

means of avoiding subsequent obstruction, when there has been great abdominal distension and fecal accumulation.

And finally, in some cases, the value of continual irrigation of the peritoneal cavity.

## THE IMPUTATIONS ON BETA-NAPHTHOL

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Naphthol, as I remarked in a paper read before the Philadelphia County Medical Society, on October 17, 1883, published in *THE JOURNAL* on November 3, 1883, stands in the same relation to naphthaline as phenol does to benzol and cresol to tuluol. If one of the six molecules of hydrogen in benzol is replaced by hydroxyl, phenol is obtained, and in a similar manner are cresol and naphthol formed. The inference may therefore be safely drawn, through this analogy of formation and similarity of constitution, that their products are similar, and in consequence their general effects, so far as toxic quality is concerned, similar in action on the animal organization. This inference I accordingly drew, and proceeded to experiment with  $\beta$ -naphthol as probably affording a product equally antiseptic and harmless with that offered by the other form.

To do this effectively it was of course necessary to discard the commercial varieties, which contained sulphur and sulphurous acid and yield when sublimated (besides the naphthol crystals,) sulphuretted hydrogen, thionaptholes, carbolic and cresylic acid, thiophenols and other products, in order to secure a perfectly pure product. This I accomplished by passing a current of steam through an aqueous solution of naphthalin, expelling all volatile by-products, and thus obtaining naphthol in a state of the greatest purity. The first product is of the beautiful silvery scales which I exhibited, supplemented with others shown illustrating the effect of the further sublimation of the product, resulting in elegant white crystals; which procedure, however, as I remarked at the time, has the effect of producing a slightly pungent and disagreeable smell, evidencing a retrograde metamorphosis. So much for securing a chemically pure product.

Now as to the other mode of preparation, the product of which is not pure. The method of producing commercial naphthol is the one usually employed in effecting hydroxyl substitutions. This consists in first producing monosulphs (substitutions accomplished by means of strong sulphuric acid at certain temperatures), and by then melting the monosulphonated compound with sodium hydrate. In the case of the naphthalin treated thus

with sulphuric acid, the naphthalen-monosulphonic acid is produced according to the formula,  $C_{10}H_8 + S. O_3H_2 = C_{10}H_7S. O_3H + H_2O$ . This, upon being melted with sodium hydrate, yields naphthalin hydroxyl, or naphthol, as per formula  $C_{10}H_7S. O_3H + 2 (NaOH) = C_{10}H_7S. O_3Na + OH_2 + NaOH = C_{10}H_7OH + S. O_3Na + OH_2$ . This naphthol is usually purified by distillation and brought to market as crystalline masses of a reddish color and of a pungent, disagreeable odor, as shown by the specimen which I exhibited to the Society.

Simply dependent upon difference of temperature employed in the sulphonation of the naphthalin,  $\alpha$ -naphthol or  $\beta$ -naphthol is produced by these processes.

At the time when I read my paper before the Philadelphia County Medical Society, there was little question of the relative merits of  $\alpha$ -naphthol and  $\beta$ -naphthol. The assumption in my mind was, for the reasons assigned, that there could be no essential difference in the qualities of the products. Since that time, however, the question, then arising, as to their relative merits finds frequent mention in medical journals and is now likely to be sifted to the bottom. The question is determinable on a sufficient amount of empirical evidence, and in no other way. I have said that the difference in the two products is dependent simply upon difference of degree in the heat in the evolution of the products, and I have also given presumptive proof that sublimation pushed beyond a certain point produces ill-effects in the product. There is no evidence yet before me which would go to show that the products of  $\beta$ -naphthol with which experiments were made to its discredit were pure, or were anything else than the commercial article, which I have already shown to be impure. Nor could the answer be made to this position by saying that both products probably stood upon the same footing, as being of the commercial kind, both impure; for as the condition which produces different varieties is dependent upon more or less heat, it may very well be that difference of degree in heat affects also in different degrees the elimination of by-products. In one word, the basis of experimentation, if not scientific, must make all reasoning from it unscientific. Therefore I have nothing to say on this topic, but that the question of whether or not the  $\beta$  variety of naphthol is poisonous is, so far as published statements go, not determined, and that it cannot be conclusively settled until commercial products are ruled out and a sufficient number of experiments in competent hands have been tried. So far as I have seen comments upon the use of  $\beta$ -naphthol to its disadvantage I have seen it assumed that  $\alpha$ -naphthol has no toxic quality at all. It is not so explicitly stated but the inference is left in the reader's mind that  $\alpha$ -naphthol is not a toxic, and that  $\beta$ -naphthol is. I have now cleared the way to the true basis

for the determination of the question. The question is not whether  $\beta$ -naphthol has or has not some toxic quality, but which of the two naphthols has, if any, more toxic quality than the other. To the determination of the question of absolute poisonousness I contribute my mite by repeating some of the results of my experiments and practice already published and since amply confirmed and increased. It is true that my results, relating only to  $\beta$ -naphthol, are not relevant to the point as stated, but they at least afford some contribution to the general question of absolute, not relative, toxic effect. They will at least, as far as they go, show that the pure  $\beta$ -naphthol is not poisonous in any sense beyond that in which many medicines are poisonous. In the broadest sense anything not food is poison and even through idiosyncrasy what is to ordinary persons food is sometimes to others poison, as witness the effect of strawberries and many other foods upon certain subjects. Ascending from this relativeness of poison to abnormal pathogenic conditions lies an immense range of poisonous qualities inherent in certain forms of matter, until we reach what we conceive of as true poisons merely because they present themselves in small bulk.

I have dissolved half a grain of pure  $\beta$ -naphthol in 3,000 parts of water and have taken it myself. It produced some heartburn and dizziness and a slight sensation in the lumbar region. These symptoms disappeared after taking the same dose for several days in succession, the urine exhibiting traces of naphtholic compounds, but no albumen or blood. I then increased the dose to four grains per day for six successive days, followed by no untoward symptoms, increased warmth in the stomach after imbibition being followed by increase of appetite. Dr. Schofield, of Albany, reported to me that, at my request, he had used the  $\beta$ -naphthol experimentally, and afterwards largely in practice in the Albany Hospital, where its excellence is now firmly established, being used to the almost entire exclusion of other antiseptics for wounds, and for the disinfection of the wards of the hospital. His experience, as well as that of Kaposi and others, has led me to employ it in both private and hospital practice with eminent success. I found that it fully sustained the claim of Kaposi as to its efficacy in scabies, psoriasis, and chromophytosis, as well as in some of the chronic forms of eczema, in which it not only allayed the attendant itching, but lessened infiltration. I have said that I found it a most useful detergent and deodorant in treating wounds and indolent ulcers, in removing the fœtor and establishing healthy action of the parts. In aqueous solutions of half a grain to the fluid ounce of water, I have used it to great advantage, as a vaginal injection, in leucorrhœa and uterine carcinoma. Equally efficacious have I found it in both male and female gonorrhœal affections.

In diphtheritic affections it forms a most useful gargle, and removes well the fœtor of catarrh and other affections of the buccal cavity. In my hands, combined with lard or gelatin, it has also been very effective in squamous and fissured eczema.

To proceed further would be only needlessly to repeat the account of my experiments and practice, published in *THE JOURNAL*, of the date mentioned, so I here pause with the mere statement that I have seen no reason since to change my opinion of the efficacy and innocuous characteristics of  $\beta$ -naphthol, if pure, and to reaffirm from my own experiments and from those made at my instance, that the  $\beta$ -naphthol, when in that condition, has been found through long trial one of the most useful medicines and medicaments that have ever come within the physician's power to employ in the treatment of various complaints. Naphtha and petroleum, those wondrous reservoirs for the needs and arts of mankind, have nothing in their repertory greater than this to boast. Late experiments of mine with it in the treatment of obstinate constipation have had results, to me, of the most surprising and gratifying kind. I conclude, therefore, by reasserting all that I have previously said elsewhere of the excellence of pure  $\beta$ -naphthol. As none of my patients have experienced from its administration the toxic effects mentioned in some medical journals, I cannot be brought to consider it absolutely toxic. I await the result of properly conducted experiments to determine the relative toxic quality, if any toxic quality inhere in them, of the two varieties of naphthol.

## TWO CASES OF MELANOTIC TUMORS IN THE LUNGS.

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I have failed to find, in a careful reading of the best medical journals of our country, for twenty-five years, a case in any respect like two that have occurred in my practice, a report of which, I have thought, was due to my brethren of the profession, to whom I owe so much.

In the spring of 1864, while living at Auburn, Cal., I was called about 9 A.M. one day, to see a Mr. R., about 60 years of age. I found him in bed, coughing up and expectorating, but not vomiting, large quantities of black grumous blood, since midnight. His wife told me he had returned the evening before from Sacramento, where he had been for a month, under the care of Dr. F., whom I knew as one of the leading physicians of that city, and who, she said, had been treating him for some hepatic disease.

On auscultation I found below the right nipple, lower lobe, a considerable tract impervious to air, but a clear vesicular murmur elsewhere through-