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THE USE OF RHUS TOXICODEN-  
DRON.<sup>1</sup>

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Rhus toxicodendron is a remedy of great practical utility in the treatment of many grave diseases, and, although it has been before the medical profession for nearly a century, it has not been very largely employed by regular physicians. It is a drug whose peculiar action is not well understood, the effects being so marked from the use of comparatively small doses that many physicians regard the reports following its exhibition as incredible. It is also a remedy claimed as the special property of medical practitioners who style themselves homœopaths, and is regarded by them as supplying one of the best illustrations of the truth of their dogma, "*Similia similibus curantur.*" The objects to be attained in the study of this drug may be summarized as follows: A better understanding of the therapeutical indications for its employment and a theory to account for the results obtained as contrasted with the theory of *similia*.

I have published two papers upon rhus

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<sup>1</sup> Read before the Montgomery County, Pennsylvania, Medical Society, September 24, 1890.



toxicodendron, the first being a short letter in the *Medical News*, April 20, 1889, in which I recorded a number of cases successfully treated by the exhibition of rhus; the second was a report of a collective investigation in the *Therapeutic Gazette*, October, 1889. I have used this remedy for several years past, and quite a number of others have used it at my suggestion in the treatment of different diseases, but I have never claimed the original discovery of the valuable properties of the drug. In my first-published paper, I referred to its use in 1798, eight years before Samuel Hahnemann invented the name of homœopathy, and mentioned also that it was official in the British Pharmacopœia in 1836; but I was not then aware that it had been studied by Piffard, of New York. Since the publication of these papers I have received communications from gentlemen who have used it for other than rheumatic affections, for which I especially recommended it. The only claim I put forward is, that through my influence its value has been brought to the attention of quite a number of physicians, and at the same time new uses have been found for it.

The principle upon which minute doses of medicines act seem to me to be best explained by what may be called Cellular Therapy. I have in previous publications foreshadowed my views on this topic, but only recently have these ideas been sufficiently crystallized to warrant their presentation to the profession in compact form. These notions have been somewhat faintly outlined in discussing "Small Doses"

(MEDICAL AND SURGICAL REPORTER, December 3, 1887, June 30, 1888, and July 28, 1888), a little over two years ago. The last two papers were devoted to a discussion of the therapeutic considerations connected with the administration of small doses, and included some remarks upon electricity, nux vomica and nitroglycerin. From the last of these I quote the following: "A few words should be added here as to the value of these generalizations and the bearing which they may have in the elucidation of the theory of the actual value of small doses in the treatment of disease. As to strychnine, for example, its value is well recognized, but the method by which we arrive at results is not so well understood, the deductions of experimental physiologists being somewhat contradictory and misleading. Its applications (effects), are accounted for on the basis of its physio-pathological action or, to be more plain, its physiological action in the presence of pathological changes involving, we may presume, certain modifications of the cell-action. Whether the tissues are normal or abnormal, we always have to do with cell-action, and when a medicament is added we have, as a resultant, the cell-action and the drug-action; and we may assume that when the latter is properly applied, the drug-action is in the nature of a complementary action to that of the cell. It is certainly not 'substitutive action,' nor does the expression, 'elective action,' sufficiently cover the ground; while in the light of these investigations, both homœopathy and dosimetry are altogether irrelevant expressions."

Going farther than this, we see that the pathological changes following the exhibition of lethal doses may be interpreted from a therapeutical standpoint, as in the case of mercuric bichloride, rhus toxicodendron and arsenite of copper, all of which are known to be exceptionally active poisons. Large doses of the bichloride, acting upon the cells of the intestinal mucous membrane as an irritant (stimulant), set up inflammatory processes, which so closely resemble the pathological changes occurring in diphtheria, that no difference between the two can be distinguished under the microscope. It is reasonable, therefore, to assume that the bichloride may be used with proper caution in the case of pathological changes affecting mucous structures, because of its known stimulant action upon the cells affected. The absorption of poisonous products in this case is prevented by the increased resistance of the cells upon the same principle as the normal cells prevent the absorption of the poisons naturally occurring in the intestinal tract even in health. The medicament merely increases the resistance of the organism by fortifying and strengthening the normal functions of the affected cells. The danger to be apprehended from the use of this remedy is ptyalism; but, in addition, there are dangers which may properly be classed as intermediate. For example, the amount and frequency of the dose may lead to the disorganization of the cells, when they are no longer capable of acting in the capacity of scavengers, and, although nature is conservative, disease gains the upper hand. The minimum dose, repeated at

short intervals, is therefore of prime necessity, as by this method the cells are constantly bathed in a fluid charged with the medicament, while over-stimulation and the consequent destruction or arrest of the cell-function are avoided.

In the case of rhus, instead of the buccal mucous membrane bearing the brunt of lethal doses, its effects are shown in the form of marked inflammatory changes in the integument, an illustration of the remote action of the drug. The direct action is upon the cells of the intestinal tract, the remote effect being manifested in the subsequent hyperemia and retrograde changes taking place in the cells of the integument. These effects have been referred to as the specific action of the drug, and it is the toxicological effect of such action that we wish to avoid in the treatment of disease. The knowledge thus acquired, while valuable from a toxicological point of view, it will readily be seen, is not of equal value as a lesson in therapeutics, unless rightly interpreted.

In the case of arsenite of copper, we have a most fitting illustration of cell-activity in the treatment of various disorders of the intestinal tract. It is closely related chemically to Paris green, and as a therapeutic agent is destined to occupy an important position in the medicine of the future. The exhibition of minute doses is attended with marvellous results, in all cases and at all seasons of the year, in every climate. That it is antiseptic cannot for a moment be doubted, but it is also an important alterative, producing effects through influences which, except

upon the basis of cellular therapy, we are unable to understand or explain. Without any undue stretch of the imagination, catalytic properties may be ascribed to it, as through its administration a series of changes are started which sooner or later manifest themselves by effects which are more or less perceptible.

In the treatment of typhoid fever, I have found it superior to any and all other remedies, when used solely with a view to maintain a healthy condition of the intestinal canal, and the only scientific basis which can be offered for this beneficent action rests upon the theory of cellular therapy. My ideas on this subject have been confirmed by the opinion of Prof. Dr. Hugo Schultz, of Greifswald, Germany, my friend and translator, who has arrived independently at a similar conclusion. In the course of a private communication he says, "It is out of the question to suppose the cupric arsenite exerts any germicidal influence when given in the doses you advise. The beneficial action of the drug, however, goes far to prove the possibility of a 'cellular therapy,' with the necessary consequence of a pre-existing cellular pathological condition."

It will be evident, therefore, to the most superficial observer, that cellular therapy is entitled to more than a passing notice, and I have confidence that it will ultimately occupy an important place in completing the chain of evidence which shall advance the art of medicine until it occupies a position on a level with surgery, as seen in the last decade of the nineteenth century.

In concluding my reference to the subject

of cellular therapy, I will anticipate some objections which may be offered. It may be asked why these cells are thus affected by different medicaments, and why certain drugs are indicated in particular diseases. These questions cannot be answered. The physiologist cannot tell why a ray of light impinging upon the retina produces a mental picture on the brain, nor explain the process by which sound is conveyed to the brain; and the therapist meets also obstacles when he tries to explain the action of drugs. The entire science of physiology is erected upon the function of the cell as a basis, and this remains one of the most profound secrets of nature. Disease, in its incipency, is a derangement of function beginning with the cell; all medicines, as a rule, are poisons, and as such produce or develop effects in the nature of force when introduced into the economy. The aim of the physician is to determine the range and extent of that power, and at the same time to locate as nearly as possible the particular cells which are modified, and the manner in which they are affected by this force.

*Pharmacology.*—The pharmacology of any drug includes a study of its physiological as well as its toxicological effects, given in small, medium and lethal doses. In order to obtain a correct knowledge of the properties of rhus toxicodendron, I may mention some points connected with its preparation, which belongs to the department of pharmacy. Many valuable medicines are ruined in the course of preparation, and unfortunately rhus toxicodendron forms no exception to this rule.

The only reliable form of preparation is the tincture made from the fresh leaves, which should be gathered during the period of efflorescence. It is said that, as far as practicable, the leaves should be selected from among plants growing in the shade ; in case this is found impracticable, they may be gathered before the sun strikes them in the early morning. The tincture is made according to the directions of the *U. S. Pharmacopœia* for the manufacture of fresh herb tinctures—fifty parts of the drug to one hundred parts of alcohol ; after thorough maceration, the liquid is allowed to stand for the period of fourteen days, when it is subjected to percolation, and is then ready for use. The active principle, toxicodendric acid, is an exceedingly volatile substance, and it is reasonable to suppose that preparations made from the dried leaves are practically inert. My observations with fluid extracts prepared in this manner warrant the statement that they are not reliable ; and I therefore desire to emphasize the need for procuring a reliable product. Dr. J. W. Keath, of Schaefferstown, Pa., wrote me some time ago that he had used rhus in all the classes of cases in which I had recommended it, in both large and small doses, and had failed absolutely to notice any effect whatever. I at once made arrangements to have him supplied with a reliable product, and the treatment was repeated with the result that not a single failure occurred.

The dose of the tincture ordinarily should not exceed one-half drop three times daily ; if the diagnosis is correct, and the results



are unsatisfactory, the dose should be diminished. For convenience the tincture may be prepared in the strength of one part of the tincture to nine parts of diluted alcohol. Each five drops of this solution carries just one-half drop of the medicine. In patients who are susceptible to the action of the crude drug, that is, those easily poisoned, it will be advisable to begin treatment with a single drop of the ten per cent. solution, which may be diluted with a little water and taken three times daily. In typhoid fever, the dose should be even smaller, but more frequent repetition is necessary.

As some present may have doubts concerning the possibility of so small a dose having any appreciable effect, I call your attention to some tablet triturates, each containing one one-hundredth of a drop of the tincture, and if you have the temerity to investigate the matter *in propriâ personâ*, take one of these tablets and allow it to dissolve in the mouth. There is no evidence superior to that afforded by one's own senses, and at the close of my paper we shall be glad to hear the results of the experiment.

Lethal doses are best antagonized by the exhibition of some preparation of lead, and you all know that lead water and laudanum are the standard remedies in the case of rhus poisoning. As an external remedy, no combination is superior to ordinary white-wash; it should be applied freely with a brush, and the patient instructed to avoid carrying the poison from one part of the body to another through the medium of the hands. To allay the irritation set up in the digestive tract, olive oil or some other bland oil may be freely swallowed.

Absorption takes place very rapidly, whether rhus toxicodendron is applied locally or taken internally, but it is said that cautiously chewing the twigs of rhus renders the person proof against poisoning from contact with the shrub. Elimination is effected through the usual channels, the effects being most marked in the skin and upon the urinary tract.

The general action, when taken in medicinal doses is that of a stimulant, acting upon the cerebral centres, as any of you may learn from taking the minute dose suggested. From small medicinal doses, I have never noticed any appreciable narcotic effect, although no doubt large dosage will show that it has decided narcotic properties. Dr. George Kirkpatrick, of La Harpe, Illinois, wrote me some time ago that he took by mistake a swallow of the tincture, and almost immediately afterwards, he took ten grains of sodium carbonate and a quantity of oil, and felt no bad effects until the second day, when he noticed that the scarf-skin was all peeling off. He suffered no serious inconvenience, however, from the accident. The form, manner and time of taking, are important factors in producing therapeutic effects. While in the case of chronic rheumatic affections half-drop doses three times daily are quite sufficient, typhoid fever and erysipelas require smaller doses given at more frequent intervals, at least as often as every hour during the day. The mixing of the plain tincture with water is contra-indicated, as a considerable portion of the active principle is thus destroyed; by using it in the form of a solution with

diluted alcohol as suggested, this objection is removed, and each dose may be combined with a teaspoonful of water without injury, if not allowed to stand exposed too long.

The action of rhus upon the nervous system is somewhat peculiar; as, although it is not a narcotic in the proper sense, it possesses the property of allaying the irritability of the sensory nerves. This is shown in a very distinct manner in the case of chronic rheumatic affections, where the pain will be arrested sometimes in the course of a few hours. My impression is, that the effect in these cases furnishes an illustration of the influence of the cell-action. In sciatica, for example, the nerve-cells are bathed in a fluid containing the rheumatic poison, which is manifested by the sensation of pain; but as soon as the circulating fluid becomes charged with the active principle of rhus, elimination begins, and at the same time more or less stimulant action takes place in the cells affected, the result being that the pain ceases. The demonstration here offered finds an apparent counterpart when the eye becomes tired from gazing at some particular color, but as soon as an acceptable shade is presented to it a comfortable sensation of rest is experienced. For a long time it was believed that nothing but opium or some of its preparations were serviceable in this class of cases; lately, however, the analgesic properties of synthetic products have been discovered, and with the light furnished by the cell doctrine, the way is clear to the discovery of other drugs possessing certain peculiar properties. We shall then be in a position to understand the claims of the homœo-

paths in regard to the harmlessness of their medicines even when taken in large quantities, providing it is not the particular remedy which meets the inroads of the disease.

The effect of medicinal doses of rhus upon the circulation, the temperature and respiration is not marked. Upon the muscular system, during the progress of rheumatic changes, the effect is very manifest; but this action is undoubtedly through the mechanism of the nerve-cells. Thus, when a nerve-trunk is stimulated (irritated) by some foreign substance, electricity, strychnine, strophanthus, or even by a blow, its power over the muscle is arrested and, as has been pointed out by Poole, the muscle supplied by the nerve exercises its inherent property and contracts. In the case of lumbago, we are warranted in assuming that the pain may be due to a combination of circumstances brought about originally through the arrest of tissue-change, by which the blood is charged with a poison that suspends the function of the nerve-cells. As a consequence of this arrest of function there is increased muscular tension, manifested by pain on motion. It is in these cases that we have the practical illustration of the stimulant properties of rhus exhibited, by which the cell-function is promptly restored. The true explanation of this "cure" is not to be credited to homœopathy, but to anti-pathology.

In the early history of the use of rhus toxicodendron, it was recommended for the relief of paralysis; but it will be apparent from the foregoing that it does not correspond with strychnine in the treatment of

this class of cases. The special forms of paralysis which it relieves are caused to disappear solely through the stimulant action upon the nerve-cells, and it is necessary to exercise care in the selection of cases for treatment with rhus toxicodendron.

Upon digestion the effect of rhus is most remarkable; and, from my experience with it in the treatment of disorders accompanied by derangements of the digestive functions, I am inclined to regard it as possessing properties allied to that of an antiseptic. It certainly has a decided detergent effect upon the blood, and persons taking it for the relief of rheumatic affections seem to experience marked improvement in digestion, the secretions being perceptibly increased. When introduced into the stomach, the eliminant action upon the cutaneous system is very noticeable. In the course of a few days the complexion begins to show favorable changes, and with increased activity of the cutaneous envelope there is a correspondingly increased cerebral activity. I recall a case in which it was used for its influence upon the genito-urinary tract, when indigestion was a prominent symptom, with indications of approaching melancholia. Half-drop doses of the tincture, three times daily, changed the whole character of the disorder, and at the end of a week, indigestion, urethral irritation and melancholia had disappeared.

*Therapeutical Applications.*—A study of the physiological actions and the toxicological effects of a drug naturally indicates its therapeutical applications; and after what has been said of rhus toxicodendron, little

need be added in pointing out the indications for its employment. I have already referred to an apparent antiseptic and alterative action which rhus seems to possess, especially in the case of rheumatic and intestinal disorders, and I desire to call your especial attention to its value in the treatment of all forms of chronic rheumatic affections. The only instances in which I have failed to obtain good results were those when the patients had become debilitated from insufficient or inappropriate food supply, and in the case of acute attacks engrafted upon a chronic disorder. The physician is frequently confronted with cases of rheumatic joint-affections, sciatica, pains in the shoulder, the ankle-joint, the ball of the foot, etc., where other medication has proved disappointing. In many of these cases rhus will prove effective, often relieving the pain within a day or two, and effecting a permanent cure. In wry-neck due to exposure, and in lumbago rhus will prove very valuable. Hemorrhoids, varicose veins and chronic cystitis are usually promptly relieved by the exhibition of this drug. Occasionally the close observer will be disposed to regard some local disturbance, such as ear-ache, sore throat, pain in the bladder or rectum, as one of the manifestations of a rheumatic tendency; and it will be found on trial that rhus is not alone palliative, but produces permanent recovery. It is often of signal value in relieving paralyses accompanied by a rheumatic history, and, while I am not prepared to say that rhus would not be useful in the absence of the latter, I am disposed to regard the presence

of this neurosis—including, of course, gouty and lithemic conditions—as the special indication for the employment of rhus.

In the treatment of erysipelas small doses seem to arrest the tendency of the eruption to spread while the fierce character of the inflammation is subdued and the temperature and pulse fall.

Rheumatic and gouty or lithemic tendencies are liable to manifest themselves during the progress of other diseases, acute and chronic. In typhoid fever, especially where it assumes the lingering form and is accompanied by what appear to be neuralgic pains, the exhibition of rhus will often cause these pains to disappear, and will produce a marked change in the course of the disease. I may add that this remedy will prove of great service in the treatment of some of the more common sequelæ of this disease, such as paralysis or sciatica and other pains of a neuralgic character, together with the usual depression of the organs of special sense.

In conclusion, I have but a word to offer relating to the use of rhus in the treatment of skin diseases. The chronic varieties respond most readily to this drug, and especially the scaly forms; but it is useful in all cases dependent upon an unhealthy condition of the digestive tract. As many of these affections are to a great extent due to the ingestion of improper food—too much starchy and saccharine material being eaten—it will be sufficient to say that these substances must be prohibited during the period of treatment, or but little benefit can be expected.

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