



E. I. DU PONT DE NEMOURS & COMPANY  
INCORPORATED

CHAMBERS WORKS

MAIL, TELEGRAPHIC AND EXPRESS ADDRESS  
PENNS GROVE, N. J.

FREIGHT ADDRESS  
CARNEY'S POINT, N. J.

June 18, 1947

Dr. Arthur Mangelsdorff  
Calco Chemical Company  
Bound Brook, New Jersey

Dear Art:

I am enclosing, herewith, two copies of the laboratory method for the determination of lead in freshly voided urine, which was prepared by Dr. Kenoc's group and is the one we will follow when we obtain facilities here.

The question of health control of employees in the manufacture of Beta Naphthylamine is indeed a grave one. As you know, we have manufactured Beta Naphthylamine for many years. Of the original group, who began the production of this product, approximately 100% have developed tumors of the bladder. Of course, methods of production have changed radically through the years. At the present time, very serious consideration is being given to extensive modifications in the process, insofar as they pertain to safeguarding the health of employees. The method of manufacture is an old one and cannot, they tell me, be materially changed.

As you know, the Haskell Laboratory have produced tumors of the bladder in dogs by feeding Beta Naphthylamine. These can be produced in these animals in 18-20 months. These experiments have been repeated by other investigators, namely, the Memorial Hospital group in New York, The Sloan Kettering Institute for Cancer Research.

We have never been completely satisfied with our operations or medical control. In our experience, the mean time of exposure, prior to the development of a tumor, is approximately twelve years. The earliest appearance of a tumor which, we believe, is directly due to chemical exposure, is five years. These tumors are multiple, they recur, new tumors appear in different areas of the bladder mucosa, and they may be in any stage of malignancy, from benign papilloma to grade IV carcinoma.

It is believed that Beta Naphthylamine when absorbed in the body is excreted in the urine as such, and

DR. ARTHUR MANGELSDORFF

-2-

JUNE 18, 1947

that also a sulfuric acid ester occurs. The exact formula for this, I cannot give you. However, we have been determining the excretion of Beta Naphthylamine as base or straight Beta Naphthylamine and total Beta Naphthylamine, which is considered the base plus the esterification of the product.

I am sending you, herewith, copies of our procedures for these practices. However, as I mentioned to you on the phone, Miss Elizabeth Hutchison, who is with you now, has specific instruction in these methods from the Haskell Laboratory and performed the work here for more than five years. Insofar as these methods are concerned, I am sure that she could discuss them in detail with you. Many questions may be raised concerning the specificity of these tests, and I believe a detailed chemical study would be valuable in perfecting these procedures. In any event, it is apparent that the manufacture of Beta Naphthylamine is a hazardous one, and every precaution should be used to prevent exposure to the workmen employed in the production of this product.

Yours very truly,

W. C. BROTHERS, MANAGER  
CHAMBERS WORKS

By E. E. Evans M.D.  
E. E. Evans, M.D., Director  
Medical Division-

EEB:BC