

**WATER-ANALYSIS: A
PRACTICAL TREATISE
ON THE EXAMINATION OF
POTABLE WATER**

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Water-Analysis: A Practical Treatise on the Examination of Potable Water by J. Alfred Wanklyn & Ernest Theophron Chapman

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J. ALFRED WANKLYN & ERNEST THEOPHRON CHAPMAN

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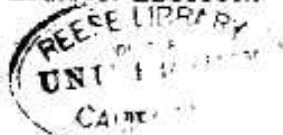
BY

J. ALFRED WANKLYN

AND

ERNEST TILLOPHRON CHAPMAN.

EIGHTH EDITION.



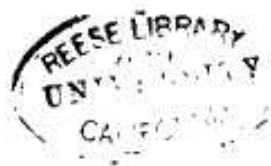
J. ALFRED WANKLYN, M.R.C.S.

CORRESPONDING MEMBER OF THE ROYAL BAVARIAN ACADEMY OF SCIENCES;
HONORARY MEMBER OF THE UNIVERSITY OF EDINBURGH CHEMICAL SOCIETY;
FORMERLY
DEMONSTRATOR OF CHEMISTRY IN THE UNIVERSITY OF EDINBURGH.

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1891.



PREFACE TO THE SEVENTH EDITION.

—♦—

TWENTY-ONE years ago the ammonia-process of water-analysis was originated: twenty years ago the first edition of this book was written.

The history of the ammonia-process is without a parallel in the history of chemical analysis, and the reception of the process on its first appearance may be gathered from the closing portion of the Appendix, which is kept on record for the encouragement of all such as are suffering persecution for the sake of truth.

No analytical process has ever been so condemned as the ammonia-process, which—having been discovered about a generation before chemists were prepared for it—has surmounted every obstacle and attained to general recognition all the world over for its pre-eminence utility and trustworthiness.

In the present edition of this book a large part of the last edition reappears without alteration. Part I. remains unchanged; but the beginning of Part II. is altered by there being two new chapters, viz., a chapter on Specific Gravity (which takes the place of an old chapter on the same subject) and an additional chapter on Carbonic Acid, which had hitherto been curiously overlooked. For the first time a real connection between the specific gravity and the contents of a drinking-water has been experimentally demonstrated.

Part III has been enlarged, and includes a section on the classification of natural waters, and in so doing embodies the accumulated experience of many years. There is a section dealing with the solution of lead by certain kinds of drinking water.

A feature of the book is the personal character of the analytical work recorded in the book. Some of the earlier work was done by Chapman, and Smith assisted him, and Chapman's name remains on the title-page. All the rest, with hardly an exception, is the work of my own hands unaided by any assistant.

In England, at the present time, chemists in official position do too much of their work by proxy. And it is not without reason that I record the personal character of that which is published in my name.

J. ALFRED WANKLYN.

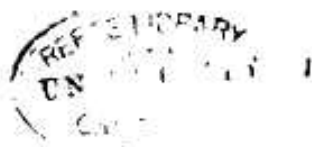
7 WESTMINSTER CHAMBERS, LONDON, S. W.,
October 1888.

PREFACE TO THE EIGHTH EDITION.

A NEW EDITION being called for, I take the opportunity of publishing explicit directions for making the solutions for the Moist Combustion process (*vide* p. 54). The patent for the process has expired.

J. ALFRED WANKLYN.

NEW MALDEN, SURREY,
March 1891.



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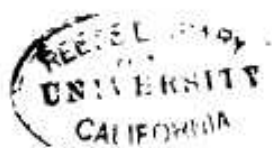
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WATER-ANALYSIS.

INTRODUCTION.

MEDICAL authorities are, at the present time, pretty well agreed that if the water of a well, which has received the excreta of a patient suffering from cholera, or from typhoid fever, be drunk, there is the utmost danger that the drinker may contract those diseases. It is also a received fact that the drinking of water which contains an undue proportion of organic filth—even assuming specific poison to be absent—is injurious to health. Such being the case, the first questions which the sanitarian asks, respecting a given specimen of water which is proposed for use as “potable water,” are—Does it contain these septic poisons? Is it abnormally charged with organic filth?

To both these questions the water-analyst is enabled, by the ammonia-process and moist combustion process, to answer, in many instances, by an absolute No. In other cases he can show that the water is abnormally filthy; and, in some cases, that there is danger of specific poison.

In the proper place (Chapter IV.) the ammonia-process will be minutely described and explained. Here, however,

some of the general results which have flowed from the diligent employment of this process during the last seven years may be briefly summarised.

First, it may be mentioned that the ammonia-process is easily able to detect one part of albumen, gelatine, organic alkali, &c., mixed with ten million times its weight of water. Armed with an instrument of this power, my colleagues and myself have proceeded to investigate the condition of natural waters, and have arrived at the following general conclusions :—

There are deep-spring waters—*i.e.*, the water from the Greensand and the Caterham water—which do not contain even this small proportion of nitrogenous organic matter.

So pure (organically considered) are these waters, that it is with difficulty even that the chemist prepares distilled water to vie with them in purity. The water which, after being stored in reservoirs and filtered, is served out by Water Companies to English and Scotch towns, is likewise, as a rule, in a state of high purity. Not indeed to the supreme degree reached by deep springs does the town water-supply attain ; but still, whatever the source whence it draws its supply, the town-reservoir discharges surprisingly pure water, if only an honest filtration be performed by the Water Company.

Leaving the pure, deep-spring water, and the fairly pure water of the town water-works, we have found unfiltered river water to be, as might be expected, of variable quality. Sometimes this, too, is fairly pure ; but at other times, as when the river Thames has received the Fleet-ditch sewer, it is abominably filthy. The surface-well is most capricious in quality. It may be fairly pure, or it may be disgustingly foul. Of all the kinds of water that are drunk, the dirty