in many ways besides oxidation, while it may be regarded as certain that the increased heat in fever and inflammation, and the increased quantity of urea formed, do not depend upon peroxidation. There is usually a very large excretion of urea in diseases in which the activity of the oxidizing processes is much reduced." (Pp. 186, 187.)

The subject of excess of the organic constituents of the urine is illustrated by several analyses in cases of skin disease and of chorea. The absence of chloride of sodium in the urine of pneumonia, on the occurrence of hepatization, is insisted upon as a general fact; and the opinion is advanced, that during this

stage of inflammation of the lungs, there is a determination of this salt towards the suffering organs, which ceases when resolution sets in.

The direct relation between the wear and tear of nerve and brain tissue, and an excess of phosphates in the urine, is, in Dr. Beale's opinion, not so well established a fact as is generally assumed. He believes himself prepared to prove "that, in this matter, speculation has, to a great extent, taken the place of reasoning founded upon facts and experimental observations." With the view of making good his statement, the author enters largely on this question of the excess of phosphates in the urine, and adduces numerous analyses made by Dr. Bence Jones, Dr. Adamson, and himself, of the secretion in various diseases and injuries of the brain, and in insanity, which, apart from the point at issue, will be examined with interest. The upshot, however, is, that the chemical examinations of the urine hitherto made are inadequate to establish the supposed relation between urinary phosphates and the wear of nerve-tissue.

The presence of abnormal soluble matters in the urine is copiously treated of, particularly in chemical details. The instructions given for testing, especially for sugar, and for estimating the proportion of sugar in diabetic urine, furnish a complete manual of reference. In discussing the nature of diabetes, the author adopts the views of Bernard on the amyloid or glucogenic matter being formed in the liver, and objects to Dr. Pavy's experiments as inconclusive. This problem of the source and mode of production of sugar in the economy is very largely considered from a physiological and anatomical point of view. According to Dr. Beale's judgment,—

"The evidence is at present strongly in favour of Bernard's view, that, in health, sugar is produced in the liver, and destroyed whilst it is in the blood. In the normal state the destruction of the sugar occurs at the same rate as its formation, while in certain lesions of the nervous system, and under other circumstances, more sugar is formed than can be destroyed, or the quantity formed remaining the same, the normal conditions under which its decomposition takes place being absent or modified, it accumulates in the blood, and is excreted by the kidneys and other secreting organs, thus producing diabetes. . . . There can be no doubt that certain parts of the nervous system are seriously implicated in all cases, but whether the nerves exert a direct influence upon the sugar-forming or sugar-destroying process, or only affect these operations indirectly through the control they exert upon the calibre of the arteries, and therefore upon the quantity of arterial blood distributed to the capillaries, is not known; but there are, I think, many facts which favour the latter view, while it has never been shown that nerves exert

any *direct* influence upon the growth or action of any cells whatever."

Part IV. "The microscopical examination of the urine, of the various urinary deposits, of calculous disorders," is characterised by the completeness of the directions and of the details of observation furnished, and more especially still by the profusion of illustrations appended, drawn with the greatest care and accuracy, according to a specific scale.

Among other subjects comprised in this part is the peculiar condition known as chylous urine, of which the account is very complete, and accompanied with analyses. An equally complete history is given of casts of uriniferous tubes considered as urinary deposits. An endeavour is made to establish criteria for judging of the dimensions and condition of the urinary tubes by the size and appearances of the casts expelled in the urine; and Dr. Beale believes that any unprejudiced person may, by clinical study, in a short time convince himself that the nature of renal disease may be diagnosed in many cases by the microscopical characters of the urinary deposit.

In bringing this review to a close, we cannot omit referring to the encyclopædic character of Dr. Beale's book, as a treatise on kidney diseases and the urine. Its leading feature, however, is the completeness of its information in all matters relative to the urine in health and in disease. In the preceding analytical sketch we have altogether passed over Part II of the work, "Of Healthy Urine and its Examination," occupying eighty-five pages, in which the chemical history of the secretion is fully examined, and the modes of analysis, and the apparatus required for conducting it, are described at large. This chemical part of the work has, the preface informs the reader, been revised by Prof. Bloxam; the section, also, on volumetric analysis has been rewritten by Mr. Sutton.

Another feature, noticed also at the commencement of this article, is the extent of illustration by a multitude of plates, whereby a much more truthful conception can be arrived at than by any amount of descriptive text. Dr. Beale rightly considers no microscopic appearance to be so simple as to be unworthy of representation. Thus, for instance, he shows, and very accurately, the appearance of air-bubbles under the microscope, and also gives drawings of extraneous matters, such as particles of hair, of woollen or linen tissue, of feathers, starch, &c., which are perplexing oftentimes to the tyro in microscopy. Such plates will, indeed, save a world of trouble both to learners and to the learned in the microscope. The former will have numerous mysteries at once cleared up, and the latter will be saved the

trouble and often the annoyance of having to explain specimens sent them by the inexperienced in microscopic work, and of convincing them that they have not made some marvellous addition to the knowledge of minute structures.

Another portion of the book that will be appreciated both by student and practitioner are the tables for the qualitative examination of urine, which indicate the changes and deposits in the urine to be looked for, the tests to be used, and the effects to follow on their application. In fine, the student, diligent in "reading up the urine," will find this treatise invaluable, whilst to the practitioner it will form a complete book of reference for information touching the minute anatomy of the kidney in health and disease, and the normal and abnormal conditions of the urine, with the best means of testing and examining them.

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#### REVIEW VIII.

*Twenty-second Report of the Commissioners in Lunacy to the Lord Chancellor.* June, 1868. Pp. 269.

*Tenth Annual Report of the General Board of Commissioners in Lunacy for Scotland.* 1868. Pp. 317.

THESE annual returns of the state of lunacy and of the condition of the insane in Great Britain will always demand consideration; but at the present time, when the conviction forces itself upon the public that the number of lunatics augments with terrible rapidity, and that the constantly extended and extending provision made for their care and maintenance is yearly pronounced inadequate, such returns possess an unusual interest.

As in past years, so now, the report of the English is drawn up on a different plan from that adopted by the Scottish Commissioners, and hence difficulties arise in endeavouring to establish comparative facts in regard to the lunacy and lunatics in the two countries. The former body pursue their well-worked—we might say with much justice well-worn—plan of publishing the information they have to give. The attempts to portray the whole state of lunacy in England for the past year, to deal with the great questions that have arisen and press forcibly for answer, and to afford the advice that a well-instructed Commission might be expected to give, are, to say the least of them, feeble.

The greater portion of the report is occupied with remarks