

**THE CHEMISTRY OF HAT  
MANUFACTURING: LECTURES  
DELIVERED BEFORE THE HAT  
MANUFACTURERS'  
ASSOCIATION**

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The Chemistry of Hat Manufacturing: Lectures Delivered Before the Hat Manufacturers' Association by Watson Smith & Albert Shonk

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THE CHEMISTRY OF  
HAT MANUFACTURING

# THE CHEMISTRY OF HAT MANUFACTURING

LECTURES DELIVERED BEFORE THE  
HAT MANUFACTURERS' ASSOCIATION

BY

WATSON SMITH, F.C.S., F.I.C.

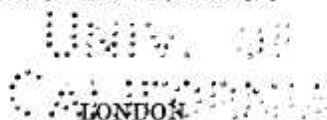
THIRD LECTURER IN CHEMICAL TECHNOLOGY IN THE OWENS COLLEGE, MANCHESTER  
AND LECTURER OF THE VICTORIA UNIVERSITY

REVISED AND EDITED

BY

ALBERT SHONK

WITH SIXTEEN ILLUSTRATIONS



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## P R E F A C E



THE subject-matter in this little book is the substance of a series of Lectures delivered before the Hat Manufacturers' Association in the years 1887 and 1888.

About this period, owing to the increasing difficulties of competition with the products of the German Hat Manufacturers, a deputation of Hat Manufacturers in and around Manchester consulted Sir Henry E. Roscoe, F.R.S., then the Professor of Chemistry in the Owens College, Manchester, and he advised the formation of an Association, and the appointment of a Lecturer, who was to make a practical investigation of the art of Hat Manufacturing, and then to deliver a series of lectures on the applications of science to this industry. Sir Henry Roscoe recommended the writer, then the Lecturer on Chemical Technology in the Owens College, as lecturer, and he was accordingly appointed.

The lectures were delivered with copious experimental illustrations through two sessions, and during the course a patent by one of the younger members became due, which proved to contain the solution of the chief difficulty of the British felt-hat manufacturer (see pages 66-68). This remarkable coincidence served to give especial stress to the wisdom of the counsel

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of Sir Henry Roscoe, whose response to the appeal of the members of the deputation of 1887 was at once to point them to scientific light and training as their only resource. In a letter recently received from Sir Henry (1906), he writes: "I agree with you that this is a good instance of the *direct money value* of scientific training, and in these days of 'protection' and similar subterfuges, it is not amiss to emphasise the fact."

It is thus gratifying to the writer to think that the lectures have had some influence on the remarkable progress which the British Hat Industry has made in the twenty years that have elapsed since their delivery.

These lectures were in part printed and published in the *Hatters' Gazette*, and in part in newspapers of Manchester and Stockport, and they have here been compiled and edited, and the necessary illustrations added, etc., by Mr. Albert Shonk, to whom I would express my best thanks.

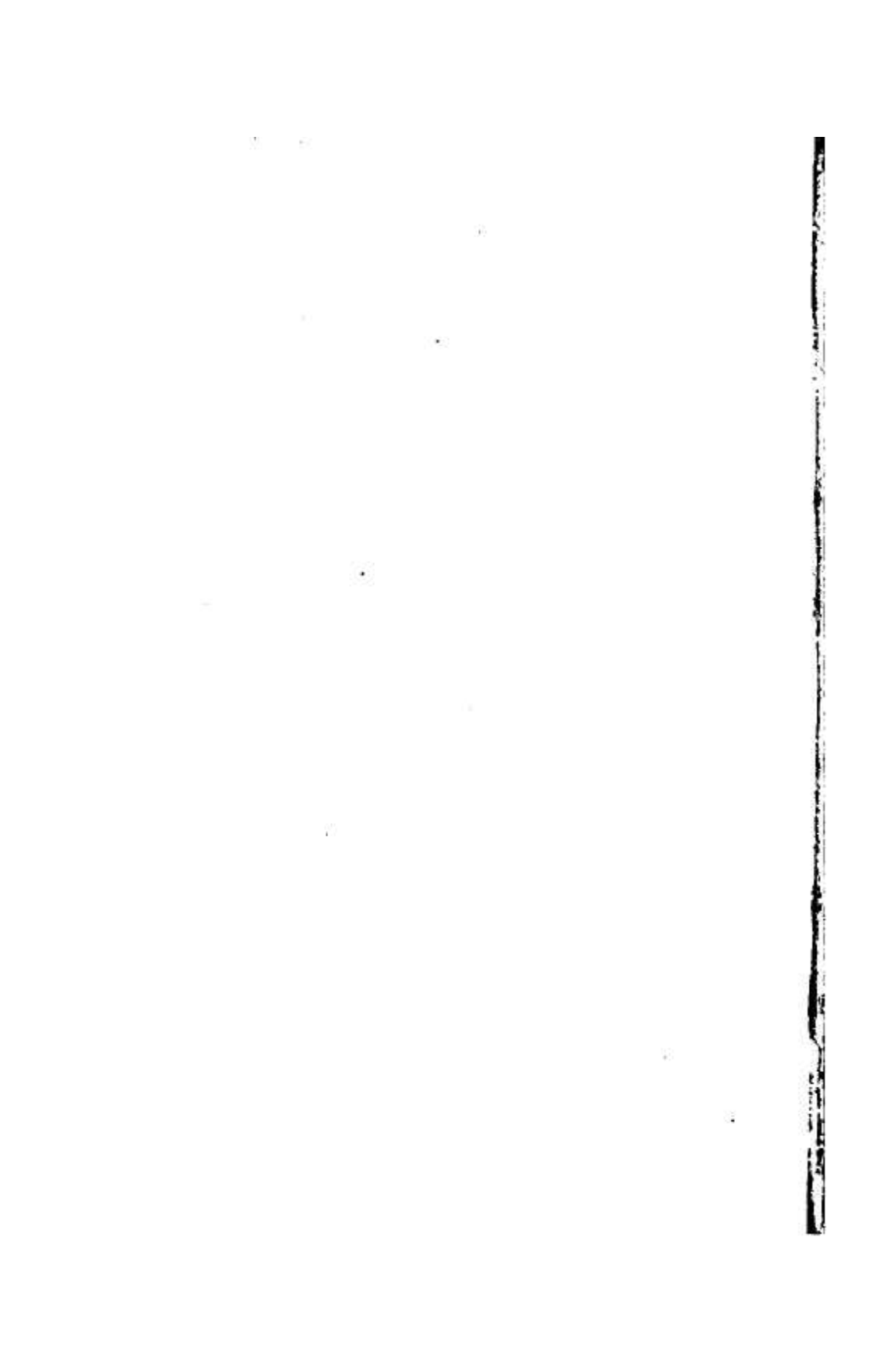
WATSON SMITH.

LONDON, *April* 1906.



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UNIV. OF  
CALIFORNIA

# THE CHEMISTRY OF HAT MANUFACTURING

## LECTURE I

### TEXTILE FIBRES, PRINCIPALLY WOOL, FUR, AND HAIR

*Vegetable Fibres.*—Textile fibres may be broadly distinguished as vegetable and animal fibres. It is absolutely necessary, in order to obtain a useful knowledge of the peculiarities and properties of animal fibres generally, or even specially, that we should be, at least to some extent, familiar with those of the vegetable fibres. I shall therefore have, in the first place, something to tell you of certain principal vegetable fibres before we commence the more special study of the animal fibres most interesting to you as hat manufacturers, namely, wool, fur, and hair. What cotton is as a vegetable product I shall not in detail describe, but I will refer you to the interesting and complete work of Dr. Bowman, *On the Structure of the Cotton Fibre*. Suffice it to say that in certain plants and trees the seeds or fruit are surrounded, in the pods in which they develop, with a downy substance, and that the cotton shrub belongs to this class of plants. A fibre picked out from the mass of the downy substance referred to, and examined under the microscope, is found to be a spirally twisted band; or better, an