

cide, has given good results. Collargol by inunction, gave excellent results in several severe cases (Netter). **Mineral Acids**, Hydrochloric is given in very large quantities in the so-called Swedish plan of treatment (W); Nitro-hydrochloric in doses of gtt. xx in simple elixir, and Sulphuric for intestinal hemorrhage, preferred over all other plans of treatment (Da C). **Tartar Emetic**, with Opium, when wakefulness and delirium; minute doses gr. $\frac{1}{16}$ frequently, are of great service (B); Antimony cuts the disease short with such certainty that it is almost doubtful whether the lesion of typhoid is specific or is not rather incidental or adventitious (Lawrie); should be given with cardiac tonics. **Digitalis**, of value in many cases as a sustainer of heart power, but may be dangerous in the later stages (Anstie, Murrell); used by the Germans when there is no cardiac weakness; gr. x-xx as antipyretic, over a period of 36 hours (P). **Quinine**, may have efficacy in typho-malarial fever, is less effective as the typhoid element predominates, useless in purely continued fevers (B); is justly abandoned, but may be used to maintain the circulation, in tonic doses, gr. vj-x in the 24 hours (Da C). **Quinine Salicylate**, not in antipyretic doses, has given the happiest results, being superior to salol or any other intestinal disinfectant (Sir J. Moore). **Saloquinine** in dose of gr. xxx given in the evening shortly before the bath, so as to develop its antipyretic action when the effect of the bath is declining (Overlach).

Antipyrine and **Acetphenetidin**, as antipyretics, but all such agents of energetic action cannot be too emphatically condemned in this disease (Sir J. Moore). **Lactophenin** gr. xv for adults thrice daily, reduced the temperature from 2° to 4° F. in 450 cases, where water treatment could not be obtained (Schuler). **Thermol** is valuable as a safe antipyretic and internal antiseptic (Miller). **Phenocoll**, the Hydrochloride is used as an antipyretic with marked success. **Veratrum Viride** to reduce temperature (R); for delirium ferox (B); is irrational and dangerous (W). **Arnica** is highly extolled; its "picture" shows definite powers in this disease (P); small doses in asthenic conditions (B); when vital powers are greatly depressed (Wa). **Baptisia** is very useful in the early stage (W). **Turpentine**, invaluable when hemorrhage and extreme tympanites (P, R); $\mathfrak{mxxx-lx}$ in Starch mucilage and \mathfrak{mxx} of Tinct. Opii (P); $\mathfrak{mrv-x}$ frequently for hemorrhage or \mathfrak{mxx} every 2 hours in advanced stage, with dry tongue (R); when coma, stupor, it often arouses the vital powers (Wa); \mathfrak{mviij} with gr. $\frac{1}{8}$ of Morphine; of especial value when marked fever and congested lungs, as well as for the tympany (Da C). **Chloral**, is the best drug for nervous symptoms, but must not be used when the heart is weak (Da C). **Opium**, small doses at night, for insomnia with delirium; also as injection for the diarrhea (R); in one case when vital powers seemed hopelessly depressed, gr. $\frac{1}{2}$ caused improvement (Wa); for spreading tenderness (peritonitis), give 10-minim doses of the deodorized tincture, also gr. j in suppository every four hours (Da C). **Belladonna**, when contracted pupils, low, muttering delirium (B); is thought to counteract the poison of typhoid (Wa). **Bismuth**, gr. x-xxv of the Subnitrate with gr. $\frac{1}{2}$ -j of Opium every 3 hours for the severe diarrhea (Da C). **Ergot**, for intestinal hemorrhage, hypodermically if the symptoms are urgent (R); Ergotin, gr. ij-vj hypodermically, or $\mathfrak{5j}$ of the fluidextract of Ergot, for intestinal hemorrhage (Da C). **Sulphur** gr. xv every 2 hours, is valuable for cases with constipation, and has a beneficial action on the intestinal mucous membrane (Caramano). **Sulphurous Acid** deserves high praise (Dewar); $\mathfrak{mij-xx}$ according to age every 2 hours for a week or ten days, if diarrhea present add Sulphuric Acid and Opium (Wilks). **Thymol** as an intestinal antiseptic is valuable (Henry); gr. ss-ij in solution (Da C). **Eucalyptus Oil**, not Eucalyptol, $\mathfrak{mxx-xxx}$ in whiskey, a very efficient intestinal antiseptic, also antipyretic and abortive to the disease, gives greater relief to all the general symptoms than any other drug (Kesteven). **Camphor** as an arterial stimulant, especially when nervous symptoms are prominent and there is a tendency to insomnia (McCormick); gr. j-ij in \mathfrak{mxxv} of sterilized olive oil hypodermically, is unequalled in extreme cases (Stengel). **Tannalbin** to control excessive diarrhea, is very efficient (Moore). **Ichthoform** as an intestinal disinfectant and for excessive diarrhea, gr. xlv- $\mathfrak{5j}$ daily, used in 20 cases with entire satisfaction (Polacco). **Calcium Chloride** gr. xv-xxx every 2 or 4 hours in hemorrhage, to increase the coagulability of the blood (Butler). **Gelatin** in 10 per cent. solution, a pint in 24 hours, for the same purpose (Id). **Suprenals** dessicated, gr. v every 4 hours to constrict the vessels (Id). **Sodium**

Citrate gr. xx-xl to the pint of milk used as diet, to secure partial decalcification of the excess lime salts and prevent thrombosis (Wright). **Trional** for insomnia (Loomis). **Serpentaria**, useful when much depression exists, cautiously if intestines at all irritable (B). **Hydrastine**, when copious sweats (P). **Lead Acetate**, with Opium, for the purging (R); also **Alum** (R). **Lime-water**, as an astringent and antacid, is efficient. **Sodium Chloride**, should not be withdrawn from the food (Wa). **Aromatic Spirit of Ammonia**, for great accumulation of mucus in the throat (Da C). **Copper Sulphate**, gr. $\frac{1}{2}$, with Opium, gr. $\frac{1}{2}$, for the diarrhea (Da C). **Strychnine**, is the remedy for the functional palsies (Da C). **Purgatives**, only the very mildest, and they with the greatest caution (Wa). **Medicine**, will never abort a case of true typhoid; its natural duration is from 28 to 30 days (Jenner); medicines should not be given in pills or tablets, which are liable to irritate the intestinal lesions. **Serum Treatment**, both antitoxic and prophylactic, has been successfully employed (Chantemesse). **Bath** at 70° F. gradually lowered by ice to 65° F., whenever the temperature reaches 103° F. (Loomis); a most important agent in this disease (B); in mild cases, cold wet compresses or wet sheets; or washing with cold water; in severe cases, affusion, shower, or general cold bath, 50° to 55° F., or better 95° cooled gradually to 60° (R); this, the Brand (more justly Currie's) method, increases the flow of urine and its toxicity, restoring the latter to normal and sometimes to double the normal, thereby clearing the system of a large quantity of toxins (Ausset). **Stimulants**, Whiskey in doses of $\mathfrak{5ss}$, as indicated by the pulse, heart action and general condition (Loomis); alcohol is necessary to sustain the heart (Da C); Coffee is a better stimulant than alcohol (P); Strychnine only to reinforce alcohol, when the latter proves insufficient (Loomis); Digitalin hypodermically for impending failure of the right heart, shown by cyanosed extremities, pulmonary edema, etc. (Id); Alcoholic stimulants freely, with Quinine, for pyemic cases showing joint complications. **Diet** should be milk alone, with lime-water, peptonized or prepared, during the whole course (Loomis); Milk must be used with great caution; if the curd be undigested great evils arise; give essence of meat alone (Sir Wm. Jenner); avoid the extremes; an absolute milk diet required if intestinal symptoms are grave; no solid food until health is restored fully; a scalded-milk diet exclusively may be depended on. **Adjuvants**, water as a drink freely, as much as possible; water locally by abdominal compress, great cleanliness, good ventilation, absolute rest and quiet. **Disinfection** of the discharges by Formaldehyde 1 to 40; of linen and bed-clothing by Phenol 1 to 20; of the nurse's hands by Mercuric Chloride solution 1 to 1,000. [Compare HEMORRHAGE INTESTINAL, RECTAL ULCERATION, TYMPANITES.]

R. Resin Podophylli,..... gr. $\frac{1}{16}$.
Hydrarg. Chloridi Mitis,
Guaiacolis Carbonatis,
Mentholis,..... \mathfrak{aa} gr. $\frac{1}{8}$.
Eucalyptolis,..... q. s.
Ft. tabella no. j. Sig.—One or more of
these tablets every $\frac{1}{4}$ hour during the first 3
days, to secure 5 or 6 free evacuations daily.
(Woodbridge No. 1.)

R. Resin Podophylli,..... gr. $\frac{1}{16}$.
Hydrarg. Chloridi Mitis,
Mentholis,
Thymolis,..... \mathfrak{aa} gr. $\frac{1}{8}$.
Guaiacolis Carbonat.,..... gr. $\frac{1}{4}$.
Eucalyptolis,..... q. s.
Ft. tabella no. j. Sig.—One tablet every
hour or two, after third or fourth day, re-
duced so as to gradually lessen frequency of
evacuations, until the temperature returns to
normal. (Woodbridge No. 2.)

R. Mentholis,..... gr. ss.
Thymolis,..... gr. j.
Eucalyptolis,..... \mathfrak{mrv} .
Guaiacolis Carbonat.,..... gr. iij.
Ft. capsula no. j. Sig.—One capsule
every 3 or 4 hours, alternating with the
tablets, after the fourth or fifth day of treat-
ment. All the medicines to be washed down
with large draughts of distilled or sterilized
water. (Woodbridge No. 3.)

R. Quininae Sulphatis,..... gr. x.
Acidi Hydrochlor. Dil.,
Vel Ac. Sulphurici Dil.,..... $\mathfrak{5ss}$.
Syr. Aurantii, $\mathfrak{5j}$.
Aquaë Cari,..... q. s. ad $\mathfrak{5vj}$.
M. Sig.—A tablesp. in an equal quantity
of water, every three or four hours.
(Murchison.)

Typhus Fever.

Antipyrine for hyperpyrexia (W); Antipyrine or Quinine as antipyretic, it being more necessary to keep the temperature within safe limits in typhus than in typhoid (B). **Acetphenetidin**, a safe and efficient antipyretic. **Baptisia**, is said to have proved very useful (W). **Belladonna**, to cleanse and moisten the tongue; controls the delirium, slows and strengthens the pulse, reduces the temperature, shortens course of disease (R, P); in the early stages, relieves severity of symptoms (P); give when the pupils are contracted (Graves). **Arnica** is highly praised as a remedy in typhus (P, Wa). **Po-dophyllin**, gr. $\frac{1}{8}$ – $\frac{1}{4}$ as mild laxative at onset, when constipation, congestive headache, biliary derangement (P). **Digitalis**, in large doses, a favorite remedy in Germany (P). **Rhatany**, as tonic, in advanced stages (P). **Hyoscyamus**, for mild brain symptoms (P). **Opium**, fulfils many important indications; never give when pupils are contracted (Wa). **Mineral Acids**, their use recommended in all countries (Wa). **Tar-tar Emetic**, with Opium in the delirium with insomnia (R). [See under TYPHOID.] **Chloral**, to produce sleep and allay violent delirium (R, Wa); its use has often been followed by amelioration of the symptoms (Wa); is highly efficient in the wild delirium of the earlier stages (Russell). **Serpentaria**, in low stage, delirium, watchfulness, tongue dry and brown, or black; combine it with Ammonium Carbonate (P); is given occasionally to excite diaphoresis and support the vital powers (Wa). **Camphor**, a remedy of considerable value, but contraindicated when flesh-red tongue, tender abdomen, diarrhea (Wa). **Purgatives**, mild salines may be used if required, but not drastics (Wa). **Alcohol** as milk-punch, is useful in all stages (W); stimulants are needed sooner than in typhoid, the adynamia being more profound in typhus and appearing sooner (B); Coffee is better than alcohol for the adynamia (P). **Cold Baths** for hyperpyrexia, have been employed on a large scale (W). **Diet**, nutritious persistently, beef-tea, egg-nog, nutrient enemata. **Isolation**, imperative, as the disease is eminently contagious (B). [Compare DELIRIUM, TYPHOID FEVER.]

Ulcers and Sores.

Arsenic, improves rodent ulcer (B). **Belladonna**, has a remarkable influence over various ulcerative processes (P). **Chloral**, as lotion for sluggish sores, 5 to 20 grains to the ʒ of water (Keyes); is highly efficient in ulcerated sore throat or ulceration from any cause (Brodnax). **Chloretone** in 1 per cent. solution as an anesthetic to irritable ulcers (W). **Mercury**, Calomel finely levigated and dusted on, is highly efficient in ulcer of the conjunctiva; Calomel Ointment or Black Wash in scrofulous or tuberculous lupus, and in open scrofulous sores (R); Corrosive Sublimate, in 1 per cent. solution, as application to syphilitic ulcers (Fox); the Ung. Hydrarg. Nitrat. diluted one-half, for serpiginous ulceration; or the Iodide, gr. xx–xl to the ʒ of vaselin, in syphilitic ulcerations (Keyes). **Lime**, as the Carbonate or Lime-water to check discharge; the Sulphide when thin ichorous discharge; the Phosphate has influence on scrofulous sores (R). **Opium or Morphine**, with glycerin, as an application to relieve pain (R); gr. j–ij, daily, also locally, has a decidedly curative value in phagedenic and indolent ulcers; not so useful in so-called irritable ulcers (Pf, P). **Ichthyol**, pure as oint. or with Lanolin, has done excellent service in ulcers of the leg; a 10 per cent. ointment is very efficient in old leg ulcers (Bulkley); a 30 per cent. solution applied after a 1 per cent. solution of Holocaine, gave phenomenal results in corneal ulcers (Travis). **Ichthargan** in 1 and 5 per cent. dusting powders made with Talcum, is extremely efficient in old leg ulcers (Unna). **Thiol**, the dry form, as dusting powder, has been of great benefit. **Piperazin**, in 1 per cent. solution, locally to gouty sores, relieves the pain and reduces the inflammation. **Resorcinol**, in strong or supersaturated solution, locally applied to tuberculous and other ulcerations of the larynx, is efficient and painless (Tymowski); locally in rodent ulcer (Williams). **Tannic Acid** locally to check excessive secretion in chronic ulcers (W); the Glycerite to coat over discharging sores (R). **Tannoform** is efficient in fetid ulcers of the leg (Von Mering). **Camphor** dusted over indolent sores (R); gives the best results in ulcers of the leg (Schulze). **Hydrogen Dioxide** is particularly useful in ulcers of the leg with an atonic base,

also in soft ulcer and tertiary phagedena (Ravassini). **Conium**, locally, by means of a poultice, will ease pain and improve the sore (R). **Chlorine**, in solution as a wash for sloughing and indolent sores (R); the gas as a local stimulant to promote healing in old ulcers is found to be highly efficient; Chlorine water properly diluted is an excellent stimulant, disinfectant and detergent wash for foul ulcers (W). **Hydrastis** internally and externally is employed with good results in rodent ulcer, and ulcers of legs, rectum, and uterus (R). **Sanguinaria**, locally, to repress fungous granulations of indolent ulcers, 1 part to 80 of Glycerin (P). **Phenol** and **Salicylic Acid** locally (B); the Glycerite of Phenol is a good application to fetid sores (R); Phenol pure, freely applied under chloroform anesthesia, as a powerful and penetrating caustic to destroy the diseased surface, in tropical sloughing phagedena (Mn). **Pheno-salyl** in 10 to 30 per cent. solution, is very effective in varicose ulcers and ulcerated gummata, even in cases resisting other medication for several years (Tshitsherin). **Picric Acid** in 1 per cent. solution locally for chronic ulcers (Maddock). **Pyrogallic Acid** is an excellent application for venereal ulcers (Vidal). **Iodoform** for venereal ulcers, dusted over surface (B); prevents granulation in all ulcers, and does no good except to relieve pain (Gross). **Thymol Iodide** is praised; an excellent substitute for Iodoform, being quite as efficient, and odorless; has given excellent results in treatment of indolent soft ulcers and syphilitic ulcerative processes. **Silver Nitrate**, as caustic, quickly rubbed over surface (B); applied to unhealthy ulcers, also ulcers of the mouth (R). **Copper Sulphate**, to indolent ulcers: touch with a crystal, or frequently apply a solution, gr. ij–x to the ʒ (R). **Nitric Acid**, as escharotic, applied with a glass rod, Oil to protect the surrounding tissues, arrest its action by alkaline wash; ʒj to Oj is a good acid lotion for washing (B); the lotion for indolent and painful ulcers (R). **Potas-sium Chlorate**, in solution as a wash to clean and stimulate foul ulcers (R); in impal-pable powder, a better application than Iodoform (B). **Cinchona**, powdered Bark dusted over foul, indolent, sloughing and gangrenous ulcers, promotes healing (R). **Alcohol**, locally to cover sores with thin protecting layer of coagulated albumin (R). **Alum**, dry or in solution, applied to relaxed and abundantly-secreting sores (R). **Tur-pentine**, internally for ulceration of bowels (P). **Collodion**, as protective covering (P). **Capsicum**, a weak solution useful as a stimulant in scrofulous or fistulous sores (P). **Savin**, as acrid (not chemical) caustic (P). **Potassa Fusa**, or the milder Vienna paste, as escharotic; to arrest its action use a dilute acid (B). **Zinc Chloride**, the most efficient escharotic consistent with safety (B). **Zinc Sulphate**, dried, dusted over sores (R). **Zinc Stearate** with Thymol Iodide, is an excellent application for ulcers (Hellman); and for obstinate ulceration of the uterus (Hale). **Acetanilide** in fine powder dusted on, an excellent agent for ulcers, sores, mucous patches and rectal ulcer. **Lead**, the soluble salts as lotions to unhealthy, over-secreting sores (R). **Balsams** of Peru and Tolu, are excellent applications (P). **Charcoal** finely powdered, locally to sloughing sores (R). **Hamamelis** is used with satisfaction as an application to varicose ulcers (Pf). **Glycerin** as the official Cataplasm of Kaolin, is an excellent application. **Potassium Permanganate** in solution, affords an excellent disinfectant and germicidal wash (W). **Oxygen**, to atonic and painful ulcers (R); locally is highly efficient (Stoker). **Nuclein** locally, cured an ulcer of 20 years' standing in 4 months (Vaughn); or Yeast poultices (R), their value probably due to the nuclein in them. **Section** of exposed nerve-filament, in irritable ulcer, by bistoury passed beneath the sore (Hilton). **Cod-liver Oil**, especially for ulcerations of the glands, or indolent ulcers with excoriated edges, and lupus. **Water**, is sufficient as dressing in the majority of cases. **Hot Water**, applied by the continuous immersion therein of the affected limb, is perhaps the most efficient treatment of indolent ulcers of the leg or foot, resist-ing other applications; proved very successful in my Philippine experience for tropical ulcer and gangrenous sores of the leg, fissures and sores of the feet, and similar affections. **Radium Rays** are of value in rodent ulcer, especially when the ulcer is smaller than a shilling, in which case they act like a charm (MacLeod). **Rest** and support of great value; cleanliness, bandaging and recumbent position in ulcer of legs, facilitate recovery; also daily washing to restore the lost vitality of parts; elastic stockings, and the Esmarch bandage in chronic cases. [Compare BEDSORES, CHANCRE, CHANCROID, THROAT; GASTRIC and UTERINE ULCERATION; SYPHILIS, TONSILS, ULCERATED.]

| | |
|-------------------------------|--|
| R. Iodoformi,..... ℥ij. | R. Hydrarg. Chlor. Cor.,..... gr. xv. |
| Mucil. Acaciæ,..... ℥xx. | Phenolis,..... ℥xx. |
| Ol. Menthæ Pip.,..... ℥ij. | Aquæ,..... q. s. ad ℥iv. |
| Glycerini,..... ℥xx. | M. Sig.—For syphilitic ulcers, pack on |
| M. Sig.—For unhealthy ulcers. | cotton, and renew daily. (Fox.) |
| (Bronson.) | |

Uremia.

Pilocarpine, as an active diaphoretic, on the first appearance of uremic symptoms, as headache, drowsiness, convulsions; also free purgation by salines or Elaterium (Y); a weak or fatty heart is a positive contraindication for this drug (B); it must not be used if edema of the lungs exists, as further edema and death will result (Whitla). **Digitalis**, the infusion internally, or a poultice of the leaves to the back and abdomen, to procure free action of the kidneys (B). **Morphine**, hypodermically, is most efficient in the uremic convulsions of acute parenchymatous nephritis (Loomis); is dangerous in chronic interstitial nephritis (Ty); when the kidneys are seriously diseased the free use of opiates is attended by much danger, because the chief channel through which its alkaloids escape is choked up (W). **Chloroform** rather than morphine, for the convulsions (White). **Oxygen** by inhalation, 10 litres thrice daily, is used with success (Jaccoud); is as useful in practice as it is rational in theory (Carter); used with remarkable success in a very bad case of uremic coma (Macalister). **Sodium Benzoate**, 15 grains 4 times daily, has been found very serviceable in threatening uremia (Whitla). **Sodium Bromide** with **Chloral**, in full doses, by the bowel, for uremic convulsions (Id). **Potassium Salts** given in Bright's Disease increase the danger of uremia, hence Sodium salts are preferred (Id). **Naphthalene**, also Iodoform and Charcoal, as intestinal disinfectants, as much of the toxic material in the blood is reabsorbed from the bowel (Bouchard). **Amyl Nitrite** or **Nitroglycerin**, and brisk purgation, to relieve the dyspnea. **Ether**, in doses of ℥ij by the mouth or ℥ss hypodermically deep into the muscles (painful), for uremic dyspnea; must be pushed to ℥ij or iij in 24 hours before good results can be expected (Gallois); being rapidly eliminated it can be given in fairly large doses without causing intoxication. **Colchicum**, is an excellent derivative in these cases and acts best when combined with other purgatives (B). **Elaterium**, gr. $\frac{1}{8}$ to $\frac{1}{4}$, to procure free watery evacuations—cautiously! (B); the compound powder of Elaterin, gr. $\frac{1}{2}$ to iij, may be thrown on the tongue and washed down with a teaspoonful or two of water (Y); clinical experience has demonstrated its value in uremia (W). **Quebracho** is a valuable respiratory stimulant in uremic dyspnea (W). **Saline** or **Hydragogue Cathartics**, are of great importance to secure elimination by the intestinal canal and to relieve the blood-pressure (B); purgation by salines on the first appearance of uremic symptoms (Y). **Transfusion**, in uremic convulsions (B). **Hypodermoclysis** is diuretic, and promotes elimination of the toxic products (Kemp); hot saline injections into the cellular tissue have given good results in chronic nephritis with uremia; used in 2 cases with recovery, the patients having been bled before administering the injections (Richardière); is worthy of a wide trial and seems to offer a chance of recovery in many cases which otherwise would prove fatal. **Hot-pack** or vapor bath, to induce powerful diaphoresis (B); the hot wet-pack or hot air bath, may be given daily or oftener when uremia is threatening. **Milk** is the only admissible food. **Venesection**, 10 to 20 ounces of blood from the arm gives striking relief in acute forms of uremia in the robust (Y); leeches to the temples for the headache (Id). **Lumbar Puncture** temporarily relieves the convulsions, and may save life (Willson). [Compare BRIGHT'S DISEASE, COMA, CONVULSIONS, DYSPNEA, SCARLET FEVER.]

Urethral Stricture.

Aconite, is of great service in spasmodic stricture (P). **Cocaine**, locally by catheter (Smith). **Buchu**, in irritable urethra, spasmodic stricture, and gleet (P). **Opium**, in full dose or an opiate suppository, with fomentations and a warm bath, will often suffice in spasmodic stricture (Cl). **Atropine** as ointment rubbed in along the canal, in spasm of the urethra (W). **Adrenalin Chloride** 1 part with 5 of Chloretone, in normal saline solution 1,000, of which a few drops instilled into the urethra, will permit

the passage of small instruments through a stricture previously impervious (Bartrina). **Catheterization**, under an anesthetic in spasmodic stricture if other measures fail to relieve; also for gradual dilatation in organic stricture, the safest and most generally applicable treatment (Cl). **Oil**, injected before dilatation (Wa). **Thorough Division**, by a dilating urethrotome, the best operation for a radical cure; 600 cases thus treated without a death or permanent disability (Otis). **Electricity**, a weak galvanic current, with negative pole to the stricture, will destroy it in 2 or 3 sittings by electrolysis, and if carefully done, is the most efficient and least painful method of treatment for radical cure.

Urethritis.

Aconite, is used to advantage in urethral fever; also for prevention of chill after passage of sound (Pf, W). **Strophanthus**, efficient in preventing rigors after instrumentation on the urethra, the tincture in doses of 5 minims (Fenwick). **Urotropin** internally, is said to effectually prevent urethral chill and fever following the use of sound or catheter. **Acetanilide** in mixture with gum-arabic water, gr. xx-xl to the ℥, may be injected in urethritis (W). **Lysoform** as an injection, is used with success (Simons). **Ichthyol** in warm 2 per cent. solution as an injection, gives great satisfaction in chronic posterior urethritis (Mueller). **Ichthoform** in solution, 1 in 2,000 to 1 in 1,000, has marked siccative and antiphlogistic effects, and is a very efficient injection in chronic urethritis (Lohnstein). **Silver Nitrate**, locally, very efficient in chronic urethritis in females (W). **Tannin**, on bougies, once a week for 15 minutes, most efficient for urethritis in the female (Wa). **Zinc Sulphate**, cast in sticks, for introduction into the urethra (Wa). **Myrtol**, internally, in chronic inflammation of the bladder and urethra (Br). **Terebene** internally, may be used in chronic or subacute inflammations of the genito-urinary tract (W). **Potassium Bicarbonate**, with Potassium Acetate, aā gr. x in a large cup of flaxseed tea or a glass of Vichy water, every 4 to 6 hours; with absolute rest in bed, a calomel purge, and urination under hot water, sufficient for most cases of urethritis, which may arise from lithiasis, leucorrhœa in females, etc.; many cases of so-called aborted gonorrhœa were really simple urethritis (Otis). [Compare GONORRHEA.]

Urinary Disorders.

Aconite, of great service in sub-inflammatory retention from chill (P). **Turpentine**, in hematuria and chronic catarrh of the bladder, and incontinence from atony (B). **Strychnine**, sometimes employed with marked benefit in retention or incontinence of the old (P). **Cantharis**, frequent or involuntary micturition, especially when coughing, in women from weakness of sphincter; one or two drop doses (R). **Cannabis Indica**, in retention from spinal diseases (R); **Diuretin**, a remarkably efficient diuretic in cardiac and renal dropsy, 15 grains several times daily will increase the urine three and fourfold. **Digitalis**, holds high rank as a diuretic, ℥j or ij of the infusion night and morning, or oftener if necessary; in sudden depression from cold or damp, or after scarlatina if danger threatens (P). **Benzoic Acid**, or Sodium Benzoate, in 10 to 15-grain doses, to render alkaline urine acid, and check the formation of phosphates (B); will not do so (Hutchinson). **Sodium Phosphate** is efficient to acidify an alkaline urine (Id). **Salicylic Acid** also **Salol** are said to render acid an alkaline urine, especially the latter. **Potassium Bitartrate** in full doses, will acidify an alkaline urine. **Urotropin** as a urinary antiseptic, gives the best bactericidal results (Sachs); very efficient in ammoniacal fermentation of the urine, which it renders acid; is useful in phosphaturia. **Helmitol** is claimed to be even more efficient than urotropin in all respects. **Nitrohydrochloric Acid**, dilute, gtt. x-xv thrice daily in water, for phosphatic deposits (Mears). **Ammonium Carbonate**, in 6-grain doses, 3 or 4 times a day, to render acid urine alkaline. **Triticum**, in pint doses daily of its infusion or decoction, for strangury, cystitis, and many other complaints connected with the urinary apparatus. **Alkalies**, to neutralize acid urine, and control chronic cystitis; the Liquor Potassii Hydroxidi preferable to the bicarbonates, which have diuretic action and increase frequency of micturition; Liquor Potassii Hydroxidi mixed with the tincture of Hyoscyamus may undergo chemical changes, but the combination materially controls

painful and frequent micturition in bladder troubles (Thompson). **Calcium Sulphate** in daily dosage of gr. xx-xxx, is particularly efficient in phosphaturia (Etterlen). **Buchu** renders more help than any other drug in retention or incontinence of urine from catarrh of bladder implicating the ureters and even the kidneys (P). **Water**, copious injections are beneficial in some cases of suppression (R). **Diet**, a vegetable diet has a powerful influence to alkalize an acid urine; also fruit, milk and fish. [Compare BLADDER IRRITABLE, BLADDER PARALYSIS OF, CHYLURIA, CYSTITIS, DIABETES INSIPIDUS, DROPSY, DYSURIA, ENURESIS, HEMATURIA, LITHIASIS, OXALURIA, UREMIA, URETHRAL STRICTURE, URETHRITIS.]

R. Scilla, Digitalis, Hydrarg. Chlor. Mitis, āā gr. xij.
M. ft. pil. no. xij. Sig.—One pill as a diuretic twice daily. (Sir A. Clark.)

R. Potassii Citratis, ℥j.
Sodii Bicarbonat., ℥v.
Syr. Limonis, ℥j.
Aqua, q. s. ad ℥iv.
M. Sig.—A teasp. every 2 hours, to render the urine alkaline. (Roberts.)

R. Tinct. Digitalis, ℥ss-j.
Spt. Ætheris Nitrosi, ℥iij.
Liq. Ammon. Acetat., ℥ss.
Aqua, q. s. ad ℥vj.
M. Sig.—One-sixth every 3 hours, to re-establish the renal secretion. (Goodeve.)

R. Potassii Bicarb., ℥iijss.
Acidi Acetici, ℥vj.
Aqua, ℥iij.
M. Sig.—Teasp. doses as required, as a diuretic. Each dose contains about gr. x of Potassium Acetate.

Urine, Clinical Examination.

Urine for examination should be about four ounces of that passed in the morning before breakfast, or a sample taken from all passed during the 24 hours.

Quantity. The amount passed normally during 24 hours varies between 40 and 50 fluid ounces (1,200 and 1,500 cc.), the quantity depending on the blood pressure and the condition of the renal epithelium. It is decreased below the normal during hot weather when the perspiration is increased, also in fevers and exhausting diseases. It is increased during cold weather when the perspiration is lessened, in both forms of diabetes, in contracted kidney, after acute infectious diseases and hysteric or epileptic attacks, also in some other morbid conditions. It may be entirely suppressed (ischemia) in cholera, acute nephritis, scarlet fever, diphtheria, severe dysentery, hysteria and shock, also by obstruction, as calculus or new growths affecting both ureters.

Composition. The average composition of normal human urine, and the amount of each ingredient voided daily, are as follows:—

| | PARTS IN 1000. | VOIDED DAILY. | |
|------------------|----------------|---------------|---------|
| | | Grains. | Grammes |
| Urea | 28.00 | 520.80 | 35.00 |
| Uric Acid | 0.60 | 11.16 | 0.75 |
| Hippuric Acid | 0.35 | 6.51 | 0.44 |
| Creatinin | 0.65 | 12.09 | 0.81 |
| Extractives | 8.00 | 148.80 | 10.00 |
| Sodium Chloride | 8.00 | 148.80 | 10.00 |
| Phosphoric Acid | 2.00 | 37.20 | 2.50 |
| Sulphuric Acid | 1.25 | 23.45 | 1.56 |
| Lime | 0.25 | 4.65 | 0.31 |
| Magnesia | 0.30 | 5.58 | 0.37 |
| Potassa and Soda | 0.60 | 11.16 | 0.75 |
| Water | 950.00 | | |
| | 1000.00 | 930.20 | 62.49 |
| Organic Matter | 37.60 | 699.36 | 47.00 |
| Inorganic Matter | 12.40 | 230.64 | 15.49 |
| Water | 950.00 | | |
| | 1000.00 | | |

Solids in Urine. The last two figures of the specific gravity nearly represent the number of grains of solid matter in the ounce of urine (Bird). The same two figures multiplied by 2 (Trapp), or by 2.33 (Hæser), give the number of parts of solid matter in 1000 of urine.

Odor should be faintly aromatic; a fragrant smell indicates cystine or sugar, the smell of violets points to turpentine, an ammoniacal odor indicates alkalinity from decomposition; a fetid smell points to the presence of blood. Asparagus, cubeb, copaiba; oil of santal, impart their characteristic odors to the urine of persons taking them.

Specific Gravity is determined by the urinometer, or by specific gravity beads of glass, and should be taken with a sample of the urine passed during 24 hours. That of normal urine varies from 1.015 to 1.025, and averages about 1.018, having 18 grains of solid matter to the fluid-ounce. If the sp. gr. is above 1.030, test for glucose; if below 1.010, suspect albumin.

Color. Normal urine has a pale yellow or amber color. When pale and copious, of sp. gr. 1.030 and above, it indicates the presence of glucose. Pale and copious, sp. gr. below 1.018, is seen in hysteria, convulsions, nervous diseases. Color high, urine scanty, sp. gr. above normal,—in fevers and the uric acid diathesis. Color high, urine scanty, sp. gr. below normal,—in Bright's disease. Urine is colored *very yellow* or *greenish-yellow*, by bile and by rhubarb; *dark*, with odor of violets, by turpentine; *dark, muddy, smoky*, by blood and strong coffee; *black*, by disintegrated blood, putridity of the urine, tar, creosote; *olive-green* or *smoky*, by phenol and by salol; *brown*, by arbutin; *green*, by indigo and salicylic acid; *dark-green*, by kairin and thymol; *dark-blue*, by methylene blue; *bluish-violet*, by resorcinol; *violet*, by juniper; *greenish-yellow*, reaction acid, or *reddish-purple*, reaction alkaline, by santonin; *blood-red*, by hematoxylin, *magenta*, by fuchsin; *reddish-brown*, by sulphonal. A *milky color* is due to fat globules and indicates chyluria, or to pus corpuscles from purulent disease of the urinary tract.

Reaction. Normal urine has a slightly acid reaction, chiefly due to acid sodium phosphate, also to uric and hippuric acids, and free acids, as lactic, acetic and oxalic. If excessively acid examine for crystals of uric acid. Hyperacidity occurs in fevers and in the uric acid diathesis; it is of slight diagnostic importance. On standing for some time, the urine undergoes ammoniacal decomposition and becomes alkaline. Alkalinity of the urine occurs temporarily soon after a meal, and permanently from the presence of alkaline phosphates in large quantity, as in anemia and nervous depression, or from the use of a vegetable diet, the ingestion of alkalies (except ammonia) and alkaline salts of the vegetable acids, from cold bathing, in gastrectasis, from free blood in the urine, and from fermentation of the urine in the bladder.

Test by litmus paper. If acid, the urine will turn blue litmus red; if alkaline it will not do so, and will turn red litmus blue, or yellow turmeric brown. If the reaction is alkaline, dry the test-paper by gentle heat, in order to ascertain by the permanency or otherwise of the reaction whether the alkali is fixed or volatile; in the latter case the ammoniacal condition points to decomposition in the bladder, as in cystitis and atony of that organ. Fixed alkalinity is due to increased alkalinity of the blood, as in cases mentioned above, also when exudates and transudates are absorbed, and in stomach disorders when hydrochloric acid is diminished.

Acetone and Diacetic Acid. For *Acetone* add to the urine in a test-tube a drop of an aqueous solution of Magenta decolorized by sulphurous acid. If Acetone is present a violet color is produced, the intensity of which is proportional to the amount of acetone. In dilute solutions the coloration does not appear until after four or five minutes. If the amount of acetone be very minute the urine may be distilled, the first portion coming over being examined. In this way a very minute proportion of acetone may be detected (Chautard). Or, to ℥j of urine in a test-tube add enough solution of potassium hydroxide to render it alkaline. Then add a few drops of a freshly prepared saturated aqueous solution of Sodium Nitro-prusside, and if acetone be present, a purple or violet-red color will be formed on the addition of chemically pure Acetic Acid. Acetone precedes the occurrence of diacetic acid in certain cases of diabetes, and is said to occur in cancer and in cerebral disease.

For *Diacetic Acid*, add to freshly voided urine a few drops of a strong aqueous solution of Chloride of Iron. If a precipitate occur the mixture should be filtered. Heat

the filtrate to boiling, and to a small quantity again add the solution of Chloride of Iron. If a red color is produced, add Sulphuric Acid, and extract with ether by distillation. Diacetic Acid is never found in normal urine. It may occur in the acute exanthemata, typhoid fever, pneumonia, phthisis, pleurisy, and pericarditis. When it occurs in diabetes, a fatal termination may be expected.

Albumin may occur in the urine in one of four forms, viz.—serum-albumin, nucleo-albumin, albumoses, and peptone; each of which has its special clinical significance. *Serum-albumin* is one of the chief constituents of the blood, and is the form of albumin which appears permanently in the urine in acute nephritis and in the various forms of Bright's disease. *Nucleo-albumin* is one of the constituents of bile, and a product of desquamated epithelium; it occurs in the urine in jaundice, and in catarrhal conditions of the urinary passages. *Albumoses* are intermediate products of the digestion of albuminoids, and are present in the urine in scarlatina, leukemia, and gastric and hepatic disorders. Their presence does not indicate renal disease. *Peptone* occurs in the urine whenever there is absorption of destroyed tissue, as in phosphorous poisoning, ulcerating carcinoma, and acute suppurations. The tests for albumin in general use are as follows, the urine having been previously filtered:—

(1) *Heat and Acid Test.* Place a drachm or two of urine in a test-tube, and if alkaline add a few drops of acetic acid. Boil the upper layer slowly. If a cloudy opalescence appears in the boiled portion, which does not disappear on the addition of a few drops of Nitric or Acetic Acid, it is albumin, if the acid causes it to disappear, it is phosphates. The chief disadvantage of this test is that it produces the reaction with all four forms of albumin.

(2) *Nitric Acid Test.* Place in a test-tube about a drachm of pure nitric acid, and carefully overlay it with an equal quantity of urine. If albumin is present a cloudy ring of coagulated albumin appears at the junction of the two liquids. Bile causes a similar reaction, hence this test is not accurate for serum-albumin as against nucleo-albumin.

(3) *Potassium Ferrocyanide Test.* Dilute the urine one-third with water, and put a small quantity in each of two test-tubes. To one tube add a few drops of Acetic Acid, mix the contents of the two several times, and divide again, having some acidulated urine in each tube. To the urine in one tube add a few drops of a 10 per cent. solution of Potassium Ferrocyanide, and compare with the urine in the other tube. If upon the addition of acetic acid a grayish cloud appears, which is not increased by the addition of ferrocyanide, nucleo-albumin alone is present, but if it increases serum-albumin is also present. This test is accurate and delicate, and is sufficient for general office work. If it is negative, all forms of albumin are excluded except peptone, for which the 4th test is required. If positive, only albumoses could be confounded with serum-albumin, and by the 5th test the presence or absence of the former is ascertained (Monroe).

(4) *Test for Peptone.* If the urine contains serum-albumin, it should be removed by heat and filtration. Then add to the urine one-third its volume of a 10 per cent. solution of Sodium Hydrate, and follow with a few drops of a 2 per cent. solution of Copper Sulphate. If a purple color appears peptone is present; normal urine showing a bluish green color.

(5) *Test for Albumoses.* Add to a small quantity of urine twice its volume of a solution composed of equal parts of diluted Hydrochloric Acid and 30 per cent. solution of Sodium Chloride. If albumoses are present a cloudiness appears which is dissipated on heating the mixture, but reappears when cooled.

Other Tests for albumin are those by Picric Acid, Potassio-mercuric Iodide, and Sodium Tungstate. The great majority of physicians rely on the tests by heat and by nitric acid, which are unreliable and unscientific (Monroe). The presence in the urine of many substances interfere with the tests for albumin; among them are alkaloids, analgen, antipyrine, chloroform, copaiba, hypnone, piperazin, oil of santal, benzozol, and benzoic acid (contained in benzoin, benzoates, cranberries, plums, styrax, balsams of Peru and tolu).

Bile Pigment. *Gmelin's Test*, as follows: Place on a white plate near each other a drop or two of urine and the same quantity of fuming Nitric Acid, and by manipula-

tion bring the two together slowly. If bile is present a play of colors results in this order,—green, blue, violet, yellow. *Maréchal's Test*, as follows: Put a drachm of urine in a test-tube, and let 2 or 3 drops of tincture of Iodine trickle down along the side of the tube, held nearly horizontally, so that the fluids may touch but not mix. If bile pigment is present, a fine green color will be developed below the iodine layer. Other tests are Vogel's color-table, Noel's test, Pettenkofer's test, and the Silver Oxide test. Bile pigment is present in the urine in the acute stage of catarrhal jaundice, and in cases of cholelithiasis.

Chloride of Sodium in the urine should be normally from $\frac{1}{2}$ to 1 per cent. The quantity is increased in intermittent fever, and is decreased during other febrile diseases, particularly in croupous pneumonia during the stage of consolidation, also in nephritis and in wasting diseases. Add to urine an equal quantity of a solution of Silver Nitrate, 1 in 8, which will precipitate both the chloride and the phosphates. Then add a few drops of Nitric Acid, which dissolves the phosphates, leaving the chloride as a dense, white precipitate of silver chloride, its bulk serving to estimate the proportion of chloride present.

Cryoscopy is the study of the freezing point of the urine and blood of those supposed to be suffering from renal insufficiency, and is an elaborate procedure requiring a large quantity of blood. It may be replaced by the *Phloridzin Test*, as follows: Phloridzin, gr. $\frac{1}{2}$ – $\frac{1}{4}$, with an equal quantity of sodium carbonate to hold it in solution, is given hypodermically, the bladder being emptied immediately before the injection. If the kidneys are healthy, elimination of sugar will occur in half an hour, but if none is then found in the urine serious renal disease may be suspected; while if the sugar is below 0.3 per cent. renal insufficiency may be diagnosed.

Diazo-reaction. This reaction is obtained in certain morbid conditions, particularly typhoid fever, acute tuberculosis, and measles. The reagents should be freshly prepared, and are (1) Hydrochloric Acid 50 parts, Sulphanilic Acid 5, Distilled Water 1000. (2) Sodium Nitrite in 5 per cent. solution. Fifty minims of the first reagent and one drop of the second are placed in a test-tube, and an equal quantity of urine is added, then mixed carefully, and Aqua Ammonia in the proportion of about $\frac{1}{2}$ the volume is added. If a red color develops on shaking the mixture, the diazo-reaction is present. Salol, indican, urochrome, codeine, resorcinol, quinine, digitalin, creosote, ingested by the normal individual, produce a similar reaction (Jung); and the use of preparations containing tannin, iodine, or iodides inhibit it (Burghardt).

Glucose. Urine containing glucose is usually light in color, has a high specific gravity, and froths readily when poured from one vessel to another. Before testing it should be freed from albumin. *Fehling's Test*, as follows: Add to the boiling urine a few drops of Fehling's alkaline cupric tartrate solution. If sugar is present a yellow, orange, or red precipitate of cuprous oxide will form; 10 cc. of the solution being reduced by 0.05 gramme of diabetic sugar (anhydrous glucose). More convenient is Piffard's cupro-potassic paste, or Pavy's cupric test pellets, or Wyeth's tablets for preparing Fehling's solution; the latter having been used by the writer for several years with entire satisfaction. *Pavy's Solution* is a modification of Fehling's, is intended for those who prefer the apothecaries' weights and measures to the metric, and is equally efficient for qualitative and quantitative testing. To make it, dissolve 252 grains of pure Copper Sulphate in distilled water to 8 fluid-ounces; and dissolve 1260 grains of Sodium and Potassium Tartrate, also 480 grains of Sodium Hydroxide in distilled water to 8 fluid-ounces. Keep the two solutions separate in glass-stoppered bottles, in a cool, dark place. For use, mix equal volumes of the two by pouring the copper solution into the alkaline one. Of the mixed solution 210 minims correspond to 1 grain of diabetic sugar. On diluting a small quantity of the mixed reagent with 3 volumes of distilled water and boiling, it should remain clear, without any trace of discoloration or precipitation, otherwise it has deteriorated and is worthless.

Other Tests for glucose are—Trommer's and Haines', which are similar to Fehling's; Bottcher's bismuth test, Moore's by sodium hydroxide, and the Picric Acid test, which

are subject to fallacious results; that by Indigo-carmin, which is unreliable; the Polarization test, the Fermentation test by yeast, and the Phenyl-hydrazin test.

Interference with tests for glucose occurs by the presence in the urine of the following substances:—acetanilide, antipyrine, ammonium salts, arbutin (contained in epigea, kalmia, uva ursi, etc.), benzoates, betol, bromides, camphor, some carbohydrates (e. g. animal gum), chloral, chloroform, copaiba, creatinine, cubeb, glycerin, glycosuric acid, iodides, morphine, acetphenetid, pyrocatechin, rhubarb, rumex, salicylic acid, (in salicylates, oil of wintergreen, oil of betula, salol), senna, serum-globulin, sulphonal, turpentine, urethan, uric acid and urates. Of the foregoing, those which actually reduce Fehling's solution are acetanilide, antipyrine, chloral, chloroform, copaiba, glycerin, morphine, rhubarb and salicylic acid.

Temporary Glycosuria may be produced by poisoning with alcohol, amyl nitrite, carbonic oxide, chloral, hydrocyanic acid, morphine, sulphuric acid.

Indican. *Jaffe's Test*, as follows: Mix 10 Cc. of urine with an equal volume of strong Hydrochloric Acid, and about 3 Cc. of Chloroform. Then add, drop by drop, several Cc. of a strong solution of Chlorinated Lime, previously filtered, and shake after each addition. Allow the mixture to stand for a few minutes, when the chloroform will collect at the bottom in a layer which will be more or less deeply blue in proportion to the amount of indican present. *Indicanuria* has been considered a symptom of albuminous putrefactive change in the intestinal canal, but in typhoid fever it is often absent, and it occurs sometimes in simple constipation. It is said to be increased after a meat diet, and in intestinal obstruction, but not invariably.

Mucus and Pus resemble each other so closely under the microscope, that it is almost impossible for any one, except an expert, to distinguish between them thereby. Mucus is more cloudy and flocculent to the naked eye than pus, which is generally of a stringy consistence and thickish yellow appearance at the bottom of the vessel. The supernatant liquid being poured off, and an equal bulk of Liquor Potassii Hydroxidi added, the deposit, if containing much pus, becomes gelatinized, and so tough that it cannot be poured out. If mucus, Acetic Acid added coagulates it, forming delicate molecular fibres.

Phosphates. Deposits of phosphates are usually white and bulky. They are distinguished from urates by remaining undissolved on boiling the urine, and from albumin by dissolving on the addition of a few drops of Nitric Acid. Most samples of urine give a precipitate of calcium phosphate on boiling, but on adding a few drops of any strong acid the precipitate is redissolved. A deposit of phosphates may occur from alkalinity or deficient acidity of the urine, or from actual excess of the phosphates excreted; the clinical significance being different in each case. Phosphates have no significance when found in urine which has become stale after being voided, and has thereby acquired an alkaline reaction. *Phosphaturia* is the constant elimination in excess of the ammonio-magnesian or triple phosphates, or of calcium phosphate; and occurs in dyspepsia, cystitis, and alkaline fermentation of the urine in the bladder. Magnesium phosphate has no special significance.

Urates. Urine containing the amorphous Urates of sodium, potassium, and calcium in excess, has a high color, is strongly acid, and deposits on cooling a brick-dust sediment, which disappears promptly when the urine is heated. This condition occurs in fevers, renal congestion, dyspepsia, hepatic affections, the lithemic and rheumatic diatheses, and after severe exercise causing perspiration. Ammonium Urate, the so-called "hedge-hog crystals," occurs in acid urine undergoing the alkaline fermentation, and is dissolved by hydrochloric and acetic acids.

Urea. Remove albumin, if any, from the urine; place a drop on platinum-foil, add a drop of Nitric Acid, and leave it undisturbed in a cool place for a minute or two. If the urea is in excess, crystals of uric nitrate form immediately. For clinical purposes it is necessary to ascertain the proportion of urea present, which is obtained by any one of several ureameters sold in the shops. The most reliable depend upon the decomposition of the urea by a solution of Sodium Hypobromite or Sodium Hypochlorite, with evolution of nitrogen, the volume of which is the measure of the urea decomposed.

These instruments are simple in arrangement, and are usually accurate enough for ordinary purposes. Bartley's ureameter is one of the most reliable and accurate.

The normal quantity of urea eliminated in 24 hours fluctuates between 300 and 600 grains, or $1\frac{1}{2}$ to $2\frac{1}{2}$ per cent. of the urine. In cold weather it may fall to 130 or 140 grains in persons who lead sedentary lives; and it is decreased in those who have lived long in the tropics. It is increased in acute fevers, diabetes mellitus, dyspepsia, nervousness, by the excessive use of nitrogenous foods, and after the copious ingestion of water. It is decreased in nephritis and starvation, by the use of vegetable foods by the excessive use of tea or coffee, and after prolonged rest.

Uric Acid. Chemical qualitative tests are usually unnecessary, as uric acid may often be detected by the naked eye as small, red crystals, in a urinary sediment, or deposited on the sides of a test-tube in which urine has stood for some time; and the crystals may be recognized with a low power under the microscope. The absence of uric acid or its compounds may be determined by the *Murexide Test*, as follows: On a watch-glass or the cover of a porcelain crucible treat the sediment with a drop or two of Nitric Acid, to dissolve it, and carefully evaporate to dryness. Then add a drop of Ammonium Hydroxide, the stronger ammonia water, and if uric acid or urates are present a purple color will be produced, due to murexide (ammonium purpurate). The quantitative test is best made by Maisch's modification of the Hopkins method, by precipitation with ammonia and hydrochloric acid, but the process is tedious and suited only to the laboratory.

The normal excretion of uric acid varies from 7 to 10 or more grains daily. When not eliminated by the kidneys it becomes stored in the body and causes the uric or lithic diathesis, the manifestations of which are often serious. Its origin is believed to be from the disintegration of leucocytes and nuclein, not from the nitrogenous elements of the food, as was formerly held. It is diminished in nephritis, diabetes, chlorosis, chronic rheumatism, and before the paroxysms of gout; and is increased in acute fevers, indigestion, leukemia, functional affections, heart and lung diseases with much dyspnea, and after attacks of gout.

Other Deposits are best examined with the microscope, and compared with good plates, rather than with printed descriptions. The plates in Hoffmann and Ullmann on Analysis of the Urine, will answer the wants of most general practitioners, but the text follows the metric system. The urinary deposits may be classified thus:—

| In Alkaline Urine only. | In Alkaline or Acid Urine. | Organized Deposits. |
|-------------------------|----------------------------|---------------------|
| Calcium Phosphate | Uric Acid | Mucus |
| Ammonium Urate | Urates | Torulæ |
| Ammoniaco-magnesian, or | Phosphates | Pus |
| Triple Phosphates. | Oxalates | Blood |
| | Cystine. | Tube-casts |
| | | Spermatozoa, etc. |

Necessary Apparatus. A dozen Test-tubes. Alcohol lamp. A small porcelain dish. 2 watch-glasses. A sheet of platinum foil, $\frac{3}{4}$ inch square. 3 pipettes of different sizes, to be used only for urine. A 2 oz. graduate. Urinometer (Squibb's). Urea-meter. Litmus paper, blue and red. Reagents mentioned in this article. Grape-sugar, for use in testing the Fehling's solution. A centrifuge apparatus is convenient but not essential. Oliver's test-papers or test-pellets, with a color scale, specific gravity beads, test-tubes, pipette, and directions for use, are sold under the name *Physicians' Pocket Reagent Case*, and are useful for the examination of urine at the bedside.

The foregoing includes the tests which a physician will ordinarily employ in the examination of urine. For complete instruction concerning quantitative urinalysis the reader is referred to one of the numerous manuals on the subject, among which may be mentioned Da Costa on Medical Diagnosis, Tyson on the Practical Examination of Urine, and Sir Henry Thompson's Clinical Lectures on Diseases of the Urinary Organs, Lecture xxiv.