

## CONTENTS

### CHAPTER I

#### INTRODUCTION

	PAGE
Importance of the paper trade—Lack of standards of quality—Deterioration of paper—Chemical and physical constants—Fibres in relation to the ideal paper—Principles of paper-making . . . . .	1

### CHAPTER II

#### TECHNICAL DIFFICULTIES RELATING TO PAPER

Specific examples of cases in actual practice—Influence of moisture—Wavy edges—Bulk—Uneven colour—Dust—Impurities . . . . .	6
---	---

### CHAPTER III

#### RAG PAPERS

Preliminary Operations.—Sorting, cutting, dusting, boiling, washing—Bleaching—Halfstuff—Beating. Hand-made Papers.—Description of process—Tub-sizing—Preparation of animal size—Drying—Plate-glazing. Machine-made Papers.—The Fourdrinier machine . . . . .	13
--	----

### CHAPTER IV

#### ESPARTO—STRAW—NOTES ON BEATING

Esparto.—Sorting, cleaning and boiling—Bleaching, beating, loading, sizing—Manufacture of rosin size—Colouring—Making paper on the Fourdrinier machine. Straw.—Preparation of straw pulp—Washing, bleaching, &c. Beating . . . . .	36
--	----

### CHAPTER V

#### WOOD PULP

Mechanical Wood Pulp.—Logs—Barking, grinding, boiling, screening, pressing. Chemical Wood Pulp.—Logs, chipping, screening, pressing, making dry pulp, sulphite liquor . . . . .	53
---	----

## CHAPTER VI

## WOOD-PULP PAPERS

	PAGE
Selection of wood pulps—Varieties of wood pulps—Nature of papers produced—Process of manufacture—Writings and high-class printings—News and common printings . . . . .	68

## CHAPTER VII

## PACKING PAPERS

Browns—Shop-papers—Millboards—Vulcanised board—Pulp boards . . . . .	78
--	----

## CHAPTER VIII

## "ART" PAPERS

Process of manufacture—Materials used—Qualities of art paper—Defects in art paper—Influence of mineral constituents—Surface—Printing process . . . . .	84
--	----

## CHAPTER IX

## THE PHYSICAL QUALITIES OF PAPER

Weight and substance—Thickness—Bulk—Strength—Elasticity—Resistance to crumpling and folding—Sizing qualities—Absorptive capacity—Imperviousness—Transparency—Colour and finish—Surface and other qualities . . . . .	98
--	----

## CHAPTER X

## THE CHEMICAL CONSTITUENTS OF PAPER

Normal.—China-clay—Sulphate of lime—Barytes—Agalite—Determination of ash—Nature of loading—Moisture—Starch—Sizing materials—Gelatine—Casein—Rosin size. Abnormal.—Acid—Chlorine—Sulphur—Metallic impurities . . . . .	128
---	-----

## CHAPTER XI

## THE MICROSCOPE

Description of the instrument and accessories—General hints on the use of the microscope—Mounting, examination and identification of fibres—Exercises for students—Measuring the dimensions of fibres—Reagents for microscopical work . . . . .	144
---	-----

## CONTENTS

ix

### CHAPTER XII

#### FIBROUS MATERIALS USED IN PAPER-MAKING

	PAGE
General classification—Linen, cotton, esparto, straw, hemp, jute, wood pulp—Other fibres—Microscopical features—Dimensions—Colour reactions . . . . .	156

### CHAPTER XIII

#### ANALYSIS OF A SHEET OF PAPER

Typical example of a report on the investigation of two high-class rag papers . . . . .	178
---	-----

### CHAPTER XIV

#### THE C.B.S. UNITS

A study of the qualities of paper in terms of the "volume composition"—The expression of the strength of paper in terms of the "breaking weight per unit of sectional area"—The alterations in physical qualities occurring at various stages of manufacture . . . . .	178
--	-----

### CHAPTER XV

#### CELLULOSE AND ITS DERIVATIVES

Cellulose, simple and compound—Cellulose and water—Solvents—Action of dilute alkalis and acids—Action of strong alkalis and acids—Industrial uses of cellulose derivatives—Investigation and analysis of raw fibres—Percentage composition of certain well-known plants . . . . .	194
---	-----

### CHAPTER XVI

History, chronology and statistics . . . . .	208
--	-----

### CHAPTER XVII

A Dictionary of Chemical Terms . . . . .	216
--	-----

## CHAPTER XVIII

	PAGE
A glossary of various papers, with brief notes as to origin of same, and use of the papers . . . . .	227

## CHAPTER XIX

Questions on "Paper manufacture" set by the City and Guilds of London Institute, 1902-1906 . . . . .	239
INDEX . . . . .	249