Notes and suggestions on cod-liver oil and its uses : with some practical remarks addressed to those who cannot take it / by Benjamin Clarke.

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NOTES AND SUGGESTIONS

ON

COD-LIVER OIL AND ITS USES;

WITH SOME PRACTICAL REMARKS

ADDRESSED TO THOSE WHO CANNOT TAKE IT.

By BENJAMIN CLARKE, F.L.S.,

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"Sublata causa, tollitur effectus."—Celsus *De Medicinâ.*

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1856.

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PREFACE.

HAVING myself taken both the pale and light brown cod-liver oils for palpitation of the heart, brought on by over-exertion and consequent debility, has given me ideas of its mode of action (or, at least of one of its effects), which otherwise I believe I should never have arrived at; my own experience, therefore, is the source of whatever is advanced respecting it, having received almost immediate relief from the Loffoden oil, after digitalis, carried quite as far as it could be borne without danger, and also the pale oil, had failed. Of its mode of action I have spoken freely, and it may be considered rather unguardedly, but it was only for the purpose of being more clearly understood; and as this is a point on which no fixed opinion prevails, I thought it would be desirable thus to endeavour to explain it. The occasion, however, of the appearance of these remarks in their present incomplete form (which may be perhaps rather premature as regards some particulars), is that some members of the profession have expressed a desire to see them. Their object is practically two-fold:—1st. To show that the pale English and light brown Loffoden oils, are, in their sensible properties, as well as in their chemical constitution, distinct medicines; but as the latter have been so completely examined, I have confined myself to differences existing in the sensible properties. 2ndly. To show

that the Loffoden oil, as an external application, is decidedly improved by having been subjected to a high temperature in the method described.

I have been induced to add some remarks on taking the oil, it being well known that many patients who might have been in all probability cured by its use, have died, being unable to take it. And, if the suggestions relating to its uses should lead in any degree to its more extended use, it will be another object gained, because I must believe that I have seen many patients die (both in hospitals and in private practice), some of them in juvenile years and others in the prime of life, who would have been cured if it had been prescribed ; neither the Loffoden oil, however, nor yet its medical properties, were at that time known as they now are, and no dependence could be placed on it as then imported.

MOUNT VERNON, HAMPSTEAD,
August 20th, 1856.

NOTES AND SUGGESTIONS

ON

COD-LIVER OIL AND ITS USES.

ITS DIFFERENCES AND MODE OF ACTION.

Differences of opinion still existing as regards the relative usefulness of the different varieties of Cod Oil (or rather of the oil produced by different species of Cod-fish) as remedial agents, and even the *modus operandi* of the medicine itself, the following notes and suggestions are advanced in hope they may lead to further inquiries, if not throw some useful light on this subject.

Differences between the Pale English Oil, as prepared by Chemists, and the Light Brown Oil of Dr. De Jongh, from the Loffoden Isles.

1. So much difference exists between their specific gravities, that the Loffoden floats on the pale oil without perceptibly mixing with it, and this equally whether the pale is gently poured on the light brown, or *vice versâ*.

2. There is a perceptible difference in the taste, the Loffoden oil having a peculiar flavour, which, together with the colour, might give rise to a question whether it had not undergone some preparatory process by heat; this however upon inquiry appears to be entirely negatived*. Compared with it, the pale oil has an insipid and almost watery taste, as any one will learn who has taken both for some time; and its insipid, or, at all events, less oleaginous taste, may serve to account for its greater specific gravity.

3. There is also a remarkable difference in the temperature at which opacity begins to take place, the pale oil becoming solidified before the Loffoden begins to lose its transparency. From

* It has been asserted of the light brown oils, that their colour is owing to the requisite precautions in preparing them being neglected; but this cannot apply to the Loffoden oil, because its colour is quite uniform, which could not be the case if it arose from any accident, as it must then vary according to the care taken in its preparation. The colour therefore of the Loffoden oil constitutes one of the distinctive characters between it and the English oil, this being also implied in the certificates of Pereira and Liebig.

repeated trials 15° F. may be considered as very near the average difference in this respect, the pale oil losing its transparency at 45° F., and the Loffoden at 30° F.; and this is so permanent that it is not affected by the oils having been subjected to high degrees of temperature, as I have kept them both at 212° F. for four hours, and even then the degrees at which they became opaque remained unaltered*. There are, however, slight differences in the degree at which the Loffoden oil becomes opaque (one specimen remaining quite transparent at 30° F.), and possibly this may prove a more delicate, or at least a more ready test for its purity or good quality, than even chemical analysis.

4. It is stated (Proceedings of the Linnæan Society†, No. LX. p. 356) as a well-ascertained fact, "that shore-fisheries of fish, whose habitat is the deep sea, seldom produce the fish in prime condition;" and it is added, that, "of this truth, the deep-sea fisheries of Cod and Haddock, as compared with those caught in high estuaries, also afford good examples;" and also that the difference in the value of the herring-fisheries of Holland, as compared with those of England and France, apart from the consideration that the former are deep-sea fisheries, are wholly unintelligible. It may therefore be a question whether the oil from the fish taken from the shallow water does not deteriorate the medicinal qualities of the pale oil (whatever they may be) as usually prepared; the superiority of the Loffoden being attributed in some degree to the bulk and condition of the livers used. This difference, however, would perhaps strictly apply only to occasional instances in which the chemist prepared the oil from such fish as he could procure from the market, and which might occasionally be all taken from the "high estuaries."

The difference of the temperature at which the oils become opaque, together with the difference in the specific gravity, would alone be sufficient to lead to the supposition that they were the produce of different species of fish, and accordingly Dr. Carey states that the Loffoden oil is most exclusively the produce of the Dorse, *Gadus callarias*, the Cod-fish from which the pale oil is procured being the *G. morhua*, which seems not to have attracted the attention it would have done had it been generally known how widely the species of this genus differ from each other.

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* I have however learned, from good authority, that there is no fixed temperature at which the pale oil becomes turbid, it taking place at any degree between 50° and 30° F., but it is admitted that this may depend on the circumstances under which it is filtered; and therefore as the Loffoden oil is expressly stated to undergo no filtration, this difference may be regarded as constant, or nearly so, unless further experiments prove otherwise.

† Dr. Knox "On the Food of certain Gregarious Fishes."

The Light Brown Oils of Commerce.

Another light brown oil was procured, supposing it might be Newfoundland cod oil; but whether the specimen now referred to was from that locality I am altogether uncertain; it however proved to be remarkable on account of its very close resemblance to the Loffoden oil, being scarcely different, unless that it was not quite so transparent. The specific gravity was less than that of the pale English oil, as it readily floated on the surface; but on being placed in a freezing mixture an unexpected difference soon became apparent, as it became completely coagulated*, so that it could not be poured out of the bottle; while the Loffoden oil, placed with it in the same mixture, remained quite fluid and transparent, and the pale English oil, also placed with it, though it had become opaque, had not lost its fluidity. The pale oil, however, soon coagulated, so that there is not much difference in the temperature at which this occurs. But the pale oil began to lose its transparency before the light brown, although it had not become completely coagulated till some time after it;—the light brown oil coagulated much more quickly, losing its transparency at the same time,—not before; so that in these particulars it disagreed with the pale, and also with the Loffoden oil. Never having, however, tried this oil in the treatment of disease, it is here noticed only as an instance of the very different medicines that are included under the name of Cod-liver oil.

Modus operandi of the Oil.

As this remains hitherto an unsettled question, I would suggest that its action is that of both a sedative and antispasmodic, these terms being so far synonymous, that they may be understood as only explaining each other; and, as far as my own experience in the use of the oil has gone, I should not have supposed that it had any other action, notwithstanding its complicated chemical components, although from the iodine, &c. that it contains, I do not intend to express any objection whatever to the belief of those who regard it as an alterative and antiscorbutic. I do, however, really believe that in the greater number of diseases in which it is prescribed, it acts exclusively by its sedative effects on the

* The weather being very warm, it could not be ascertained at what temperature the coagulation took place, it being impracticable to keep the water at a fixed degree, but it evidently took place sooner than in the pale oil.

nervous and arterial systems, allaying more especially the irritability existing in chronic inflammation, and also that depending on anemia; and it appears difficult in any other way to account for its having become regarded by some continental physicians as an almost universal remedy (either singly, or as an adjunct to others) for chronic diseases. And apart from this conviction, deduced from its internal use, I feel confident that, topically applied, it is (although not the most powerful) the most permanent in its effects of any of the antispasmodics*, which may lend some support to the opinion that its action, when taken internally, is to be explained by regarding it as a sedative and antispasmodic.

The difference between the action of the Loffoden and the pale English oil, as far as my own observations have extended, I believe to be as follows:—The Loffoden oil stops the apparently sthenic pulse (that is to say, that excitement of the pulse which depends more on irritability than on any chronic inflammation which may accompany it), which is so liable to be mistaken for an inflammatory pulse by the practitioner who does not carefully examine all the symptoms; thus it removes the hardness of the pulse in hectic fever, and other febrile conditions depending on irritability and debility; and I believe it may be said to have a *sui generis* mode of action, *i. e.* to allay irritability in a peculiar way, which no medicine of either the vegetable, saline, or mineral departments will accomplish, although it does not supersede the use of any of them, as they may be advantageously prescribed in conjunction with it, as Dr. De Jongh has particularly noticed†. This effect on the circulation the pale English oil has, at all events, in a much less degree, it being perhaps so feebly marked as not to be perceptible, so that in the meantime the patient (from the slowness of its action in some cases of extreme debility) must be in danger of sinking from exhaustion, or the case (*e. g.* in phthisis) may become incurable from protraction. But as far as the pale oil has medicinal qualities, I feel satisfied that its mode of action is the same as that of the Loffoden, producing the same effects, only in a minor degree; so that my inference agrees with the observations of those who have asserted the superiority of the light brown oil as a medicine, as for instance

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* This observation applies more especially to the boiled oil afterwards noticed, which as a topical antispasmodic and sedative, has, I doubt not, much more,—perhaps more than double the power of the oil before it has been boiled.

† I believe, however, the strictly curative powers of the oil to be weak, which is shown by its extreme slowness in effecting a cure in some cases where, nevertheless, no other medicine succeeds. Its most beneficial effects, therefore, are to be expected only when that kind which has the medicinal property in the highest degree is employed.

that it effects a cure in half the time that the pale does. It seems, however, from the observations of others, that it is questionable if the pale oil deserves even so much reputation.

But my knowledge of their comparative value is not such that I could offer an opinion as to whether the Loffoden should entirely supersede the pale English oil; but yet I cannot doubt but that the former would succeed in some cases where the latter had entirely failed. Of the merits, however, of the other light brown oils, comparatively with the pale English oil, I have had no opportunity whatever of forming an opinion.

If such is the action of these two oils, it becomes an interesting question whether this difference does not depend for the most part on the volatile fatty acid, of which Dr. De Jongh asserts the pale English oil contains only a very small proportion. Could not this be obtained separately for trial as an external application in nervous pains, &c.?

And as the oil at a low temperature separates into two portions, a solid and a fluid, in some degree analogous in their appearance to the two constituents of animal fats, stearine and elaine, it has occurred to me whether the fluid portion might not be separated, and employed as a liniment in phthisis, where patients could not take it internally. If it contained the active principle or principles, this might possibly succeed, because the oil is very readily absorbed by the skin, and the fluid portion thus separated would probably be absorbed more readily still; and supposing the solid portion to be inert, it would be a desideratum to remove it on account of its preventing the absorption of the fluid portion, at least to an amount equal to its own absorption.

It appears also not at all improbable that the oil produces its curative effects for the most part by being taken unchanged into the circulation; and if so, when it is taken into the stomach, the greater part so taken is at once destroyed by the gastric juice, and answers no further purpose than supplying nutriment*. And supposing its curative effects to be so produced (which may in some degree be assumed, on account of its good effects when only externally applied in rheumatism, scrofula, and diseased joints, and from its external use having cured skin-disease after its internal use had failed), the use of its most active principles as a

* Agreeably with this, it is affirmed that the attempts made to correct the taste by mixtures, chiefly in the form of emulsion, have not attained the object, they having weakened or destroyed the therapeutical action, which is said to depend much upon the oil being given in an uncombined state. May not this be the consequence of the oil, when in the form of emulsion, becoming sooner and more completely acted on by the gastric juice?

liniment would to a certain extent fulfil an important indication, in any case where the patient could not be induced to take it.

ON BOILED OIL.

As empyreumatic oils had been employed with some success both in medicine and surgery, it became a question whether the light brown Cod-liver oils had not been subjected to heat, and so altered in their medicinal qualities. This part of the inquiry has, however, proved fruitless; further than that I have subjected the Loffoden oil to the temperature of boiling water in the following manner, with, I doubt not, very useful results:—

Place a glass bottle, or other convenient utensil, half or two-thirds full of the oil, in a boiler containing cold water, there being sufficient water in it so that it covers part of the bottle above the oil; that is to say, the water outside the bottle must rise to a higher extent than the oil contained in it. Then place it on the fire, and having gradually raised it to a boiling temperature, keep it steadily boiling for four hours. The water will of course very soon waste, and, to obviate this, have a convenient utensil, containing water kept constantly boiling, and whenever the water in the boiler has wasted, so as to become lower than the oil, add boiling water sufficient to make it rise to the same level it was at at first. This will require to be done about every half-hour, and particular care should be taken that the water added is quite boiling at the time. To prevent the entrance of steam or soot, the mouth of the bottle must be covered loosely with a linen or paper cap, and it should afterwards be preserved in closely-stopped bottles. The oil will not, however, even in well-stopped bottles, keep unchanged any length of time, and not more than three months in warm weather unless kept in a very cool place.

The oil, as thus prepared, I have not had opportunity of trying extensively; but in every instance the result has been so successful, that I feel no hesitation whatever in affirming its superiority over the unboiled oil as an external application. I have before alluded to it as having much more power in allaying pain and irritability as compared with the unboiled oil, but this depends on the time which it has been subjected to the boiling temperature. I have boiled it from one to eight hours, with the following differences in the effects:—Boiling one hour made but little impression on it, but yet it certainly produced less redness of the skin, as I

believe any one will find on applying first unboiled, and then boiled oil, in a case of chronic rheumatism, where there is redness of the skin. By boiling it two hours, its sedative effect becomes more decided, but not until it has been boiled four hours are its salutary effects brought to their maximum; for when boiled only three hours, it still leaves, I believe, more redness than when boiled four hours. When boiled six or eight hours, I suspect it undergoes some slight modification; it is then, I believe, not more powerful as a sedative than it is after four hours' boiling: possibly it may be less, so that four hours seems all that is required.

With regard to the boiled oil as an internal remedy, I have only to add that a teaspoonful of that which had been boiled four hours, has been taken into the stomach without any immediate injurious effects; but this quantity having been taken three days successively, it produced dyspepsia, with some pain in the right side, so that its further use was relinquished, and I believe especial attention would be necessary in repeating the experiment*.

On its External Application in Rheumatism and Painful Nervous Affections.

In a severe case of chronic rheumatism, or rather of acute merging into chronic, in which the patient could not be persuaded to take the oil, not even a single dose (all other modes of treatment having failed, and the case from the swelling of the joints having been regarded by the surgeon who first attended as incurable), the Loffoden oil unboiled, was in the first place applied over the entire hands and forearms, which were in an inflamed condition, the skin being reddened. Its effects, however, appeared of a questionable character, for although it in some degree reduced the swelling, and even alleviated the pain, yet at times the pain was not at all diminished; and there was also a degree of heat which seemed as if it were exasperated by the oil, and which made the patient rather wish to leave it off. This suggested the expedient of trying the boiled oil, and the

* The question whether the oil is deteriorated when obtained by high degrees of temperature having given rise to some controversy, this experiment may be adduced as decidedly tending to the conclusion, that, when so prepared, the ordinary dose would be likely to be followed by faintness, and languor, and even nausea. I once took (not suspecting there would be any difference in its effects) about half an ounce of the pale oil, which had been subjected to the temperature of boiling water, as described, for twenty minutes, about two months after it had been so treated; a feeling of faintness followed, with a somewhat quickened pulse, and a peculiar sensation as if it would produce diarrhœa, but all went off, and in five or six hours I felt as well as usual again.

result proved quite satisfactory*, the redness almost immediately diminishing, in some degree also in parts to which the oil was not applied, together with the heat, pain, and swelling; and from the time of its first application, the patient gradually recovered; the change from the unboiled to the boiled oil (boiled only one hour), although not particularly explained, occasioning the patient to remark that the liniment was a different one. When the inflammation had subsided Spt. Terebinth. was added to the oil with evident advantage, assisting in relieving the remaining pain, and not appearing in any degree to frustrate the intention for which it was prescribed. The oil has also been successfully applied for the relief of nervous pains following a surgical operation, and for a fixed pain in one side of the head, the boiled relieving it more decidedly than the unboiled†.

The boiled oil may deserve, as an external application, trials in practice, as Dr. De Jongh speaks decidedly of the beneficial effects of the external application of the unprepared oil in rheumatism, swellings of the lymphatic glands, scrofulous ulcers, and scrofulous affections of the joints. Where, however, extreme debility exists, especially in children, the unprepared oil might be preferable to the boiled, as in such cases its application (if in considerable quantity) might be followed by languor or faintness it might be desirable to avoid; at all events, first trials should be made with caution. He states also, "I have very successfully applied the Cod-liver oil externally in cases of scrofulous ophthalmia;" from which it may be expected, that, from its possessing a greater power of allaying irritability, the boiled oil would prove a yet more effectual remedy.

It may be suggested also that the boiled oil might be tried as an external application in those cases of insanity where the principal indication is to allay the irritability of the nervous system, in obstinate and supposed incurable cases of epilepsy (as an ad-

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* The difference in the effect of the unboiled and boiled oil, as regards the redness of the skin, is accounted for by the fact, that the oil in some degree reddens a healthy skin if very delicate, and may even produce the appearance of a red spot; but when it has been subjected to the boiling described, its effect in reddening the skin is scarcely, if at all perceptible, and I believe it will be found frequently to reduce the redness of chronic inflammation shortly after its first application. It is not likely that the boiling alters the chemical constitution of the oil, as the degree at which it loses its transparency remains the same, but it destroys its heating quality, so that it has a milder taste, which may account for its being better suited for external application in cases where chronic inflammation exists, and I believe also it is absorbed faster than the unboiled where inflammation exists.

† Such being the effects of the boiled oil, an ointment composed of it and spermaceti, or other convenient adjunct, might prove (as an extemporaneous prescription, because from its mode of preparation the oil would soon become rancid) a very useful application in surgical practice, as in scrofulous and other cachectic ulcers, and for irritable wounds of all kinds for which the lead cerates are employed.

junct to the treatment), in irritable ophthalmia, cancer, painful cicatrices, irritable testis, and (as an injection) in stricture of the urethra, and as an enema in traumatic tetanus.

NOTE ON TAKING THE OIL.

As it is continually occurring that parties cannot take the oil, any remarks which may assist in overcoming the difficulty, whether they have attempted to take it, or whether they have not, will be as desirable to them as any information relating to its properties or uses. And in fact, every objection to its use should be removed, it having been stated on good authority that it has extensive analeptic and prophylactic powers*, so that it becomes desirable that all should endeavour to possess the power of taking it, which, from its being used in high northern latitudes as an article of diet, would at least appear practicable.

Those who have never attempted to take it, and suppose they should dislike it, should bear in mind that nothing is easier of digestion than this oil in small quantities, being, when pure and well preserved, like an agreeable vegetable oil with a fishy flavour; thus if it is taken when there is some appetite for food (not after a meal), it passes off the stomach almost as readily as water, particularly in cold weather. In warm weather, however, less of it can be taken, from which it seems probable that some patients could take it in the winter, who could not well take it, or only in small quantities, in the warmest months of summer.

When attempts to take the oil have failed, the precaution of taking it when there is some appetite, as an hour or two before dinner, should at least be attended to; because it usually occasions no loss of appetite or disagreeable feeling when the food is afterwards taken; and it appears very probable that it is from this precaution not having been tried, that in *some cases* it produces indigestion, as any other kind of rich aliment would do, if taken when there is no appetite, or when the stomach was habitually so out of tone that animal food was unsuitable. It has been remarked, that it is liable to produce yellowness of the skin; but it is probable that such an effect is mostly the consequence of taking the oil at improper times, or more of it than the stomach

* From my own knowledge of its effects, I should conclude it would have a decided tendency to prevent, in thin subjects, and in those not of a sanguine temperament, epilepsy and apoplexy, and also some forms of asthma; it alters the temperament to a considerable extent, destroying the preternatural irritability of the nervous system, one of the consequences of which is better sleep; and when the pulse is preternaturally quick, which I believe not unfrequently happens in the earlier part of life, extending into the years of maturity, I believe it tends to lessen its frequency more permanently than any other medicine, giving it at the same time steadiness and regularity.

would bear, as in either case indigestion would follow; the yellowness of the skin, however, disappears in a few days, on leaving off the oil. With regard to any addition to it, to make it more palatable, copious directions are usually given, but it may be worth the notice of some patients, that if a small quantity of sweetened lemon-juice be taken half an hour before the oil, it will probably be taken with less difficulty and digest more readily; and another expedient is to take a teaspoonful or two of vinegar immediately after it, a small quantity of salt being added to the vinegar, to assist digestion.

I also believe it to be the fact, that the more keen the appetite, the sooner the oil digests and passes off the stomach. I am aware that these hints are very different from those given by some, and perhaps by most practitioners, and wish to leave to the patient's choice the preferable mode of taking it. Probably the truth is, that there are some who will find it more suitable to take the oil as here recommended, while others, perhaps the majority, will prefer adopting other directions.

There being, however, certain parties who find great difficulty in taking the oil, more minute directions may be desirable, as I feel confident there are few with such an idiosyncrasy that it might not be overcome. Taking it for granted, then, that it is most easily digested when the stomach is nearly empty, such parties should arrange so as to take dinner or other meals later than usnal, so that by being taken two or three hours before them, the stomach may have time to recover itself. This, however, in households would be with difficulty arranged, and therefore they should bear in mind that if one dose only is taken in twenty-four or even forty-eight hours, beneficial effects are sure to accrue, provided the case is one that can be relieved by the oil. They are therefore advised to take no supper, and in most instances they will be able to take a dose at bedtime every other night, if not every night. Those who take no supper feel of course no inclination for food at that time, and to such it may be recommended to take a dose in the night, or towards morning, even as late as three or four hours before breakfast.

A dose of the oil may, in some instances at least, be regarded as analogous to an equal quantity of rich animal food, having much the same effect; that is to say, the appetite, although good, is taken away for an hour or two, yet on its return, food taken digests quite as readily as usual, and on this account I would recommend those who find a difficulty in taking it, not to attempt to take it unless they feel an inclination to take animal food. The fact that some parties are obliged to avoid beef and fat meat while they are taking the oil, and can only take the lighter kinds of animal food, such as fish, chicken, &c., is, I think, a proof that the foregoing hints are applicable to a considerable extent, although perhaps not to the majority of those for whom it is prescribed.

Where there exists a very decided disinclination to take it, something may depend on the quantity taken, and such parties should not attempt at first more than a dessert-spoonful in the twenty-four hours, or should commence with only a teaspoonful for a dose; and even so small a dose

would in all probability, if continued daily for some months, prove a useful adjunct to other medicines in the treatment of diseases for which the oil is prescribed.

And finally, to show that the objections against taking it are almost entirely illusions, some patients who have a strong disinclination to take castor oil, even after they have taken it occasionally for years, can nevertheless take cod-liver oil without difficulty or any subsequent nausea; and it frequently occurs that where in the first instance it occasioned nausea and even sickness, it is afterwards taken without any reluctance or disrelish, so that it appears to be one of those products to which the system becomes accustomed if taken for some length of time.

With regard to the different kinds of oil, it has been asserted that the light-brown is more nauseous than the pale; this however I must regard as a mere illusion, for in fact neither the pale English, nor the Loffoden oil, deserve to be called nauseous, any more than some kinds of animal fat in common use as articles of diet. The difference between them is simply this, that the pale oil is nearly insipid, while the Loffoden has more of the fishy flavour, which to many who take it is agreeable rather than otherwise; and there are many entirely ignorant of the difference between them, who would, on tasting each for the first time, prefer the light brown oil as being the more agreeable to take.

On its External Application in cases where it cannot be taken internally.

There can be no doubt however that all persuasions and directions as regards taking the oil will occasionally fail, and therefore it becomes most desirable to apply the oil externally, in the most advantageous manner, hoping thereby to obtain (although not so rapidly) the same curative effects as when taken internally; rheumatism, even when bordering on the acute, I have already shown can be cured merely by its external application; and surely therefore, in that disease, if the patient could not be persuaded to take it, the boiled oil would deserve a trial as an adjunct to other medical treatment; and palpitation of the heart has also been relieved by its external application.

Why, therefore, may it not deserve trial as an external application in any case where it cannot be taken internally? A headache, threatening severe consequences, has been cured by the external application of the boiled oil, it being considered desirable to avoid the use of mercury in weak constitutions. In cases of consumption, however, where it is so frequently prescribed, and it is continually occurring that the patient after a few trials is unable to take it, its external use does not appear to have been followed by any very advantageous results; but yet even here I would suggest that the oil, if found ineffectual in its natural state, might be tried, boiled in the method described, only one hour or two at most, as having a greater power of allaying both irritability and chronic inflammation. It might be employed as a liniment to the chest

three times in the twenty-four hours, and the whole so applied would be absorbed, the parts to which it was applied being lightly covered with a piece of India-rubber, cloth or flannel.

A more convenient mode, however, of application in consumption, and probably a more effectual one, would be to place a piece of sponge about the size of an egg or larger, in the armpit, it having been previously filled with the oil, and gently squeezed, so that it did not flow out spontaneously. It would be necessary to confine it by two pieces of tape, one of them passed round the chest to the opposite shoulder, and the other round the shoulder of the same arm, so that by tying it over each shoulder, the sponge can be kept up in the armpit; and the arm itself, deprived of its coverings, must be placed under the dress as in using a sling, unless some modification of dress could be made so as to leave room in the armpit for the sponge. By this means a drachm and a half by weight of the oil was absorbed in one night by one armpit, so that there can be no doubt that by attention to management, half an ounce at least could thus be taken into the system every night.

In cases of epilepsy, supposed to be incurable, I would venture to suggest (as an adjunct to the treatment, and even if the oil could be taken internally) that a portion of the hair should be removed from the top of the scalp, but not larger than half-a-crown, because in some cases it is not advisable to expose the surface to cold in any way; to the part so exposed, about a teaspoonful of the boiled oil might be applied once or twice in the twenty-four hours; and it appears also advisable that the hair should not be at all clipped away further than the space mentioned, so that after the application of the oil, it could be combed over the exposed part, so as to prevent the cooling effect of the atmosphere.

And from the reports of its trials, so decided appear to be the beneficial effects of its external application, that it may be within the bounds of probability to expect that all, or nearly all, the good results of its internal use may be produced (although more slowly), by improved modes of using it, and substituting, where it may appear desirable, the boiled oil.

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