COAL-OIL AS A MEDICINAL AGENT.

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COAL-OIL, as an illuminating agent, has been in use from the most remote antiquity. Mention is made of it in the writings of Herodotus and Pliny. Its name, petroleum, was given to it on account of its being found issuing from crevices in the rocks in Agrigentum, Zante, Persia, etc. Its more modern and less classic designation, coal-oil, was given to it on the supposition that it is produced by a subterranean destructive distillation of coal, effected by means of the internal heat of the earth. Whether this theory or its converse—viz., that coal is formed from petroleum—hold good, is a subject worthy of the attention which it at the present moment excites, but one in no way bearing on the subject of the present paper. It may not, however, be irrelevant to state, that petroleum is now universally considered to be the result of a slow process of decomposition of the woody fibre of plants, and, in a minor degree, of the tissues of the lower animals; that it is found issuing from the soil in various parts of Canada, and exuding copiously from the Devonian sand-stones, in several states of the great Republic, south of the New Dominion, and in connection with limestone and rocks of all ages, Palæozoic, Lower Silurian, and others, up to the tertiary period. As it issues from the "springs," it is unfit for either lighting or medicinal purposes. Although used by the Indians as an external application, the hydrocarbons with which it remains charged—naphtha, benzole, benzine, etc.—render its application exceedingly risky; high inflammation, and even mortification, having resulted from its incautious application to abraded surfaces. For medicinal purposes, therefore, oil of great purity should be procured. As a general rule, that refined in Canada will be found sufficiently free from impurities, the temptation to adulterate it with the more volatile hydrocarbons being comparatively slight, on account of the much smaller demand for it for exportation, and the vast number of coal-oil wells in the dominion. When pure, petroleum is of a clear slightly amber tint, having a bluish tinge when examined by reflected light. In composition, it is a hydrocarbon, having its two constituent elements in equal proportions, its formula being $C_{24}H_{24}$ according to some, whilst others place it in the marsh gas series, and state its composition to be $C_{18}H_{20}$. Its odour is penetrating and disagreeable; specific gravity, 815; point of ignition, 117 to 128° Fahr. Specific gravity, as a test of its purity, is worthless. Fraudulent manufacturers sometimes substitute a mixture of heavy coal-oil and naphtha for the pure article, which has the same specific gravity. Its point of ignition will be the surest index of its purity; the volatile hydrocarbons with which it is sometimes adulterated being much more explosive and inflammable at a lower temperature. Petroleum at one time, I believe, was officinal in our *Pharmacopæias*; but, owing to its impurity, and its *modus agendi* not being, perhaps, correctly appreciated, it fell into disuse, and at the present day is but little used, except by Indians and quacks. I was first led to suspect that it might possess therapeutic properties which would repay investigation by accidentally discovering that it was an excellent application for

Burns or Scalds.—In the summer of 1867, an engineer on board one of the boats on Lake Erie was accidentally scalded in the right wrist. The scald, measuring three inches in diameter, was produced by steam, and corresponded in severity to the third order of burns, according to Dupuytren's classification. Petroleum being the nearest species of oil at hand, he applied it freely to the part, and kept it constantly applied until I saw it next day. I was equally surprised at the application which he used, and at its results. The part looked so healthy and nice that I advised a continuance of the treatment, and watched its effects. From day to day the improvement was rapid and uninterrupted. No slabby nor unhealthy granulations formed, and cicatrization took place with remarkable celerity. Its application was momentarily painful, but assuaged in a very short time the intense pain of the scald.

Ulcer.—The patient, a young man, aged 25, came under my care on March 5th, with an ulcer situated over the right gastrocnemius. He had been suffering from it for a fortnight previously to applying to me. At the date of his application, the sore measured one inch and a quarter in diameter, was partially covered with a thick scab, and surrounded by a purplish zone, which measured two inches and a half from the edge of the ulcer to its circumference; it was the seat of a severe burning pain, which almost entirely prohibited locomotion. Under the usual orthodox treatment—cataplasms and water-dressing, etc.—less than twenty-one days would not suffice for a cure. On the morning of the 5th, I

applied a poultice to remove the scab, and in the afternoon I dressed the entire sore, ulcer and zone, with lint saturated in coal-oil, and a bandage. On the 6th, at 9 A.M., the inflammatory zone had quite disappeared, and the swelling had so much subsided, that the part looked wrinkled and had a whitish brawny appearance, as if shedding its epithelium. There was no pain. The oil was continued. In the evening, the pain which restrained his movements on the previous day having completely subsided, my patient got up a little impromptu pugilistic drama on the fore-castle, with one of the jolly tars, in which he gave a grand exposition of the science and mysteries of the art. The only advantage which accrued to him from the elegant performance in which he figured as principal actor was simply a confirmation of the old adage, "*Joco di mano joco villano*"; an advantage which, if his mind had been more philosophically disposed, might compensate for the sundry *meurtrissures* sustained by his body, and the aggravated condition in which I found his leg, which was more swollen, more red, and more painful than when he came under treatment. However, I again applied the coal-oil, and had the satisfaction of witnessing on the following morning (the 7th) the same gratifying results which I had observed on the preceding day. The patient now remained quiet, and in a few days the coal-oil was changed for water-dressing, the surrounding inflammation having entirely subsided, and the ulcer commenced to cicatrize healthily. I have since employed it with equally satisfactory results. In bringing forward coal-oil as a remedy of incalculable value in the treatment of ulcers, I do not claim for it any specific virtues, its action consisting simply in dispersing the surrounding congestion, and reducing inflammatory action to a condition favourable to the proper development and organisation of healthy lymph, at the same time that it exerts a healthy influence on the ulcer itself, be it indolent, irritable, or sloughing.

Phlegmonoid Inflammation.—W. M., aged 31, applied to me for an extensive phlegmonoid inflammation of the leg. The whole of its middle third was much swollen, the swelling shading off towards the ankle and the tubercle of the tibia. Over the centre of the crest of the tibia there were considerable pain, redness, and pitting on pressure; and the heat was so great, that cold applications to it became immediately vaporised. This patient wished to be married in four days. Here was a predicament! Were I to treat his leg by cold applications, there would not be the least likelihood of his becoming a Benedict in less than seventeen days; were I to apply cataplasms and make incisions, the chance of his putting his head into the matrimonial noose would be equally remote; accordingly, I enveloped the affected part in lint saturated with coal-oil, and applied a bandage, strictly enjoining him to remain quiet, which he did. Next day, the swelling and heat were much reduced; the part seemed wrinkled and brawny, and the pain was much less. The application was continued. On the third day, the swelling over the shin had quite disappeared. There was no pain nor pitting on pressure, and no abnormal heat; but, on each side of the tibial crest, there was a slight degree of redness, and minute papulæ-like sudamina had formed about the roots of the hairs from the constant contact of the oil. The application of coal-oil was omitted, and cold water-dressing was applied. On the fourth day (Sunday), he was well.

If coal-oil has such a controlling power over congestion or inflammation of external parts when applied topically, I reasonably inferred it would exercise a similarly curative influence over the same diseased conditions in internal parts, if we could only apply it topically to them. But not knowing at this time but that it might be possessed of toxic qualities when administered internally, I tried the effects of a small dose on myself, and became satisfied that it was neither poisonous nor palatable. I accordingly determined to try its efficacy in a case of

Chronic Duodenitis, and prescribed it as follows:—*R* Olei petrolei ʒss; chloroformi ʒss; tincturæ cardam. co. ʒi. M.

From fifteen to twenty drops were dropped on sugar, and taken three hours after each meal. My object in mixing the chloroform with it was to disguise the smell and taste. The cardamoms were simply intended to give it a colour, and still further disguise its taste. In giving it three hours after meals, I expected that it would pass from the stomach with the end of the chyme, and come directly into contact with the inflamed portion of the duodenum. After taking a few doses, the pain subsided, and did not return as long as the patient continued the drops. When these were out, the pain again returned; and, as I was not quite certain whether the beneficial effects were attributable wholly to the coal-oil, or in part to the chloroform, I reduced the quantity of this in the next bottle from half a drachm to ten drops, and gave the same dose as before. The pain again disappeared, and never returned.

Dysentery.—Soon after this, in the cold weather towards the end of February 1868, I became the subject of a rather smart attack of dysentery. The same reasoning which led me to administer it in the above case, determined me to employ it *in propria personâ*. So, mixing an ounce of it with two ounces of water, I injected it into the bowel—not,

I must confess, without some little timidity, and with but little advantage. An hour subsequently, I injected two ounces of the oil, and the same quantity of water, with immense relief to the painful feeling of fullness in the rectum and the tenesmus. Encouraged by the almost instantaneous improvement, I in two hours afterwards threw up between four and six ounces of the pure oil, retained it as long as possible, took a dose of castor-oil, and was free from all dysenteric symptoms next day.

Erysipelas.—At my suggestion, petroleum was used as a topical application to facial erysipelas, by a civil practitioner in Dunnville, with much benefit. At the same time I had a case of erysipelas of the velum and uvula under treatment, over which nitrate of silver, solution of tannin in glycerine, and various other remedies, exerted no control whatever. The velum was much congested, relaxed, and of a dusky violet colour. The uvula was enormously elongated, of the size of a small pear, ulcerated on each side, and covered with albuminoid patches. As a *dernier ressort*, I applied coal-oil freely to the velum and uvula three times a day, with an almost immediately perceptible improvement.

Erysipelatous Laryngitis.—March 22nd. G. D., aged 30, came under treatment for congestion of the spine, which yielded to the treatment employed. Two days, however, before its final disappearance (April 8th), erysipelas of the fauces set in, which slowly extended down the pharynx, from which it passed into the larynx, producing total inability to swallow either solids or fluids; these seemed to pass to the root of the tongue, remain there a second or two, and be entirely ejected. The back part of the tongue became quite black, the tip remaining whitish and moist. The breathing became embarrassed; air entered and passed out through the glottis with a hissing sound. Dyspnoeal paroxysms from laryngeal spasms set in, increasing in severity as they augmented in number. From the forenoon until 4 P.M., he had three of these attacks. The last proved nearly fatal; the poor fellow staggered about the room like a drunken man, clutching at his throat, as if to remove the obstruction; and at his ribs, as if to forcibly inflate the lungs; his eyes were fixed and staring; and the perspiration stood in large beads on his forehead. Lest a fourth paroxysm might prove fatal, I made preparations for opening the larynx; but, before proceeding to operate, I applied the stethoscope, and found evidence of the disease having extended two or three inches into the trachea. Deeming the case, therefore, badly suited for laryngotomy, I, instead, by means of an atomiser, threw about a drachm of coal-oil, in the form of spray, into the larynx and trachea every two hours. The relief to the dyspnoea was immediate; the breathing became easy; and, after a few inhalations, the power of swallowing was regained. Towards morning, he felt the premonitory symptoms of another paroxysm coming on; so, jumping out of bed, he seized the atomiser, inhaled the coal-oil spray, and returned to bed, feeling comparatively comfortable, and thankful that the impending attack was averted. He had no more dyspnoeal paroxysms, nor did he again experience difficulty in deglutition; but, I regret to say, the onward march of the erysipelas was not arrested. Inch by inch it invaded the air-passages, until it passed into the most minute ramifications of the air-tubes, and terminated fatally by hæmoptysis.

Ischio-rectal Abscess.—A poor man, aged 60, placed himself under the care of a person practising as a homœopathic doctor in Dunnville, on the Grand River, Ontario, in the month of June 1868, for ischio-rectal abscess. The bump of caution must have been developed to an enormous extent on this son of Hahnemann, or his ignorance must have been profound; for he poulticed and poulticed the poor man until not only both ischio-rectal fossæ became involved, but the scrotum also. When the case came under the care of Dr. McCallum, a regular practitioner of the village, the scrotum had attained the size of the head of a nine months old fœtus; and extensive incisions into it, as well as into the fossæ, had to be made. When I saw him, in a few days afterwards, he was in the most miserable plight I have ever witnessed. His right fossa resembled a rabbit-burrow; fœtid matter ran in streams through an enormous gash by the verge of the anus. The left fossa was distended with matter, which could not escape against gravity. The patient lay on his left side. The scrotum was sloughing, and the smell was most intolerable. The poor man's agony was extreme. I received Dr. McCallum's permission to apply coal-oil. So, having thoroughly cleansed the abscess with warm water by means of an enema-machine, I inserted the nozzle into the abscess, and Dr. McCallum pumped coal-oil into it until it must have come into contact with every portion of its walls. The scrotum was dressed with lint soaked in coal-oil, and he was given a morphia pill. The poor man rested better that night than he had done for many nights before. When I met Dr. McCallum a few days afterwards, and asked him how his patient was getting on, and how the coal-oil was doing with him, "The right fossa," he said, "is granulating nicely. The coal-oil is an admirable application. I omitted it one night, and

the patient did not get a wink of sleep. Next night, I applied it again, and he slept until morning."

Sprains.—As an application to sprains, coal-oil is probably unsurpassed, reducing pain and removing the swelling with remarkable celerity. M. Y., aged 30, was knocked down by a dog on the 10th ult. He fell on the back of his right hand, and started some of the ligamentous structures of the carpus. Immense swelling succeeded, which, in the course of a day or two, extended to the middle of the forearm. The part was exceedingly painful from the first; but, about the fourth day, it extended up to the shoulder, and for this I had to give opiates. To the swelling I applied cold lotions; but these produced neither an alleviation of the pain nor a diminution of the swelling. Warm fomentations, for which I had to change them, produced a more soothing effect; but, these being of little use, I had the shoulder well rubbed with coal-oil, and the same applied to the hand and forearm by means of lint, and retained in position by a bandage. This was on the 15th. On the morning of the 16th, he informed me that he slept pretty well during the night; that the pain was much less. The swelling had very much decreased. On the 17th, the pain was all gone from the shoulder; the swelling nearly gone. On the 18th, the swelling was almost quite gone from the hand and forearm; but the skin was a little red, and had a number of papule around the hairs. The petroleum oil was omitted, and water-dressing applied. On the 20th, he was well.

Rheumatism.—Petroleum enjoys an extensive and well-deserved reputation as an external application in chronic rheumatism.

Black Knot on Fruit-Trees.—Some of the fruit trees in the New Dominion, more especially the plums, are annually attacked by flies which pierce the bark and deposit their eggs in the trees; the punctured part swells, and exudes a resinous fluid which forms what is popularly known as the black knot; in this, the young flies are brought into existence, and, by-and-by escaping, sting the fruit and cause its destruction. Such, at least, is the history of the black knot, which I received from an accomplished gentleman, a Catholic priest, but lately a medical man. However, it is a fact, that the destruction of the eggs or young flies in the black knot has been found by gardeners to be the surest means of preserving their fruit. For this purpose, they incise the knot and swab it freely with coal-oil.

Itch.—Acting on the hint thus furnished me, I made use of coal-oil for the cure of itch, with an almost unvaried success; out of about forty cases, only one proved rebellious to its influence. For the cure of the pruriginous affection which attacks many at the setting in of cold weather, it is equally successful. In cases of itch it is peculiarly invaluable, since it removes the necessity for segregation or suspension from duty.

Mode of Action.—These few cases which I have selected from many others, will, I trust, suffice to call the attention of the profession to what, in my opinion, will be found to be one of our most invaluable antipruritics. As a topical application to inflamed parts, it is, judging from my limited experience, unsurpassed by any other known remedy. It possesses also two other advantages which materially enhance its value as a remedial agent. First, it is always at hand; and, secondly, it is extremely cheap, the very purest not costing more than 18 or 20 cents per gallon. Its mode of action is simple, combining, as it does, stimulant and astringent with anodyne properties. It acts by restoring tone to the paralysed contractile textures of the small arteries and veins, whereby the retardation of the blood-current is overcome, the stagnant corpuscles urged from the capillaries and venous radicles into the general circulation, and the condition on which the transudation of serum and blood, etc., depends, removed; whilst, at the same time, it so materially expedites the absorption of the effused fluids that the parts, swollen by the products of effusion or capillary rupture, shrink with such celerity as to give the part a shrunken, wrinkled, and brawny appearance in, at least, twenty-four hours. It may be that it is owing to this shrinking that the rapid cessation of pain is produced. It does, however, unquestionably relieve pain even where there is no inflammatory effusion, and, I am inclined to think it exercises an anodyne influence, by directly acting on the nervous filaments distributed to the cutis. When rubbed on the skin, or thrown on it in a fine spray by means of an atomiser, it produces a sensation of numbness and of partial insensibility, which soon passes into a pricking sensation, then becomes hotish, and soon passes off. Trying to remove its disagreeable smell, I passed it, in a state of vapour, into a bottle of chlorine gas. A heavy oily compound resulted, devoid of the characteristic odour. I applied some of this to my wrist, but it caused so much pain and smarting that I imagined I had discovered an instantaneous blistering fluid. It did not, however, vesiculate, and the pain soon passed off.

The efficacy of coal-oil in the treatment of black knot and itch shows it to be destructive to the lower organisms; on which account it might probably be useful in those cases in which carbolic acid is employed.