

Observations on the Apocynum cannabinum. By JOHN H. GRISCOM, M. D. of New York.

THE properties of the *Apocynum cannabinum* or Indian hemp, especially in a medical and chemical point of view, have been hitherto but little, if at all investigated, for I have met with no dissertation on the subject, and with but few medical men who have any acquaintance with it. This is the more striking when we consider that it is an indigenous plant, of great frequency in almost every section of our country, and possessed of properties which can scarcely fail to entitle it to a respectable rank in the materia medica, when they become properly known and duly appreciated.

Botanical History.—The term *Apocynum* is derived from the Greek *Αποκύνειν*. (Diosc.) *ἀποκύνειν* and *κύνειν*, because it was supposed to kill dogs. The Egyptians call this plant *oszar*, whence comes the name of the fruit *bidessar*, q. d. *Bordes oszar*, which in Arabic, signifies the egg *oszar*, the pods of the great Assyrian sort, being shaped like an egg.*

Of the Genus *Apocynum*, there are reckoned by botanists seventeen species,† of which the *cannabinum* is the second in order. It belongs

* Miller's Gardener's Dictionary.

† We have only three species of *Apocynum*, according to Nuttall and Eaton.

to the *Fifth* class, *Pentandria*, order second, *Dyotnia* of LINNÆUS, and to the Natural order *Contorte Apocynæ* of JUSSIEU.

Synonymæ.—Indian hemp—Dog's bane. It is most commonly known in this country by the name of Indian hemp.

GEN. CHAR.—*Calyx*. Perianth one-leafed; five parted, acute, short, permanent.—*Corolla*. Monopetalous, bell-shaped, semiquinifid, divisions revolute. *Nectary*, of five glandular, oval corpuscles, surrounding the germ.—*Stamina*. Filaments very short. *Anthers* oblong, erect, acute, bifid at the base, converging.—*Pistils*. *Germ*s two, ovate. *Styles* short. *Stigma*, roundish, bifid at the tip, mucronate, glued to the anthers.—*Perianth*. *Follicles* two, long, acuminate, one-valved, one-celled.—*Seeds*. Numerous, very small, crowned with a long down. *Receptacle*, subulate, very long, rough, free.



Sp. CHAR.—*Corolla*. Bell-shaped. *Nectaries*, five, alternate with the stamens. *Stem* straightish, herbaceous, leaves oblong, cymes lateral, longer than the leaf.

The foregoing characters, taken from MILLER, do not appear to coincide entirely with those given by other botanists. There seems to have been some doubt among

them as to which plant the name *cannabinum* should strictly be attached, and by the quotations from the authorities made below, it is sufficiently proved that there are several varieties of this species, and the *A. pubescens** described by R. BROWN, appears to be one of these

* Professor Eaton says, "Brown seems to have forced in an additional species, not found in nature."

varieties; its character is therefore subjoined to the others. There is not however, any probability that there is much, (if any,) difference in their medicinal virtues, therefore as no description yet given will apply to all the varieties, and as any plant which will agree with any of these descriptions, may be safely taken for *Spocynum cannabinum*, practitioners in different parts of the United States, or elsewhere, who may wish to use this medicine, may be saved from inconvenience and expense.

ANATOMY.—Calyx very small, 5-cleft. Corolla campanulate; border with 5 sheet, spreading, or revolute lobes. *Anders* sagittate, connivent, covering to the stigma by the middle. *Glandular teeth* 5, acute, alternating with the stamens, and opposite the segments of the corolla. *Style* obsolete. *Stigma* dilated, and conical at the apex. *Follicles* 2, long, linear. *Seeds* comose.*

A. cannabinum. Leaves lanceolate, acute at each end, glabrous; cymes paniculate; calyx as long as the tube of the corolla. **OBSERVATION.** Stem herbaceous, 2 or 3 feet high. Cymes lateral, longer than the leaf. Flowers greenish-white.

A. pubescens. Leaves ovate-oblong, mucronate, obtuse at the base—on both sides, and with the shorter cyme, pubescent; calyx nearly as long as the corolla. **OBSERVATION.** Stem herbaceous, 2 or 3 feet high. Leaves almost tomentose on the under surface. Cymes terminal. Flowers greenish.—*Elliot's Sketches*.

A. canabimum. Leaves oblong-oval, with hoary pubescence underneath; panicle pubescent; the limb of the corolla erect. **OBSERVATION.** Leaves and flowers greenish-white, or yellowish-green.—*Barton's Compendium Floræ Philadelphiae*.

A. americanum. Leaves oblong-oval, acute at each end; cymes paniculate; limb of the corolla erect. **OBSERVATION.** There is some variety in the leaves of my specimens; some being oblong-oval, and others lanceolate and tapering at base; or possibly I may have blended the two species *A. canabimum*, and *A. pubescens*.—But if they are really distinct, they closely resemble each other in habit.—The pubescence is but slight in any of those which I possess.—*Darlington's Florula Castrica*.

A. canadense. Stem upright, herbaceous. Leaves oblong, tomentose beneath; cymes lateral, longer than the leaves.—*London's Encyclopaedia of Floræ*.

A. americanum. Leaves lanceolate, acute at each end, smooth on both sides; cymes paniculate; calyx as long as the tube of the corolla. **OBSERVATION.** Stem erect, slender, branched, purple, a little glaucous. Leaves 2 or 3 inches long, and three-fourths of an inch broad, on short petioles, attenuate at the base, very smooth. Cymes many flowered, paniculate, smooth, segments of the calyx,

* The generic character here copied, is taken from Torrey's Flora, "which being one of the latest publications, is more likely to be correct. The discoveries of new species, and the establishment of new genera, nearly allied to *Spocynum*, may from time to time, cause slight alterations in its character, according as new species are added, or old species are separated into other genera."—(Letter from his highly esteemed friend, E. Thomas, to the author.)

subulate, about as long as the tube of the corolla. Corolla small, campanulate, green; border erect. *Fillicles* long, very slender.

A. pubescens. Stem erect; leaves ovate, hoary pubescent beneath; cymes pubescent; corolla longer than the calyx; border erect. **Observation.** Stem 2 to 3 feet high, with a few erect branches. Leaves on short villous petioles, obtuse, but not cordate at the base, mucronate, more or less pubescent beneath. Cymes short. *Flowers* few, (small.) Segments of the calyx lanceolate. Corolla greenish-white.—*Torrer's Flora*.

A. cannabinum. Stem erect and branching; leaves oblong-oval, hoary beneath, and downy when young, (more or less glabrous in maturity;) cymes lateral and terminal; pubescent when young, (more or less glabrous in maturity;) tube of the corolla about equal to the calyx, with an erect limb.—*Botan's Manual*.

Apocynum cannabinum is easily distinguished from *A. androsaemifolium* by the much larger flower of the latter, and from *A. hypericifolium* by the somewhat procumbent stem of the last, and by its having "very much the aspect of *hyecium*."—*Vide Barton's Compend. Flor. Philad.*

Description.—The roots of this plant are perennial, and creeping, the stems are brown, and about two feet high, the leaves smooth, in pairs; it abounds in a milky juice. Towards the upper part of the stem the flowers come out from the wings of the leaves in small bunches; they are of an herbaceous white colour, and being small, make no great appearance. This therefore is seldom admitted into gardens except for the sake of variety.* It flowers from July to September, and is a native of Virginia and Canada. It is propagated by parting the roots in March, before they put out new stems. It is hardy enough to thrive in the open ground, but the soil should be light and dry, otherwise the roots are apt to rot in winter. This sort spreads so much by its creeping roots as to be troublesome in gardens. The stems decay to the root in autumn, seldom ripening their seeds.† The bark of the stem when dry is very fibrous, and may be peeled off in strings, which are very tough and strong. The Indians of North America prepare the stalks of this species as we do hemp, and make twine, bags, fishing nets, and lines, and linen for their own wear.‡ It was cultivated by the Dutchess of Beaufort in 1699. One species of this plant, the *A. juvenas*, renovating dog's bane, is esteemed by the Chinese for possessing similar properties to those of the ginseng.§

The root of the species under consideration, which is the only part of the plant employed in medicine, belongs to the class *Radix repens*,

* The *androsaemifolium*, whose flower is larger, and of a purple colour, is more cultivated for appearance.

† Miller's Gard. Dict. London, 1798. ‡ Vide Kalm. § Rees' Cyclop.

and is frequently very tortuous. It consists of two distinct portions, the main body of the root covered with a bark. The ligneous portion is of a yellowish-white colour, possessing considerable bitter taste, and some odour. The cortical part is of a brown colour, and rough externally, white, and smooth within. Its taste is extremely bitter, rather nauseous, and somewhat similar to that of the *Sanguinaria canadensis*. Odour strong, and unpleasant.

Chemical properties.—Organic chemistry has hitherto been but partially pursued as a distinct science; its votaries have been comparatively few, and the facts which have been made known are still very much isolated and scattered. But the multiplied discoveries which have been made, and the numerous, interesting, and important circumstances relative to this class of bodies which have been given to the world, induce us to believe that this branch of analytical investigation will ere long advance to the rank of a distinct science, and claim a large share of attention. In the mean time, he who, by experiment and research, shall add one fact to the accumulated series, will furnish an additional stone for the erection of this new edifice, and lighten the task of him who shall undertake its construction.

The chemical investigation of this root has been pretty fully entered into, in order to ascertain its proximate principles. With this view numerous experiments were instituted, more than it would be advisable to embody here. In some instances the results obtained by the use of reagents, were somewhat doubtful as to their nature; in such case I have drawn the most correct conclusions I was able, considering the limited state of our knowledge in this department of chemistry.

Experiment 1st.—Two hundred grains of the dried root were boiled one hour in eight ounces of water till reduced to six and a half ounces. The decoction was of a bright brownish-red colour, having a strong and somewhat nauseous odour, and a very bitter taste, resembling very much those of the dry root. The addition of a few drops of a solution of *sul. ferri*, to a portion of it, changed its colour to a dark green. The primitive colour was restored by *sulph. acid*. A portion of the decoction was treated with the *acet. plumb.* in solution, which caused the immediate precipitation of a light brown, flocculent matter, in considerable quantity, leaving the supernatant liquor perfectly clear and transparent.

Experiment 2d.—One drachm of the fresh dried root was subjected to the action of three ounces of alcohol, also one drachm to three ounces of water. The tincture was of a very light brown colour, and possessed very little bitterness. The infusion was much darker and much more bitter.

Experiment 3d.—The addition of water to the tincture rendered it of a turbid, opaque whiteness, destroying its original colour. *Sol. sulph. ferri*, caused a

light green colour. When added to the infusion it became of a turbid green colour.

Experiment 4th.—Forty grains of the ligneous part of the root were macerated in two ounces of water for forty-two hours; the infusion was slightly tinged with yellow, apparently containing a good deal of mucilage. An equal quantity of the cortical part of the root was treated with the same quantity of water for the same length of time. This was of a bright brownish-red colour, similar to Madeira wine. On the first, sulph. ferri. had but a partial effect, causing a very slight tinge of green. Acet. plumb. had only a slight effect; it threw a little precipitate. On the second, sulph. ferri. had a decided effect, causing a dark green precipitate as in the former experiments. Acet. plumb. precipitated the same dark brown substance before noticed, in considerable quantity, leaving the liquor clear and transparent. From the latter, a white caecous precipitate was separated by the aqueous solution of gallic acid. A solution of carb. pot. had no effect on either infusions. The precipitate of the second from the sulph. ferri. being filtered off, the remaining liquor was changed to a beautiful violet colour by the gallic acid.

Experiment 5th.—Eighty grains of the dried root were macerated in two ounces of water forty-eight hours, and the infusion evaporated to dryness. The residuum was of a fine brown colour, and of a tenacious consistence.

Experiment 6th.—Two hundred grains of the dried root were put into ℥ssj. of distilled water; immediately after the immersion, the transparency of the fluid was lost, and it assumed a dull cloudy appearance, probably owing to the abundance of mucilage contained in the plant. At the end of twenty-four hours the liquor was of a clear amber colour, transparent. Neither the tinc. gallicæ, tinct. iodine, exal. ammon. or mur. baryta, had any effect on it. Eight ounces of the fluid were evaporated at steam heat. The residuum was of a reddish-brown colour, thick in consistence, gummy. It could not be dried at this heat. Its taste was bitter, though differing somewhat from the solution before evaporation.

Experiment 7th.—The residual matter of the preceding experiment, was treated with distilled water; all the brown part was immediately dissolved, but a white scaly substance in considerable quantity remained undissolved. This was soluble in alcohol.

Experiment 8th.—The root remaining from the sixth experiment was then treated with alcohol. The addition of water to a portion of it caused a precipitate in the form of a white cloud. The rest of the tincture was evaporated, and a white substance was left which was insoluble in water.

Experiment 9th.—Twelve ounces of boiling water were poured upon two hundred grains of the sliced root. The water immediately became cloudy, soon assumed a yellowish tint, and at the end of twenty-four hours was of a clear amber colour. At this time, at the bottom of the liquid, resting on the root, was observed a layer of a substance of a white woolly appearance, doubtless the mucilage of the plant, which was dissolved by the hot water, and precipitated when cold. Sulph. ferri. produced a slight green tinge, and acet. plumb. its before mentioned precipitate.

Experiment 10th.—When the aqueous infusion was treated with a solution of vit. of mercury, a dirty-white precipitate was formed, leaving the liquor above Empid, which in twenty-four hours, had assumed a purple colour. A solution

of chlorine being added, this colour was destroyed, and a white precipitate thrown down. Lime water added to a part of this, caused a yellow colour, which immediately changed to black. When the precipitate was washed with water, before adding the lime water, no yellowness was produced.

Experiment 111A.—One hundred and fifty grains of the dried root were macerated in successive portions of alcohol, until all the matter soluble in this menstruum without heat was taken up. The remainder of the root was then dried, and was found to have lost from forty to fifty grains, equal to about twenty-nine per cent. The alcoholic solution was of a bright yellow colour, possessing much bitterness.

Experiment 12A.—This was distilled in a glass alembic until two-thirds had gone over. The remaining fluid was then of a rather deeper yellow, intensely bitter, and containing a yellow, powdery looking substance in small quantity. This concentrated tincture was then placed over steam in a glass vessel, and evaporated nearly to dryness. Soon after the evaporation had commenced, there began to form a thick viscid substance of a yellowish-brown colour, and a bitter taste, sufficiently acrid to blister the tongue in a few seconds. This substance appeared in considerable quantity. There was also observed a greasy looking substance, floating on the fluid, not so abundant as the preceding, but evidently differing from it.

Experiment 13A.—Five hundred grains of the root were covered with alcohol and allowed to macerate; which operation was repeated four successive times. The last time very little colour or taste was perceptible in the tincture. The united tinctures were distilled until about two-thirds had passed over, (a small portion being retained, which was changed to a milky-whiteness when diluted with water, depositing in a few hours a white powdery precipitate.)

Experiment 14A.—The residuum in the alembic was placed over a steam bath, and about one-third evaporated, and then cooled. The edge of the fluid at the dish was covered with a white, greasy looking substance, very much resembling tallow, which extended in a thin coating up the sides of the glass. The bottom of the dish was also copiously dotted with a substance of apparently similar nature, but formed in distinct and separate globules, about the size of a large pin's head. They were entirely loose upon the glass, and a few of them uniting, floated on the liquor. The fluid was drawn off into another vessel, and this adipose substance left over the bath to dry, but as the globules soon began to assume a yellow colour from the heat, they were removed and allowed to dry spontaneously.

Experiment 15A.—The tincture was further evaporated, and when about one-half of it had disappeared, and the rest cooled, a considerable number of the brown, greasy looking globules, before mentioned, (Expt. 12th,) were observed, floating on, and dispersed through the fluid.

Experiment 16A.—The white substance, upon examination, presented the following characteristics. It had no odour, but possessed the peculiar nauseous, bitter taste of the plant in a very strong degree, and had an unctuous feel in the mouth, as well as between the fingers. It was insoluble in sulphuric acid, either dilute or concentrated, hot or cold, though blackened by it when concentrated. Acetic acid did not dissolve it. Potash water, nor aq. ammon. had

any effect on it. Ether dissolved it readily; alcohol slowly, but completely. It was insoluble in water.

Experiment 17th.—The yellow or brownish, and greasy looking substance, which always appeared after the other in evaporating a tincture of the root, appeared to contain all the colouring matter capable of being extracted by the alcohol. This was so bitter, that when a piece not larger than a pin's head was held a short time in the mouth, it blistered the tongue severely, and the bitter taste remained several hours, affecting the tongue and fauces very disagreeably. It dissolves completely in alcohol, though slowly, and communicates to it a beautiful amber tint. It is insoluble in water, but after remaining in it a few hours, it loses its characteristic colour, and becomes of a dirty-white; it is also rendered very pulverulent, where, as before, it was very adhesive.

Experiment 18th.—Two ounces of the root were boiled in twenty ounces of distilled water one hour, then allowed to cool, decanted, and a fresh portion added, and boiled half an hour; this was decanted, and more water added. This operation was repeated until the water remained tasteless and colourless. The different decoctions being added together, were filtered; the colour was like that of Madeira wine. When tested with a solution of sulph. ferri. no change was produced until the fluid was concentrated, when it assumed a black colour, and threw down a slight precipitate. The tinct. of iodine produced a dark purple hue, showing the presence of *fecula*. A solution of nit. of silver caused a yellowish precipitate, showing the presence of *gum*, or *bitter principle*. Solution of acet. of lead produced a yellowish-white precipitate. The decoction affects litmus paper, showing the presence of an uncombined acid. A solution of gelatine proved the presence of *tannin*. The decoction was evaporated nearly to dryness, and treated with alcohol, which separated a portion of *gum*. This tincture was filtered, and evaporated nearly to dryness. The result was a dark reddish mass, which tasted at first sweet, but soon became intensely bitter, producing a swollen sensation of the lips and tongue.

Experiment 19th.—One ounce of the sliced root was boiled in ten ounces of alcohol fifteen minutes, and then macerated ten days. The alcohol when filtered, had the appearance of Madeira wine, and was very bitter. About one-third was evaporated, and on cooling, a substance like wax was deposited, which was removed, and two ounces of distilled water added, which separated a quantity of *resin*. This was removed, and the evaporation was continued until it had the consistence of thick syrup. The taste of this was at first sweetish, soon becoming very bitter, and occasioning a swollen sensation of the lips and tongue.

Experiment 20th.—The root after being treated with alcohol, was dried, boiled half an hour in twelve ounces of distilled water, and then allowed to macerate three days. The water was then decanted, a fresh portion added, and boiled three-quarters of an hour, when it presented a greasy appearance, which on cooling was found to be caused by *wax*. It was then filtered, evaporated to the consistence of a thick syrup, treated with alcohol, which separated a quantity of *gum*, again filtered and evaporated nearly to dryness. The result was the same as in Expt. 19th, but in a lesser degree.

Experiment 21st.—The root, after being treated with successive portions of alcohol and water, until the bitterness was dissolved, was macerated one week

in six ounces of ether. It was then filtered and four ounces distilled off, when the remainder became turbid; this on cooling deposited a copious, yellowish-white precipitate, which had the appearance and feel of wax. This, when heated, melts, swells, takes fire, and burns with a white flame, leaving a very small portion of charcoal. The remainder of the ether was distilled, and left a very small quantity of resin, which was not bitter.

Experiment 22d.—Two ounces of the sliced root were macerated in repeated portions of distilled water until it came off colourless and insipid. The several portions were united, filtered and evaporated nearly to dryness, the extract being dark-coloured, very bitter, and viscid, weighing two hundred grains. This was macerated in successive portions of alcohol as long as it dissolved any of it. The residue was a spongy mass, insipid, possessing all the properties of gum. The alcohol was then boiled with eighty grains of calcined magnesia, filtered and evaporated to dryness. The result was a dark, reddish-brown mass, brittle, very bitter, nauseous and deliquescent. This may be considered as the pure bitter principle, coloured, as it is affected only by sub. acet. plumb. and nit. argent. which require twelve hours to show any change.

Observations.—The *first* experiment shows the action of two of the most active reagents which were employed.

By the *second* we have very clearly proved the superior power of water over alcohol in extracting the colouring and bitter materials of the root.

The object of the *fourth* experiment was to ascertain which part of the root contained the greatest quantity of active matter. The *central* part, it will be observed, contains by far the larger quantity.

It is shown by the *fifth* that much of its virtues is imparted even to cold water.

Experiments *third*, *seventh* and *eighth*, prove the existence of a resinous substance, and that a considerable quantity of matter which cold water does not dissolve, is soluble in alcohol.

From these experiments we may finally conclude that this root consists of—1, tannin; 2, an acid, probably the gallic; 3, gum; 4, resin; 5, wax; 6, fecula; 7, bitter principle, or apocynin; 8, colouring matter; 9, woody fibre; and though I have not been able to prove its existence satisfactorily in the dry root, in the laboratory, I very strongly suspect that the fresh root and the juices of the plant contain a considerable quantity of—10, caoutchouc.

Medical properties.—The medical qualities of this plant must be deemed of the most important kind. I was led to the examination* from hearing it spoken of in very favorable terms by a medical gentleman of established reputation of New York, who declared it to be

* My attention was first directed to this article as the subject of an inaugural essay.

one of the most valuable remedies in dropsy he had ever employed. A careful inquiry into the correctness of this remark has led me to adopt the same conclusions, and the cases which I have detailed will prove to the reader that its efficacy as a remedy has not been misjudged.

I have before observed that it is somewhat surprising that a plant possessing such well-marked and energetic, as well as varied properties, and which grows in such abundance in the United States, should not before have been noticed by physicians generally. There are a few, however, who have employed it in their practice with the most decided benefit, and even with extraordinary effect. In some cases its benefits have been more partial, but in none that have come to my knowledge, where it has had a fair trial, has it been entirely inert. It has been used for some years past in country places, amongst those not connected with the profession, with whom it seems to have obtained a full share of the credit which it merits.

In 1831, there appeared in New York a small pamphlet purporting to be a translation of a paper read before the Royal Academy of Sciences, containing the botanical description, chemical analysis, and exposition of the medical properties of a plant of South America, called the Kahinga, (*Chiococca racemosa angusifuga, flore luteo*), by MM. FRANÇOIS, PELLETIER and CAVENTOU. Between this vegetable, and that forming the subject of this thesis, there is a remarkable analogy, and were it not for the difference of the botanical characters, we might readily suppose them to be merely varieties of the same species. They are used in the same disease, and produce nearly the same effects. The *Spocynum cannabinum* bears also a close analogy to the common milk weed, (*Asclepias*.) Several cases related in PARIS' Pharmacologia by ANDREW HAMMERSLEY, go far to prove the similarity of their medicinal virtues.

This medicine has been administered in the various forms of tincture, powder, pill, and decoction. From the unpleasant effects produced upon the stomach of some patients, by the latter mode of exhibition, the other methods were resorted to, in the hope of producing the same ultimate effect in a more agreeable manner. But it was found after various trials, that their operation was by no means so effectual, and they were abandoned, the form of decoction being retained as the only method by which the qualities of the plant can be efficiently administered. By this method all the properties of the root which are of any use in medicine appear to be fully extracted, and the results of some of the chemical experiments will show to how much greater extent they are imparted to water than to alcohol.

The formula for preparing the decoction will be given in another place.

The Indian hemp when taken internally appears to have four different and distinct operations upon the system:—1st. As an emetic. 2d. As a purgative. 3d. As a sudorific. 4th. As a diuretic.* Each of these effects it produces almost invariably. Its first operation when taken into the stomach is that of producing nausea, if given in sufficient quantity, (which need not be large,) and if this is increased, vomiting will be the result. It very soon evinces its action upon the peristaltic motions of the *prima viæ*, by producing copious feculent and watery discharges, particularly the latter, which action, when once excited, is very easily continued by the occasional administration of a wine-glassful of the decoction. The next operation of this remedy is upon the skin, where it displays its sudorific properties often in a very remarkable manner. Copious perspiration almost invariably follows its exhibition, to which effect it, in a great measure, attributed by some, the powerful influence it exercises over the various forms of dropsy. The activity of its diuretic properties does not appear to be so great in many instances as in others. In the first three or four cases related, the urinary secretion, although somewhat increased in quantity, was not such as to be commensurate with the effect produced upon the disease by the exhibition of the medicine. In other instances its diuretic operation has been more manifest, causing very profuse discharges of urine, and in a very short time relieving the overloaded tissues of their burden.

Dropsy is, I believe, the only morbid affection for the relief of which the powers of this plant have been brought into successful requisition. Its very active, and often violent operation, would seem, in a great measure, to preclude its use in diseases which are accompanied with much febrile excitement. Yet one might readily suppose that some of its particular properties might be very advantageously sought for in some diseases where much arterial excitement was not present—especially its emetic, sudorific, or cathartic properties, each of which operations might probably be separately obtained by giving it in well regulated doses.

Upon the discussion of that interesting question, whether the power of hydragogue medicines depends upon their agency in increasing the

* As a *sternutatory* also it has a very powerful effect, as I have experienced in my own case; the fumes, on one occasion, produced, not only long-continued and violent sneezing, with an increased discharge from the Schneiderian membrane, but were unquestionably the exciting cause of an attack of erysipelas of the face and head.

action of the absorbent system of vessels, or of diminishing that of the exhalants, or both, it is not my purpose here to enter; but I may say, that the experiments of a talented and ingenious professional individual of Philadelphia, JOHN K. MITCHELL, M. D. lately given to the public in a paper "on the Penetrativeness of Fluids," would seem to throw a new light upon the question, and lead us to believe that *percolation* through the membranous parietes of the cavities containing the fluid of dropsy, promoted in some manner by the operation of diuretics and hydragogue cathartics, is one means of the ready removal of the liquor.

Without further remark or comment upon the plant under consideration, I shall now proceed to relate a few cases, kindly furnished me by some of my medical friends, in which the efficacy of the remedy is most fully proved, and its inestimable virtues placed in their proper light.

CASE I.—"A. B. aged sixty-eight, of temperate habits, was affected after exposure to cold, and fatigue, with difficulty of breathing, particularly when lying in bed, or going up stairs, with a feeling of great weariness and fatigue. Being of a plethoric make, and full habit, he was bled with a view to relieve these symptoms. Some benefit followed the loss of blood in the shortness of breath in particular. The lower extremities began soon to become oedematous, and there was also an evident deposition of water in the cavity of the peritoneum as evinced by fluctuation. All his hydropic symptoms continuing to increase, after free depletion from the blood-vessels, bowels, and kidneys had been practised by bleeding, purging, and diuretics, he was put upon a decoction of the *Apocynum cannabinum*, and in the course of two days it produced considerable nausea, with occasional vomiting. This was followed by an active cathartic action on the bowels, accompanied with profuse perspiration. All other medicines were now suspended to witness the action of the apocynum singly. Some diuretic effect also accompanied the first action of the medicine—but this was far from being its first or peculiar action. The effects of it upon the skin, stomach, and bowels were readily kept up by a small quantity of the medicine occasionally administered. All the dropsical symptoms soon began to abate, and in a short time he was freed from this aqueous deposit. To keep up its action, he took from time to time a wine-glassful of the decoction, made by boiling two drachms of the root in three pints of water, to two. In a few days he could only bear two or three wine-glassfuls in the course of the day. To promote a discharge from his bowels, he would have recourse during convalescence to one or two

wine-glassfuls, whenever the state of his bowels might require. He took it also in pills, in the quantity of three or four grains of the powdered root, three times a day. The distressing sickness the pills occasioned, caused them to be discontinued. They did not produce the same beneficial effect upon the bowels and skin, as the decoction.⁷⁷

In this case we have the therapeutic operations of this medicine very clearly instanced; first its action upon the stomach, producing nausea and vomiting, followed by an active cathartic operation, and this succeeded by a very active diaphoretic action, with but a partial effect upon the urinary organs.

CASE II.—"Mrs—, ætat. 58, of a full and plethoric habit, has, since the cessation of the catamenia, been subject to congestive attacks of the brain, and has twice been affected with paralytic seizures of the hemiplegic character. To relieve the general and local plethora, repeated venesections have been resorted to from time to time. They have been followed by the happiest effects; but from the crowded state of the large vessels about the heart and general fulness of the system, serous effusions have taken place into the pleura, pericardium, peritoneum, and cellular tissue generally. In this case I have witnessed the happiest effects from the use of the *Apocynum cannabinum*. The hydropic symptoms have several times been removed by this medicine. Its beneficial operation seems to depend mostly upon the effect it exerts upon the stomach, bowels and skin, and when this effect passes by, the action of it upon the kidneys denotes that it has also that determination."⁷⁸

CASE III.—C. D. ætat. 66, of rather a spare habit, has been accustomed to much activity of body and mind, and from occupation has been in the habit of living luxuriously. From time to time for several years past, a frequent dry cough, with shortness of breath in walking fast, and on ascending a flight of stairs, particularly began to denote, that probably some serous deposit was going on in the pleura. This was ultimately confirmed by difficulty of lying down, with œdema of the feet and ankles.

After the usual depletory treatment, which never failed to relieve the symptoms in the early period of the disease, he at length found upon trying the *apocynum*, that it exercised a complete control over the disease; and he for a long time used it exclusively in the treatment of his disorder. Such was the confidence he reposed in it, that he cultivated a considerable quantity in his garden for his own wants and the benefit of others. His physical powers, after repeated attacks, were unable to bear up against the disease, and he sunk exhausted and died.

CASE IV.—“E. F. *ætat.* 4 years, had for some time laboured under the most unequivocal evidences of a deposit of water in the ventricles of the brain. Other means being exhausted, the apocynum was had recourse to, and the strength of the child being adequate to the violent action of this medicine, particularly upon the stomach and bowels, and considerably upon the kidneys, the hydrocephalic symptoms gradually yielded, and the child recovered perfectly.”

After detailing the foregoing cases, the narrator of them remarks, “from what I have observed of the operation of the Indian hemp, more of its remedial effects are to be ascribed to its action upon the stomach, bowels and skin, than upon the urinary organs. It is in my opinion a valuable addition to the articles of the materia medica, which are derived from the vegetable kingdom.”

The particulars of a case, of which the following is a summary, was obligingly furnished me by a professional friend at New York, who had the patient under his care during the trial of the apocynum.

CASE V.—The patient was a large, athletic Englishman, of sanguine temperament, aged about fifty years, by profession a cook, and had always enjoyed excellent health until within a few months, when he was attacked with inflammatory affections of his chest and liver, for which he was treated in Washington, D. C. by large depletions, mercurials, &c. His general health appears to have received from this attack, a shock from which it never recovered. When my friend saw him first, in New York, “he was found seated in an arm chair, leaning across the back of a small chair, pallid, breathing with great difficulty, scarcely able to answer the questions put to him, being under such general oppression and debility, with effusion of the chest and abdomen, and general anasarca. He had not been able to lie in bed for upwards of three weeks. He complained of no pain, with the exception of a slight uneasiness of the right hypochondrium, where the liver was evidently enlarged. His pulse was slow and intermittent. He was immediately put upon the use of the Indian hemp, which was continued in this rather hopeless case for three weeks, without any other internal remedial means; after which period he was enabled to return to his usual employment, and actually cooked a dinner for thirty persons, almost without aid. The formula employed in this case was somewhat different from that before mentioned, and was as follows:—℞. Rad. apocyn. cannab. contus., bacc. junip. ℞. ℥j.; aqua font. Oij. S. *Decoqus leni igne ad octantes duos, cola, et adda, Spiritus junip. ℥iv.*

"The gin is added for the purpose of preventing its spoiling.

"Of this he took a wine-glassful three times a day, diminishing the quantity if it purged or vomited him too much. Its diuretic qualities did not appear until the second or third day, when it seemed no longer to affect his stomach, but acted very powerfully on his kidneys. He obtained almost immediate relief however, and was able to lie down in bed, and in any position, before the swellings of his hands and feet had subsided, which, for the last few days were kept constantly bandaged. The patient some time afterward died very suddenly, probably from a rupture of his heart, but an examination could not be obtained."

In this interesting case, we find that the remedy had a much greater effect upon the kidneys, than in those before related, and that more benefit is attributed to its operation on these organs than upon any other. Its action upon them appears to have been very powerful. This may, doubtless, in some measure, be ascribed to the additional ingredients in the formula, which are both somewhat diuretic in their operation, but perhaps more to its superior strength. Two drachms only of the root were employed in the cases first given, whereas one ounce was used in this case with the same quantity of water. The effect upon the cutaneous surface does not appear to have been noticed.*

* Since this essay was written, I have had the pleasure of witnessing another case of entire removal of very extensive dropsical effusions, which occurred during the last summer in the New York Hospital, under my own care, while resident physician of that charity. The patient was a young coloured man, who, when he entered the house, was totally unable to lie down, from the difficulty of respiring in that posture; his articulation was very much impeded; he had immense fluctuating distentions of his abdomen and scrotum, and very large swellings of all his extremities. He was at first put upon the use of the ordinary hydragogue medicines of the house, which course, together with puncturing the scrotum and penis, in a few days gave him some relief, but of short duration. A trial of the properties of the Indian hemp was then made, which resulted in a short time in the complete removal of the adventitious deposit, so that the dyspnoea disappeared, his utterance became unembarrassed, and his belly and limbs resumed their wonted dimensions. The primary effects of the medicine upon his stomach were very distressing, producing such disagreeable nausea and vomiting, that it was found necessary to diminish the dose; but he soon became able to bear its exhibition in the ordinary quantity, particularly when combined with some grateful aromatic. The patient did not live long to enjoy his renewed state of health, but died shortly after, of an attack of apoplexy, though he had been copiously depleted during his illness.

The following letter from Professor RAWSON, contains strong evidence of its efficiency:—

"DEAR SIR,

"In compliance with my promise, I have to communicate to you the circumstances of the case of a child of mine of dropsy in the head, by the use of the Indian hemp, (*Apocynum cannabinum*.) Not having taken memoranda at the time, I am compelled to trust to memory for the facts.

"The child is a girl, and was then about sixteen months old. After about ten days of sickness, the disease, which had at first been treated as an inflammation probably of the chest, but which had, after the second day, been suspected to be an affection of the head, manifested itself clearly as the latter, with all its most decided symptoms. The sutures of the head were opened; the forehead projecting considerably; the sight of one eye was totally lost, the other retained but little sensibility in the short intervals of stupor rather than sleep, in which she lay. A constant involuntary motion of one arm and leg remained for thirty-six hours. The night preceding the exhibition of the medicine, I had lain down in my clothes in the room, and was called up to see her expire, as the attendants conceived life was nearly extinct. A partial revival however took place, without any lessening of the symptoms. The only treatment used by the attending physician at this time, was the administration of a mixture of rhubarb, magnesia, and aniseed water, and the application of a blister to each temple. By the action of the medicine the discharge from the bowels was kept up, but the urinary functions had ceased altogether for more than twenty-four hours. The physician saw the child about ten in the morning, and while he intimated that the means he had indicated should be persevered in, expressed no hope, and assented forthwith to my request that the Indian hemp should be administered. It was 12 o'clock before it could be procured. It was then prepared by dropping pieces into a coffee-cup until it was nearly full, covering it with water, and stewing it by the side of the fire for about an hour; of this half a tea-spoonful was given every hour, commencing at about 2 o'clock. The physician called about an hour after; the unfavourable symptoms had by this time so far increased, that he informed me the child must die during the night, and probably at the return of the hour at which the crisis had appeared to take place the preceding night. At ten the next morning, he repeated his visit without any hope of finding his patient alive. But by this time, under the constant exhibition of the medicine, a marked change had occurred. The urinary organs had been restored to natural action; the sight of both eyes was perfect; the blisters that had not even caused a redness of the skin, had risen and given a copious discharge. The stupor and insensibility which had permitted the nauseous medicine to be given without difficulty, had passed away, and its administration was forcibly resisted. The quantity was diminished in the course of the day to less than one-half, and the favourable indications continuing, the child was on the next pronounced in a fair way of recovery. The hemp was given for about a fortnight, diminishing the dose gradually until it fell to half a tea-spoonful of the strong decoction in twenty-four hours.

"About a month afterwards, symptoms appeared that seemed to threaten a

relapse; on this occasion the Indian hemp was directed by the physician, and they speedily abated."⁹

Columbia College, New York, December 3d, 1832.

There has now been adduced, I think, sufficient evidence to prove that this remedy is entitled to a considerable share of attention from the medical public, and that it is worthy of a distinguished place among the articles of the materia medica. Were it necessary to bring together multiplied proofs of its efficiency, this might easily be done, but I think enough has been said to justify its extensive introduction into medical practice.

I trust that this invaluable plant will be rescued from its unmerited obscurity, and become the means of preserving to the world many valuable lives; or, at least, of meliorating in numerous cases, the excruciating tortures attendant upon some of the protean forms of dropsy, and of smoothing the path "to that bourne whence no traveller returns."¹⁰

New York, December, 1832.