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SANGUINARINE AND ITS SALTS.

On the Medicinal Powers of Sanguinarine and its Salts. By WILLIAM TULLY, M.D., Professor of Materia Medica and Therapeutics in Yale College.

Communicated for the Boston Medical and Surgical Journal.

In the year 1828, Adrian Russell Terry, M.D., then a student in the office of Dr. Alden March and myself, in Albany, obtained, under my direction, a considerable quantity of the vegetable alkaline salifiable base *Sanguinarine*, with which he prepared several of its salts, and with all of which he made experiments (still under my immediate observation) first upon himself, and subsequently on some of his fellow students, till its operative effects upon persons in health seemed to be well determined. From that time to the present, I have been constantly in the habit of employing the *Tartrate of Sanguinarine* in my medical practice, by which I have obtained decisive proofs that it possesses, in a concentrated form, all the most valuable remedial powers of the root of the *Sanguinaria*, and its ordinary pharmaceutic preparations, with the medicinal use of which, I have now been extensively conversant for about twenty years. Most, if not all of the results thus obtained by Dr. Terry and myself, have been confirmed by the observations of several other professional gentlemen, whom we furnished with the salt in question, or who have obtained it for themselves. That the operations of *Sanguinarine*, and its salts, may be the better understood, and more especially to assist the comparison between these, and the ordinary preparations of the root of *Sanguinaria*, I shall here give a summary of the effects of the latter.

The continued internal use of simple root of *Sanguinaria*, especially in tincture, in as large doses as can be taken without disquieting the stomach, and repeated at regular and short intervals, removes torpor of the liver, and occasions an increased secretion from that viscus, and apparently also from all the secretories that open into the stomach and upper intestines; while, at the same time, it seems to produce a universal change of condition and action in the whole secernent and absorbent systems, by means of which, as would seem, it resolves and entirely obviates certain acute, sub-acute, and chronic atonic inflammations, not only of the thoracic and abdominal viscera, but also arthritic (i. e. gouty

and rheumatic) inflammations of the muscles and joints. In connexion with, and, as I am satisfied, in consequence of its operation upon the secretories of the alimentary canal, it *occasionally* excites the appetite, promotes digestion, and produces a gradual and moderate (though, as is believed, indirect) increase of the force and fulness of the pulse. In addition to these more common effects, it sometimes promotes the excretion of mucous or muco-purulent matter, from the bronchial membrane, and sometimes it restrains these discharges, according to the different circumstances of the case. Sometimes likewise it powerfully excites the catamenial secretion, and occasionally it has been known to produce uterine hemorrhage. In still larger doses, it nauseates strongly; but, independent of this effect, it powerfully abates irritative hardness and frequency of the pulse, and irritative heat and dryness of the skin, and usually it occasions a quickly diffused and transient, but, at the same time, a very peculiar nervous thrill, which pervades the whole system, and is often extended to the minutest extremity. When *Sanguinaria* is pushed in this way, to an improper extent, it sometimes occasions vomiting, but more frequently burning at the stomach, faintness, vertigo, impaired vision, general insensibility, coldness, extreme reduction of the force and frequency of the pulse, together with great irregularity of action, and often palpitation of the heart, great prostration of muscular strength, and sometimes, though rarely, a convulsive rigidity of the limbs. In a few instances, in which very large doses have been taken by mistake, neuralgic pains have been produced in various parts of the system, and sometimes a violent but transient gastrodynia. In other instances a tetanic rigidity of the limbs, and even of the whole body, has followed such a dose;—and in others still, both of these effects. In large and full emetic doses, it speedily excites vomiting, but without producing much nausea, or any considerable evacuation of fluids from the stomach, or any material diminution of the general energies of the system. If pushed to an injudicious extent as an emetic, it occasions great anxiety, and the above detailed symptoms of narcosis. As a general rule, it is believed, that after the internal use of *Sanguinaria*, the stomach and intestines are mostly left in a good condition, and not in an irritable, and disordered state. Now, I have repeatedly witnessed all of the above operations, except the neuralgic pains and the convulsive affections, from the use of the *Tartrate of Sanguinarine*, and I entertain no doubt that even these may be produced by a sufficient quantity of this salt.

Under ordinary use, the *Tartrate of Sanguinarine*, in moderate and uniform doses, at regular and short intervals, commonly allays morbid irritability and irritation, and particularly irritative frequency of the pulse and irritative cough. It likewise evidently exerts an especial operation upon the secernent and absorbent systems, by which a greater or less change of condition and action is produced,—by which in health, or when there is torpor or inactivity of these parts, both secretion and absorption are increased; or, when there is excessive or vitiated secretion, it is restrained and improved,—by which certain dysthenic or cachectic complaints are removed, certain cutaneous eruptions cured, and a resolution of certain chronic, sub-acute, or acute atonic inflammations, is produced; the whole independent of any change in the degree of the vital

energies, or the strength of the action of the circulating system, and unconnected with any evacuation to which the remedial effects can be attributed,—at least, independent of any which can at all be considered as an essential part of the general operation. In one word, it is eminently deobstruent. It also possesses emetic powers, but it appears to be of very little value for the purposes of an emetic.

In large doses at once, or large quantities in the twenty-four hours, it produces vertigo, dilatation of the pupils, the appearance of a cloud before the sight, staring and protuberance of the eyes, a peculiar haggard expression of the countenance, nausea, epigastric uneasiness, coldness of the surface, more particularly of the extremities, cold sweats, diminution of the frequency, and irregularity of the pulse. From a single large dose, these symptoms begin in the course of half an hour, and disappear entirely in the course of about three hours.

The emetic powers of the *Tartrate of Sanguinarine* are much less considerable in comparison with its deobstruent and narcotic operations, than of the ordinary preparations of the root of *Sanguinaria*. However, small doses of the *Tartrate of Sanguinarine* are much more emetic, in proportion to their size, than large ones. Perhaps this may be accounted for by the circumstance that large doses produce so much narcotic effect as to prevent an emetic operation, while small ones scarcely produce any narcosis at all.

After trying various doses, Dr. Terry at last took a scruple of the *Tartrate of Sanguinarine* at once, with the production of all the preceding symptoms. In this case, the dilatation of the pupils was very great, and the strongest light of the sun was utterly incapable of producing the least contraction, or of giving the least uneasiness, though vision was no otherwise impaired than by a sensation of a dark cloud immediately over the eyes. The maximum of the effects of this dose, took place in about an hour; and while under its greatest influence, the pulse was preternaturally full and flowing, without bounding, hardness, or any mark of irritation. In about twenty hours after this dose was taken, there was a discharge from the intestines, which was noticed to contain a very unusual quantity of bright yellow bile.

I think there are some cases of disease in which *Sanguinaria* appears to be highly indicated, but, on trial, it produces a disagreeable effect either upon the stomach, or the head, or both, and fails of giving the desired relief. I know of no means of distinguishing these particular cases, except by trial. If the case is one of this sort, any of the ordinary preparations of the root of *Sanguinaria* will perhaps impair or destroy the appetite, increase the frequency of the pulse, and gradually debilitate, without relieving the disease. Under such circumstances, the article should never be persevered in. I think, however, that I have satisfactory reason to believe that the *Tartrate of Sanguinarine* will agree sufficiently well in many, if not the whole of such cases.

With pure and uncombined *Sanguinarine*, but few trials have been made. Mr. A. B. with torpid liver, evinced by cinereous discharges, and costiveness, at about eight o'clock in the evening (November, 1828) took a fluidrachm of a saturated alcoholic tincture of pure *Sanguinarine*, the alcohol being of the specific gravity of 835. In a few minutes, there

was nausea, which continued about two hours, but not in a very urgent degree ; and, at the same time, there was a lancinating pain, rather severe, in the superior and posterior part of the orbits of the eyes. The patient went to bed at the customary time, and no further effects were perceived during the night. In the morning there was a profuse loose discharge from the intestines, of a bright yellow color, and evidently containing a considerable quantity of bile. From the circumstances attending this, and other analogous cases, in which *Sanguinarine* or the *Tartrate* of this alkali has been employed, there is believed to be good reason for concluding that discharges from the intestines are not a direct, primary, and regular effect of these preparations, but dependent merely upon their cholagogue operation ; since they have never been observed to operate in this manner, except where they have produced a considerable excretion of bile.

In short, the *Tartrate of Sanguinarine*, and some other of its salts, have been considerably used by several of my professional friends, as well as by myself, and, as I think, to an extent sufficient to prove abundantly that this alkali is the medicinally active principle of *Sanguinaria*. Since I first became acquainted with it, I have taken care not to be destitute of it, so that I have already acquired a good degree of familiarity with the modes of management which seem to be necessary to its best effects, and I am satisfied that it is much preferable for medicinal purposes, to all the common preparations of the root of *Sanguinaria*.

It is not my intention, at this time, to treat of its therapeutic applications. In this place it will be sufficient to state, that I have found it peculiarly valuable in Icterus, Dyspnoea-exacerbans, Pneumonitis Typhodes, and Arthritis Rheumatismus v. acutus v. sub-acutus. In several instances, I have very speedily cured severe cases of jaundice, almost exclusively with this article, and I have as often suddenly arrested an exacerbation of Dyspnoea. I have also several times known a rapid resolution of Pneumonitis Typhodes produced by one, two, or three full doses of it, and I have reason to believe that many cases of acute and sub-acute atonic Rheumatism are equally capable of being suddenly arrested by it.

Indeed, such is my conviction of the value of the salts of *Sanguinarine*, that I am satisfied they require only to be well known, by the medical profession, to be introduced into general use ; and were they to be obtained upon a large scale, I am inclined to think they might be afforded at the rate of a dollar an ounce.

New Haven, Ct., May 17, 1832.

SCARLATINA.

To the Editor of the Boston Medical and Surgical Journal.

SIR,—A communication in the 13th No. of your Journal, upon the treatment of Scarlatina, induces me to give my experience in the management of the disease, which differs in some points from that of your correspondent.