REPORT OF COMMITTEE ON UNOFFICIAL STANDARDS.

The following portion of the report of the Committee on Unofficial Standards relates to certain crude drugs and chemicals suggested for inclusion in the next revision of the National Formulary, and by order of the Council is published in the JOURNAL in order to afford opportunity for discussion before the standards proposed are finally adopted.

Manufacturers, importers, analysts, and others interested in any of the proposed standards, are requested to send their criticisms and comments to the chairman of the committee, Geo. M. Beringer, 501 Federal St., Camden, N. J.

APPROVED MONOGRAPHS SUBMITTED AS STANDARDS FOR UNOFFICIAL DRUGS AND CHEMICAL PRODUCTS.

ALLIUM.

Allium. Garlic.

1. The bulb of *Allium sativum* Linné (Fam. *Liliaceae*). Bulb subglobular, 4 to 6 cm. broad, compound, consisting of 8 to 15 bulbels (so called "cloves") and surrounded by 1 or 2 dry, whitish, membranaceous scales and attached to a flattened circular base from the lower portion of which arise numerous yellowish-white roots, bulbels more or less ovoid, in transverse section 3 to 4 sided, the outer surface being convex, summit acute and narrowed into a thread-like fibrous portion, base truncate, each bulbel covered by one or two layers of whitish, membranaceous scale-like leaves, beneath which is the light brown and pinkish, thin and coriaceous layer of epidermis, cohering but easily separable from the solid portion of the bulbel; odor of broken or bruised bulbel aromatic, disagreeable; taste intensely pungent and persistent.

Under the microscope, transverse sections show three distinct portions: (a) the large fleshy scale consisting chiefly of parenchyma enclosing scattered vascular bundles, epidermis in both ventral and dorsal surfaces consisting of small tabular cells; (b) the middle layer nearly circular in outline, about 0.750 mm. in diameter, the tissues resembling those of the outer fleshy scale, but the cells containing numerous yellowish-brown plastids; (c) an innermost bright green layer consisting of a single leaf folded lengthwise along the midrib so that the ventral surfaces lie close together.

Garlic should be used in the fresh condition only.

FLORES VERBASCI.

Mullein Flowers.

1. The dried corollas, with adhering stamens, of *Verbascum phlomoides* Linné, or of *V. thapsiforme* Schraeder, (Fam. *Scrophulariaceae*).

2. Verbascum flowers should be kept in a tight, dry container.

3. Corolla light-yellow, the outer surface grayish with a fine soft woolly indumentum, the inner surface sparsely hairy and finely veined; tube of the corolla only 1 or 2 mm. long and almost equally broad, the limb from 14 to 30 mm. broad, between wheel-shaped and saucer-shaped, obscurely two-lipped, the unequal lobes rounded-obovate. Stamens five, borne on the base of the corolla, shorter than the corolla, two of them longer than the other three, the filaments thick and fleshy, more or less pilose, especially the three shorter, usually orange colored. Stamen-hairs cylindrical, unicellular, non-branching, surface minutely reticulate, apex rounded, frequently enlarged. Pollen grains smooth, triangular and more or less rounded, 0.025 to 0.030 mm. in diameter. Odor peculiar, agreeable; taste mucilaginous, not agreeable. The flowers impart a yellow color when boiled with water, and a rather permanent green with dilute sulphuric acid, which latter color becomes brown upon the addition of alkalies.

HYDRANGEA.

Hydrangea. Seven-barks.

1. The dried rhizome of *Hydrangea arborescns* Linné (Farm. *Saxifragaceae*).

2. Rhizome, cylindrical, usually cut into

pieces 3 to 10 cm. in length, 3 to 20 mm. in diameter; light brown to yellowish-brown with a pinkish tinge, longitudinally wrinkled, marked by few elliptical lenticels and occasional prominent buds, short branches or stem scars, and from the lower surface arise a few coarse fibrous roots; fracture tough, splintery; internally yellowish-white or light brown, bark thin, easily separable from the distinctly radiate wood which surround a prominent whitish pith; inodorous; taste of the bark sweetish, becoming slightly acrid. Roots attaining a length of 25 cm. and a thickness of 2 mm., irregularly bent and branching, otherwise resembling the rhizome with the exception of the pith being wanting.

3. Under the microscope, sections of the rhizome of Hydrangea show a gray cork of a few rows of tabular cells, a cortex made up chiefly of parenchyma containing starch, large cells containing raphides and small isolated groups of stone cells or sclerenchymatous fibers; a woody cylinder composed of slender wedges made up of prominent tracheae with reticulate thickenings and tracheids separated by medullary rays 1 to 3 cells wide, the cells of which are filled with small starch grains; pith of large polygonal cells with prominent simple pores.

4. Powder: Light yellowish-brown, containing irregular fragments consisting of strongly lignified tracheae, tracheids and medullary ray cells; stone cells and sclerenchymatous fibers, 0.050 to 0.200 mm. in length, strongly lignified, the walls marked by simple and branching pores; raphides numerous, 0.070 to 0.130 mm. in length; starch grains mostly single, more or less ellipsoidal, occasionally with a prominent central cleft and varying from 0.002 to 0.010 mm. in diameter.

INULA.

Inula. Elecampane.

1. The dried rhizome and roots of *Inula Helenium* Linné (Fam. *Compositae*), with not more than 5 percent. of its stem bases.

2. Rhizome usually split into longitudinal or more or less oblique pieces to which may be attached one or more of the roots; up to 8 cm. in length and 4 cm. in diameter; externally grayish-brown to dark-brown, longitudinally wrinkled with occasional buds or stem scars and surmounted at the crown by a portion of the over ground stem; inner or cut surface somewhat concave, the edges incurved with the overlapping bark, yellowish-brown to grayish-brown, longitudinally striate and more or less fibrous near the cambium zone; fracture short and horny; inner surface light brown and marked by numerous circular or elliptical oleo-resinous canals; roots cylindrical and tapering, frequently curved or irregularly curled, up to 13 cm. in length and 1.5 cm. in diameter; odor aromatic; taste acrid, bitter and pungent.

3. Sections under the microscope show a corky layer of 4 to 7 rows of broad tabular cells; a cortex of numerous parenchyma cells containing inulin in irregular or fan-shaped masses and a number of large intercellular oleo-resinous reservoirs arranged in nearly radial rows and forming interrupted circles; woody portion consisting chiefly of parenchyma, a number of tracheae with simple pores or reticulate thickenings and associated occasionally with a few strongly lignified wood fibres, and oleo-resinous reservoirs similar to those occurring in the bark; parenchyma cells in the pith of the rhizome large, containing less inulin than the cells of the wood and bark and separated by large intercellular spaces.

4. Powder: Light brown; consisting chiefly of fragments of parenchyma containing inulin and small irregular separated masses of inulin; tracheae with simple pores and reticular thickenings associated occasionally with strongly lignified wood fibres; occasional reddish-brown fragments of the walls of the oleo-resinous canals.

IRIS.

Orris.

1. The rhizome of *Iris florentina* Linné *Iris Germanica* Linné, and *Iris pallida* Lamarck (Fam. *Irideae*), freed from the roots, peeled and dried.

2. In pieces of various form and size, sometimes branched, 5 to 10 cm. long and 2 to 3 cm. in diameter, usually round and plump or flattened and showing knotty enlargements. The under surface may show numerous round root scars and the upper surface remains of leaf scars; externally white or yellowish-white; fracture rough, showing a narrow cortex, a brown cambium layer and large central stele. Odor fragrant, resembling that of the violet; taste aromatic and bitter. The ash should not exceed 6 percent.

MACIS.

Mace.

1. The arillode of the seed of *Myristica fragrans* Houttuyn (Fam. *Myristicaceae*).

2. In narrow bands, 25 mm. or more long, somewhat branched and lobed above, united into broader bands below; yellowish to brownish-orange; greasy; odor fragrant; taste warm and aromatic.

3. When powdered, orange-buff to orange-brown in color. Mounted in water and examined microscopically the powder exhibits elongated epidermal cells; parenchyma containing very small amylodextrin granules, which are colored red-brown by iodine T. S.; large oil cells the contents of which are not greatly changed in color on the addition of alkali.

4. Powdered false or Bombay mace is yellow-brown to deep-brown in color and deficient in odor and taste. When mounted in water and examined microscopically it exhibits flattened thick-walled epidermal cells and oil cells much more numerous than in true mace and containing an orange-red resinous substance which is dissolved by alkalies to a blood-red liquid.

5. When moistened with hydrochloric acid, no greenish color should be produced (difference from and absence of arillode of *Myristica Malabarica* Lamarck or Bombay Mace).

6. If an alcoholic extract of Mace (1-10) be treated with potassium chromate T. S., the precipitate formed should be yellow, not changing to red on standing, nor should the solution develop a red coloration (difference from and absence of Bombay Mace).

7. If a piece of filter paper be saturated with an alcoholic extract of Mace (1-10), and 1 drop of potassium hydroxide T. S., be added, no blood-red coloration should be produced (difference from and absence of Bombay Mace).

8. The ash should not exceed 3 percent. and this should be almost completely soluble in hydrochloric acid.

9. Mace should yield not less than 8 percent. of volatile ether extract, and not less than 20 percent. nor more than 30 percent. of non-volatile ether extract.

PETROSELINUM.

Parsley Root.

1. The root of *Petroselinum sativum* Hoffmann (Fam. *Umbelliferae*).

2. The entire fusiform root up to 20 cm. in length and up to 2.5 cm. in thickness at the crown, or somewhat broken or cut into pieces; usually cut lengthwise into two or four sections, externally light yellowish wrinkled longitudinally, somewhat annulate, root scars distinct and corky; fracture tough when damp, brittle when dry; internally, cortex whitish and characterized by numerous reddish-brown oleo-resin cells, cambium zone distinct and brownish, wood about the same thickness as the cortex, slightly radiate and light yellowish in color. Odor aromatic; taste sweetish and pungent.

3. The powdered drug shows numerous truncate or somewhat angular starch grains up to .030 mm. in diameter, reticulate tracheae up to .060 mm. in width and thin walled, lignified fibers with simple pores.

4. Ash not more than 6 percent.

PIMPINELLA.

Pimpernel Root.

1. The dried rhizome and roots of *Pimpinella Saxifraga* Linné, or *Pimpinella magna* Linné (Fam. *Umbelliferae*).

2. Cylindrical or slightly tapering, about 10 to 20 cm. in length and from 1 to 1.5 cm. in diameter at the crown, frequently branching, sometimes split longitudinally or broken into pieces; the upper or rhizome portion annulate, with undeveloped stem buds and a few attached stem remains which should not be over 5 cm. in length; roots longitudinally wrinkled, slightly annulate, cortex thin, easily detached; fracture short when dry, tough and flexous when damp; externally light yellowish-brown; internally porous, cortex broad and whitish with numerous groups of projecting radial bast fibers and reddish-brown oleo-resin cells, wood yellowish, usually with a few indistinct fibers, medullary rays interrupted, cambium zone distinct; odor, aromatic; taste sweetish, pungent and acrid.

3. The powdered drug shows numerous simple or 2 to 4 compound starch grains from .004 to .010 mm. in diameter; secretion canals from .050 to .060 mm. in diameter; trachea reticulate or scalariform .035 to .070 mm. broad; fibers, thin walled numerous, thick walled with simple pores few (P. magna).

POTASSII FORMAS.

Potassium Formate.

1. It should contain, when dried, not less

than 98 percent. of potassium formate ($KCOOH = 84.11$). It should be kept in well-stoppered bottles.

2. Very deliquescent, colorless crystals, or white crystalline powder, odorless, taste saline bitter.

3. It is very soluble in water, soluble in alcohol.

4. Its aqueous solution is slightly alkaline to litmus, but should not redden phenolphthalein.

5. When the salt is heated, hydrogen is evolved and a residue is left which effervesces with acid, and imparts to a non-luminous flame a violet color.

6. On adding sodium bitartrate T. S. to the aqueous solution of the salt (1:20) a white crystalline precipitate is slowly formed which dissolves on the addition of ammonia water.

7. When ferric chloride T. S. is added to the aqueous solution of the salt (1:20) a red color is produced which is discharged by strongly acidulating with sulphuric acid.

8. The addition of mercuric chloride T. S. to the warm aqueous solution of the salt (1:20) produces a white precipitate of mercurous chloride, which turns gray on further warming in the presence of an excess of the formate.

9. The aqueous solution of the salt (1:100) should comply with the U. S. P. test for Limit of Heavy Metals.

10. 10 cc. portions of the aqueous solution of the salt (1:20) slightly acidulated with acetic acid should not be rendered turbid within five minutes by the addition of ammonium oxalate T. S., (calcium), or by calcium chloride T. S. (oxalic acid).

11. Weigh accurately about 2 gm. of Potassium Formate, previously dried to constant weight at 120° C. and ignite it thoroughly at a temperature not exceeding a red heat. Dissolve the residue in hot distilled water, filter, if necessary, and wash until washings cease to affect phenolphthalein. Then cool the solution and titrate with normal sulphuric acid V. S., using methyl orange as indicator. The number of cc. of normal sulphuric acid V. S. consumed should indicate not less than 98 percent. of potassium formate. Each cc. of normal sulphuric acid V. S. corresponds to 0.08411 gm. potassium formate.

QUININAE VALERAS.

Quinine Valerate.

1. The Valerate of the alkaloid quinine. It should be kept in well-stoppered amber-colored vials.

2. White lustrous crystals, having an odor of valeric acid and an intensely bitter taste.

3. It is very sparingly soluble in cold water, soluble in hot water, becoming less soluble by age on account of loss of valeric acid; readily soluble in alcohol.

4. Its aqueous solution is neutral or slightly alkaline to litmus.

5. On treating 10 cc. of the aqueous solution of the salt (1:1000) with a few drops of bromine water, then with an excess of ammonia water, an emerald green color will be produced.

6. The aqueous solution acidulated with sulphuric acid exhibits a blue fluorescence and emits the odor of valeric acid.

7. On incinerating 1 gm. of Quinine Valerate, not more than 0.1 percent. of ash should remain.

8. About 0.1 gm. of the salt should dissolve in 5 cc. of sulphuric acid without producing more than a light-yellow color (readily carbonizable impurities).

9. 10 cc. portions of the cold saturated aqueous solution of the salt should not give more than a slight turbidity with barium chloride T. S. when acidulated with hydrochloric acid (sulphate) or with silver nitrate T. S. when acidulated with nitric acid (chloride).

10. The quinine obtained by shaking out the salt with ammonia water and chloroform should comply with the U. S. P. test for absence of excessive amounts of other cinchona alkaloids.

SODII FORMAS.

Sodium Formate.

1. It should contain, when dried, not less than 98 percent. of anhydrous sodium formate ($NaCOOH = 68.01$). It should be kept in well-stoppered bottles.

2. A white crystalline powder, or colorless crystals, containing one molecule of water; odorless and having a saline bitter taste.

3. It is very soluble in water, sparingly soluble in alcohol.

4. Its aqueous solution is slightly alkaline

to litmus, but should not redden phenolphthalein.

5. When the salt is heated, hydrogen is evolved and a residue is left which effervesces with acid and colors a non-luminous flame intensely yellow.

6. Ferric chloride T. S. added to the aqueous solution of the salt (1:20) produces a red color which is discharged by strongly acidulating with sulphuric acid.

7. The addition of mercuric chloride T. S. to the warm aqueous solution of the salt (1:20) produces a white precipitate of mercurous chloride which turns gray on further warming in the presence of an excess of the formate.

8. The aqueous solution of the salt (1:100) should comply with the U. S. P. test for Limit of Heavy Metals.

9. 10 cc. portions of the aqueous solution (1:20) slightly acidulated with acetic acid should not be rendered turbid within five minutes by ammonium oxalate T. S. (calcium) or by calcium chloride T. S. (oxalic acid).

10. Weigh accurately about 2 gm. of sodium formate, previously dried to constant weight at 120° C. and ignite it thoroughly in a crucible at a temperature not exceeding a red heat. Dissolve the residue in hot distilled water, filter, if necessary, and wash until washings cease to affect phenolphthalein. Then cool the solution and titrate with normal sulphuric acid V. S., using methyl orange as indicator. The number of cc. of normal sulphuric acid V. S. consumed should indicate not less than 98 percent. of anhydrous sodium formate. Each cc. of normal sulphuric acid V. S. corresponds to 0.06801 gm. of anhydrous sodium formate.

STRYCHNINAE VALERAS.

Strychnine Valerate.

1. The Valerate of the alkaloid strychnine. It should be kept in well-stoppered amber-colored vials.

2. A white crystalline powder, having an odor of valeric acid and an intensely bitter taste.

3. It is sparingly soluble in water, becoming less soluble by age on account of loss of valeric acid; soluble in alcohol or chloroform; slightly soluble in ether.

4. Its aqueous solution is neutral or slightly alkaline to litmus.

5. On dissolving about 0.05 gm. of Strychnine Valerate in 2 cc. of sulphuric acid not more than a faint yellowish color should be produced, but on adding a fragment of potassium dichromate a deep violet color will be produced which changes to orange or yellow.

6. When sulphuric acid is added to the salt, the odor of valeric acid is evolved.

7. On incinerating 1 gm. of Strychnine Valerate, the ash should not exceed 0.1 percent.

8. 10 cc. portions of the aqueous solution of the salt (1:100) should not be affected at once by barium chloride T. S. when acidulated with hydrochloric acid (sulphate) or by silver nitrate T. S. when acidulated with nitric acid (chloride).

9. About 0.02 gm. of the salt moistened with nitric acid may be colored yellow, but should not become red or reddish (brucine).

THYMUS.

Thyme.

1. The dried tops of *Thymus vulgaris* Linné (Fam. *Labiatae*) collected when the plant is in flower.

2. Stems quadrangular, about 0.5 mm. in diameter, greyish-brown or purplish in color, pubescent, nodes from 5 to 20 mm. apart, occasionally with the opposite leaves attached; leaves linear, linear lanceolate, or ovate oblong, 0.5 to 4 mm. long and from 0.5 to 2 mm. broad, apex acute, base obtuse tapering into a petiole 0.5 to 2 mm. long, margin revolute, upper surface greyish-green, puberulent, with numerous one-celled thick-walled, non-glandular hairs, lower surface greyish, pubescent, with non-glandular one to four-celled, thick-walled, rough simple hairs, up to 0.135 mm. in length and usually curved at the first joint in the bases, numerous compound glandular secreting hairs with a short one-celled stalk occurring chiefly on the upper surface and depressed in the cuticle give the leaf a glandular-punctate appearance; inflorescence in about twelve-flowered axillary whorls; flowers polygamous, calyx tubular, about 4 mm. long, ovoid or slightly curved on the lower side near the base, 9 to 12 nerved, pubescent, the throat bearded with longitudinally striated straight simple hairs up to 1 mm. in length, bilabiate, upper lip three-toothed,

lower lip with two hairy ascending attenuate divisions, corolla about twice as long as the calyx, purplish, smooth within, slightly pubescent without, upper lip emarginate, lower spreading and three lobed, stamens slightly didynamous and exserted, stigma bifid; nutlets about 0.5 mm. in diameter, spheroidal and finely tuberculate. Odor agreeable, aromatic; taste aromatic and warming.

3. Ash not more than 10 percent.

X-RAYS SHOW ETHER WAVES.

Professor W. H. Bragg delivered at the British Royal Institution a lecture on X-Rays and crystalline structure. Two years, he said, had gone by since Dr. Laue made his surprising discovery of the interference effects accompanying the passage of X-Rays through crystals. The pioneer experiment had opened the way for many others, and a very large amount of work, practical and theoretical, had now been done. There was work enough in sight to absorb the energies of many experimenters, and there was sure to be far more than we could see. It would scarcely be an over-statement to say that Laue's experiment had led to the development of a new science. The experiment itself, which, to put it briefly, constituted a proof that X-Rays consisted of extremely short ether rays, had already been described and was well known. A fine pencil of X-Rays passed through a thin crystal slip and impressed itself on a photographic plate. Round the central spot were found a large number of other spots, arranged in a symmetrical fashion, their arrangement clearly depending on the crystal structure.

Mr. W. L. Bragg (the lecturer's son) had discovered the "reflection" method, and had shown that it was able to elucidate the position of all the spots on the Laue photograph. This conception led to the construction of the X-Ray spectrometer, which resembled an ordinary spectrometer in general form, except that the grating or prism was replaced by a crystal and the telescope by an ionisation chamber and an electroscope. In use a fine pencil of X-Rays was directed on the crystal, which was steadily turned until a reflection leaped out, and the angle of reflection was then measured. If we used different crystals or different faces of the same crystal, but kept the rays the same, we could compare the geometrical spacings of the various sets of planes. If we used the same crystal always, but varied the source of X-Rays, we could analyze the X-Rays, measuring the relative wave lengths of the various constituents of the radiation.

At this stage a critical point had been reached. If we knew the exact spacings of the planes of some one crystal we could by comparison find the spacings of all other crystals and measure the wave lengths of all X-radiations. Or if we knew the exact value of some one wave length we could find by comparison the values of all other wave lengths and determine the spacings of all crystals. But at this stage there was no absolute value either of wave length or spacings.

Mr. W. L. Bragg appeared to have overcome the difficulty by his comparison of the reflecting effect in the case of rock salt or sodium chloride and sylvine or potassium chloride, and the spectrometer had now become a means of measuring the length of waves of any X-radiation and the actual spacings of the atoms of any crystal.