

should desire. I may say, however, that the method does not seem to me calculated to prove convenient and popular in private practice. I had for some time been making some experiments in my service at the Polyclinic in the preparation of gelatines impregnated with chrysarobin and pyrogallie acid, but without much satisfaction, when Dr. Charles L. Mitchell, the well-known pharmacist of this city, sent me some excellent preparations of his own, which seem to be perfectly adapted to the purpose for which they are intended. A bit of one of these gelatine sticks is cut off and placed in a water-bath, where it soon melts into a clear homogeneous fluid, which may then be applied to the lesions of the skin by means of a paint-brush. The advantages claimed are cleanliness and transparency. The coating of gelatine does not rub off on the clothes, and is therefore not so dirty as an unctuous application. A fresh coating can be painted on every day or two as the old layer wears off. The chief disadvantage of this method of treatment is that it requires apparatus which is not convenient to carry about, nor can the patient be trusted to employ it at his discretion. My own experience is that in psoriasis, at least, the gelatine applications are not active enough. I have not, however, used them with sufficient frequency to pronounce a positive opinion.

Recently a solution of chrysarobin in collodion has been recommended in the treatment of psoriasis by Dr. George H. Fox, of New York, and several dermatologists have confirmed his statements with regard to its efficacy. I have employed this preparation in one or two instances, but it has seemed to me so much less active than the chrysarobin ointment that I have not been encouraged to continue its use. It has one great advantage over the gelatine applications, however, and that is that it can be applied extemporaneously and without the paraphernalia which must accompany the use of the gelatine.

A few weeks since a pamphlet by Professor Auspitz, of Vienna, reached me, in which that distinguished dermatologist recommended liquor gutta-perchæ as a vehicle for the application of chrysarobin. I at once obtained a ten per cent. solution, or rather emulsion, of chrysarobin in liquor gutta-perchæ, and happening to have a case of psoriasis of the face and scalp under treatment, I gave some to the patient to apply once daily. The effect was so happy as to encourage me very much to hope that we have in this preparation the most convenient method of applying chrysarobin yet devised; and as chrysarobin is, after all, the most efficient local agent in the treatment of psoriasis as yet brought forward, I have no hesitation in urging the trial of this preparation on any one who may have a case of psoriasis under treatment. It is to be noted, however, that the same watch must be kept upon the skin for fear of exciting dermatitis as when the ointment is used. Only when the liquor gutta-perchæ dries, which it does very quickly, there is little or no danger of rubbing the chrysarobin over the good skin, nor is there much danger, if any, of staining the clothing.

— Dr. Tanner, the notorious faster, has been arrested at Jamestown, N. Y., for practicing on a diploma from a so-called Eclectic College, which has no legal recognition. As usual in such cases he claims it to be a case of persecution aimed against eclecticism.

NAPHTHOL. ITS MEDICINAL USES AND VALUE.¹

BY JOHN V. SHOEMAKER, A. M., M. D.,

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NAPHTHOL is one of the remedies of recent introduction, and of the two products of that name the β naphthol is the one which was first used by Professor Kaposi as a substitute for the tar preparations in skin diseases. It was thought by him as the essential and curative ingredient of tar, while it was free from the objectionable features of the latter.

My attention was directed to this remedial agent by Dr. Justus Wolff, a chemist largely interested in the manufacture of coal-tar products, who kindly furnished me a paper on the chemistry of this substance, along with some novel properties which he had observed in it. As this paper, however, is too long for reproduction here in its entirety, and besides is largely of chemical interest only, I will here give it briefly in abstract as far as will be necessary to acquaint us with the chemical character of its subject, as follows:—

Naphthol is a derivative of naphthalene, a hydrocarbon found in large quantities in coal-tar, belonging to the so-called aromatic group. In the fractional distillation of coal-tar various hydrocarbons are obtained at different degrees of heat. Thus at 80° C. benzol distils over; between 80° and 110° C. benzol and toluol mixed; at 111° C. toluol alone; from 111° to 136° C. toluol and the different xylenes mixed; from 136° C. to 142° C. xylenes only; then the cumenes, phenol, and cresols; and at 218° C. naphthalene, which sublimes in colorless, transparent, brilliant, crystalline plates, possessed of a disagreeable pungent odor, the empyric formula of which is $C_{10}H_8$.

Naphthol is produced from this by a substitution of one of the hydrogens in naphthalene by one molecule of hydroxyl = OH.

According to the different positions of the hydrogen substituted in the naphthalene by the hydroxyl two different naphthols are obtained, of which one is called α naphthol, and the other, the one we shall alone speak of hereafter, is the β naphthol of the formula $C_{10}H_7OH$

The naphthols stand in the same relation to naphthalene as phenol to benzol and cresols to toluol. If one of the six hydrogens in benzol is substituted by hydroxyl, phenol is obtained; in the same way are cresols and naphthols formed. By this analogy of constitution of naphthols, phenol, and cresols, the inference may easily be arrived at, that they may prove alike in their disinfectant character as well, and in order to prove this I undertook a series of experiments. Of course the use of commercial naphthol for that purpose was out of the question, and I experimented, therefore, first to obtain a naphthol free from odor. As the crude article contains, as contaminations, sulphur and sulphurous acid, the sublimates thereof will yield, besides the naphthol crystals, also sulphureted hydrogen, thionaphtholes, carbolic and cresylic acid, thiophenols and the like, to which ordinary naphthol owes its pungent and disagreeable odor. I avoided this all by passing a rapid current of steam through its aqueous solution, expelling thus all volatile by-products, and ob-

¹ Read before the Philadelphia County Medical Society, October 17, 1883.

tained naphthol thus in its greatest state of purity, in beautiful silver crystalline scales, as here submitted. This naphthol may again be sublimed and obtained then in elegant white crystals as here shown, but by the heat employed more or less decomposition again takes place and renders the product somewhat odorous and pungent.

In order to test the disinfectant and antiseptic properties of my inodorous naphthol, I added one part thereof in powder form to 480 parts of urine, which at the expiration of six months, at a varying summer temperature, manifests no odor or signs of decomposition, while another of the same urine without addition of naphthol had a strong putrid odor already, after standing for three days only. To this latter I added, after standing thus for eight days, some of my inodorous powdered naphthol in the above-mentioned proportion, and in twenty-eight hours it had lost its putrid odor, and has kept thus up to the present writing, when no putrefaction or signs of it can be detected in either specimen. The same experience I have made with meat immersed in a solution of naphthol in 520 parts of water, as well in other experiments similarly conducted.

Experiments with solutions of the compounds of naphthols with alkalis or alkaline earths prove that these are very much less antiseptic than the solutions of pure naphthol soaps, containing four to ten per cent. of free naphthol, which were found excellent and serviceable in removing odors of putrefaction or decomposition from hands or cloths. They are also very efficacious in destroying clothes or body lice, as naphthol is a very active parasiticide. If naphthol is evaporated by means of heat, the air in rooms contaminated in consequence of disease or otherwise will be found to be rapidly deodorized and rendered fresh and sweet without other odors, making it thus of the greatest value for sick-rooms, hospital wards, dissecting rooms, etc.

As carbolic acid has many disadvantages, and is not the deodorant or antiseptic *par excellence*, the inodorous naphthol can certainly take its place in every respect. As naphthol has been described variously as poisonous and injurious to the animal economy, which by its composition and analogy was not apparent, I felt it my duty to experiment with it in regard to such, and commenced at once, without hesitation, by taking it internally; one part dissolved in 3000 parts of water produced at first heart-burn, a slight sensation in the right lumbar region, and some dizziness. Of that solution an equivalent amount was taken to represent a half grain.

These symptoms disappeared after continuing its use for some days, and while the urine showed, upon analysis, traces of naphthol and naphthol compounds, no albumen or blood could be detected therein. The doses then were gradually increased to four grains per day for six days, and still no untoward symptoms were discovered, while the warmth in the stomach directly after taking was followed by increased appetite. Dr. Schofield, of Albany, reports to me that upon my solicitation he has used it largely; at first experimentally in the Albany Hospital, where it has now become a staple article, and is used almost entirely to the exclusion of other disinfectants and antiseptics. They use it there for all kinds of disinfection in wards, sick-rooms, for wounds, etc., and have abandoned carbolic acid in all but a few cases, and always with the great-

est satisfaction and success. This far the paper of Dr. Wolff.

His experience, as well as that of Kaposi and others, led me, some eight or nine months ago, to employ it both in private and hospital practice, and the success attained with it soon led me to further experiments. I found it to fully sustain the claim that Kaposi had made for it in scabies, psoriasis, and chromophytosis, as well as in some of the chronic forms of eczema, in which it not only allayed the itching attendant thereto, but lessened the infiltration as well. In wounds and indolent ulcers I have found it a most useful detergent and deodorant, removing the fetor and establishing healthy action of the parts. Aqueous solutions, containing half a grain to the ounce, I have used to great advantage as vaginal injections, especially in leucorrhœa and uterine carcinoma, as well as in gonorrhœal affections both in male and female. In diphtheritic throat affections it made a most useful gargle, as well as to remove the fetor of catarrhal and other affections of the buccal cavity. Its greatest value, however, arose from its disinfectant action of the evacuation of fever patients and rooms containing them, while by its absence of odor it did not tend to produce inconvenience both to patient and attendants. Combined with powdered talcum or starch, or both, and dusted into the shoes or stockings of those affected with fetid exhalations of the feet it acts most satisfactorily, and its effects are equally as good in the same affection involving the hands, axillary, and inguinal regions. Combined with other ointments in the proportion of from one to ten grains to the ounce, it not alone preserves the unguent from decomposition, but exercises also an antiseptic action to the parts and the exudation therefrom. A slight admixture to an experimental sample of lard has preserved the same in excellent condition throughout the hot summer months. In chronic psoriasis, particularly when there is great infiltration, a five to fifteen per cent. ointment has frequently been attended with good results. It has also been very effective in squamous and fissured eczema used in combination with lard or gelatine.

To test for myself its antiseptic properties in comparison to that of carbolic acid, I mixed two whites of an egg with equal weight of water, and took one half of this mixture in one vial, adding one grain of crystallized carbolic acid, while to the other half in another vial I added one grain of Dr. Wolff's odorless naphthol. After the expiration of five days the carbolized albumen assumed a putrid odor, whereas the naphtholized part, though discolored by the naphthol, remains to this day, twenty days after the experiment, without odor. A quantity (about half pound) of meat already commencing to putrefy was also at the same date immersed in a saturated aqueous solution of naphthol, with the effect of arresting the putrefaction and preserving it for some time.

After using naphthol so long and successfully without any untoward occurrences, I read, to my astonishment and alarm, that Dr. A. Neisser, in the *Centralblatt für die medicinischen Wissenschaften*, 1881, No. 30, reported most extraordinary toxic effects obtained with naphthol, and that also Kaposi reported having seen hæmaturia, ischuria, vomiting, unconsciousness, and eclamptic attacks in a boy after the external application of naphthol. Also that Squire reports, in the *British Medical Journal*, January 14, 1882, of it producing blisters and irritating the skin.

Dr. Piffard regards it as a dangerous remedy, and Professor Rapon, while he reports good results with it¹ in scabies, prurigo, and eczema, advises in prolonged cases simple ointment to be substituted every fourth week to avoid any possible risk of absorption.

Dr. Neisser stated that one gramme of a saturated solution (which in water would contain about one thirtieth grain of naphthol) injected hypodermically in a dog produced hæmoglobinuria, and shortly afterwards death.

To verify these accounts and satisfy myself on the toxic effect of pure naphthol, if any it possessed, I administered to one rabbit, repeatedly in twenty-four hours, thirty-four minims of a saturated aqueous solution, hypodermically, without any result, either to inconvenience the animal, increase his temperature, diminish his appetite, or cause lethal effect. This method of treatment was pursued for five days, not less than four to five injections being made per day, and the result was still the same. Determined to obtain toxic effects with it, and, if possible, to demonstrate its toxic action by a post-mortem examination, another rabbit was fed, at first every three hours, with one-grain pills of naphthol, and subsequently with two and four grain pills, at the same intervals, but, beyond increasing the appetite of the animal, no special effects were apparent. In consideration of this, one of my assistants, Dr. Charles S. Means, and my student, Mr. F. C. Waterman, volunteered to take naphthol themselves internally, to test, if possible, its action upon the human organism. They commenced with one quarter of a grain dose every two hours, their pulse, temperature, and urine being subjected to the closest inspection both before and after. The second day they took a half grain every two hours; the third, one grain every three hours; the same on the fourth, while on the fifth and sixth they took two grains every three hours, and on the seventh five grains twice daily. The pulse and temperature did not appear to be affected by this, nor was at any time albumen or blood apparent in the urine. Though they experienced great warmth in the epigastric region after each dose, that passed away in a short time, but left them with slight vertigo, buzzing of the ears, with all evidence of cerebral hyperæmia. The alvine evacuations were softened and of mushy consistence, changed to a clay color, and in one of the cases increased to diarrhœa.

Arriving at a résumé of my experiments, I must certainly proclaim the odorless naphthol which I had received from Dr. Wolff as not a toxic agent; and while I have found it a most useful remedial substance, and a disinfectant and antiseptic of the greatest value, it does not, in my experience, confirm the dangerous influence exercised on the human organism as reported by the gentlemen above quoted; a fact for which I can only account by the greater purity of the material used by me, — purified from the deleterious contaminations above enumerated by the process already described, which is not employed abroad, where yet naphthol is sold and used as reddish crystalline masses, with strong, pungent, and disagreeable odor. That it is far superior to carbolic acid and other disinfectants and antiseptics I have no doubt, and I am informed that in price it is not alone cheaper than the former, but, by its greater efficacy and smaller amount necessary, it is certainly more advantageous, aside from its greatest recommendation of being almost absolutely odorless. It must be

¹ British Medical Journal, page 750.

borne in mind that all my remarks apply to odorless naphthol, — only such as I have exhibited, — and that I consider that alone as safe for medicinal use.

RECENT PROGRESS IN PUBLIC HYGIENE AND STATE MEDICINE.

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SEWERAGE AND SEWAGE DISPOSAL.

Sewage Utilization at Pullman, Ill. — The practical results of sewage farming at the town of Pullman, Ill., have been thus far unusually successful, and demonstrate the fact that under favorable conditions the work can be conducted in such a manner as to yield a fair profit on the investment. The town of Pullman has a population of 8000 or more. During the past season the sewage farm has been devoted to an experimental crop of a varied character. A general estimate is given as follows: —

Acres cultivated, 160.

Total investment, \$80,000.

Estimated cost of operating, \$8000.

Estimated value of crops, \$12,500.

Estimated profit beside taking care of the sewage of 8000 people, \$4500.

With longer experience and better appliances the superintendent believes he can considerably increase this profit in coming years.²

Sewerage of London. — Complaints having recently been made that the sewage of London, which is discharged into the Thames below the city, at Crossness and Barking Creek, has become a nuisance to the inhabitants dwelling near the outfalls, the Secretary of State has, in compliance with statutes, recommended the appointment of a royal commission to investigate the cause of complaint. A commission has, therefore, been appointed and instructed "to inquire into and report upon the system under which sewage is discharged into the Thames by the Metropolitan Board of Works, whether any evil effects result therefrom, and, in that case, what measures can be applied for remedying or preventing the same."

Sanitary measures have accomplished much toward reducing the mortality rate of the great metropolis in the past half century, and the report of this commission as a continuance of the same important service will be looked for with much interest.³

The Sanitary Works of Paris. — M. Durand Claye, the secretary of the recent Commission appointed to report upon the sanitation of Paris, has published a summary of the proceedings of the Commission.

Certain points of interest in this report show a decided inclination on the part of the majority of the Commission to adopt a general sewerage plan in place of the storage of filth which has long been tolerated throughout the city. (The traditional sewers of Paris are not sewers in the sense of conduits for the conveyance of household sewage.)

At its session of June 21st the Commission adopted several resolutions relating to the regulation of —

(1.) Water-closets, with their accompanying supplies of water, and the soil-pipes connected with them. Also the necessity of traps between each house and the sewer.

² Sanitary News, October 1, 1883.

³ Report of Metropolitan Board of Works, May, 1883.