CŒLENTERATA AND ECHINODERMATA

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CŒLENTERATA

The Cœlenterata are the lowest phylum of the Metazoa, the multicellular animal organisations. As the name Cœlenterata implies, the abdominal cavity, the "cœlom", and the enteric (or gastro-vascular) cavity are one and the same, not yet differentiated. In our context it is of no import that some zoologists classify the Spongia (or Porifera) as a phylum separate from the Cnidaria. From the biological and pharmacological point of view it is more appropriate to draw the dividing line between the sponges and corals on the one hand, and the medusæ on the other. The sponges and corals are sessile, colony-forming animals whose peculiar skeletons supply closely related drugs. The Medusae, the mobile forms of many species floating in the sea, defend their independence by peculiar poison apparatus arrayed in vast numbers on their surface; on contact with, for instance, the human skin or mucous membranes, they inject their proteinic venoms, causing inflammation and sometimes fever of the allergic kind. The actions of Medusae of various species have so far been mainly of toxicological interest; the provings of *"Medusa"* are but rudimentary and the indications for its use are therefore still too vague. The occupational disease of sponge divers is caused not by the sponges themselves, but by Cnidaria (Actinia) equipped with those stinging venom capsules, "nettle-cells' or cnidoblasts as they are called.

SPONGIA

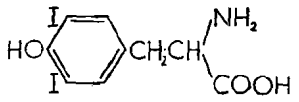
Spongia tosta is the roasted and pulverized skeleton of Euspongia officinalis which is found in the Mediterranean and some other seas. It is important that it should be roasted to a brown colour and not burnt black.

The use of the roasted common sponge for goitre has centuries of empiricism behind it. To quote Harington:[1] "It is interesting to reflect that, even if we date the first therapeutic use of burnt sponge from the time of Arnaldus Villanovanus (say 1276), this remedy was known as a specific for disease of the thyroid gland some 550 years before the discovery of the element to which it owed its activity, and some 650 years before the final demonstration of the role of this element in the economy of the thyroid gland itself." Hahnemann, in his pre-homœopathic *Apothekerlexikon,*[2] says on "Kropfschwamm": "The ancients attributed an aperient and antiscorbutic virtue to the burnt sponge. At present it is used only for dissolving goitres, not without success, as I have seen, if hot spices are added to it." In the preface to his provings of *Spongia*[3] Hahnemann is more explicit. He not only mentions the probable presence of iodine in the sponge, which in

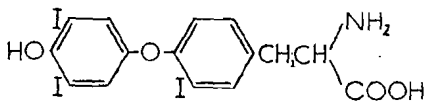
fact had been demonstrated in 1819 by Fyfe at Edinburgh, but also names Arnaldus da Villanova in the 13th century as the first author to have stated this use of roasted sponge which might have gone on for thousands of years before. The provings (l.c.) have given us at least one other valuable indication for the use of *Spongia*, namely in laryngitis crouposa of children.

Sponges are known to accumulate iodine from the sea to about the same high degree as corals and sea-weeds (Fucus, Laminaria). The peculiar skeleton substance, spongin, is constituted by a fibrous halogen protein containing approximately 2 per cent. of iodine. About half of the iodine occurs as diiodotyrosine, the well-known precursor of thyroxin in the thyroid gland. Diiodotyrosine was first isolated from a coral Gorgonia by Drechsel (1905) who named it iodogorgoic acid. It is perhaps not without significance for the actions of *Spongia* that spongin contains also some dibromotyrosine (bromogorgonic acid). There can be little doubt that the organic and inorganic halogens are the main active principles of *Spongia*.

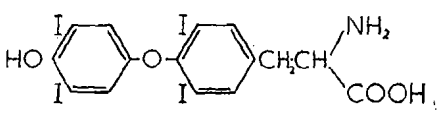
The therapeutic effect of *Spongia* in goitre is apparently due not solely to the supply of iodine to a system deficient in it. The hyperplasia of the thyroid gland may well have been induced by a relative deficiency of iodine and consequent over-stimulation of the tissue by the thyreotropic hormone of the anterior pituitary. The cases amenable to *Spongia* treatment generally do not present signs or symptoms of hypothyreosis, but rather of a slight hyperthyreosis. Apparently *Spongia* stimulates the function of the gland to form and to store the organic iodine compounds, and reduces the proliferative action of excessive thyreotropic hormone. It is probable that the diiodotyrosine gives *Spongia* an advantage over inorganic iodine in this action. Though a precursor of the hormones (besides thyroxin=tetraiodothyronine, triiodothyronine is now recognized as such) diiodotyrosine is in some respects antagonistic to these hormones. In recent years diiodotyrosine has been recommended in Graves's disease; it remains to be seen whether it gives more lasting effects in toxic goitre than the two-edged use of iodides according to Plummer's method.



Diiodotyrosine



Triiodothyronine



Tetraiodothyronine = Thyroxine

As one would expect, the symptomatology of *Spongia* has much in common with that of *Iodine* and *iodide salts.* Hahnemann's provings (l.c.), still the only ones worth considering, confirm this relation in many details, though not all characteristic features of *Iodine* are brought out. Hahnemann himself, according to his preface, considered his account (156 symptoms from male and female provers under his own surveillance, and 235 symptoms extracted from papers of 10 other authors) as far from complete. Such characteristics of *Iodine* as restlessness and general aggravation from warmth are not found (except the aggravation of headache on entering a warm room in one instance). The syndromes for which *Spongia* is suitable in preference to other iodine drugs are known not so much from scrutinizing the provings as from its successful uses. As already mentioned, goitre and laryngitis crouposa are the most notable examples.

With regard to goitre, one should not make too much of the observation of one prover: "*the region of the thyroid gland seems indurated.*" It may well be admitted that *Spongia* can increase the activity of the thyroid and that this in time can become manifest in symptoms and even signs. From a practical point of view it is often emphasized that hard, indurated, "fibrous" goitres are particularly suited for the use of *Spongia.* In these cases one finds mostly neither hypo- nor hyperthyreotic symptoms, but not seldom signs of pressure on the trachea and enlarged veins; the impaired pulmonary circulation may involve the right heart. The latter symptoms are then usually the first to be relieved, if *Spongia* proves effective. The soft, "parenchymatous" kind of goitre with slight hyperthyreotic symptoms may even be benefited by *Spongia* as well. Circulatory symptoms of hyperthyreosis are numerous in the provings: "*palpitation of the heart and rush of blood to the chest*", "*several attacks of heat, with anxiety, daily; pain in the precordial region*", *sleeplessness, etc.* Tremor is, however, not mentioned. There seems to be a general reluctance to use *Spongia* in cases of thyreotoxicosis, but one cannot be sure whether this is due to prejudice or to experience.

The strong affinity of iodine compounds to the respiratory passages and particularly to the larynx is well known. With regard to *Spongia,* a *dry, spasmodic* kind of *laryngitis,* with a *barking cough,* is indicated by such symptoms as "*difficult respiration, as if a plug were sticking in the larynx,*" *and the breath could not get through on account of the constriction of the larynx,*" "*dry cough*" and hoarseness; *scraping, burning and constriction in the larynx.* The preference given to *Spongia* before other iodine drugs in cases of laryngitis crouposa is mainly a matter of experience; the quick relief of this distressing condition after *Spongia* is often very impressive. The difficulty of respiration in *Spongia* cases of laryngismus stridulus concerns the *inspiratory phase* (impeded expiration is more characteristic of *Hepar sulph. calc.*). Several modalities of the irritated, dry condition of the respiratory tract which are claimed for *Spongia* are not backed by the provings, and are of doubtful value for selecting the remedy. Coughing is alleged to be worse

in the open, cold air, from sweets, from cold drinks, and better from warm drinks. The provings state that coughing is relieved by eating and drinking. It is plausible that the dry spasmodic cough and suffocation are *worse when lying with the head low*, and that may account for the asserted aggravation at night, and particularly before midnight. It goes without saying that stridor and suffocative sensations are accompanied by signs of *great anxiety*. The symptom "the larynx feels painful to touch, as if swollen" comes from a woman who for years had trouble from the throat, and received the 30th potency of *Spongia*. One hesitates to repeat "sensitiveness of the larynx to touch" as a significant symptom of *Spongia*.

There is no point in dwelling on the symptoms from other mucous membranes, from the skin and lymphatic glands, which *Spongia* has in common with *Iodine* and *Iodides*. It is said that the swelling of lymphatic glands in the case of *Spongia* is distinguished by its hardness, but this can hardly be confirmed, as *Spongia* seems to have been used only rarely in scrophulosis.

To judge from the provings, *Spongia* has a marked action on the male organs, more so than *Iodine* itself. The symptoms "pressive, *painful swelling of the testicles;* a pinching *bruised, squeezing pain* in the testicles; *spermatic cords swollen, painful*" point to orchitis and epididymitis; but the literature offers little or no evidence of successful uses on this indication either of *Spongia* or of *Iodine*. Nevertheless, one should not lose sight of this trend of actions which, for *Iodine*, is substantiated by observations on animals. As for swollen lymphatic and salivary glands, hardness and induration are deemed to be characteristic also of the swelling of the testicles.

SPONGIA TOSTA—SUMMARY

The roasted sponge skeleton of Euspongia officinalis. Coelenterata: Porifera.

Main active principles: iodine and diiodotyrosine.

Thyroid hyperplasia.

Goitre hard, "fibrous" (with or without compression of trachea, enlarged veins, involvement of pulmonary circulation and right heart).

Parenchymatous goitre with palpitations, attacks of heat, precordial pain.

Dry, spasmodic, barking cough, constriction of larynx, scraping and burning, hoarseness, inspiratory stridor, sensation of suffocating with great anxiety. (Laryngitis crouposa.) Worse on lying with head low.

Worse at night, before midnight?

Cough relieved by eating and drinking (especially warm drinks?).

Hard lymphatic and salivary glands.

Swelling of testicles and spermatic cords, with pains as if bruised or squeezed. Indurated testicles. (Orchitis and epididymitis?)

Dosage: Mostly 3*c* trit. or dil. in goitre.
3rd or 30th in croup of children.

BADIAGA

Badiaga is the Russian name of a fresh-water sponge, a species of the Spongillida. Whether the usual name Spongilla fluviatilis designates the species correctly may be doubted; it is possible that Ephydatia fluviatilis Lk. or Spongilla lacustris Lk. is meant by that name. As in the case of *Spongia,* the dried skeleton supplies the drug, but without being roasted. The amount of iodine is probably much less than in marine species, the fresh-water sponges form less spongin and use more silica for their skeleton. The silica probably plays some part in the action of *Badiaga,* if it is prepared by trituration.

Badiaga is or was a popular remedy in Russia for enlarged and indurated glands and other manifestations of scrophulosis; inguinal buboes of syphilitic origin are also mentioned. Drop doses of the tincture are reported to have been effective. Thus iodine from a source readily available in those regions seems to have been put to an empirical, but appropriate, use. The further popular use of *Badiaga* for chilblains and bruises is hardly worth mentioning.

A proving of *Badiaga* has been made, but only with the 30th potency.[4] It has brought out no symptoms or modalities which would allow *Badiaga* to be distinguished from *Spongia* or other iodine-containing drugs. Before such distinctive features have been ascertained, it appears fortuitous to assign a proper place to *Badiaga* in homœopathic materia medica.

CORALLIUM RUBRUM

The skeleton of the red coral (family Corallina of the sub-order Gorgoniacea, class Anthozoa of the phylum Coelenterata) is supposed to consist almost exclusively of calcium carbonate. The chemical nature of the red dye is not established for certain, but probably is a derivative of alizarine, an anthraquinone compound. If so, it could well play a part in the main action of *Corallium* on the mucous membranes of the respiratory tract. The actions, however, point strongly to the presence of iodine, though the amount be minute compared with that of Gorgonia species which contain up to 7 per cent of iodine, mainly in the form of gorgonin, a halogen protied.

Hahnemann[5] gave as his opinion that "the red corals have no other medical virtues than the pure Calcarea carbonica". With regard to the red colouring substance, he states that it is dissolved by continued boiling with etheric oils, so that the coral becomes white and the etheric oil red; he concludes that the red substance is chiefly "bituminous" (an "organic" compound, in present-day parlance) and not due to iron, as was assumed by other authors.

The many diverse virtues with which the red coral has been credited by ancient authors, Dioscorides, Arnaldus da Villanova, the Arabian School, and Paracelsus, need not be recounted, for none of them have stood the

test of later experience. Only since Attomyr (on himself and two girls) and Melicher[6] undertook provings with the 3rd trit. of *Corallium* has its main affinity to the upper respiratory ways been brought to the fore. Subsequent use has filled in some characteristic details. *"Great accumulation of mucus through posterior nares, making him hawk constantly"; "on breathing deeply, the air that passes through the air passages appears to be icy cold, with some irritation to cough and much difficult hawking up of bronchial mucus"*, "a painful cough, with sensation as if a stone lay in the pleural sac, pressed it down, and caused a violent pressive pain in the chest beneath the sternum, thence the pain extended to the scapulae, but goes off gradually as the cough diminishes. He expectorates yellow, pus-like mucus," are recorded by Melicher. In Attomyr's provings cough is not mentioned at all, but "*great dryness of the mucous membranes of the nose and throat*", and an intense *nasal catarrh with a peculiar discharge of mucus:* "After a stuffy cold in the head for two days, a very violent coryza, during which *mucus resembling melted tallow,* and which leaves a similar stain on the linen, comes away in such quantities that four pocket-handkerchiefs were saturated in an hour; it dropped out of the nose as fast as blood in epistaxis, ceased for a short time, and again recurred, for two weeks."

These data would hardly suffice for a discriminative use of *Corallium* were they not substantiated and made more precise by later clinical observations. A. Teste[7] seems to have been the first to recognize the *spasmodic* character of the *Corallium* cough. He says: "Having experimented with this medicine on myself, some four or five years ago, I have obtained several very characteristic symptoms which have induced me since to prescribe it, and sometimes with extraordinary success, in nervous coughts, Millar's asthma, endemic whooping cough, and finally certain gastralgias." Guernsey's description of the cough, "when the *attack comes on with a very rapid cough and the attacks follow so closely as to almost run into each other*" has often been found characteristic for *Corallium.* The paroxysms may be preceded by gasping for air, and followed by exhaustion and epistaxis. In whooping cough itself *Corallium* does not appear to have fulfilled earlier expectations; but when after any infection of the upper air passages (whooping cough, influenza, etc.), attacks of *irritating, "nervous" cough at regular intervals* persisted for weeks, *Corallium* has proved its value by promptly terminating the attacks. The use of *Corallium* has been advocated particularly in those recurrent *paroxysms* of *coughing* which are *elicited by lumps of mucus dropping from the choanae* in post-nasal catarrh. The provings support this indication.

Some symptoms of the provings have in the past suggested the usefulness of *Corallium* in syphilitic conditions: "On the palm and some of the fingers smooth spots, at first coral-coloured, then dark red, finally copper-coloured", and "the whole glans and inner surface of prepuce secretes a yellowish-green fœtid pus, is very sensitive, red, swollen; red flat ulcers on

glans and inner surface of prepuce, with secretion of much yellowish matter." Yet no reports are found in the available literature in which a cure of a syphilitic case is claimed; indeed, old casuistics could anyhow not stand up to the present-day criteria of a "cure". Those conjectures in respect of the usefulness of *Corallium* in syphilis may therefore be left to oblivion; but that does not imply that the above symptoms of the provings are altogether spurious. An odd case reported in 1841[8] could be adduced in confirmation of the said symptoms: A man suffering from purulent erosions on the glans and the inner surface of the prepuce, stated as being not of venereal origin, was given ½ grain doses of *Corallium* thoroughly triturated in lactose. After 12 such doses had been taken, he developed a phlegmonous inflammation of the nose which later discharged purulent matter. (The curious point is the fact that in Attomyr's provings an inflammation of the nose with ulcer formation is explicitly described.) After 16 doses of the *Corallium* powder had been taken (one every day), the erosions on the glans and prepuce had healed completely; but then an exanthema appeared on the arms and legs, dark red, smooth spots, small or larger in size, thought to be of a hæmorrhagic nature; the larger bluish-red spots changed after a few days to a brown-red, then yellow colour, and then gradually disappeared. Singular though the case may be, the resemblance of the manifestations in its course to those observed in the provings gives a certain weight to the latter. Further observations only can show whether this strange syndrome is within the sphere of actions and uses of *Corallium.*

CORALLIUM RUBRUM—SUMMARY

The skeleton of red corals. Coelenterata: Anthozoa: Corallina.

Main sphere: upper respiratory tract.

Paroxysms of spasmodic cough in rapid sequence, or "nervous", irritating cough at regular intervals (persistent after infections of the respiratory tract, whooping cough, influenza, etc.).

Mucous membrane of nose and throat dry.

Inhaled air feels very cold, irritates and provokes coughing attacks; air passages very sensitive to cold air.

Lumps of thick mucus dropping from the choanae (post-nasal catarrh) cause constant irritation, hawking, and coughing.

Dosage: Usually 3*x* trit., but 30th also recommended by Teste and Hughes.

MEDUSA

Medusa is a general name for the mobile forms of Cnidaria (sea-nettles), in contrast to the sessile "polyps". Medusa thus does not designate a particular, genus or species. Extracts of any of the numerous species equipped with! "nettle cells" (cnidoblasts) could serve the purpose for which *"Medusa"* is, though very seldom, used, namely in urticaria and other allergic condi-

tions. Aurelia aurita L., being the most common medusa in the North Sea and the Baltic Sea, is the usual source of the preparation. The sting of other "jelly-fish" such as the Portuguese man-of war, Physalia pelagica, is known to be far more toxic, causing, in addition to allergic skin eruptions, neurological and cardiovascular disorders; but no use has been made of them so far.

Two fractions have been discerned in the allergenic venom of the nettle cells: thalassin and congestin, both apparently polypeptides. Thalassin crystallizes from an alcoholic solution and degrades into amines only at approximately 200°C. On intravenous injection of 0.00012 g. in a dog, thalassin has been shown to produce intense irritation of the skin and mucous membranes. One need not distrust, therefore, the observation that a decoction of a medusa, two cupfuls taken internally, produced strong effects in a woman. This case reported by Houard[9] is the main reason why *Medusa* is mentioned at all in our context, though it does not amount to a proper proving (the woman being affected with disorder of the stomach and leucorrhœa). The acute but transient manifestations of dermatitis after contact with medusae are familiar; from prickling and burning heat, erythema, urticaria, vesicular and pustular eruptions, to angioneurotic œdema, sometimes ending up with desquamation. The extent to which the acute inflammation proceeds probably depends partly on the quantity and virulence of the toxins, partly on the susceptibility of the affected person. In the case cited above, the symptoms, after taking the decoction by mouth, were prominently œdema of the eyes, ears, nose and lips, with difficult speech and extreme anxiety. *Medusa* seems to have been used very rarely in urticaria; the results in a few cases of recurring urticaria were, in the author's experience, inconclusive. As so many plants (for instance Urtica, Rhus, and many Euphorbiaceae) and animals (for instance Astacus, Homarus, several caterpillars, and Apis) are able to cause similar allergic conditions, the choice of *Medusa* remains, in the absence of distinguishing features, somewhat arbitrary.

[The same applies to *Astacus fluviatilis* (crawfish) and *Homarus marinus* (lobster) which occasionally cause nettle rash and have been used—it seems very rarely and without striking success—in urticaria. These Crustacea are supposed to act as allergens only on specially susceptible persons, but one has to remember at the same time that these animals feed on small cnidaria, "sea nettles", and are themselves apparently immune against their toxins. They therefore probably act as transmitters; which does not exclude idiosyncrasy playing a part. As no provings of *Astacus* or *Homarus* have been made, there is no need for any further consideration of the Crustacea in our context.]

With regard to *Medusa*, a strange observation is recorded in the case quoted above of the woman (age 38): "The secretion of milk was re-established in this woman's breasts three years after the birth of her last child, although she had twelve children without having suckled any of them, no milk having been secreted." Although we have no confirmation of such

a hormonal influence on the mammary glands from other sources, the observation is perhaps worth mentioning in view of the fact that similar actions on the breasts have been asserted for extracts from other marine animals, such as Asterias rubens and Murex.

ECHINODERMATA

The Echinodermata are represented in materia medica by only one species, Asterias rubens, alias Asteriacanthion rubens L. (class Asterioidea), the starfish common to the sea-shores of France and England. The species used by Hippocrates as one of the pain-relieving remedies for women's diseases was the black starfish Asterias bispinosa Lck.,[10] and this probably is what has also been used in epilepsy by the ancients. No toxic effects are known from Asterias; and from a few other species of starfish and sea-urchins only a few are on record as having caused inflammations. *Asterias rubens* would have no place in materia medica, were it not for the proving of Petroz[11] on nine provers. The preparation apparently was a maceration of the living starfish in alcohol, but the potency used for the proving is not stated. A re-proving at Stuttgart (conducted by J. Mezger) gave no tangible results and has not been published. There seems to be no modern case histories which would encourage the use of *Asterias* on the indications inferred from the provings. Nor are any peculiar substances known so far in Asterias which, by their chemical constitution, could offer an explanation of the asserted actions. Yet it would be too rash to discard *Asterias* altogether from our armamentarium; for there is a remarkable similarity between its trend of actions and that of *Murex purpurea* and *Medusa*. Although these belong to different phyla, it is conceivable that the comparatively low organisations of marine animals build up similar substances from their common environment. Here are problems for future biochemical investigations.

The provings of *Asterias*, fragmentary though they are, suggest hormone-like actions on the sex organs and the circulation. Sensations in the uterine region, excessive sexual desire, and pains in the breasts are described similarly as for *Murex*. "Excitement of sexual desire, each morning in bed", and from another female prover: "Beset with desires, she fears she will not be able to bear these painful sensations." Congestion of the pelvic organs and tendency to protrusion are indicated by "Sensation of pressure on the lower abdominal organs, impeding locomotion; general feeling of distress in the womb as though something were pushing out; general feeling as if the menses were to appear; menses retarded eight days, during all which time the colics and other sufferings which usually accompanied them continued, but ceased on their coming on; they were more abundant than ordinarily." The symptoms pointing to an action on the mammary glands are almost the same as for *Murex*, but for *Asterias* they have been more strongly emphasized as indicating its usefulness in cancer of the breasts; the one or two case-reports found in the literature are not convincing.

Further trials in otherwise intractable cases should, however, not be dissuaded. Drugs able to interfere with the functions of sex-hormones may well influence the course of cancer of the breast. Besides, the remarkable power of regeneration of starfish—any arm detached from its body can grow once more into a complete animal—may well be significant. The respective symptoms in the proving of *Asterias,* though, sound harmless enough: "Swelling and distension of the breasts as if before the menses", "feeling as if the left breast were drawn inwards", "drawing pain in the breast".

Another syndrome emerging from the provings reminds strongly of *Iodine,* the presence of which, however, has not yet been established in Asterias, although in an animal feeding on other marine animals it is very likely. "Fullness and heat in the head, as if from a rush of blood to the head"; "frequent violent palpitations, anxiety caused by undulating throbbings in the chest"; "aversion to everything which increases the heat of the body"; "restlessness in the limbs, it is difficult to remain doing nothing". Eruptions on the skin, irritation of various mucous membranes, and increased salivation are also recorded. There is no evidence that *Asterias* has been used successfully on these indications in the past. The recommendation of *Asterias* for hypertension and imminent apoplexy is based on the following observations of one prover only: "Woke up at night with great uneasiness, it seems to him as if his brain were shaken by electric shocks, his head seems empty, almost deprived of consciousness, thinks he is attacked by apoplexy; this lasts several minutes; when he recovers his consciousness, his pulse is hard and much accelerated, the right carotid beats violently; this febrile state continued to the end of the next day." Again, there is no evidence in support of the said recommendation.

On the whole, both on theoretical and practical grounds, our knowledge of the drug actions of *Asterias rubens* is still in its infancy.

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