ON THE
ACTION OF COD-LIVER OIL AS A CURATIVE
AGENT IN THE TREATMENT OF DISEASE.

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I AM induced to make a few observations on this subject, on account of a reference to my opinions regarding the matter, in the recent elegant and practical work of my valued friend Professor Bennett, of Edinburgh, on Tubercular Phthisis. Every one knows that we are indebted to his practical sagacity for calling the attention of practitioners in this country to the value of this remedy. Any theory of his, therefore, with regard to its *modus operandi* is entitled to great respect, and it is with respectful consideration that I ventured, and do still venture, to differ from him.

I may beg to remind Dr. Bennett that in his original work on Cod-liver Oil he placed much more stress on the mechanical fact stated by Ascherson, that under the microscope a little oil mixed with albumen becomes surrounded with a pellicle, as affording an explanation of the supposed effects of cod-liver oil in increasing the number of blood-corpuscles in scrofulous blood, (i. e., blood loaded with excess of albumen—unworked-up blood-plasma, and deficient in corpuscles,) than he now does. He now adds to that explanation very considerably; hence my objections to his views lose a good deal of their force.

My objection to the theory, that the fact of oil placed in contact with albumen under the microscope forms a globule with a central nucleus and outward pellicle, affords any sufficient explanation of the value of cod-liver oil in scrofula and phthisis, I retain as strongly as ever. Dr. Bennett, in his recent work, says that I object to his views because, "first, so far as his analyses go, the fats are not deficient in blood," (scrofulous;) "second, because tubercle itself often contains a considerable quantity of fat; and third, because the theory is too mechanical, and vitiates itself by giving a too easy explanation of great difficulties."

Now, that this explanation is too mechanical, I submit for the following reason: I ask any person if it is reasonable to suppose that the mechanical fact of a little albumen and oil forming a globule with a non-vital nucleus can explain the power of cod-liver oil in enriching the blood? But other substances mixed with albumen assume a similar appearance, although I admit that oil is one of the best. But I believe the explanation, whatever it may be, is rather a chemical than a mechanical one, if the following facts, which I have occasionally thought upon for years, be correct:—

First. That drunkards hardly ever die of phthisis. Even if the proportion of deaths from phthisis in drunkards were only as great as in other people of more temperate habits, the circumstance would still be curious, since an irregular life, *cæteris paribus*, predisposes to phthisis; but if it be the case, as I have stated, that drunkards rarely die of phthisis, the circumstance is still more remarkable. Drunkards of course die of numerous diseases, but I believe rarely of phthisis. Second. Oils of all kinds and fatty substances are beneficial in phthisis. Third. Pitmen, according to my observation and inquiries, very rarely die of phthisis.

If the first and last kinds of alleged facts are incorrect, I shall be glad to have them corrected; if they are true, what do they point to?

Oils, alcohol, and the carburetted hydrogen of mines, constantly inhaled by the coal-miners, all agree essentially in affording to the blood large quantities of combustible substances; and I may mention along with this, that I have known, during my experience, many instances of young surgeons of small fortunes being compelled to go a voyage in a Greenland ship, and thus saved for some time at least from hereditary phthisis. Now during these voyages there is great consumption of nutritious substances, and perhaps not a little of alcoholic fluid.

I infer that the efficiency of the oils and, generally speaking, the hydro-carburets in tuberculosis, is due to some chemical influence which they exercise. This is supposing my premises admitted.

In the last part of Dr. Pereira's work, just published, the editors, in seeking to explain the operation of cod-liver oil, attempt to return to the idea that it is due to the iodine and bromine in the oil. They say—"as the oil contains iodine, and as it proves most successful in those maladies in which this element proves successful, it has been suggested

that iodine is its active principle. Taufflied, however, denies this, and asserts that the properties of the two are not identical, for the one succeeds where the other fails. Is bromine the active agent? (It must not be forgotten that iodine and bromine are combined organically with some of the constituents of this oil, and in such manner that they are not to be immediately recognised by the ordinary tests. This fact may perhaps tend to develop a peculiar action of iodine and bromine, and endow them with an efficacy not otherwise attainable.)"

Now in 100 parts of oil there are never more than 0.04 parts iodine, and as iodine exists in all fish, what possible virtue can it have, especially as it no doubt exists combined with alkaline or earthy bodies? A fabulous reputation seems attached to bromine. I have taken the bromide of sodium to my dinner instead of common salt!

The fact is that all the chlorides, bromides, and iodides are analogous; they afford a beautiful illustration of the greatest law ever observed in therapeutics, and of which very few seem to be capable of realizing an adequate idea—viz., that the chemical properties of bodies are exactly imitated by their physiological and medicinal properties.

Some years ago, as an illustration of this great law, I selected the group of chlorine, bromine, and iodine, so closely related in their chemical and physical properties, and as the compounds of bromine had been least examined they were especially chosen; and I think I proved that the physiological activity of these bodies was as their solubility, and their facility of decomposition, with this allowance, that as chlorine is the more active element of the three, chemically, so it and its compounds are the more active of the three physiologically, *cæteris paribus*. We find everywhere bromine and its compounds occupying an intermediate place between the others physiologically as they do chemically.

In the electro positive salts—say, the chloride, bromide, and iodide of potassium—the chloride is the least easy of decomposition and the least soluble, the bromide more so, the iodide most, in the ratio of their activity. When we come to the electro negative compounds—say, those of mercury—when the affinities come to be invited, there the physiological and medicinal powers are inverted also; for instance, iodine will decompose the chloride of mercury, while it will not decompose the chloride of potassium, and the chloride here is the most active, the bromide less so, the iodide least. Now I account for this by supposing that the activity of such substances depends in great part upon a series of molecular changes which they produce in the system, and that the elements liberated in the nascent form in the system produce a series of combinations and decompositions; but the fact remains, that these bodies are closely related, and as cod-liver oil contains more chlorides than bromides or iodides, the activity of it may just as well be attributed to the first class as to the others. But *omne ignotum est pro magnifico*. In the "Archives Générales d'Anatomie," for 1846, there is a paper which would seem to controvert some of these views; but for the present I shall content myself with stating that I adhere to them.

The late Mr. West, of Leeds, in an analysis of the mineral water at Shotley Bridge, in the county of Durham,—which, if his statement be correct, has wrongly fallen into desuetude,—states that there are traces of bromine, and attributes great probable powers to it. Now, as the proportion of bromides—for of course the bromine must exist in combination—is in infinitesimal proportion to the chlorides, this idea is another illustration of the hallucination which many men appear to entertain with regard to these bodies.

As a further illustration of the relationship between all the properties of the chlorides, bromides, and iodides, I may give an extract from the recent letter of Dr. Cogswell on the "Employment of the Chlorate of Potass in Cholera," published in THE LANCET of October 22nd. He found the endosmotic properties of the chloride, bromide, and iodide of potassium, to be as follows:—

"Elevation in inches—1st hour: chloride, 1.5; bromide, 5; iodide, 3. 2nd hour: chloride, 4; bromide, 2; iodide, 1." Always the chloride occupies the first position, the bromide the second, and the iodide the third. As the extraordinary confirmation which these results afforded to my conclusions was unknown at the time, and not thought of by Dr. Cogswell, they are the more valuable.

In conclusion, in my work on Scrofula I say that the merits of cod-liver oil are in all probability "as a tonic, from the resinous principle it contains; by stimulating animal heat; occasionally by acting as an aperient; and also as a deobstruent, more particularly by increasing the quantity of urine."

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