

**CHEMICAL ANALYSIS OF  
HEALTHY AND DISEASED  
URINE, QUALITATIVE AND  
QUANTITATIVE**

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Chemical Analysis of Healthy and Diseased Urine, Qualitative and Quantitative by T. C. van Nüys

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*Dave*

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## PREFACE.

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In the preparation of this Manual no labor has been spared to adapt it to the requirements of all persons into whose hands it may fall. With this object in view, simple qualitative tests are given in full, and the rationale of chemical processes fully explained, and, to meet the requirements of students somewhat familiar with laboratory work, nearly all the methods employed in quantitative estimations are given in full; especially is this true in processes peculiar to work in physiological chemistry.

The plan of the part of the work devoted to the Qualitative Examination of the Urine is understood by examination of the Index of Chapters. Chapter VI is devoted to Processes of Examination of the Urine and Sediments, and Chapter VII is given to the consideration of Concretions and Stones. The preceding chapters, I to V inclusive, are devoted to the Physical and Chemical Properties of Constituents of the Urine. These chapters, therefore, embrace materials with which the student should become quite familiar by experimentation, in order that the work laid out in Chapters VI and VII may not be mechanical.

In Chapter VIII is found a brief consideration of Processes and Apparatus employed in Quantitative work, and also the Preparation of Normal Solutions required. In this connection the student should not infer that a general work on Quantitative Analysis, embracing details of manipulation with description of apparatus, is not required. The most important facts, as regards laboratory work, have been incorporated, that they may be of some assistance to those who have no complete treatise at hand.

In Chapters IX, X and XI are found Methods for Estimation of Quantities of Constituents of Healthy or Diseased Urine, as the case may be, and in Chapter XII are Methods for Estimation of Quantities of Albuminous Bodies, and Sugar in Urine. As an aid to students to gain an insight into the constitution of food and urine, and the relationship they sustain to each other, the four Tables in the Appendix are introduced. Tables 2, 3 and 4 are from Zuelzer, while Table 1 was arranged from data collected by the author.

The Quantitative part of the work is perhaps fuller than is generally required, but with a moment's consideration it is understood that it was by quantitative analysis that nearly all the facts concerning the transformation of tissue and the elements of food have been brought to light; and that quantitative analysis will eventually be employed in many cases as an aid in diagnosis and in the treatment of disease, is an assured fact if the practice of medicine is to become to a certain extent fixed, as mathematics and physics.

Presumably it would not be speculative to assume that the natural history of a specific disease embraces a typical composition of the urine. In this direction much is due to the labors of Zuelzer, of Germany, and Lépine, of France. By Zuelzer the quantity of nitrogen excreted by the kidneys is placed at 100, and in health the variation of the relative quantity of each constituent of the urine is known from the results of numerous estimations. This basis of measurement is satisfactory in all cases, as nitrogen is a constituent of all tissues, and nitrogenous products are excreted by the kidneys. When an organ or particular tissue yields an increased quantity of products of waste these products are, to a great extent, found in the urine, in which case the relative quantities of these products are increased. Without some standard of measurement, the fact that a product,  $P_2O_5$  for example, is found in increased quantity in the urine, is of little or

no value; but if the quantity of  $P_2O_5$  is much greater than in health, while that of nitrogen is not greatly increased, attention is directed to tissues containing much phosphorus, as lecithin, in nerve centres. From these facts it is implied that the estimation of the quantity of nitrogen in urine should be made, when the quantities of other constituents are determined.

Until recently this was an obstacle not easily overcome, when the only methods for the estimation of nitrogen leading to correct results were those of Dumas and Varrentrapp and Will, but now, as Kjeldahl's method is known to yield results as accurate and not requiring much time or apparatus, there is no reason why the employment of quantitative estimations will not lead to a knowledge of types in the constitution of the urine peculiar to different diseases. It was with this view that the quantitative part of the work was made somewhat lengthy, and that the methods employed are the most exact.

VAN NÜYS.

INDIANA UNIVERSITY CHEMICAL LABORATORY,  
BLOOMINGTON, IND., December, 1887.





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