

CONTENTS

	<i>Page</i>
FOREWORD	v
PREFACE	vii
ACKNOWLEDGEMENTS	ix
INTRODUCTION	i
Chapter 1. COLLECTION OF WATER	5
1.1 RAINFALL—Rainfall maps—Reliability of rainfall. 1.2 RUN-OFF, EVAPORATION AND PERCOLATION—Run-off—Evaporation—Percolation—Surface-water losses. 1.3 UPLAND SURFACE-WATERS—Geology of upland catchments—Capacity of impounding reservoir—Compensation water—Flood overflows—Catchwaters. 1.4 RIVER-DERIVED SUPPLIES—River intakes. 1.5 UNDERGROUND WATER—Underground flow—Collecting ground-water. SELECTED REFERENCES.	
Chapter 2. WATER QUALITY	26
2.1 WATERBORNE DISEASE. 2.2 PREVENTION OF WATERBORNE DISEASE. 2.3 WATER EXAMINATION. 2.4 PHYSICAL EXAMINATION OF WATER. 2.5 CHEMICAL ANALYSIS. 2.6 BACTERIOLOGICAL EXAMINATION OF WATER. 2.7 BIOLOGICAL INVESTIGATION. 2.8 SAMPLING WATER. SELECTED REFERENCES.	
Chapter 3. WATER TREATMENT	40
3.1 NATURAL PURIFICATION—Self-purification. 3.2 SCREENING AND STRAINING—Micro-straining. 3.3 SEDIMENTATION—Design of sedimentation basins. 3.4 COAGULATION AND FLOCCULATION—Coagulation—Flocculation. 3.5 RAPID SAND FILTRATION—Types of rapid filters—Operation of mechanical filters—High-rate filtration—Double filtration. 3.6 SLOW SAND FILTRATION—Operation of slow sand filters—Biology of slow sand filters. 3.7 STERILIZATION—Chlorine and chlorine-ammonia—Chlorine dioxide—Ozone. 3.8 REMOVAL OF COLOUR. 3.9 REMOVAL OF TASTES AND ODOURS—Preventive measures—Correcting tastes and odours. 3.10 SOFTENING AND DEMINERALIZATION—Lime and lime-soda softening—Stabilizing lime-softened water—Ion-exchange softening—Demineralization—Choice of method. 3.11 REMOVAL OF IRON AND MANGANESE—General characteristics of these waters—Control and treatment. 3.12. REMOVAL OF FLUORINE. 3.13 CONTROL OF INCRUSTATION. 3.14 PREVENTION OF CORROSION AND SCALE—Corrosion and plumbosolvency—Carbonate balance—Control of corrosion and plumbosolvency—Prevention of scale—External corrosion of pipelines. 3.15 BIOLOGICAL CONTROL—Control of reservoir weeds—Control of algae—Use of algicides. 3.16 MASS PROPHYLAXIS—Iodine and thyroid dysfunction—Fluorine and dental caries. SELECTED REFERENCES.	
Chapter 4. DISTRIBUTION OF WATER	96
4.1 QUANTITY OF WATER REQUIRED—Rural water requirements—Urban water requirements. 4.2 THE DISTRIBUTION SYSTEM. 4.3 MAINS—Network calculations. 4.4 PRESSURE ZONES. 4.5 BOOSTERS. 4.6 SERVICE RESERVOIRS—Capacity of service reservoirs—Siting service reservoirs. 4.7 WATER FOR FIRE-FIGHTING. 4.8 DETECTION AND PREVENTION OF WASTE—Water losses—Detection of waste—Prevention of waste. SELECTED REFERENCES.	

Chapter 5. SEWERAGE AND SEWAGE DISPOSAL

5.1 SEWER SYSTEMS. 5.2 QUANTITY OF SEWAGE. 5.3 QUANTITY OF STORM-WATER—Ormsby and Hart method. 5.4 PRINCIPLES OF SEWER DESIGN. 5.5 STORMWATER OVERFLOWS—Design of side weirs. 5.6 DISPOSAL AND TREATMENT. 5.7 LAND DISPOSAL. 5.8 DISPOSAL BY DILUTION—Mechanism of self-purification—Degree of dilution—Discharge to the sea. 5.9 SOIL FERTILITY—Soil fertility and soil erosion—Soil fertility and health. SELECTED REFERENCES.

Chapter 6. SEWAGE TREATMENT

Treatment plant. 6.1 SEWAGE EXAMINATION—Physical analysis—Chemical examination—Bacteriological examination—Strength of sewage—Sampling sewage. 6.2 PRELIMINARY TREATMENT—Screens—Detritus channels. 6.3 SEDIMENTATION—Continuous-flow settlement—Chemical coagulation—Mechanical flocculation—Sedimentation basins. 6.4 SEPTIC AND IMHOFF TANKS—Septic tanks—Imhoff tanks. 6.5 BIOLOGICAL FILTRATION—Bacteria beds—High-rate filtration—Re-circulation of effluent—Alternating double filtration—Aerated filters. 6.6 ACTIVATED SLUDGE—Diffused-air aeration—Mechanical aeration—Partial purification—Relative advantages of activated sludge. 6.7 EFFLUENT TREATMENT—Humus tanks—Mechanical flocculation—Rapid filtration—Micro-straining—Chlorination. 6.8 CHLORINATION OF SEWAGE. 6.9 SLUDGE TREATMENT—Methods of pretreatment—Sludge filtration—Sludge drying. 6.10 SEWAGE EFFLUENT RECOVERY. SELECTED REFERENCES.

Chapter 7. RIVER POLLUTION

7.1 TYPES OF POLLUTION. 7.2 DISSOLVED OXYGEN AND SELF-PURIFICATION. 7.3 EFFECTS OF POLLUTION ON PLANT LIFE—Sewage fungus—Nutrient salts and green plants. 7.4 EFFECTS OF POLLUTION ON INVERTEBRATE ANIMALS. 7.5 EFFECTS OF POLLUTION ON FISH. 7.6 EFFECTS OF POLLUTION ON THE USE OF WATER. SELECTED REFERENCES.

Chapter 8. TREATMENT OF TRADE WASTE WATERS

8.1 GAS LIQUORS—Recovery of ammonia—Treatment of gas liquors for discharge to sewers—Other methods of disposal. 8.2 PICKLING AND PLATING WASTES—Polluting effects of these wastes—Methods of treatment. 8.3 PAPER-MILL WASTES—Treatment of pulp and paper wastes. 8.4 MILK WASTES—Treatment of milk wastes. 8.5 CANNERY WASTES—Treatment of cannery wastes. 8.6 BREWERY WASTES—Treatment of brewery wastes. 8.7 DISTILLERY WASTES—Methods of treatment. 8.8 ABATTOIR WASTES—Methods of treatment. 8.9 TANNERY WASTES—Effects of this pollution—Methods of treatment. 8.10 FLAX-RETTING WASTES—Methods of treatment—Aerobic retting. 8.11 LAUNDRY LIQUORS—Treatment of laundry wastes. 8.12 WOOL-SCOURING LIQUORS—Treatment of wool-scouring wastes. 8.13 WATERS FROM COAL-MINING—Mine drainage—Coal-washing. SELECTED REFERENCES.

Chapter 9. REFUSE DISPOSAL

9.1 REFUSE COLLECTION—Collecting vehicles—Organization of collection. 9.2 DISPOSAL METHODS. 9.3 REFUSE RECOVERY—Treatment of kitchen waste—Separation of salvage. 9.4 REFUSE DISPOSAL—Controlled tipping—Incineration. 9.5 COMPOSTING—The technique of composting—Value of compost. 9.6 WATER-CARRIAGE OF REFUSE—The Garchey system—Disposal of food waste with sewage. SELECTED REFERENCES.

Chapter 10. ATMOSPHERIC POLLUTION

10.1 NATURE AND SOURCE OF ATMOSPHERIC POLLUTION. 10.2 ATMOSPHERIC POLLUTION AND METEOROLOGY—Dispersion of airborne pollution—Atmospheric stability. 10.3 EFFECTS OF POLLUTION ON HEALTH. 10.4 POLLUTION AND PLANT LIFE. 10.5 OTHER EFFECTS OF ATMOSPHERIC POLLUTION. 10.6 MEASUREMENT OF ATMOSPHERIC POLLUTION—Measurement of flue gases—Determination of airborne contaminants. 10.7 ABATEMENT OF ATMOSPHERIC POLLUTION—Control of emission—Prevention of emission. SELECTED REFERENCES.

Chapter 11. DISTRICT HEATING

11.1 THE NEED FOR DISTRICT HEATING. 11.2 OTHER CENTRALIZED SUPPLIES OF HEAT. 11.3 ADVANTAGES AND DISADVANTAGES OF DISTRICT HEATING. 11.4 FUEL SAVING. 11.5 DISTRICT HEATING TECHNIQUE. 11.6 DISTRICT HEATING SYSTEMS—Thermal-electric heating systems—Distribution systems. 11.7 HEAT PUMP. 11.8 DISTRICT HEATING IN BRITAIN—Manchester—Liverpool—Leicester—South Wales—Dundee—Urmston—Pimlico. 11.9 HEAT PUMPS IN BRITAIN—Norwich—*Daily Mirror*, London. SELECTED REFERENCES.

SUBJECT INDEX

AUTHOR INDEX