Bulkley (L. D.)

THE LOCAL USE OF TAR

AND ITS DERIVATIVES, INCLUDING CARBOLIC ACID,

IN

The Treatment of Skin Diseases.

BY

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IV.

THE LOCAL USE OF TAR

AND ITS

DERIVATIVES IN THE TREATMENT OF SKIN DISEASES.*

BY

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THE external use of tar is by no means of recent date, mention being made of it in the Hippocratic writings as a dressing for sores, while Pliny states that it cures papular eruptions and the itch of dogs and cattle, heals indolent ulcers, promotes the cure of carbunculous and sloughing sores, of fissures of the anus and nipples, and that it is also a remedy for alopecia. Similar virtues are ascribed to it by Dioscorides. Other ancient writers, including Galen, repeat the same account.†

Coming down to modern times, for the remedy seems to have fallen into disuse for a long time, owing, as Hebra says, to the disregard of all local treatment in the search after an *acrimonia sanguinis* to account for all skin affections, we find tar ointment recommended by Cullen in 1789, and Willan in 1809, in lepra or psoriasis, the latter alluding to the "powerful effect it has in allaying that troublesome itching which often attends the disease." Bateman repeats the same in 1824, with reference to lepra. Most writers since that date speak of its virtues in one or more cutaneous affections, especially with reference to its anti-pruriginous powers.

The tar employed in medicine is commonly that derived from wood, although coal-tar is used somewhat—I have never employed it—and furnishes the carbolic acid now in such common use; also much of the creosote.

We will first consider the varieties of wood-tar and their source, next their preparations and application, and then their therapeutical

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* Read before the New York Dermatological Society, January 21st, 1873.

† Stille, Vol. II., p. 486.

indication, hoping subsequently to treat of their derivatives, as creosote, acetic acid, turpentine, pitch and resin, also of coal-tar and its derivatives, carbolic acid and petroleum. The varieties of which we shall speak are, the common wood-tar, the oil of tar, the oleum cadini, the oleum rusci and the oleum fagi.

Ordinary wood-tar, the *pix liquida* of our pharmacopœia, is an impure turpentine obtained by destructive distillation, or slow combustion without the admission of air, of several species of the *pinus* and *abies*, the pine and fir trees of different countries; turpentine being the concreted juice exuding from incisions into these trees, from which again our *oleum terebinthinæ*, or spirits of turpentine, is prepared by distillation. Wood-tar, as obtained from the apothecary, is a very dark brown, semi-liquid substance, with a peculiar empyreumatic odor, and a bitterish, resinous, somewhat acid taste. It consists of resinous matter united with acetic acid, oil of turpentine and various volatile empyreumatic products, and is colored with charcoal, which component parts may be resolved by distillation into crude acetic acid, pitch and oil of tar.

Oil of tar, *oleum picis*, is a dark-brown liquid, quite oily in its look and feel, and having strongly the odor of tar. It is found to contain six principles, only two of which are of much importance, namely, *picamar*, to which it owes its bitterness, and *creosote*, on which its medical properties probably depend.

Oleum cadini, oil of cade, the best known in this country of the remaining three varieties, is obtained from the wood of the *juniperus oxycedrus*, and manufactured in the south of France. It is more syrupy than the last named oil of tar, but not so thick as the next named, *oleum rusci*, or as common tar itself. It is perhaps the most used variety in this country and France, partly, I imagine, from fashion, based on the idea that the odor is less disagreeable than the other varieties, which to me, however, is not the case.

Oleum rusci, or oil of birch, is the product of a similar destructive distillation of the bark of *betula alba*, or white birch, and is a product of Russia and Poland. Its consistence is much greater than the other two and its color darker, its smell, moreover, is far less unpleasant, and indeed, to many it is very agreeable, it being this oil which imparts to the Russian leather its peculiar perfume, now so highly esteemed. It is used extensively by Hebra, and valued most by him of all the empyreumatic oils. Anderson, also, recommends it very highly. It is more expensive than other preparations, which, however, is of importance only where it is used on a large scale, as in hospitals. It is rarely seen here; I have inquired for it in vain at a number of drug-stores; some keep it, however.

Oleum fagi is but very little known in this country, mention being made of it only by Hebra and Neumann, although it is the variety most commonly used in Germany. I have not been able to find a specimen yet, although I have instituted quite a considerable search among the city druggists. It is a German product, coming from the white and red beech, *fagus sylvatica*, the nuts furnishing most of the tarry oil.

PREPARATIONS OF THE TARS, AND MODE OF APPLICATION.

Tars are soluble in alcohol, ether, and the volatile and fixed oils, and may be made into ointments with various excipients, and further may be mixed with glycerine under certain conditions, and, finally, some of the oils of tar will dissolve iodine.

1. *Preparations and Uses of common Wood-Tar.*

The pharmaceutical preparation of tar of oldest date is the *unguentum picis liquidæ*, made by melting together equal parts of tar and suet, straining and stirring constantly while cooling. I have already metioned that Willan recommended tar ointment, as also Bateman, who says, in speaking of lepra: "In a few cases, the continued application of tar ointment has effectually cleared the skin of the patches, and restored its texture, even when internal remedies had little influence; but this advantage is not always permanent." I have used the unguentum picis liquidæ with good effect in scaly eczema, also in two cases of non-specific palmar psoriasis, combined with sulphur ointment in each instance. When nicely prepared and fresh, it is not an unpleasant application—very decidedly stimulant, and is especially applicable to ill-conditioned ulcers of the lower extremities.

Tar is sometimes employed pure, applied directly to the skin, alone or diluted one-half with olive or cod-liver oil. This is especially true of the three oils of tar last mentioned, particularly by Hebra, but I have seen most excellent effects follow the faithful use of common ship-chandler's tar in a very trying case of almost general psoriasis. A gentleman, aged thirty, first had psoriasis eleven years ago, which had been treated by different physicians with varying success, generally very unsatisfactory, until he began, two or three years since, the external use of common tar, first diluted one-half, when it began to disappear, and the body has remained almost entirely free during the past two or three years; when a new spot appears a brief course of tar removes it. I would say, however, that he has taken arsenic in combination with iron and bark most of the time, but the patches always resist until tar is applied. He has been very diligent in its employment, remaining often for several days or a week, and on one oc-

casion a whole month, with the continual contact of tar and the diseased surfaces. Hebra frequently directs a bath of an hour or two, while the parts are covered with tar or its oils. As applied in Vienna, the patient, after tarring, lies between blankets, completely naked, or sometimes underclothing of pure wool may be put on and the patient attend to business. Starch may be dusted on to hasten the drying.

In applying tar and its preparations, more is to be expected from an energetic friction at the time with a moderately stiff brush or flannel, than from a great expenditure of the substance employed. Dr. Wigglesworth, of Boston, in the January number of the *American Journal of Dermatology*, gives an interesting case of prurigo ferox where he prescribed most successfully Hebra's method of using his modified Wilkinson's ointment, and afterwards the application of oil of cade to the whole body, giving the bath thereafter for two hours.

It may be well to mention in this connection the local and general effects which may sometimes follow the use of tar. It may produce an acute eczema, some skins not tolerating the substance at all, while in others an acne is developed from closure and irritation of the sebaceous orifices, while Neumann asserts that the vapor of tar acts in the same way locally; as in workmen in factories where tar was manufactured or employed, this eruption was seen on the exposed parts, face and arms, while the body remained free. Again, the constitutional symptoms following the application of tar to one-third or more of the body are described as being quite severe in exceptional instances. They are, a high fever, fulness and pain in the head, pain in the stomach, vomiting of a blackish fluid, together with dark-colored fecal evacuations and urine. The latter may be darkly stained without having any great significance, this being often the only symptom, and will generally become lighter colored even under the continuance of the remedy. The addition of sulphuric acid to such urine develops a strong odor of tar, and a beautiful blue color results from the addition of chloride of iron.

Common wood-tar applied pure has many disadvantages, among which are its odor, color and stickiness, which may in a measure be rectified by combination with other substances, its efficacy being greatly increased, especially by a union with alkalies.

One of the most acceptable and useful preparations of tar is found in Guyot's solution, "Goudron de Guyot," a French secret remedy; in it the odor is masked very agreeably; it mixes perfectly with water in all proportions, and discolors the skin to a very moderate degree; moreover it dries rapidly and leaves very little stickiness. The late Dr. H. D. Bulkley had occasion to use this, when in Paris, for a very obstinate case of psoriasis in the person of a New York

lady, in whom the acute symptoms had been greatly aggravated by the treatment prescribed by Continental physicians. On returning to this city he succeeded, with the aid of Mr. Mittendorf, pharmaceutist, in imitating it, producing a most perfect watery solution of tar by means of caustic potash, which I now present for the first time to the profession. It has since borne the name, "*Liquor picis alkalinus*," the prescription for it being as follows: ℞. Picis liquidæ, ʒ ii, Potassæ causticæ ʒ i, Aquæ ʒ v. M. ft. sol. This, like the French solution, may be mixed to any extent with water, and is, in my experience, one of the best methods of employing liquid tar. The odor is not unpleasant; when diluted the clear solution is but little sticky, and it has the advantage that it can be washed off readily with water; the stain caused by it is also slight. This I have used in all degrees of strength, from one teaspoonful in a cup of water up to the pure fluid. The potash heightens the anti-pruritic effect of the tar, and the relief given by it is often immense; I will mention a single case:—

Mrs. M., aged 32, of intensely nervous temperament, with insanity in the family, and the subject of general paralysis eleven years ago, lasting four years, sent for me last April on account of a most severe lichenous eruption occupying the entire exterior surface of the right arm and extending over the shoulder upon the back. She is a literary lady, and was accustomed to spend at least twelve, sometimes sixteen or eighteen hours a day in writing, reviewing, correcting proof, etc., thus using the right hand and arm constantly. The eruption had commenced at the wrist eight months previously, and had extended ever since. The itching and burning she described as horrible, and the marks of her nails bore abundant testimony to that effect. She had been using various remedies under a physician's direction, each one aggravating the trouble, the culmination being reached in a wash containing sulphuret of potash, the pain and burning from which was almost insupportable, while the itching made life a burden. I gave her, together with internal treatment and an hypnotic, the above watery solution of tar, directing that she dilute it six or eight times, or use it of a strength, to give relief. She employed it with about six parts of water and the relief was immediate and perfect. She has since used it much stronger, even to the pure solution, under which the disease has disappeared, with the exception of one or two patches, which were removed by the application of blistering collodion twice.

I have used this solution with advantage in eczema, both in its chronic stage with thickenings, and in the more acute forms where exudation has about or nearly ceased, and the itching is intense. I have employed it in children with delicate skins. In chronic cases with infiltration it may be rubbed in full strength.

I have used this also with good success in four cases of lupus erythematosus, in varying strengths, the pure liquid being well borne after a while. The redness and thickening have diminished and the

improvement is manifest; the cases are still under treatment. The effects observed in psoriasis have been satisfactory as regards relieving the itching and diminishing the congestion and thickening, but caution must be observed in hastily judging of the effects of any remedy, external or internal, in this disease, which with its obstinacy is still so remarkable for its ready yielding to treatment in some instances, and even disappearing for a season spontaneously, *in spite* of medical interference. I find notes of ten cases in which it was advised, and in those cases seen afterwards the results were favorable, most of them continuing the remedy at last accounts.

In using the "*Liquor picis alkalinus*" it is well to remember the caustic potash which it contains, a drachm to the ounce, double that in the officinal liquor potassæ. For this reason Mr. Mittendorf attempted a more concentrated solution with less of the caustic, and succeeded with the formula: ℞. Picis liquidæ ℥ ss, Pot. caustic ʒ j, Aq. destillat ℥ j. M. ft. sol., in which the potash is in only about one-half the quantity. This also forms a clear solution with water. I have not used this, but it will prove of service where the action of the tar is desired rather than the alkali. Watery solutions were also made with carbonate of soda (not the bi-carbonate, which failed to combine) after the following: ℞. Tar., Carb. sodæ, aa ʒ ij, Aquæ ʒ iv. M. ft. sol. Likewise with carbonate of potash, as follows: ℞. Norwegian tar ʒ iij, Carbonate of potassa gr. xxv, Water ʒ v, Alcohol, a few drops. M. Here we have rather the action of the tar, the alkali being a mild one and only gr. xxv ad ℥ j. This solution, however, forms a milky emulsion with water.

Water alone will take up a certain amount of the active properties of tar, dissolving a small portion of the acetic acid and empyreumatic oil, including creosote and resinous matter, acquiring a sharp empyreumatic taste, the odor of tar and the color of Madeira wine. This is of service in the scaly affections, also as a wash sponged lightly over an exuding eczema, which is afterwards to be covered with an ointment. Tar-water is made by pouring four parts of water on one of tar, shaking them frequently together, pouring off the infusion and filtering it through paper. Hot water is said to extract more of the properties of tar than cold.

Hebra's celebrated compound tincture of green soap, the "*Tinctura saponis cum pice*," so highly praised by Anderson and others, deserves all the commendation I can bestow upon it. Wilson says, "We have nothing more competent to quell a raging pruritus than Hebra's famous lotion," which is composed of equal parts of tar or one of the oils, the German potash or green soap and alcohol. It is exceedingly valuable in the treatment of chronic eczema, psoriasis, etc., rubbed

well in, pure or diluted, and it is on account of the well-known virtues of this preparation that I expect much from the somewhat similar compound presented to-night of tar and potash, it having the advantage of possessing a much larger share of potash, which is invaluable in checking cell formation and removing effused products; it also forms a clear solution with water—Hebra's making an emulsion.

Tar mingled with alcohol alone, *tinctura picis*, in varying proportions, is of great service in certain conditions. I have employed it with great advantage, made with equal parts of tar and alcohol, in impetiginous eczema of the beard, applied even where there were acute imflammatory pustules.

The dispensatory directs a preparation of glycerinated tar, thus: ℞. Liquid Tar, Glycerine āā ʒ vi, Starch in powder ʒ ii. Warm the glycerine, mix with the starch, then add the tar and heat quickly to 212° Fahr. Strain if necessary, and stir while cooling. Dr. Piffard of this city presented a similar preparation to this Society some time since, also a glycerate of cade. I used this preparation a little, but without any very satisfactory results. I should expect it, however, to be serviceable in certain cases.

Another method of employing tar locally is in the form of soaps; of these I have seen several varieties, but have made practical use of but two: Constantine's Persian Healing or Pine-Tar Soap, and the Juniper Tar Soap of Caswell, Hazard & Co. Both answer the purpose of mild stimulants to the skin very well, but I have never seen the great benefit from them which we could wish from such a combination. It is hard to determine their real efficacy, as with me they have always been given in conjunction with other measures. Not infrequently, however, I have met patients who had previously used them of their own accord for various skin troubles without any benefit. They are irritating to some skins. Wilson advises the juniper-tar soap a great deal, and I have thought that I have seen benefit from it in scaly eczema, psoriasis, pityriasis and indolent acne.*

Finally, the efficacy of oakum in the treatment of bed-sores and indolent ulcers is undoubtedly due to the tar it contains.

II. *Preparations and Uses of the Oil of Cade.*

The oil of cade has been employed very frequently in a pure state, brushed directly on the skin. For the introduction of the oil of cade we are indebted largely to the French school, and to M. Bazin in particular, although Hebra has also used it on a very extensive scale. I saw impetiginous eczema of the scalp treated successfully in Paris

* It was remarked in the subsequent discussion, that tar-soaps were valuable as reducing to a minimum the irritation attendant upon the necessary employment of soap in some form or other.

by repeated applications of the pure oil of cade, also a case of chronic eczema of the scrotum with great thickening, removed by Hebra with renewed paintings with the same. Bazin advises the *huile de cade*, pure or diluted with sweet almond oil, in lichen and psoriasis and the vegetable parasite diseases.

I have used oil of cade very extensively in the form of an ointment with oxide of zinc, of each a drachm to the ounce of rose ointment, in the treatment of eczema, and when prepared well this forms a most agreeable application, allaying the itching to a very great degree. In eczema of children, in almost any stage save the very acute, I direct the crusts to be removed by poultices or oil, and cloths spread with this ointment to be kept constantly in apposition, to the total exclusion of air and water. Sometimes, however, when the crusts are not very thick, or when the skin has been much irritated by injudicious treatment or neglect, this ointment is best applied directly, it sufficing to soften the crusts which are removed with each renewal of the ointment. The old ointment may be wiped off, but never washed. My inclination now, however, is greatly in favor of the *oleum rusci*, next to be mentioned, or our ordinary tar ointment properly diluted, the preference for the latter being based principally on the good effects obtained with the liquor *picis alkalinus*, before spoken of.

Oil of cade is very commonly employed in forming the compound tincture of green soap of Hebra, as is also the oleum rusci.

Hardy unites cade oil with the glycerine ointment, as follows: ℞. Glycerine, 30 grammes, warm and add starch sufficient to reduce it to the consistence of ointment, mix carefully with this oil of cade, 4 to 6 grammes, and allow it to cool. It forms a very elegant preparation. Dr. Chapin (*Bost. Med. and Surg. Jour.*, April, 1859) combines it with the acetate of lead, thus: ℞. Oil Cadini ʒ ii, Glycerine ʒ v, Sol. plumbi sub-acetate ʒ i, to be rubbed over the affected part every night.

Wilson calls the following a "most certain and powerful anti-pruriginous lotion:" ℞. Oil of cade, Spirits of wine āā ℥ i, Water ℥ vi. M.

III. *Oleum Rusci.*

This oil claims, I think, more attention than it has hitherto received. It is the thickest of the tar-oils, and has by far the least unpleasant odor: the consistence is a great consideration in the opinion of Neumann, and when diluted its odor not at all disagreeable. Its color, however, is darker than the oil of cade, which sometimes is a consideration, when exposed parts are to be treated. My experience has shown it to be stronger, that is, more stimulating, than the oil of cade, its preparations and applications being the same.

IV. *Oleum Fagi.*

This, as before stated, is rarely seen in this country. It is the common tar of Germany, entering largely into the therapeutics of skin-diseases at Vienna. It is a component part of Hebra's famous "Kursalbe," a modification of Wilkinson's ointment, after this formula: ℞. Olei fagi, Flor. sulph., āā ʒ iii, Cretæ alb. pulv., ʒ ii, Saponis viridis, Axung. porci, āā ʒ vi. M. ft. unguentum. I have not found any special virtues claimed for the oleum fagi, nor, indeed, do the German pharmacopœias give it at all; I insert it here for completeness alone.

THERAPEUTICAL INDICATIONS FOR THE USE OF TAR.

Some judgment is necessary, and some experience, to know just the moment to employ tarry preparations, and just which form will best suit the case in hand, for a routine treatment in the use of this remedy will be surely followed by want of success. Chiefly is it to be remembered that tar is a local stimulant, and even when it gives relief from pain and itching it acts in this manner, as Anstie has shown that food and alcohol relieve pain, reduce excessive secretion, increase local nutrition, etc., in virtue of their stimulant properties.

Tar, then, as a local stimulant fulfils three indications: 1st, to check irritation or relieve itching; 2d, check secretion or diminish the formation of scales; 3d, Improve nutrition or remove cell deposit. The first and last of these are intimately connected, the first being frequently dependent on the last, as in true prurigo, when the papules give rise to the itching by the cell pressure on the nerve termini, a condition seen also in chronic eczema. Bearing in mind these three modes of operation of tar, let us see where it is contra-indicated.

Take first the disease psoriasis, in which it has won, perhaps, its greatest reputation, and in which, as we have seen, it was recommended by Willan nearly seventy-five years ago. When there is some itching with burning and hyperæmia, with the development of new spots, any strong preparation of tar will certainly do harm, and the disease requires a soothing treatment, emollient baths, together with diuretics and mild cathartics. But even here I have seen relief given by the *Liquor picis alkalinus*, very largely diluted (say ʒ i. to ℥ i. water), and applied without friction. In chronic cases, where there are excoriations or cracks, tar will irritate. When, however, the disease has lasted for a time, remaining in a measure quiescent, we may safely venture a very considerable amount of stimulation, proportioned to the extent of the eruption. At the College Clinic the most common form used in such cases has been Hebra's compound tincture of green soap, rubbed well in after the removal of the scales, by washing with

green soap, by scratching, or a water-dressing, or, if they are very hard, a poultice. And I may here say, that whatever preparation of tar is chosen, it is next to useless to simply apply it over the hard, imbricated scales, as will most certainly be done unless the physician directs definitely to the contrary. When the mixture contains a considerable amout of potash, as Hebra's soap tincture or our alkaline solution, this will often be sufficient to remove the scaly accumulation if well rubbed in.

When the tendency to scaling is not very great, but where thickening and redness still remain, we may try more decided stimulation, using the *unguentum picis liquidæ*, the pure empyreumatic oils, or the *liquor picis alkalinus*, up to full strength, or the ship-chandlers' tar undiluted, as in the case before given.

Equally valuable, in my estimation, is tar in the management of eczema, and with a proper selection and mode of application, will benefit at some period a large share of the cases of this very common and troublesome disease. But here, even more than in psoriasis, must a proper position be taken, or the remedy is worse than useless, inasmuch as the acute stage and condition of eczema bears a greater proportion to the chronic than in psoriasis. In this, pain, heat and inflammatory swelling are as a rule definite contra-indications to the employment of any of the products of destructive distillation, while thickening of the skin without acute inflammatory action, itching without pain or burning and chronicity, call loudly for some preparation of tar. Again, lasting pain on application, with increased heat of the part, indicate clearly that the use of tar should be abandoned for the present, at least; while absence of feeling, or a sense of relief from its use point to a continuance of the remedy, it may be, in augmented strength. The oil of cade in zinc ointment, ʒ i. ad ℥ i., is perhaps my most frequent prescription of tar, unless it be the caustic solution, brought forth so prominently in this paper. This latter is so convenient and serviceable that it can be left in a measure to the patient to dilute it to suit the feelings and condition of the parts, as in the case of lichen or papular eczema already narrated. A good method is to use the wash and apply zinc or some other mild ointment thereafter, repeated once or twice, daily.

In lupus erythematosus, tar will sometimes act wonderfully well, either applied pure as one of the oils, or rubbed energetically on, in the *tinctura saponis cum pice*, or our alkaline aqueous solution. The two latter I have employed with a fair measure of success, but very much must not be expected from this or any other remedy in a disease so notoriously rebellious to treatment. When the tar seems to irritate the surface, when there is heat, swelling and extension of the

disease, it must be discontinued at once, and should never be used while there is an acute inflammatory condition of the parts.

The tars have been extensively employed from time to time in the treatment of the vegetable parasitic diseases, Bazin using the oil of cade to a great extent in favus, brushing it directly on the skin, undiluted or mixed with other oils. Tinea tonsurans can be cured by keeping the spots painted continuously with one of the pyroligneous oils, or with repeated frictions with tar ointment. I have used the compound tincture of green soap and tar, but the color and odor of tar are obstacles to its use in exposed positions where other means will answer. Nayler gives, with recommendation, the treatment employed on a large scale in tinea circinnata in a London district school; the preparation is made after this formula: ℞. Iodinii pur. ʒ ii, Ol. picis (sp. gr. 853) ℥ i. M. et solve. These should be carefully mixed, otherwise an amount of heat will be generated and the iodine dissipated. This is rubbed in freely after the hair has been cut short, and allowed to dry on, one application being sufficient to cure recent cases, but in the more chronic it needs to be repeated three or four times. It does not cause irritation or inconvenience.

Various means have been devised for avoiding the color and disguising the odor of tar. It was hoped that the former was obtained in carbolic acid, which, however, has proved itself far inferior to tar in efficacy,—but of that hereafter,—while the odor may be in a measure corrected by the addition of some of the essential oils—Hebra commonly adds a little lavender to his compound tincture; Guyot's *goudron* has very little of the smell of tar. The *liquor picis alkalinus* smells more of the caustic potash than of the tar, and when diluted is very little offensive.

Such are a few of the interesting points which have occurred to me in the study of this single remedy. Much more might be said, but I have already exceeded my intended limits in time, and I must beg leave to defer the consideration of the products of tar, as creosote, acetic acid, turpentine, pitch, and resin, also of coal-tar, and its derivatives, carbolic acid, etc., to a future occasion, if the Society shall honor me with an invitation to appear again before them.

VIII.

THE LOCAL USE OF TAR

AND ITS

DERIVATIVES IN THE TREATMENT OF SKIN DISEASES.

BY

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(PART II.)

In our former article * we discussed the preparations and mode of employment of common tar and its oil, also the oleum cadini, oleum rusci and oleum fagi; it remains to examine the nature and applications of the other results of destructive distillation, namely, pyroligneous acid and its products, acetic acid and creosote, and pitch, likewise turpentine, resin and resineon, as also coal tar, with its carbolic acid and naphthalin; finally, petroleum.

When wood is submitted to a high temperature in closed vessels its organic elements are separated and pass off in vapors, which may be largely condensed into two liquids of different densities and properties; these are, crude pyroligneous acid and tar. If the wood is burned coarsely in pits for the production of the tar of commerce, these two are united, forming the *pix liquida* of our Pharmacopœia, from which the acid may be obtained by distillation. Pyroligneous acid furnishes us with much acetic acid, which likewise results from an acetous fermentation of certain vegetable substances, the same which are susceptible of vinous fermentation.

Pyroligneous acid was used considerably in skin diseases in former years, mainly, it appears, for its antiseptic power, dependent upon the creosote it contains, and was applied to sloughing gangrenous ulcers with the best results; it was also used in the parasitic diseases, where its action is assisted by its acetic acid as well.

* Archives of Scientific and Pract. Med., Feb., 1873, pp. 123-133.

Acetic acid is officinal in three different strengths: the glacial, sp. gr. 1,065; commercial, sp. gr. 1,047, and dilute, sp. gr. 1,006.

Glacial, or mono-hydrated acetic acid, HO $C_4H_3O_3$, is a decided irritant to the skin, and when kept applied pure, will produce vesication; it has been found very effectual in removing warty growths, and a moderate patch of tinea circinata may be cut short at once by a thorough application of this acid. Dr. Buck of Germany reports* a great measure of success in psoriasis following the local use of strong acetic acid painted on the patches after removing the scales with soap and water and friction. The tissue becomes white and puffed out, and the surrounding tissue inflamed; the smarting at first is moderately severe, but subsides in the course of fifteen minutes. This is to be renewed when the scales fall off in a few days. By this means the eruption is said to be removed easily within eight weeks, no eschar being left. The property of allaying itching, which we noticed as belonging so markedly to tar, is found also in acetic acid, which when diluted as a wash will ofttimes control the intolerable pruritus of urticaria and other affections: its action, like that of tar, depends upon its stimulant properties. Acetic acid in various dilutions has been found to greatly mitigate the pain and improve the condition of cancerous ulcerations.†

Creosote. Much confusion has existed with reference to creosote, it being described as a derivative of both wood and coal tar, whereas the two products are quite distinct, although resembling each other, the substance from coal tar being crude carbolic or phenic acid, creosote resulting from wood tar, the German pharmacopœia naming especially that from the beech, *oleum fagi.* Much that is sold for creosote is said to be the impure carbolic acid, ‡ coal tar furnishing in proportion many times the amount of this acid to the creosote of wood tar.

Shortly after the discovery of creosote by Reichenbach, in 1830, it seems to have been most extensively employed in dermatology and with very good success, and has since held quite a prominent place in the treatment of skin diseases, although its odor prevents its very general use. In its pure state it may be brushed over indolent or gangrenous ulcers beneficially, but placed in contact with the healthy skin for ten or twenty minutes it induces superficial inflammation. It has been employed to remove nævi, applied two or three times a day, more or less diluted. Excoriation, ulceration and gradual disappearance of the nævus ensues, leaving a smooth and sound cicatrix.§

* Berlin klin. Wochensch. Am. Practitioner, Sept. 1872.
† Brit. Med. Journal, April 21, 1866.
‡ Dispensatory, 1872, and N. Y. Med. Jour. 1869, p. 161.
§ Braithwaite, XI. p. 186.

Creosote is said to unite in but two proportions with water: one part to eighty of water, and one part of water to ten of creosote; it is however soluble in all proportions in alchol, ether and alkaline solutions.

Creosote is of greatest value in the scaly diseases, as also in relieving itching, particularly in chronic eczema; it is also useful as a wash in burns and chilblains; for the latter Devergie advises the following ointment:—℞. Creosoti, Liq. opii subacet, āā gr. x Ext. opii gr. iss. Adipis ʒj. M. Creosote has been strongly recommended in erysipelas, in the strength of two drachms to the ounce of ointment, almost a specific effect being claimed for it; also painted full strength over the inflamed surface.* Squire has recommended to use creosote in chronic psoriasis, in the proportion of two ounces to one of white wax, the ointment to be rubbed firmly into the eruption morning and night, after removing the scales. Anderson has found it useful, but too irritating in some cases. He adds from five to ten minims to ointments for the purpose of allaying irritation of the skin. Tilbury Fox employs six drops of creosote with six grains of the nitric oxide of mercury to the ounce, in cases of psoriasis in hospital practice.‡ The officinal ointment of creosote is of the strength of half a drachm to the ounce.

Analogous to creosote, and probably depending upon it for any medicinal virtues it may possess, is common wood *soot*, which has been used in earlier times locally in many skin affections with asserted excellent and rapid effects. It was prescribed mostly in the form of a decoction, made by boiling two handfuls of soot in a pint of water for half an hour, and has been applied to parasitic eruptions and also to burns. Cazenave gives an ointment of a drachm to two ounces of lard, others a drachm to the ounce, which is reported to have been very successful in curing obstinate cases of chronic eczema.

Pitch.—Several different substances pass under this name, Pix Burgundica, Pix Canadensis, Pix liquida or common tar, treated of in our former article, and Pix nigra, the residue from the distillation of wood tar, together with coal-tar pitch. These substances are all mildly stimulating; entering into the composition of plasters which act by their counter-irritant effect upon the skin, they may in some cause considerable local inflammation. The older writers on dermatology recommend ointments of pitch for the cure of scabies, prurigo, and the scaly diseases. I do not know of their use in later times. The pix nigra enters into the composition of the *Emplastrum fuscum*,

* Am. Jour. of the Med. Sci., July, 1848, p. 152.
† On the Treatment of Diseases of the Skin. London, 1872.
‡ Skin Diseases. London, 1873.

much used in Germany for boils, etc., as in the formula: ℞. Camphor ʒ ss., Picis nigræ ʒ vi., Ceræ flavæ ʒ ix., Plumbi oxid. rub. ℥ ij., Olei olivarum ℥ iv. M. To be melted together till a little burned.

Turpentine in its natural state is seldom used in medicine, but on distillation yields the *oleum terebinthinæ*, or spirits of turpentine and *resina*, both of which are of occasional service in cutaneous therapeutics. Oil of turpentine has been highly recommended in burns in the *linamentum terebinthinæ* introduced by Kentish in 1797, and again brought forward by Greenhow in 1831 and 1838, and which has since become officinal. It is made by adding, with heat, twelve ounces of resin cerate to half a pint of oil of turpentine. The parts burned or scalded are to be covered at once with this on lint, to the total exclusion of air, avoiding the healthy parts.* A good liniment for chilblains is composed of equal parts of spirits turpentine, tincture of aconite or belladonna, and soap liniment.† Oil of turpentine is said to cure the itch very speedily, by simply sprinkling the bedclothes and night-dress with an ounce and a half of the substance, the cure taking but one night.‡ Turpentine has been given internally with good results in certain hemorrhagic affections, and purpura rheumatica is reported to have been cured by it.§

Resin is an active ingredient in basilicon ointment, our officinal *ceratum resinæ*, one of the most commonly used ointments in chronic ulcerations, and often prescribed in eczema of the legs. It is well to remember that this is certainly stimulating and rather provokes suppuration, and is consequently contra-indicated in acute inflammatory states, instances of the forgetfulness of which fact I am constantly meeting with.

Resineon is given by Neumann as an ethereal fluid, colorless in its fresh state, turning dark afterward. It is one of the products of distillation from wood-tar, is very quickly absorbed, and soon imparts the odor of tar to the urine. He employs it in psoriasis after the following formula: ℞. Resineon, Petrolei, āā ʒ i., Saponis viridis, Axung. porci., āā ℥ iss., Pulv. pumicis q. s. ut ft. unguentum. To be rubbed in well. Hebra mentions it.

Coal Tar.—This substance, *pix mineralis*, is but little used in cutaneous medicine; although its derivative, carbolic acid, has gained considerable reputation in the treatment of skin diseases. Anderson‖ indicates the employment of coal tar in certain scaly stages of eczema, and gives a prescription whereby an emulsion is produced on dilution with

* Stillé, vol. i. p. 622.
† Tilbury Fox—Skin Diseases. London, 1873.
‡ Am. Journ. of Med. Sci., July, 1848, p. 152.
§ Stillé, vol i. p. 617.
‖ A Practical Treatise on Eczema, 2d edit., p. 109.

water to suit the requirements of the case, and which he imagines represents, in a measure, the "*liquor carbonis detergens*," an English patented preparation. It resembles our watery solution of tar, *liquor picis alkalinus*, before given, with the exception of forming an emulsion with water instead of a clear solution. The following is Anderson's formula: ℞. Picis mineralis ʒ ii., Spts. rectificati ℥ ii., Cola et adde Liquoris ammoniæ fort. ♏viii., Glycerin (Price), ʒ vi., Aquæ destillat. ℥ xii. M. Sig., sponge the parts two or three times daily. The "liquor carbonis detergens" he alludes to as an excellent preparation. He also uses coal tar in eczema in the form of an ointment, thus: ℞. Picis mineral. ʒ ii., Glycyrini ʒ iii., Adipis unguent. ℥ iss. M.

Coal tar is also used for its disinfecting and antiseptic properties, and is applied to fetid gangrenous or sloughing ulcers in the form of a powder, made by mixing from one to three parts or more of coal tar with one hundred of plaster of Paris, forming a uniform grayish, pulverulent mass. I saw this used largely in Vienna by Professor Zeissl, as an application to gangrenous and unhealthy ulcerations, especially those resulting from buboes. The results were excellent, a healthy action replacing the destructive process, and all offensive odors were checked. It was laid directly on the diseased surfaces by means of a spatula, large cavities about the groin sometimes being filled up with several ounces of the preparation. This was removed in about twenty-four hours, generally caked firmly by the exudation, and the parts were syringed to free the wound from particles of the dressing, and then filled anew with the powder. The treatment was considered a success.

V.

ON THE EMPLOYMENT OF CARBOLIC ACID IN DERMAL THERAPEUTICS.*

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NOTWITHSTANDING the fact that this acid has been discovered nearly forty years, and has become an article of almost daily use with many, it has but recently obtained a place among our officinal drugs.

Carbolic acid is generally found in the shops in the form of a transparent oily fluid, and in prescribing for is to be written for in drops or minims, inasmuch as the crystalline form is soon lost after exposure to the air from the absorption of a very little moisture; also the crystals melt at from 95° to 106°, and are readily liquefied by immersing the bottle in warm water. I am told by one druggist that the carbolic acid sold for pure acid is kept liquid by adding a drachm of water for each ounce of crystals, and this they reckon at a drop to the grain; another adds five per cent. water, by weight. The acid is but sparingly soluble in water, Crace Calvert says, 3 parts in 100, *i.e.*, gr. xv ad ℥i; Lemaire gives 5 to 100, *i.e.*, gr. xxiv ad ℥i; this proportion may be much increased by the addition of from five to ten per cent. of alcohol or acetic acid; it is perfectly soluble in alcohol, ether and glycerine, and partially so in glacial acetic acid. Mr. T. A. Redwin, in a paper before the British Pharmaceutical Conference, advises always to dissolve the crystallized carbolic acid (Calvert's) in the proportion of one part by weight of the acid to six of glycerine, forming a carbolate of glycerine, which can be diluted as required.†

The local effects of carbolic acid in skin diseases are, I believe, referable to three modes of action,—its stimulant, anti-septic and anti-parasitic powers. Its anti-pruritic powers depend to a great degree

* Continuation of the author's paper "On the local use of tar and its derivatives in the treatment of skin diseases," in Nos. 2 and 3 of this Journal, pp. 123 and 272, Feb. and March, 1873.

† N. Y. Med. Journ., vol. xii., p. 448.

upon its stimulating effect, as in the case of the preparations of tar already mentioned, and also on a specific benumbing of the sensory nerves, often, however, I conceive, upon its destruction of the pediculi or acari which have been the cause of many of the cases of pruritus passing under the name of prurigo. Its antiseptic virtue Prof. Lister, of Glasgow, holds to be due to its destructive action upon certain minute organic germs in the air, which entering open wounds cause a decomposition of the blood or serum, and consequent inflammation and suppuration.* This view has been opposed by Dr. Wolfe of Aberdeen, Sir J. Y. Simpson of Edinburgh and others.† Of its parasiticidal powers we will speak later.

Pure carbolic acid acts powerfully upon the skin, but its destructive effects are very superficial. It coagulates the albumen, and so produces a white surface, the depth of which may be increased by repeated applications. Wilson has employed it successfully as a local anæsthetic, previous to cauterizations in lupus and epithelioma.‡ Dr. Bill, of the U. S. Army, reports a similar anæsthetic effect, having laid bare the radial artery on his own arm, the incision of the integument being rendered painless by the application of carbolic acid. He has since employed this means constantly with uniform success in all minor cutting operations. He first applies for fifteen minutes or half an hour a weak solution of carbolic acid, either by compresses or soaking the whole part, then traces with a camel's hair brush, dipped in strongest acid, the course of the intended incision.§ Dr. Andrew H. Smith, of this city,‖ also made some experiments on his own person in this direction, painting carbolic acid of about 85 per cent. on the forearm. "For about a minute there was a slight burning sensation, after which the integument became entirely insensible, the cuticle being whitened and shrivelled, and the spot slightly elevated. An incision was then made about half an inch through the whole thickness of the skin. This was done without even feeling the contact of the knife. The capillary circulation seemed not to be materially interfered with, as the blood flowed as freely as it would from a similar wound under ordinary circumstances; the reparative process was also not impaired, adhesion taking place immediately. Three hours after the application of the acid, a needle could be thrust freely into the skin without causing pain." He also used it in two cases before incising a whitlow, which operation was then almost painless.

* Lancet, March 16, 23, 30, April 27, July 27, and N. Y. Med. Jour., Vol. 6, p. 264, and Vol. 9, p. 152, and Braithwaite, 58, p. 127.

† Braithwaite, 56, p. 124.

‡ Journal of Cutaneous Medicine, Vol. 4, No. 13.

§ Amer. Jour. of Medical Sciences, Oct. 1870, p. 573.

‖ The Medical Record, June 1, 1872, p. 231.

Lister also mention its local anæsthetic effects.* The pure acid has also been applied directly to wounded surfaces, and injected into the cavity of boils, whitlows and abscesses with excellent reported results. It has also been applied in a pure state with success to venereal vegetations; also mixed with camphor, thus: ℞. Camphor gr. xv., Acid carbol. ʒ j. M. Heat to deliquescence; two or three applications serving to remove them.† Likewise in primary syphilitic sores by Dr. Holmes Coote.‡

As a wash for indolent ulcers, especially when attended with fetid discharge, a watery solution of from 8 to 15 grains of carbolic acid to the ounce is one of the best, but in my experience it will carry the healing process but to a certain point, when other means serve far better to promote complete cicatrization.

Burns and scalds have been very extensively treated by this means with excellent results, Professor Pirrie, of Aberdeen, being one of the first to try it.§ It is but to dissolve the acid in linseed or olive oil, ʒ ss or ʒ j ad ℥ j, also in the linimentum calcis, ʒ j ad ℥ jv, with which cloths are to be saturated and kept in contact with the injured surface, covered with some impermeable dressing, as gutta-percha paper.‖ Dr. Squibb thinks harm is done by too strong solutions of carbolic acid in burns, and has seen one of the strength of from two to four grains to the ounce give relief, whereas a strong solution produced a pain exactly like that of the burn.¶ He has often experienced its benefits in his own person, once after a scald from a jet of steam.** The same has been found serviceable as a dressing to blistered surfaces. I have used with very good results an ointment of carbolic acid, ♁ j. ad ℥ j., in frosted fingers and toes, with ulcerations, the pain subsiding at once, and a healthy reparative action ensuing.

From the beneficial effects obtained in these and other inflammations of the skin it was thought that carbolic acid would prove exceedingly useful in eczema, at once allaying the itching and pain, preventing suppuration and mildly stimulating the diseased surface to healthy action. I regret that these hopes have not been realized in my practice, although some record success with it. I am certain that it does harm in many cases of acute eczema, and not infrequently see patients who have had their trouble much aggravated by the use of

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* Braithwaite, 58, p. 129.
† N. Y. Medical Record, July 15, 1871, p. 223.
‡ Brit. Med. Journal, April 25, 1868.
§ Lancet, Nov. 9, 1867, p. 575.
‖ Lancet, Feb. 1, 1868, p. 181; and Cincinnati Med. Repert., Oct. 1869.
¶ N. Y. Med. Jour., Vol. ix., 1869, p. 158.
** N. Y. Med. Gazette, April 18, 1868, p. 236.

this substance in various ways under the direction of a physician. If it is used at all in exuding eczema, I believe it should be greatly diluted, not stronger than two to four grains to the ounce, although it is reported that a seven or eight grain solution ended up chronic infantile eczema with fresh accessions.* Anderson has seen cases where a four and a half grain lotion has removed excoriations and ulcerations almost completely within a week, but also advises the employment of from half a grain to four and a half to the ounce.†

More may be expected from carbolic acid in the chronic forms of cutaneous disease, and here let me first mention its internal use, which has been tested extensively by Kohn and Neumann, of Vienna,‡ and also reported on by others. Their results show that it has an effect in diminishing the hyperæmia of the skin and in alleviating the pruritus to a considerable degree, six to nine grains a day accomplishing all that a much larger quantity will. Psoriasis at its inception was checked thereby, but temporary benefit being observed in old cases, inasmuch as the remedy after removing the congestion was incapable of reducing the thickening beneath the patches. Prurigo and pruritus were relieved, the papules of the former subsiding as the scratching was obviated. Prof. Binz, of Bonn, also testifies to its value in certain cases of pruritus.§ Dr. Güntz, of Dresden, has given carbolic acid internally to at least 150 patients and finds that cases of pruritus alone with no lesion of the skin are relieved and cured by it. In true prurigo the results are uncertain, sometimes good, often bad; the remedy must be continued for some time to produce any great effect, and often the patient is relieved only while taking the medicine. No satisfactory results in eczema, psoriasis, lupus or syphilis.‖ Dr. Rothmund¶ speaks in the highest terms of its internal use in prurigo and pruritus, advising, after repeated trial, the injection of it hypodermically, giving about $\frac{1}{6}$ of a grain each time from a solution of about four grains to the ounce. All the results have been unsatisfactory in the treatment of syphilis by the internal use of this acid. Sigmund** agrees with Neumann and Kohn in this.

Externally applied, carbolic acid, like all the tars, is of greatest service, besides its parasiticidal value, to be considered hereafter, where there is chronic hyperæmia and thickening, together with consequent

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*N. Y. Med. Jour., Sept., 1868, p. 515.
†A Practical Treatise on Eczema. 2d Edit. London, 1867, p. 111.
‡Archiv für Dermatologie und Syphilis, 1869, pp. 219 and 424.
§Practitioner, Jan., 1871, p. 59.
‖Archiv für Dermatologie und Syphilis, 1872, p. 551.
¶Aertzliches Intelligenzblatt—quoted in Half-Yearly Compend. of Med. Sci., Jan., 1873, p. 861
**Practitioner, July, 1872, p. 61.

scaling and pruritus. These elements are found in varying degrees in chronic erythema, chronic eczema, psoriasis and prurigo, and in these do we obtain the best results from the use of carbolic acid. As a rule, ten or fifteen grains to the ounce in solution, or twenty in oil or ointment, is quite strong enough, certainly to commence with, and even a less strength will often relieve the itching. Anderson gives the following formula often used by himself:—℞. Cryst. carb. acid, ʒ ij; Price's glycerine, ʒ vj; Rectified spirit, ℥ jv; Distilled water, ℥ j. M. Sponge the affected parts two or three times a day, and also when itching is complained of. Dr. M'Nab* reports great success in psoriasis following the use of carbolic ointment, one part to four of lard, by weight, applied every night at bedtime with gutta-percha tissue covering. The disease is treated internally with arsenic and medicines to place the system in health, but he considers the specific local inflammation to be "more amenable to the direct curative influence of carbolic acid than to any other therapeutic agent with which we are acquainted." Dr. Liveing agrees in general with Dr. M'Nab, and advises its internal use, saying that it certainly cures some cases of psoriasis in which arsenic has failed to produce its usual effect.† F. P. Mann‡ gives a case of inveterate psoriasis where an aqueous lotion with Donovan's solution internally removed the disease of two years' standing in a girl aged fifteen. My experience has not been favorable in the treatment of psoriasis with carbolic acid, but I have never used it in the strength which these writers recommend. Most writers consider it as inferior to the preparations of tar in the treatment of the scaly diseases, having, however, the great advantage of the absence of color.

Remembering the great advantage obtained by combining tar with a large amount of alkali, in the "*liquor picis alkalinus*," and that caustic potash is known to be serviceable in removing effused products, I have imitated this watery solution of tar in the substitution of carbolic acid in the same proportion, after the following formula:—℞. Acidi carbolici, ʒ ij; Potassæ causticæ, ʒ j; Aquæ, ʒ v (by weight). M. ft. sol., a combination which I do not find recorded anywhere, except the mention that a little liquor potassæ will increase the solubility of carbolic acid. I present this prematurely, not having had time to record sufficient cases to warrant my recommending it, and desiring that others should make a trial of it in comparison with the alkaline solution of tar given in my former paper. This alkaline carbolic solution, "liquor carbolici alkalinus," forms a clear mixture

* Lancet, March 19, 1870.

† Lancet, April 23, 1870, and The Treatment of Skin Diseases, 1870, p. 44.

‡ N. Y. Med. Jour., September, 1868, p. 515.

with water in all proportions, and can safely be left to the feelings of the patient to apply of a strength to suit the case. In its pure state it acts quite powerfully on the skin, it being one part in four by weight of carbolic acid, and has double the amount of caustic potash found in the officinal liquor potassæ. Diluted, one drachm to the ounce of water, it gives a lotion of 15 grs. to the ounce, proper to apply to indolent ulcers, and to relieve moderate itching, or as a parasiticide, where the alkali assists in disintegrating and removing the scales. In small spots of tinea it can be applied full strength. Diluted two or three times it answers, when well rubbed in, to relieve the itching of eczema of the legs, or may be applied up to full strength in these cases and in psoriasis, as was recommended with the tar solution. In psoriasis the potash will serve to remove the scales, causing the acid to penetrate to the diseased cells.

Carbolic acid is also well applied in the glycerine ointment, made by stirring powdered starch into boiling glycerine till the consistence of an ointment is reached, to which, after cooling, the acid may be thoroughly mixed to suit the requirements of the case,* from 5 to 10 grains and upwards to the ounce. It may, however, be often incorporated in any ointment, that of the oxide of zinc, simple cerate, ung. stramonii, ung. resinæ, etc.

Carbolic soaps have been employed, containing 20 per cent. of this agent, and are recommended by some.† I have never used them.

The most decided and certain action of carbolic acid in dermal therapeutics is in its effect upon the parasites which infest the human skin. It is destructive to life, as has been shown where small animals have been exposed to a vapor of carbolic acid in confined vessels, also lice on a rose-bush, where both were killed by a solution of about two grains to the ounce.‡ Mould likewise is speedily arrested in its growth when brought into near contact with a solution of 1:500;§ Neumann has also proved that fermentation is arrested, and the penicillium glaucum, mucor racemosus, and other fungi cease to grow when treated with very dilute carbolic acid.‖ Carbolic acid has also caused death in the human subject, in two cases from the asserted absorption of it when applied for the itch, another when injected into the rectum, another when swallowed.

Most of the parasitic diseases have been reported as cured by carbolic acid; with some it is quite common in the treatment of scabies.

* Journal of Cutaneous Medicine, Vol. 4, No. 16, p. 324.
† British Medical Journal, Nov. 26, 1870, p. 582.
‡ Am. Jour. of Med. Sci., July, 1868, p. 33.
§ New York Med. Gazette, April 18, 1868.
‖ Archiv für Dermatologie und Syphilis, 1869, 3, p. 440.

Rothmund* gives :—℞. Acid carbolic, ℈i ; Ol. lini, vil. glycerine, ℥ ij, M., patients to be rubbed thrice daily with ; even old cases yield in 2½ days. Lemaire says that in itch a simple application of one part of carbolic acid in forty of vinegar and one hundred of water is sufficient to kill the acarus.† I have used a lotion of carbolic acid, gr. x, xv ad ℥ j, in dispensary practice in cases of phthiriasis corporis, it having the further advantage of allaying the itching speedily, an important item in many cases. But whatever treatment is adopted in the animal parasitic diseases, it must never be forgotten that clothing may remain a permanent source of infection, and a cure can be obtained only by disinfecting the garments, as it were, either by subjecting them to considerable and prolonged heat, as baking in an oven many hours, or thoroughly saturating them with the carbolic lotion, a cleanly procedure.

The diseases dependent upon vegetable parasites, *tineæ*, are treated by many with carbolic acid, and in my experience recent cases may be removed with a moderately strong lotion or ointment, but after the disease has lasted for a time very little benefit can be derived from it. The reason for this is found in the superficial nature of the trouble in the first instance and its deep-seated character in the second, extending even into the hair-follicles and between the epidermal cells, a cause of failure with other really excellent parasiticides. Another cause of the want of success in the use of carbolic acid in these affections is its imperfect application. Neumann observed‡ that a solution of 1:500, or about one grain to the ounce, will arrest the growth of microscopic fungi only for a season, and after three days' respite they grow as luxuriantly as ever ; a solution of 1:300 (*i. e.*, gr. jss ad ℥ j) will check their development for fourteen days only, but when concentrated it destroys their life. If the acid is used, therefore, it must be in some strength, and it is well to cover it with some impervious dressing, as gutta-percha paper, to prevent evaporation. A mixture of equal parts of carbolic and acetic acid is effectual, but can, of course, be applied to only a very limited area at once. From the experiments of Neumann we learn that a continuous atmosphere of carbolic acid must be maintained in order to destroy the fungus.

My experience in the treatment of the dermatophytic diseases with carbolic acid has not been very great, as I much prefer sulphurous acid and other remedies ; what I have seen of its action, however, in cases which have come to me, has been unfavorable to its employ-

* Archiv für Derm. und Syph., 1872, 3, p. 464.

† Sydenham Year Book, 1861, p. 440.

‡ Archiv für Dermatologie und Syphilis, 1869, 3, p. 440.

ment. Nevertheless the testimony in favor of it in this class of affections is great. Küchenmeister has applied carbolic acid with the most satisfactory results, both in medical and surgical practice, as a means of arresting putrefaction and preventing the development of fungi.* James Watson, of Edinburgh, considers it one of the most efficient parasiticides known, reporting cases of favus and alopecia areata cured by it.† Lemaire in tinea uses a solution of one part of acid, forty vinegar and one hundred water with good results. Parasitic sycosis is reported as cured by creosote with equal parts alcohol and water.‡ Neumann§ advises in favus, after removing the crusts and epilating, to wash the affected parts twice a day with sapo viridis and keep them moist with a lotion composed of ℞. Acid carbol., ʒ j; Glycerine, Alcohol, āā ℥ j; Aquæ destillat., ℥ vj. M., recommending the same in tinea tonsurans. Dr. Browne, of Liverpool, obtained very good results in tinea tonsurans and circinnata with carbolic acid, but not better than that following other treatments; but one case of favus was thus treated, and that successfully, with an ointment of a drachm of acid to an ounce of glycerine thickened with spermaceti, applied under gutta-percha.‖ The results were decidedly unsatisfactory in tinea versicolor, and he suggests as a reason that in this disease the parasite is situated more in and beneath the epidermis, which is hardened by the carbolic acid, preventing its own penetration. This is in a measure prevented in the alkaline solution before referred to, *liquor carbolici alkalinus*, by the solvent action of the caustic potash.

Carbolic acid has been used lately as an external application in small-pox, dissolved in oil in the proportion of 1:12. This is kept applied constantly and abundantly on cotton wadding over all the affected parts; the swelling of the skin rapidly subsides, the course of the disease, when this treatment was adopted from the beginning, seemed more favorable and the disease appeared to be less contagious.¶

Naphthalin has not been used of late in dermatology; as far as I can learn, most of the statements in regard to it are based on the trial given this substance by Dr. Emery in the Hôpital St. Louis in 1842. Naphthalin is a white crystalline substance, fusible at 176°, soluble in alcohol, ether, naphtha and the oils, but insoluble in water. It is obtained in the distillation of coal-tar after the gaseous and

* Deutsche Klin. No. xiii. Sydenham Year Book. 1860.
† Edinburgh Med. Jour., Jan. and Sept., 1864.
‡ Braithwaite. 51, p. 190.
§ Hand Book of Skin Diseases. Amer. Edit., p. 428.
‖ Practitioner, Dec., 1869, p. 352.
¶ Wiener Med. Wochenschrift. No. 6. 1872.

liquid elements have passed over and the residue is heated to 390°–410°; it has a faint odor and excites a peculiar hot, pricking sensation when applied to the tongue. Emery found decided benefit from it in twelve out of fourteen cases of psoriasis.* He used it in an ointment composed of naphthalin ℈j to adipis ʒ v, also of twice that strength. When applied too strong it caused a burning heat and irritated the skin considerably. The advantages claimed for it are its freedom from color and slight odor.†

Petroleum.—The only application of this substance to the treatment of diseases of the skin which I can vouch for is in the destruction of head lice, pediculi capitis, for which purpose I use it constantly in dispensary practice. Cases of poisoning by absorption of corrosive sublimate washes are on record, while there is always some danger of the remedy being incautiously taken internally with serious results: this reason, and its convenience and thorough efficacy, has led me, among the poor, to make use of the common kerosene, or rectified petroleum, found in almost every house. Even when there is a considerable amount of eczematous inflammation with raw surfaces, I direct the head to be thoroughly saturated, and bound up with a cloth with kerosene for twenty-four hours, fresh oil being added several times, then to be washed thoroughly and freed from scabs, when the pediculi will be found dead, and, I believe, their nits also. The head is now soaked with cod-liver oil, morning and night, without washing, for some days, when it may be again cleansed and cod-liver oil reapplied till cured. This plan I have used almost exclusively for nearly three years, and to me it is very satisfactory, and I may say I have never found that any object to it; the stinging from the first application of the kerosene is transitory. Petroleum oil has been proposed as a cure for scabies, as it instantaneously kills the parasite, and is at the same time a disinfectant against the *larvæ* which are wont to be found in the wearing apparel and bed-clothes.‡

Neumann recommends petroleum in favus, the parts after epilation and washing with sapo viridis to be kept covered with compresses soaked in it.

* London and Edinburgh Monthly Jour. Med. Science, Jan., 1843.
† Cazenave—Note to American Edition. 1852, p. 224.
‡ Glasgow Medical Journal, January, 1865, p. 482.

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