A SIMPLE UREAMETER.*

By Prof. L. E. SAYRE.

It is, perhaps, conceded by the pharmacist generally that that part of chemical analysis involved in the examination of urine is a branch of chemistry which comes very properly within the lines of professional work of the pharmacist. It may be urged that the physician is quite competent to make all the examinations necessary of this kind; the majority of young men now graduating at our medical colleges being well equipped for accurate urinary analysis. While this is true, physicians in active practice who are convenient to a pharmacist will not always take the time nor give the patience to making repeated, careful analyses such as are demanded in some classes of disease. I was impressed with this fact some time ago, while visiting in one of our large cities. A physician wanted a quantitative determination of samples of urine; he was able to do the work himself, but was one of the class I have described. It fell to my lot to accommodate him, as the pharmacist (my friend) to whom he applied did not feel himself competent to perform the work. This incident forcibly brought to my mind the importance of the pharmacist's being fully equipped for chemical work of this sort. He has the time, and the busy practitioner has not, and such chemical service as this, rendered to the physician or the patient, is sometimes of pecuniary benefit to the pharmacist.

In the college laboratory the pharmaceutical student of to-day receives a more or less thorough course of instruction in this branch of chemistry, which shows a recognition of this matter on the part of the pharmaceutical institutions of instruction.

In the instruction of the student in urinary analysis, it is especially desirable that he be educated to use the simplest forms of apparatus and to make these simple forms to have as wide a range of application as possible. It is the attempt to carry out this principle last winter in this class of work that suggests the present article. It became necessary to extemporize some home-made instrument for the use of each individual member of the class, to be used as a ureameter. With but a few suggestions on my part, the students made the following: A piece of soft glass tubing 10 inches long and $\frac{3}{8}$ to $\frac{5}{8}$ inch in diameter, was provided. Over the Bunsen burner one end was carefully rounded and closed, making a sort of long and narrow test tube.

SAYRE'S UREAMETER.

This was covered with a thin film of melted wax and graduated into cubic centimeters by pouring into the tube metallic mercury, 1 c. c. at a time, and marking with a fine point each c. c. on the glass through the wax film. The tube thus graduated was etched in the fumes of hydrofluoric acid in the following manner: A piece of lead pipe was closed at one end; at the opposite, open end, a cork was provided, through which a hole was cut, just large enough to admit and suspend the glass tube. Fluorspar and sulphuric acid were introduced into the pipe, and the suspended glass tube was placed in position. After an exposure of a short time the etching was complete, and a sort of Bunsen eudiometer was made, which served admirably as a ureameter.

In using the tube, it is first filled with a solution of hypochlorite of sodium and inverted into a beaker partly filled with the same liquid, held in position by a clamp as represented. One c. c. of the urine is introduced into the tube by means of a curved pipette, also shown in the figure. The pipette consists of a glass tube $\frac{1}{8}$ inch in diameter and 8 to 10 inches in length, drawn out to a fine point and curved at the pointed end, at such an angle that it can readily be inserted up a little distance into the inverted eudiometer. The straight arm of the pipette is graduated so that between two marks, made with a file, it measures 1 c. c.

This simple instrument has so pleased me in the accurate results which it gave, and in the drill and independence it gave the students, that I have made it the basis of a paper to be read among our San Francisco friends. The students realized that they could be independent of the more elaborate instruments which are being figured from time to time in the journals, and the results obtained were always more satisfactory than those obtained from the use of the Prof. Doremus ureameter, which appears to be the more commonly employed.

The objection to the latter I have found to be that in the hands of the students it does not furnish accurate results, because so much of the gas is allowed to escape at the open end. I have had the students compare their own with the Doremus instrument, using a solution of urea of known strength for the purpose. As a result they report that the eudiometer always shows

more exactly the quantity of urea, gives more nearly the theoretical quantity of gas, than the ureameter of Dr. Doremus. I may add that this has been my own experience as well.

I have no doubt that this simple and inexpensive piece of apparatus has suggested itself to others, but there may be some of the craft who may not have had occasion to think of it, and may appreciate this reference to it.—*Amer. Druggist*.

DISCOVERIES IN EGYPT.

A FEW months ago there lay, on the edge of the yellow sandy desert some sixty miles south of Cairo, two gray patches of ruins, of which none but the peasantry around them even knew the existence. No walls or tokens of work were to be seen, but only a low rise of a few feet of Nile mud, with some chips of pottery scattered over it. The name of one of these mounds was taken merely from the ravens which alighted on it—Medinet Gurob; the other, a few miles distant, scarcely had even a name—only one man could be found who had heard its name when he was a boy—Medinet Kahun. Yet these unnoticed and unknown places have given us evidence on the origin of writing, a subject which has been debated for generations, and their evidence will probably be discussed by generations to come.

Last year we noticed Mr. Flinders Petrie's exhibition of Roman portraits, which he had discovered at Hawara, in the province of the Fayum. This year we have before us in London the results which he has obtained from the hitherto unknown ruins which we have just mentioned. While Mr. Petrie was finishing the excavations at Hawara the past winter, and laboriously penetrating the pyramid there, he determined next to attack the site of Gurob.

The first time he had walked over that mound he saw that it belonged to the flourishing period of the great Rameses; for to the practiced eye chips of pottery are as intelligible as printed words and dates. While working there he walked over the blank gray swell of Kahun—this was clearly of a still earlier date, for none of the pottery was of any style yet known. On digging here this proved to be the town built for the workmen who labored at the pyramid and temple of Useresen II., one of the great kings of that remote age—the XIIIth Dynasty, about 2,600 B.C.

The houses, the agriculture, the tools, the ornaments, the literature, and even the amusements of more than four thousand years ago are brought vividly before us by these discoveries. The dancing profession is of immemorial age in the East, and the acrobats and performers of the early times are pictured on the walls of the tombs; here we have a wooden statuette of a dancer or mummer, dressed in a mask, and a tail, and—nothing more.

The strange animal headdress which she wears is evidently much the same as that in which Bes, the god of dancing, is always represented. With this image was found a pair of ivory clappers or castanets, all buried in a hole in the floor of a room. In the next room of the same house was found the actual mummer's mask, made of canvas and plaster, painted black, with crescents of color around the eye-holes, and with patches on the cheeks. Torn, patched, broken, and at last thrown aside, how many antics have been performed under that! How many miseries have passed behind that screen! What jests and what shame it had covered! Perhaps no relic has brought us so touchingly to the frailties of past humanity as the dancing girl's mask, her castanets, and her little statuette, which have lain during thousands of years in silence. The merry children played in the streets then with tipcat and whip top, and threw the ball and made their little mud toys; quaint figures of men and pigs and crocodiles were pinched up from bits of clay, and a curious little model boat and a hippopotamus chipped out of flint are here illustrated. We know how the Egyptians obtained fire, a point never yet discovered until the fire stick came to light. On this an upright stick would be rotated, so as to ignite the powdered wood by friction, as in India at the present time. Delicate and graceful wood carving is shown in the wooden spoon shaped in the form of a shell supported by a serpent.

A sling, far older than that of David, shows us how carefully such things were woven and provided with a loop to hold on the finger. Tools were strangely like modern forms; the plummet, the brick mould, the plasterer's float, might any of them belong to an English workman as far as their form goes. It is only where metal has come into common use and driven out the wooden hoe and the flint saw in the sickle that any essential change is to be seen. The music of the time was much the same as now, as we see by the boy playing on double pipes like a modern Egyptian.

The greatest discovery, however, in this ancient town is that of alphabetic writing, quite distinct from any Egyptian inscriptions yet known—neither hieroglyphic, hieratic, nor demotic. Dozens of signs are found upon pottery, as the marks of the owners, and on one piece of wood are five letters, evidently forming a word or name. So far as yet examined, it seems most likely that the foreign captives from the Mediterranean (who were certainly in this town, by other tokens) had here adopted the marks used by the Egyptian masons—corruptions of the hieroglyphs; and then from these signs a syllabic alphabet was formed, which is evidently akin to that of Cyprus, and, perhaps, some other early writing. Here we are on the track of the very origin of all our Western writing, at a date two thousand years before almost all of the inscriptions yet known.

Leaving this early town, we will come down some thirteen hundred years to the time of Rameses the Great, or about 1400 to 1200 B. C., which is revealed to us in the town of Gurob. Here, amid all the works of that age, we find again a colony of foreigners, comprising Hittites and Turseni. These people were probably accompanied here by the Achæans or Greeks, with whom they are mentioned on the Egyptian monuments of that age. The same Cypriote characters are again found here on the pottery; and, moreover, a great variety of the earliest Greek pottery, exactly like that found in the oldest remains of Mycenæ by Dr. Schliemann, and that from beneath the lava beds of Thera. The false-necked vases and the figures of pottery might be supposed to have come from Greece itself, and not from a colony in a remote part of Egypt.

The historical value of such a well-dated discovery is immense, as we now have for the first time a solid basis for our chronology of the prehistory of Greek civilization. The beautiful head carved in wood comes from a coffin of about 1300 B. C.; and the elegant but less artistic carving of the head belongs to a few centuries later.

We have barely indicated the most curious objects, without touching on the beautiful necklaces, amulets, and embroideries, and the other historical interests of the large collection made by Mr. Petrie.—*Illustrated London News*.

BRACKET FERNS.

"I SHOULD be glad if you could recommend me a few ferns which I could use for brackets. I have platyceriums," says J. Foden, Halifax. There are several plants well deserving attention, and which are peculiarly fitted for situations of the above-named character. All the kinds described here require the warmth of a stove, and should be potted in peat and loam in about equal parts, with a little sand added. The plants should also be well drained, as they require a considerable amount of water all the year round to keep them in good condition. I know that in some places they are dried off in winter, the argument in favor of this practice being that it is natural for them to be so dried up, and they require rest, but this is a foolish and absurd notion, and to teach such a system is to encourage the worst form of gardening.

Under such a system the plants can never be any larger, and only the one season's growth can be had upon them. If carefully nurtured, however, through the winter months, the freshness is maintained, and the plant increases in size and stateliness. Therefore, I say that while less water is necessary for these plants in winter, it should never be curtailed to such an extent as to cause the specimens to suffer; indeed, there is not a single fern in cultivation, be it evergreen or deciduous, that is benefited by an entire withholding of the water supply. The following few kinds should form splendid ornaments as bracket ferns in a well-arranged fernery, all that is necessary being to drain the pockets or brackets well and to allow sufficient head room:

Aglaomorpha meyeriana.—This plant has acquired the name of bear's-paw fern from its very stout rhizome being covered with thick woolly scales, which are of a bright red; the fronds attain a length of some 3 feet or more, and are thick and leathery in texture; they grow erect, are divided in the lower part nearly to the stem into somewhat broad, oblong entire pinnæ, which

DRYNARIA MORBILLOSA.

are closely set and long and narrow. It is a native of the island of Luzon.

Drynaria coronans.—This is a very handsome species, with large, broad fronds, which are erect and arranged in a circle, hence its name. It has a stout and woolly rhizome; the fronds each attain a height of 4 feet and about 2 feet in breadth, tapering slightly upward, and divided into broad pinnæ; these are not contracted like those of the previously named plant, otherwise it is similar. It is a native of Malacca.

D. morbillosa (see illustration), sometimes called *D. heraclea*, is a bold, large-growing plant, which in large examples attains a height of 6 feet by 2 feet in breadth. It is rigid in texture, and the base is wide and cordate. It is a beautiful object in any position in a fernery, and comes from various islands in the Malay Archipelago.

D. quercifolia is a distinct and pretty plant with dimorphous fronds, the barren one being sessile and lobed toward the top, in shape something like a large oak leaf; the fertile frond is some 2 feet long and pinnatifid; the barren frond usually dies annually, but remains on the plant. It is a very suitable plant for brackets, and forms an elegant ornament. It is a native of Moulmein and various other parts of India.

Hymenodium crinitum is a bold, handsome species, and it has obtained the name of the elephant's ear fern, and its large entire dark green fronds give a very good foundation for the name. These are simple and entire, some 18 inches long and about 9 inches broad, deep green covered with very long black hairs. The stem is from 6 to 9 inches long and covered with black hairs. This plant is found in Jamaica and several of the West Indian islands, and it requires an abundant supply of heat and moisture. If used for the purpose here indicated, it should have a moist shady situation selected for it, so that the edges of its fronds may be preserved, otherwise these become brown and shabby. When grown into a good specimen it is a distinct and magnificent fern.

The above are a few kinds suitable for brackets, and if used alternately with platyceriums (the stag's horn fern), will render a fernery very attractive.—*W. H. Gower, in The Garden*.

SOME PHYSIOLOGICAL TRAITS OF THE SOLID-STEMMED GRASSES, AND ESPECIALLY OF INDIAN CORN (MAIZE).*

By F. L. STEWART, Murrysville, Pa.

THE laws of nutrition and growth are at the present time understood to cover a few general principles, which, as far as we are capable of comprehending them, embrace in their range of action all manifestations of

* Paper read at the meeting of the Am. Pharm. Assoc. at San Francisco.

† It will suggest itself to any one, perhaps, that a long, narrow test tube, graduated on paper, will answer for extemporaneous ureameter. L. E. S.