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Botanical Medicine Monographs and Sundry

EXTRACT OF BUTTERNUT.

BY B. F. MOISE, JR.
Abstract of an Inaugural Essay.

The author endeavored to obtain from the bark of Juglans cinerea an extract, which should be equally sufficient but in much smaller doses than the one now officinal, prepared with cold water.

A quantity of butternut bark was powdered so as to pass through a No. 20 sieve, and by percolation exhausted with distilled water; the extract obtained (quantity of the bark not given) weighed 4.989 grams — 77 grains, and proved to be an efficient cathartic in doses of 20 to 30 gr.

An extract was next prepared with alcohol, the amount of bark being the same as in the preceding experiment. This extract weighed 10.84 gm. — 166.6 gr. It contained some fixed oil, which keeps it of a plastic consistency and prevents its adhering to the jar and spatula. In doses of 3 and 4 grains the extract had a gentle laxative effect; 5 grains acted as a good purge and 10 grains proved to be quite actively cathartic.

The extract prepared with diluted alcohol weighed 10.216 gm. — 157.2 gr. It was free from fixed oil, and in doses of 5 grains acted promptly, nearly equal to 10 grains of the alcoholic extract, while the diluted alcohol extract in doses of 10 grains acted as a prompt, reliable and certain cathartic. The stools were sometimes of a semi-solid consistency, at times watery, and accompanied with a feeling of sickness and inclination to headache.

A few experiments were made with an alcoholic fluid extract of butternut bark. By diluting with water and acidulating with hydrochloric acid a blackish precipitate was obtained, which was soluble in alcohol and ether, sparingly soluble in benzin and oil of turpentine, and consisted of resin, with a little fatty matter.

An alcoholic extract of the bark was treated with benzin to remove fat, then redissolved in stronger alcohol, and this solution poured into water acidulated with acetic acid, when a greenish-brown resinous precipitate was obtained, which, on being dried at a gentle heat, gave off vapors having a decided acid reaction on litmus. This resin is colored dark purple by alkalies and dissolves completely in potassa solution. (For researches on the constituents of butternut bark consult essays by Chas. O. Thiebaud and E. S. Dawson in "Amer. Jour. Pharm.," 1872, p. 253, and 1874, p. 167.)

GUM SAVAKIN.

BY GEORGE BEIMANN, PH.G.

From an Inaugural Essay.

This gum is gathered near the west coast of the Red Sea, further east than the other varieties of gum arable, and is shipped from the port of Suakin or Savakin, hence its name. It appears in commerce as sub-globular tears, which are more or less broken, have a conchoidal glass-like fracture and, in consequence of numerous fissures, quite opaque. It is imported in considerable quantity and not unfrequently sold for medicinal use.

A mucilage made with 8 ozs. of this gum to one pint of water was. found to be very thick and viscid, a great deal of the gum remaining, as it seemed, undissolved; this was strained out. On diluting the mucilage with water it was noticed that what appeared to be small transparent globules separated, and upon repeated shaking would not dissolve. Some of these globules were collected by diluting the mucilage with water, stirring constantly, allowing to settle, decanting the water, and repeating this operation until all the soluble matter had been removed. The globules were found to be insoluble in boiling water, but on the addition of solution of caustic potassa, or other caustic alkali, they were dissolved, but the salts of the alkalies were without action. A quantity of the globules were spread on panes of glass and dried, yielding thin transparent scales. On boiling these with water they would merely swell up and be transformed into transparent globules again.

These experiments show that they are analogous to and doubtless identical with gummic acid, which seems to pre-exist in the gum, in the free state, and in the mucilage is held in suspension, while from a dilute aqueous solution it separates as colorless globules.

Numerous expedients have been tried to prevent this precipitation, and the only one found successful was to carefully add, before straining, to one-half of the mucilage sufficient solution of caustic potassa to make it very slightly alkaline, then add the other half of the mucilage and shake the mixture well, which should now have a slight acid reaction. After it has stood a little while it can be strained without loss, and may be mixed with water and otherwise used like tliat prepared from Kordofan gum.

Five grams of the gum were incinerated and yielded .19 gram of ash, equal to 3.8 per cent. Analysis showed the presence of calcium, magnesium and potassium.

THE ROOT OF HYDRANGEA ARBORESCENS.

BY JACOB BAUR, PH.G.

From an Inaugural Essay.

In looking over the pharmaceutical and chemical literature with reference to hydrangea, the only analysis found was that by Mr. Jos. Laidley, of Richmond, Virginia, in the year 1851, since which time no one seems to have published anything with regard to the principles to which the drug might owe its activity. Laidley found but gum, starch, resin, etc. In writing of the drug and its uses in gravel and urinary diseases, he notes some marked cures effected by its administration, which are no less remarkable than some which have been communicated to me by Dr. Jno. H. Parrish, of Saundersville, Tenn., who has used with good results an extract of the root prepared by the late Prof. Edward Parrish, and recently by Mr. Clemmons Parrish. He says, “My case-books show thirty-one cases of gravelly deposits in the bladder, which I believe to have been cured by hydrangea; I remember no case in which it has failed under fair circumstances. I regard hydrangea as a valuable remedial agent not only in sabulous troubles, but in any case where the functions of the kidneys are impaired.” Other physicians have recommended it in the same complaints. That it is used by many physicians may be known from the words of Prof. J. U. Lloyd, of Cincinnati, who writes: “The section of country about Cincinnati annually supplies large amounts of hydrangea root for other markets.”

A quantity of the root of good quality was obtained, its identity established and carefully inspected as to the absence of all foreign admixtures. This was ground suitably for percolation; some difficulty was here encountered owing to the peculiar ligneous character of the root, the greater portion of which is an insipid hard wood, with but a thin much fissured bark, which, as found in the market, is quite frequently detached in thin conceentric layers, due to the unequal shrinkage of the wood and bark in drying. The peculiar sweetish but acrid taste of the root seems to reside in the bark.

Three grams of the root were ignited, yielding 13 grams of ash, the greater portion of which was soluble in water. The appropriate tests being made, carbonates, sulphates and phosphates of potassium, sodium, calcium, magnesium and iron were found in the ash.

In a preliminary investigation, which was undertaken to ascertain the best solvents for its important constituents, a decided indication of an alkaloid was obtained by the application of the various alkaloidal tests; the following experiments were made in order to isolate the alkaloid, if possible.

One thousand grams of the drug were exhausted with alcohol of .828 sp. gr. by percolation, yielded 38.209 grams of extract, which was redissolved in a small quantity of warm alcohol, and poured into one quart of water previously acidulated with acetic acid; the resin separated weighed 6.43 grams.

The nitrate (a) was set aside for further investigation. The resin obtained had a sweet, mild, but afterwards lastingly acrid taste. It was insoluble in ammonic hydrate, almost entirely soluble in potassic hydrate, which solution was precipitated by hydric chloride. Approximately one-half the resin was soluble in ether. The insoluble portion was almost insoluble in amylic alcohol. Tlie alcoholic solution of the resin was precipitated by solutions of neutral and basic plumbic acetate.

The filtrate (a), obtained on separating the resin, was evaporated to an extract which had a saccharine odor and a bitterish taste, and weighed

31.566 grams. This extract was dissolved in a small quantity of warm water and filtered; the next morning the solution contained a few crystals which it was found impossible to separate. Solutions of neutral and basic plumbic acetate were added to thoroughly precipitate tannin, yielding a bluish-black precipitate with iron salts; the excess of lead was removed by sulphuretted hydrogen, the filtrate evaporated to small bulk, acidulated with hydric chloride and shaken with ether; the ethereal layer evaporated spontaneously left but a slight residue, in which no alkaloid was present.

The aqueous portion was then shaken with pure amylic alcohol, the latter separated and evaporated to dryness, the slight residue remaining gave in solution the following reactions: with Mayer's solution, a light, whitish, flocculent precipitate; with iodine in potassium iodide, a brown precipitate. Phospho-molybdic acid and tannin both gave precipitates. Platinic chloride gave a yellowish precipitate having a crystalline appearance on standing a short time. Picric acid gave no precipitate.

One hundred and twenty-five grains of the drug were exhausted by maceration and percolation with pure coal tar benzol. The greater portion of the benzol was recovered and an extract weighing 1.43 gram was obtained. Warm acidulated water (with HCl) was shaken with the extract and yielded then, with the alkaloidal reagents, light precipitates. Tests for glucosides were also applied with no indication of their presence. The extract was almost entirely dissolved by alcohol.

The drug exhausted by benzol was dried and exhausted by 80 per cent. alcohol. On evaporation to a small bulk a few crystals separated; the solution was acidulated, diluted and precipitated with plumbic acetate. After removing excess of lead by sulphuretted hydrogen, the filtrate gave again indications of the presence of an alkaloid by the above tests. The drug treated with benzol and alcohol was exhausted with water; the extract obtained contained sugar and gum.

Five hundred grams of the powdered root were boiled repeatedly with acidulated water, the mixed decoctions evaporated to a small volume, the gum removed by an equal volume of alcohol, and, after recovering the alcohol, the tannin precipitated by subacetate of lead, which precipitates also coloring matter. After removing excess of lead reactions were again obtained pointing to the presence of an alkaloid; however, judging by the quantity of drug operated upon, this alkaloid, if such it is, must be present in minute quantities. The presence of an alkaloid would, indeed, be interesting as being the first one discovered in any plant of the natural order saxifragaceæ.

The constituents of hydrangea root, determined by these experiments, are resin soluble in ether, resin insoluble in ether, probably an alkaloid and a crystalline compound, the nature of which was not determined; also tannin, gum, sugar, coloring matter, and 4.33 per cent. of ash.

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Recognition of Quebracho Bark.—G. Fraude recommends the following process: 5 grams of the bruised bark are boiled for about 5 minutes with 25 cc. of very light coal-benzin; the slightly colored liquid is filtered while hot and agitated with 10 cc. of dilute sulphuric acid; the aqueous solution is mixed with excess of ammonia, shaken with 10 cc. of ether, the etherial liquid evaporated in a test tube and the residue boiled with solution of perchloric acid. In place of the latter a little water and 3 or 4 drops of concentrated sulphuric acid are added to the residue, and afterwards a very minute quantity of potassium chlorate. In either case, after boiling for some time, a beautiful intense fuchsin-like color is obtained, due to the presence of aspidospermina.—*Ber. Deutsch. Chem. Ges.*, 1881, p. 319.

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Alkaloids of Quebracho Bark.—O Hesse has satisfied himself that Wulfberg's assertion concerning the identity of Fraude's aspidospermina with Hesse’s paytina is incorrect. Hesse has also isolated a second alkaloid, *quebrachina*, which has the composition $C_{21}H_{26}N_2O_3$, crystallizes in small, white, anhydrous prisms, melts at about 215°C. (uncorr.), undergoing partial decomposition, dissolves readily in hot, slightly in cold alcohol, and is sparingly soluble in ether. Its solution in pure sulphuric acid has a bluish color, becoming darker in a few hours, and in the presence of lead peroxide is of a magnificent blue. A similar blue color is produced by sulphuric acid in the presence of molybdic acid or of potassium bichromate. Boiled with perchloric acid solution a yellow-colored liquid is obtained. Though these reactions are similar to those of strychnia and curarina, Dr. Petzoldt found it to differ from them in its action upon frogs; however, 0.04 gram was sufficient to kill a small rabbit.

Quebrachina is a strong base. Its sulphate, $(C_{21}H_{26}N_2O_3)_2.H_2SO_4+8H_2O$, forms colorless short quadrangular prisms, which are freely soluble in alcohol and water. The hydrochlorate is in similar crystals, very sparingly soluble in cold, but readily so in hot water. The salts with other acids are likewise crystallizable and mostly sparingly soluble in water.

Of quebrachina 0.28 per cent. was obtained; of aspidospermina only 0.17 per cent. The new alkaloid, and three other alkaloids observed in quebracho bark, will be further investigated by the author.—Reprint from *Ber. der. Chem. Ges.*, 1880, p. 2308.

JAFFERABAD ALOES.

BY E. M. HOLMES, F.L.S.

Read at the Evening Meeting of the Pharmaceutical Society, March 2d, 1881.

About a year ago a specimen of a drug known in the Bombay market as Jafferabad aloes, was presented to the Museum of the Society by Dr. Dymock. In a letter received from him in July last, he states concerning it:

"I shall try and send some small plants of the Jafferabad aloe in a tin box. I want to have it compared with Dr. Balfour's aloe from Socotra, as the character of the drug yielded by it is similar to that of Socotrine aloes in not giving a red color with nitric acid. Jafferabad belongs to the African family who were admirals to the Mogul, and they may have introduced the plant. Difference of climate might account for the difference of the two drugs."

The difference here alluded to will be best understood by those who are familiar with tlie appearance of Socotrine aloes, if the appearance of the Jafferabad drug be here briefly described.

The specimen received from Dr. Dymock is a circular flattened cake, 7 $^1/_2$ inches in diameter, and $^3/_4$ of an inch in thickness. Externally it is of a black color, and having a lustre not unlike that of pitch, to which at first sight the aloe bears some resemblance. The fracture is black and glassy, and very slightly porous, as if heat had been used in its preparation.

The powder, when two pieces are rubbed together, is of a pale brown hue. When the glassy broken surface is breathed on, it becomes, after a time, of a brownish hue, and under the lens looks like aventurine, apparently owing to an immense number of minute cracks, causing the partial separation of minute translucent laminae. The odor is a characteristic one, having some resemblance to that of socotrine, but less fragrant, as if it contained a trace of Barbadoes aloes and sandal wood. The taste of tlie decoction is not so pleasant as that of the Socotrine aloes; but the amount of matter insoluble in water seems to be equal in amount to that of the Socotrine aloes.

When submitted to the action of nitric and sulphuric acids no change takes place with the first named reagent, but when the vapor of nitric acid is passed over the mixture of Jafferabad aloes and oil of vitriol a slight greenish tinge is developed. This hue is, however, quite different from the distinct blue color developed by Natal aloes when similarly treated.

Dr. Dymock has cultivated the Jafferabad aloes plant in his garden, and it flowered at the end of last September. A few of the blossoms which he sent me have been submitted to Mr. J. G. Baker, of Kew, who has recently paid considerable attention to this group of plants, and he considers, so far as it possible to determine from the flowers alone, that they belong to *Aloe abyssinica*. Dr. Dymock collected some of the aloes from the Jafferabad plant in his garden and found it to give the same reaction as Socotrine aloes, and as he obtained the same results as with the aloes imported from Jafferabad there can be little doubt that the species of aloe cultivated in his garden is the source of the drug bearing that name.

A specimen of Mocha aloes in irregular masses, which was obtained in the London drug market last year, gives exactly the same faint greenish color when mixed with strong sulphuric acid and the vapor of nitric acid is blown over it. The powder is more of a reddish-brown hue, like that of catechu, and the odor slightly different. The surface has the pitch-like appearance of Jafferabad aloes, but it seems to have been prepared with less care, which might account for the slight difference in odor, and as according to Dr. Pereira, "Materia Medica," vol. i, p. 102 (4th ed.), it is imported from Muscat, lower down the Persian Gulf, it seems probable that it may be yielded by the same species of aloes. I hope to receive specimens of the Jafferabad aloe from Dr. Dymock shortly, when the identity of the species can doubtless be set at rest.

My excuse for bringing forward incomplete information at the present time must be that it seemed desirable, while the drugs from Socotra, kindly presented by Professor Balfour, were under discussion, to mention an aloes which seemed so nearly related to the Socotrine variety.—*Pharm. Jour. and Trans.*, March 5, 1881.

SPONGES.

Sponges present a point still somewhat problematical as to their true position in the scale of animal life, and there are still many doubtful or imperfectly known facts pertaining to their organization. As a family, sponges are very remarkable for the lack of a definite and constant form, have various habits of growth, are insensible to irritation and powerless to move about. The known species number now about three hundred, and new ones are constantly observed, in view of which fact it is obviously impossible to describe, within the limits of this sketch, more than the prominent characteristics of the type. The description following may be referred more particularly to the sponges of commerce.

Milne-Edwards and others have considered each sponge as one separate and distinct individual; but Prof. Clarke, Dr. Lockwood, Prof. Grant and others, regard them as an aggregation of minute infusoria, each within its living cell, and they are considered to begin life as solitary animalcules, and only in associations of these does the characteristic sponge structure appear. Of course this reduces it still lower in the plane of animal life, because individuality is soon lost when many of the same species are brought together and coalesce. The mass then may be considered in its complete state as being composed of three parts, namely, the *skeleton*, known, when cleansed, to commerce as the sponge; the *fleshy matter*, by which this is surrounded; and third, the *spicules*, or little spines, by which the fleshy matter is held in place.

The skeleton is a fibrous mass of complicated network of more or less regularity in the meshes, and of different patterns in the various, species. The fibre appears solid under the microscope, but in some species at least it contains within its interior another cylindrical thread, which usually becomes elegantly wavy or spiral under flexion, and probably adds to the elasticity. In some the skeleton is soft, compressible and very bibulous, from which there is a gradual passage into those of a rigid and compact texture, sometimes friable.

Fig. 1.—Sponge (one-half natural size) attached to rock.

The first are composed of a horny substance, and the varying excess of silicious or calcareous matter causes it to lose more or less elasticity, and impairs its usefulness. As the skeleton is secreted by the fleshy mass of the animal, which is an active eliminator of the salt of the ocean, it is attempted to group them upon considerations of their building propensities, and the toilet and domestic sponges generally affecting horn, or *keratose*, are grouped as "keratora." With an excess of lime, as *calcarea*, building with silex—*silicea*. Various varieties exhibit all the colors, and many, are, while alive, very brilliant in appearance. Examining a toilet sponge, we find that the framework is covered with a membrane (not universal with all species), thin above, deep-brown on the sides and yellowish-brown towards the base. This investing membrane exhibits larger and smaller openings, is not spread smoothly, but appears irregularly covered with conical shaped points. Making a section of the still living sponge, we find the skeleton embedded in a glairy, gelatinous or albuminous substance, about the consistency of raw beef, with an exuding viscous, yellowish clear brown (in the bath sponge a clear gray) slime, called milk by Greek fishermen. This investing flesh has so little resemblance to ordinary animal tissue that it is technically called "sar-code." In this tissue we perceive a system of canals or pores, which run downward in all directions and enter directly certain little cavities or chambers connected with circuitous passages, wliich finally lead to large outlets or "oscula." The pores, belonging only to the flesh, are not visible in the skeleton, are very small, yet, compared with the cells, very large. In some orders of sponges the outer walls of the flesh open anywhere and everywhere for the admission of food, and no well-deftned pores are visible, but open as required.

Prof. Grant first observed closely the ceaceless flow of liquid matter through and out of the living sponge. Another discussion has been had over the manner in which this is caused or maintained. Dutrochet, having made his celebrated discovery of that law of endosmose which regulates the transmission of fluids of unequal densities through organic membranes, was perhaps biased or prejudiced in applying the same law to the solution of this problem. At any rate, naturalists now agree that the flow is produced by the lashes or cilia, with which the unnumbered animalcules are each provided. The little chamber into which the pore opens has its wall lined with these uniciliated cells, and each lashes its cilium with vigor, and all harmoniously downward and inward, the effect vacuum above, the water, of course, passing in, being carried through the ramifications and out of the oscula with some vigor. Hurled along in the liquid are opaque masses, composed of excrementous particles, and at certain seasons ova and germicules, from which new beings are produced. We may consider the sponge mass as having a complete assimilating or digestive apparatus. The cells, or some of them, probably act as stomachal sacs, with the lashes for motors to attract food and repel refuse after the extraction of nourishment, which latter probably passes through the gelatinous mass into the general development. The sponge has such remarkable recuperative powers that one, being cut while alive, quickly rejoins, though not replaced in the same position. We show in Fig. 2 a group of living sponges.

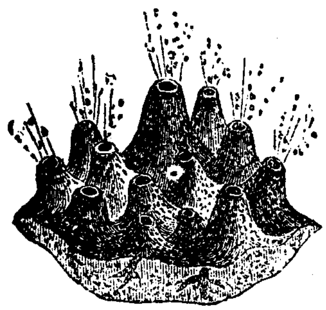

Fig. 2—Living sponges.

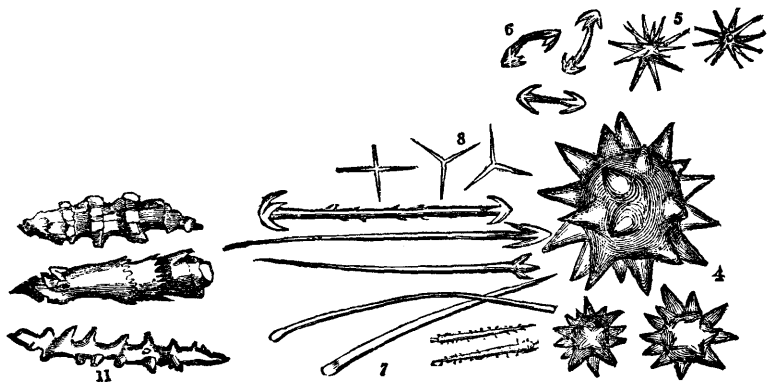

Fig. 3.—Spicules of various forms.

Perhaps the most curious parts of the sponge structure are the spicula, or little spines, shown in Fig. 3. These, embedded in all parts of the sarcode, serve to bind the tissueless flesh in form. They serve as a natural felting, or as tiny anchors, generally composed of silex or lime, and are of an infinite variety of shapes, sometimes, occurring separately and sometimes in bundles, generally in this case bound together with horny matter. The spicules of the “sheep's wool” are of the latter class, and under a low magnifying power will be found generally broken and frayed. Spicules of silex are the most common and most variable in shape, and present every gradation, from simple needle to many-pointed star. Spicules of the same material, but of various forms, are found in the same sponge, but seem to occupy certain definite positions—some are peculiar to crust, some to sarcode and others to margins of canals, etc. They cannot be considered as formed by crystallization, as many could not so be produced; they exhibit more or less of a central cavity, in some of which organic matter has been discovered. Being beautiful microscopic objects, they have excited much attention, especially as they are the most lasting parts of the structure, and are distributed'not only over every known sea, being constantly dredged from the greatest depths, but they also in a large measure, in connection with other silicious bodies of like insignificance, go to form many large portions of the earth's surface. They occur in guano deposits, largely in the chalk formations, also in the tertiary formations in England, etc. Sponge tissue may often be observed in sections of agate, chalcedony, etc. Nodular flints are believed to be fossil sponges, as are also the celebrated “moss agates.” Fossil sponges of many species are found in many localities in this country, notably in Kentucky and Tennessee. Spicules predominate so far in some sponges as to render them valueless, and their absence is always essential to its domestic uses.

The sponge is propagated by an *ovum* or *germicule* cast from the parent at certain seasons, this being usually a ciliated cell, which, floating for awhile, at last settles for life on some hard substance, and, giving no signs of sensibility, yet undergoes a change, the gelatinous flesh is riddled and channeled, the fibrous framework is formed, and the sponge is complete.

The process of generation is involved in some doubt, but they seem to contain within themselves the power, and seemingly by germination or budding. These germicules are apparently produced in some of the cells, and pass through the sarcode to the large canals, from which they are ejected, sometimes being protected and surrounded at their exit by spicules.

The duration of life and rapidity of growth are not known, though in the Mediterranean it is agreed that the ground may be fished over again in three years. The period probably varies greatly in different latitudes, for the species are widely distributed over the seas; they are scarce and small in cold latitudes, and increase most abundantly in the tropics.

Many strange and beautiful forms occur among sponges, some of which have received popular names, as Feather, Fan, Bell, Lyre, Trumpet, Distaff, Peacock Tail, Neptune's Glove, Neptune's Car, Venus' Flower-basket, Class Sponges, etc.

The cornucopia-shaped Glass sponge, the Venus' Flower-basket (*Euplectella speciosa*—the specially beautiful well-woven), is one of the rarest, and, as its name implies, one of the most beautiful varieties. It is found near the Philippine Islands. It resembles a structure of spun glass, and though apparently so delicate is yet quite strong; each thread, although of pure silex and seemingly solid, is really composed of a series of concentric tubes or cylinders, as if spun on a central thread. As the threads are of pure silex, one might suppose them to be perfectly transparent; but, on the contrary, they are translucent, and have a most exquisite opalescence. The structure has a woven fabric, and as it progresses it takes on the most quaint little flounces, with the most delicate frilled edges imaginable, and all arranged with such charming grace and ease. The lace-like structure is. so aerial a fabric, so quaintly graceful, and so deftly done in the putting together, that any embroidery would seem bungling in comparison.

The *Cliona*.— Sponges to which this name has been given have been observed to have the power of boring into substances the hardness of which might be considered a protection from such apparently contemptible foes, Shells, corals and solid rocks are broken up, and probably made available for the supply of the necessities of other creatures. The mechanism by which so low an animal produces so remarkable effects is still doubtful, but is attributed to a multitude of minute silicious crystalline particles adhering to the surface and set in motion by something analagous to ciliary action.

The Mediterranean and Red seas have from time immemorial afforded the finest sponges of commerce, and at the present time the most important sponge fisheries are those of the Grecian Archipelago and the coast of Syria, the products of which find their way to all parts of the world. The trade in sponges with Europe and America has of late greatly increased. Some three or four hundred boats are regularly engaged in the sponge fishery in these waters during the fishing season, which usually commences about tlie beginning of June and terminates at the close of October, the months of July and August being the most favorable for the pursuit of the industry. The method pursued by the sponge fisher is about as follows: A boat's crew of four or five men will scatter themselves along the coast for two or three miles, in search of sponges under the cliffs and ledges of rock. Those of inferior quality are found in shallow waters; the finer qualities are only found at a depth of from 20 to 30 fathoms. The first are fished for with three-pronged harpoons, by which they are forcibly torn from tlieir rocky attachments, with more or less injury to their textures. The finer kinds are collected by divers, who descend to the ocean's bed and carefully cut them from tlieir fastenings with a knife.

The sponge fisheries of the archipelago yield a large annual product, but the quality is not so fine as tliat of the Syrian fisheries, while the Syrian sponges in turn are surpassed in dimensions and fineness of tissue by tlie product of the Barbary coast. The sponge fishery of these favored regions is conducted without intelligent direction or thought of preserving the supply, in consequence of which the product, though it has of late largely increased, must in time become restricted in quantity from the failure of the supply. Well informed writers on this subject, in fact, assert that it is only a question of time when the trade shall altogether cease, unless some reform in the existing state of things shall be introduced, as the demand which every year clears the submarine fields of these sponges. causes such destruction that even the prodigious reproductive power which they possess is inadequate to keep up the supply.

To successfully counteract the rapid depletion of the sponge in these waters, it has been repeatedly proposed to naturalize the more valuable species on the French and Algerian coasts, and to protect their cultivation by special laws. It has been conclusively demonstrated that sponges may be artificially propagated with little trouble, and with successful results, from cuttings of the living sponge, so that no serious difficulty would be met with on this score; but thus far, for a variety of reasons, no practical measures of this kind have been taken.

The sponge fisheries in American waters are by no means insignificant, the principal localities of the industry being the Gulf of Mexico, the Florida Keys and the Bahama Banks. The quality of American sponges, however, as compared with those of the Mediterranean, is inferior. The annual product of the American fisheries is, nevertheless, very considerable. The fine Syrian sponge is distinguished by its lightness, its fine flaxen color, its fineness of texture, and its cup-shaped form. This sponge is specially employed for toilet use, and commands a high price. The fine sponge of the Grecian Archipelago is scarcely to be distinguished from that of Syria, though generally it is weightier, not so fine in texture, and the holes with which it is pierced are larger and fewer in number. The sponges of American waters are coarser in texture, harsher, and wanting in flexibility.—*The Manufacturer and Builder*, March, 1881.