

(c) Pus is easily recognized as a rule by the presence of the familiar polymorphous nucleus in most of the cells. Should doubt arise, a drop of dilute acetic acid allowed to run under the cover glass will sharpen the outlines of the nuclei and facilitate their recognition.

(d) Spermatozoa (see Fig. 194) are often seen in the urine after coitus or nocturnal emissions. They are of no importance, except that when appearing in the urine of females they may afford valuable medico-legal evidence. They are easily recognized by their size and shape.

(e) Other varieties of cells need not be differentiated, since almost any of the varieties usually described (*squamous, spindle-shaped, caudate, etc.*) may come from any part of the urinary tract. *Renal cells* are not recognizable by our present methods of examination.

Any of the urinary cells may contain fat drops, but these have no special diagnostic significance.

B. Interpretation.—The significance of large quantities of blood or of pus in the urine has already been discussed (page 421). When recognizable *only* by the microscope they have no diagnostic value.

The presence of large numbers of cells not coming from the blood-vessels (*squamous, spindle-shaped, etc.*) is usually associated with cystitis, provided the accidental admixture of vaginal detritus is excluded. Pyelitis and renal suppurations may fill the sediment with similar cells, and only by other methods of examination (cystoscopy, ureteral catheterization) and by tak-

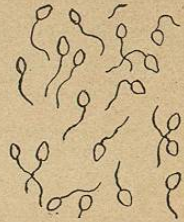


FIG. 194.—Spermatozoa.



FIG. 195.—Crystals of Triple Phosphate (prisms) and Ammonium Urate (small spheres with spines).

ing account of all the facts in the case can the differentiation be made.

3. *Crystals in Urinary Sediments* (see Figs. 195, 196, and 197).

—The varieties oftenest seen are: (a) Triple phosphate (ammoniacal urine, cystitis); (b) ammonium urate; (c) uric acid; (d) calcic oxalate.

All of these varieties are colorless except the uric-acid crystals, which are usually light or dark *yellow* or yellowish-brown.

None of these have much significance in diagnosis. The first two merely confirm the evidence of urinary decomposition (usually from cystitis) afforded by the re-

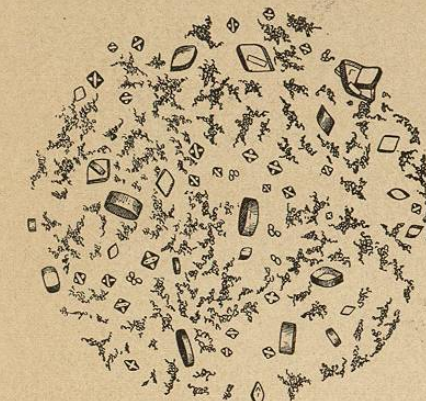


FIG. 196.—Crystals of Uric Acid (whetstone-shaped) with Calcic Oxalate (small octahedral) and Amorphous Urates.

action, turbidity, and odor of the urine.

Uric-acid crystals, if present in great numbers in the urine when passed, suggest the search for macroscopic masses (gravel) and for other evidence of renal stone, but as a rule they are of no importance.

The same may be said of calcium oxalate. Oxaluria is one of the most persistent bugbears of the medical profession, but it is utterly harmless except in the rare cases in which it accompanies macroscopic gravel and points to renal stone.

4. *Animal parasites or their eggs* are occasionally found in the

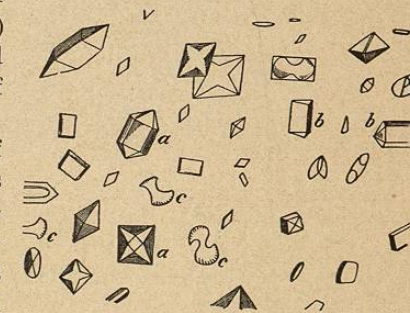


FIG. 197.—Calcic Oxalate Crystals.

urine, with or without hæmaturia and evidence of cystitis (see Figs. 198 and 199).

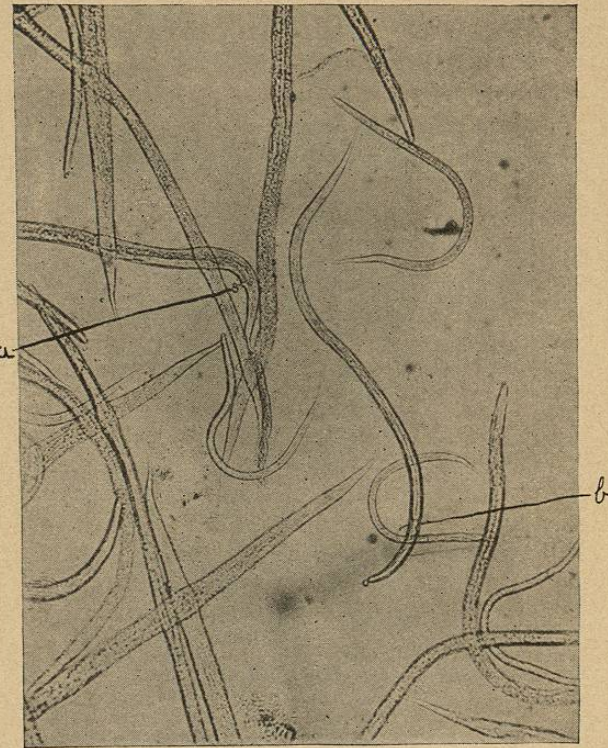


FIG. 198.—Vinegar Eels in Urine. (Billings.) *a*, Protruded hooks of male; *b*, top-shaped oesophageal enlargement. The *Strongyloides stercoratis* (see above, Fig. 187, page 410) has also been found in the urine.

Summary of the Urinary Pictures Most Useful in Diagnosis.

Aside from *polyuria*, *oliguria*, *hæmaturia*, and *pyuria*, which have already been discussed, the most important conditions in which the urine gives valuable diagnostic evidence are:

1. *Cystitis*.—Urine passed frequently, painfully, and in small amounts. Turbid, ammoniacal, and offensive (after the earliest stages). Much pus and many other cells are found in the sedi-



FIG. 199.—Bilharzia Eggs in the Urine, with Blood, Calcic Oxalate, and a Hyaline Cast. (O'Neil.)

ment, with bacteria, triple phosphate crystals, and amorphous débris.

2. *Acute Nephritis* (or acute exacerbations in chronic cases).—Scanty, heavy, highly albuminous urine, often bloody and containing in the sediment *much blood* and many cells, free or on casts. Other varieties of casts occur, but are not characteristic. In convalescence the urine becomes abundant and of light weight, and the other abnormalities gradually disappear.

3. *Chronic Glomerular Nephritis* ("parenchymatous").—The urine is rather scanty, pale, and of light weight (1.012-1.018,) with a large amount of albumin and, in the sediment, *much fat*—free,

in cells, and on casts. Also found, but not characteristic, are all the other varieties of casts. If death does not ensue within eighteen months, the urine is apt to assume the characteristics of the:

4. *Contracted kidney* (primary, secondary, or arterio-sclerotic), with polyuria (often several quarts; urine especially abundant at night), low specific gravity (1.010 or less). Traces of albumin and a few hyaline and granular casts occur steadily or intermittently.

CHAPTER XXI.

THE BLADDER, RECTUM, AND GENITAL ORGANS.

THE BLADDER.

Incidence of Bladder Disease.

(Massachusetts General Hospital, 1870-1905.)

Cystitis.....	829 cases.
Stone.....	538 "
Cancer.....	57 "
Papilloma.....	20 "
Tuberculosis.....	43 "

Data.

Distention, tumor, the urine, and the results obtained by *cystoscopy*, by *catheterization*, and by *sounding for stone* furnish most of our direct evidence in bladder disease. Pain in the bladder or near the end of the penis, and frequent, painful micturition with vesical tenesmus or straining, are common symptoms in various lesions of the organ, and direct our attention to it, though they do not indicate the nature of its trouble.

I. Distention of the Bladder.

In the male, distention is often wholly unknown to the patient, and may be accompanied by frequent acts of urination, especially in prostatic obstruction. A distended bladder is readily recognized by palpation as a smooth, round, firm, symmetrical tumor in the median line, above the pubes. The tumor is *dull on percussion*, and in slight degrees of distention this *dulness above the pubes* may be the only physical sign obtainable. In marked cases, which are almost invariably in males, the distended bladder may reach to the navel or even above it, and the beginner is usually astonished at its