

even to the extent of inducing a catarrhal condition; whence it has been inferred that the metal is separated with the mucus secreted by the mucous membrane.

NITRATE OF SILVER.
OXIDE OF SILVER.

The soluble preparation of silver, when painted on the entire skin, colours it first an opaque white, which changes gradually to brown and black; and the application if a strong one will even produce vesication. Nitrate of silver is sometimes applied as a caustic to warts and other excrescences.

Applied to the abraded skin or to sores, the soluble silver salts form an albuminate which coats the surface with a thin layer and protects the skin from the irritation of the air. The nitrate of silver acts as a powerful excitant of the tissues, and destroys them, but only very superficially. It is very frequently applied to unhealthy and unclean ulcers, to induce healthier growth. It gives much smarting pain, which, however, soon passes away.

Like most other soluble metallic preparations, the nitrate causes condensation of the tissues as well as contraction of the blood-vessels, on which account it is used to stay hæmorrhage. Being liable, however, to excite much inflammation and pain, other blander astringents should first be tried. Sometimes it is necessary to check the bleeding from leech-bites by touching them with a stick of nitrate of silver.

It is stated that if a burnt or scalded surface is painted over with nitrate of silver, before vesication takes place, both the blistering and pain are prevented.

The pitting of small-pox may be prevented if each vesicle is opened, as soon as formed, and nitrate of silver is applied to the raw surface beneath. Dr. F. Bowen has recorded an instructive case showing the good effects of this treatment. He treated the vesicles on one side of the face and neck in the

way described, but left untouched the vesicles on the opposite side, with the result that on recovery the untreated side was deeply pitted, while the opposite side remained smooth and scarless. Dr. Bowen, who has devoted much attention to this subject, states that it is easily carried out by a nurse. At an early stage of the eruption, at the latest on the fourth or fifth day, he punctures the vesicles with a fine needle dipped in a solution containing twenty grains of nitrate of silver to an ounce of water. Mr. Higginbottom finds it unnecessary to puncture the vesicles. It is enough, he says, to paint the skin in the manner recommended by him in erysipelas, which subdues inflammation and prevents suppuration.

Bed-sores are best prevented by painting the threatened but unbroken skin, as soon as it becomes red, with a solution of nitrate of silver (20 grains to an ounce) with the effect of dispersing the redness, hardening the skin, and preventing the bed-sore, unless, as in the case of paralysis, there is a great proneness to the formation of bed-sores.

That species of boil which, beginning first as a papule matures into a pustule, and inflames and extends till a large dead core is produced, may, it is said, be arrested in its early pustular stage by painting it over at its very commencement with a strong solution of nitrate of silver. The author has had no experience of this method; but of the beneficial influence of collodion on similar boils, to be mentioned in another place, he can speak with great confidence.

Herpes labialis and the vesication of shingles may be arrested if the patch of erythema is painted over with nitrate of silver before or as soon as the vesicles begin to form.

It is not uncommon to meet with patients annoyed with a patch of lichen, the size of the palm of the hand, affecting almost any part of the body. The irritation caused by this patch may be excessive, sufficient even to break the sleep, and injure the health. By painting the patch with the nitrous ether solution (*vide* p. 202) of silver every day, or second day, as the itching may require, it may generally be removed.

Limited patches of eczema are sometimes treated with benefit in the same way. Nitrate of silver proves most serviceable after the weeping stage.

Psoriasis of the tongue and mucous membrane of the mouth is benefited by the occasional application of nitrate of silver or sulphate of copper; but if it depends on syphilis, mercurial applications are best. A weak solution of nitrate of silver, gradually strengthened, is stated to be useful in the superficial kinds of lupus.

Higginbottom very strongly recommends the local application of nitrate of silver in erysipelas. No agent, he says, is so safe or efficacious in subduing external inflammations; but he points out that the success of this treatment depends entirely on the manner of conducting it. He directs the skin to be well washed with soap and water, then with simple water; then to be wiped quite dry. Next, a solution of four scruples of the brittle stick of nitrate of silver, in four drachms of water, is to be applied two or three times to the inflamed surface, extending two or three inches beyond.

The intolerable itching of pruritus pudendi often yields to the application of nitrate of silver. A large camel-hair brush saturated in a solution containing from two to five grains to the ounce, should be painted three or four times a day over the vulva, and be thrust up to the os uteri. A stronger solution used less frequently will not answer so well.

A weak solution of nitrate of silver often relieves pruritus ani.

Pruritus cutaneus of the meatus auditorius, occurring without any eruption on the skin, should be treated by the application of a strong solution of nitrate of silver, carefully avoiding the membrana tympani. If the itching arises from undue dryness of the ear from deficient secretion of wax, almond oil or glycerine should first be tried.

Nitrous ether is by far the best solvent of nitrate of silver when used as an outward application, for this solution by dissolving the fatty matters of the skin forms a uniform layer over the surface, and, unlike a watery one, does not run into

drops leaving the intermediate skin dry. This solution is not available for erysipelas, as nitrous ether will not dissolve the quantity of silver required. It is important to bear in mind that a nitrous ether solution acts much more strongly than an aqueous solution of corresponding strength. The nitrous ether solution applies itself to the skin more uniformly and thoroughly, while the watery solution runs off or collects in drops. The ether solution must therefore be made weaker, five to ten grains to the ounce being generally strong enough. Five grains to the ounce is sufficiently strong for threatened bed-sore, a stronger solution often blistering, particularly on applying several coats.

Solutions of nitrate of silver are used to blacken the hair of the head. The hair is first washed with the solution of nitrate of silver, and then a comb, dipped into a solution of sulphide of potassium, is passed through it; a process resulting in the production of a dull, shiningless, ghastly, black-bluish colour.

The solid nitrate of silver stick is sometimes passed over the edges of the eyelids in obstinate tinea tarsi, first removing the eyelashes and the scabs.

A few drops of a solution of nitrate of silver, varying in strength, is inserted with the aid of a quill several times a day into the eye, in conjunctivitis. It excites in the membrane a healthier inflammation, which soon subsides.

The nitrate may be applied to ulcers of the mouth.

The soluble salts have an astringent metallic taste.

In the early stage of inflammation of the throat, when the inflammation is superficial and there is only a little swelling, the application of a strong solution, or of the solid stick of nitrate of silver, subdues and sometimes even extinguishes the inflammation.

In chronic sore throats, when the tissues are relaxed and covered with pus, solutions of the nitrate are serviceable, but the author does not think they are superior in any way to strong astringent and unirritating applications. Even ulcers are best treated by the glycerine of tannin; but if in a slough-

ing and unhealthy condition, then the irritant nitrate must be preferred. The nitrate of silver is also applied with doubtful benefit in diphtheria. Most authorities are agreed that the application should be limited to the inflamed patches; for if applied beyond their area, it excites an extension of the inflammation, on which the false membrane may readily plant itself.

Nitrate of silver, in powder or solution, is sometimes applied by means of a probang, brush, or sponge, to the chronically inflamed larynx, as in phthisis; or solutions of nitrate of silver, in the proportion of gr. $\frac{1}{2}$ to gr. v. to the ounce of water, may be brought to bear on the pharynx and larynx by the spray producer.

Dr. Horace Green injects a solution of nitrate of silver into the trachea in asthma, bronchitis, and phthisis, after deadening the sensibility of the glottis by applying to it for one or two weeks a solution of nitrate of silver. He passes a no. 10 or 12 catheter which produces only a sensation of warmth, through the rima glottidis down even to the bifurcation of the trachea and injects the solution. Dr. Hughes Bennett, who endorses this treatment, injects either two drachms of a solution containing half a drachm of nitrate of silver to an ounce of water, or even half an ounce of a solution consisting of forty grains of nitrate of silver to an ounce of water. While introducing the catheter the head is thrown back and the tongue drawn forward, when the catheter glides along the laryngeal surface of the epiglottis which is nearly insensible through the rima glottidis itself.

Sponging out the throat with a solution of nitrate of silver greatly diminishes the violence and frequency of the paroxysm in whooping-cough, and renders the cough but half as frequent and the fits much less severe, and enables a child harassed with broken sleep to obtain a good night's rest. But there is a formidable drawback to this treatment; for the application generally produces, especially with very young children, so violent an attack of coughing, as to excite fears lest suffocation should ensue. Instead of sponging the throat,

the nitrate of silver may be applied in the form of spray by the atomizer. Very young children, however, cannot be induced to open their mouths, and allow the inhalation of the spray; hence the use of this application is restricted to children more than two or three years old. As either of these applications is apt to excite retching, they should be employed when the stomach is empty.

That part of the salt having escaped conversion in the mouth is changed into an albuminate when it enters the stomach. If sufficient albumen is not present to effect this, the salt attacks the mucous membrane, and excites an active inflammation. The best antidote for a poisonous dose is common salt, a fact useful to bear in mind, if as sometimes happens, the solid stick of nitrate breaks off and is swallowed.

Nitrate of silver acts as an irritant in the stomach, and may be used in precisely the same class of cases for which arsenic is applicable. It often checks the pain and vomiting of chronic inflammation, of chronic ulcer, and even of cancer, of this organ. It should not be given in the form of a pill, but in solution.

The nitrate acts as an astringent in the intestines, and, in common with several other metallic preparations, may be used in diarrhœa, both of the acute and chronic kind.

These salts enter the blood, and probably collect in the red corpuscles as other metals tend to do, if not speedily deposited in the organs or separated by the secretions. These salts after absorption are supposed to be astringent to the tissues to which they are conveyed, but this is doubtful, and they are never used to check either bleeding or secretion from the distant organs of the body.

Both the oxide and nitrate are employed in chorea and epilepsy, apparently with occasional benefit. The oxide has been given to check profuse sweating. If administered too long, these substances, in some form, probably as the reduced metal, are deposited in the deeper parts of the skin and most abundantly where the skin is finest and most vascular; but, once deposited, the metal remains as a permanent discolora-

tion, of a deep leaden hue, which neither time nor treatment can remove. Silver appears to be chiefly eliminated by the intestines and bile, very little escaping by the urine.

The nitrate, in solutions of various strength, is used successfully as an injection in gonorrhœa. Some advocate a very strong solution (twenty grains to the ounce), averring that in many instances the disease may be at once cut short by it; others prefer a much weaker solution of one or two grains to the ounce of water, repeating the injection several times a day.

The solid stick is sometimes applied to strictures of the urethra.

The author believes that a solution of glycerine of tannin, one half the strength of the pharmacopœial preparation, will be found a better injection for both gonorrhœa and gleet than nitrate of silver.

MERCURY AND ITS PREPARATIONS.

THE salts of mercury possess very various physical as well as chemical properties; but as in every instance their effect on the system is well-nigh the same, probably all mercury compounds ultimately assume the same form in the blood.

The nitrates of the oxide and suboxide are escharotic; but much of this action is due to the free nitric acid of the salt. They are used to remove warts, condylomata, and other slight excrescences. The annoying itching of some skin affections may be completely allayed by mercurial applications. Solutions of bichloride, black wash, yellow wash, or mercurial ointment, may each prove useful, but the application must be a strong one. Trousseau highly recommends the part to be bathed with a solution of about twelve grains of bichloride in a pint of very warm water. After much experience of these applications, the author believes that an oint-

ment composed of a drachm of calomel to an ounce of lard will be found by far the best application.

But this ointment, in common with other mercurial applications, is not useful in all kinds of itching of the skin; for instance, the irritation of urticaria remains unaffected by it.

Calomel ointment often immediately removes the itching of pruritus ani. This irritation may be due to rashes, as psoriasis, lichen, or eczema, or no eruption may be visible, yet the ointment will prove equally efficacious. Sometimes the itching is felt along the raphé between the anus and scrotum, and may be due to little round spots looking like psoriasis, with the scales washed off. This form also yields to the ointment. Pruritus pudendi is less frequently eased by this application. In obstinate cases of pruritus ani and pruritus pudendi, blisters to the thighs, or the application of a few leeches, sometimes afford relief.

The ointment in many instances improves the rashes themselves, but this is due, in some measure, to the cessation of the scratching on the disappearance of the itching.

Sometimes a little scabbiness of the head, looking like mild eczema, occurs in children, accompanied by a degree of itching sufficient to prevent sleep, and to cause constant restlessness. The calomel ointment speedily appeases this irritation.

The inunction with calomel ointment allays the distressing itching of the scalp sometimes accompanying pityriasis. It may be profitably added to other ointments used for the removal of pityriasis, as oxide of mercury or of tar.

It may be objected that so strong an application of mercury, especially when applied to soft and absorbing parts, as the inner surface of the vulva, and the skin around the anus, must surely produce salivation. No doubt care should be exercised, and no more ointment used than is needed. Yet the risk of salivation seems to be extremely slight; for, with a very large experience of the ointment, the author has never seen salivation produced by it. Properly applied, a very small piece of ointment is generally sufficient to allay the irritation at once, and even to remove it altogether in a few