RESERVOIRS

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Engineering Hydrology, second edition

E. M. Wilson

RESERVOIRS

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For Ann

There is nothing in nature more enchanting than a lake. Rivers I have loved, and with them the restless sea, so magical and yet so melancholy, perhaps because it seems the symbol of our desires; but it is those lovely lapping sheets of water, neither seas nor rivers, yet having the charm of both with something added, some touch of quiet, peace, soul's ease, that really possess my heart. You travel over leagues of hulking and stubborn land, then suddenly turn a corner and find a space where there is no earth, but only a delicate mirroring of the sky and that faintest rise and fall of waters, the lap-lap-lap along the little curving shore. Where else can you find such exquisite beauty and tranquility? May I end my days by a lake, one of earth's little windows, where blue daylight and cloud and setting suns and stars go drifting by to the tiny tune of the water.

J. B. Priestley, *Essays of Five Decades* (Heinemann, 1969)

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Preface

This book is intended to describe what a reservoir is, how it operates and why indeed it is necessary at all. The subject is approached from many angles: engineering, biology, chemistry, management, ecology and mathematics. It thus should be of interest to anyone wishing to gain a foothold in this interdisciplinary subject, by learning a little about the views taken by specialists in fields different from, but nevertheless closely allied to, his own interests. To facilitate understanding by a wide readership, technical language and complicated mathematics have been avoided. Some numerical examples are included. It is considered that, although fuller understanding can be best gained by working through examples, the flow of the text would be interrupted if too large a number were included. The reader is therefore advised to consult the appropriate (single-subject) text and work through examples on his or her own. For this (and many other) reasons a fairly comprehensive bibliography is included, to direct the reader to texts that deal in detail with the more orthodox approaches to this subject of reservoirs—a topic which, as water demands continue to increase, must enter *all* our lives at home and at work with increasing frequency and importance.

When units occur the SI (*Système International*) units will be used. When older units are, perhaps, more meaningful or familiar these are included in brackets.

Because natural lakes are often used as water-supply reservoirs (for example, Haweswater, Thirlmere)—in effect a reservoir is but a man-made lake—the terms ‘lake’ and ‘reservoir’ may be regarded as interchangeable for our present purposes, and will be used as such.

BRIAN HENDERSON-SELLERS

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I am also grateful to Mrs S. E. Mather for her excellent artwork and to the following authors and publishers who have given me permission to include several of their tables and figures: *Area* and the Institute of British Geographers for figure 2.3; Edward Arnold and A. C. Twort for table 1.2; the Controller of Her Majesty's Stationery Office for figure 11.1; the Division Director, Southern Division, Yorkshire Water Authority for figure 6.1; Freshwater Biological Association for figures 10.8 and 10.9; Gleeson Civil Engineering Ltd for figure 2.4; Dr D. H. Mills for figure 7.1; W. B. Saunders Company and Professor R. G. Wetzel for figure 7.6; Severn-Trent Water Authority for figure 4.6; Keith Smith for figure 11.4; Thames Water—Vales Division for figure 8.4; Welsh Water Authority for the cover photograph; the World Health Organization for table 12.1; R. E. Youngman for figure 8.3; also J. B. Priestley and William Heinemann Ltd for the quotation appearing on p. vi.

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