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UNDERGROUND RAILWAY OPERATION

HANDLING LONDON'S UNDERGROUND TRAFFIC

By

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FOREWORD

IN this book is a record of the various aspects of the problem of handling London's traffic on the Underground railways as they presented themselves to the author in the Spring of 1928. The organization and equipment which is clearly and carefully described in this book was not found ready made. It represents the result of a policy of constant adjustment and improvement spread over some twenty years, in which the author has borne no small or light part. In fact, largely owing to his enterprise and liveliness, the machinery, both human and mechanical, which he describes has been built up and perfected. The book necessarily gives a static impression. It sets out a state of affairs which to the reader may appear as fixed and settled. Yet this is far from being the case. To stay, as it were, the march of progress for a brief while, to survey the position reached, is a convenient and educative step to take. It affords a measure of what has been achieved. Yet, even as I write this brief note of introduction, I know that the position is changing, that progress cannot be checked or thwarted in a living organization, that what is written in the book will need amplification and amendment almost as soon as it is published. To those who know and use the Underground railways, the impression must always be dynamic.

I am driven, therefore, to ask what is the value of this book, and I conceive it to be a groundwork for further advancement. It offers to those who wish to learn about this problem a conspectus of what has been attained to date. They are enabled to share in the experience of the past, so that they may take their places in the machinery promptly and effectively. They may start where those who have toiled at the building have left off. But they must not rest there. They are not required to come into the machinery merely to keep it turning. There is no real education in that. They are expected to continue those adjustments and improvements which will keep it a living organization, growing and developing all the while like a natural creature.

It is easy to say this, difficult to realize it. There is a dreadful inertia about large and complicated machinery. If it slows down or stops, great effort is needed to start it up again. I am thankful that on our Underground system we keep moving. We have a staff trained to watch and act right through the stages of our organization, so that our progress depends not on one here and there, but upon all the members of our organization. That is our strength. It adds to the responsibility of those to whom we must look for the financial resources to continue and expand our work.

This book was started for the benefit of the staff employed. It was intended to assist them to view their work as a whole from the outside, as it were. Then it was felt that a still wider audience might be interested, so it was enlarged and adapted to meet their requirements. Hence the book has grown to be a considerable work. It constitutes a valuable record of present achievement. I hope that it may serve as a groundwork for study and thought so that the next twenty years may show as great a measure of progress as the past twenty years. To save labour, yet to increase efficiency; to give better service to the public, yet to raise the standard of wages; to attract traffic and to bring the Underground railways to prosperity; these are the ultimate aims of the multiplicity of details pursued with care and ingenuity as described in the pages of this book.

FRANK PICK,
Managing Director.

London Underground Railways,
55 Broadway, Westminster, S.W.1.
August 1928.

AUTHOR'S PREFACE

THERE are many books on railway operation, but few that deal with the working of underground electric railways. The want of such literature must necessarily be felt by those who are concerned or interested in rapid-transit undertakings. It is hoped that the present work will fulfil this need, and that it will also form a useful text-book for students of underground railway operation. It deals with the methods adopted in the handling of London's sub-surface system of transport, and pays particular regard to the many innovations for which the London Underground group of companies may claim to be the pioneers. Improvements to secure greater efficiency and economy are constantly under review, and hardly a day passes but that some new instrument or advanced method of working is being tried or introduced. The indulgence of the reader is, therefore, claimed, if, when this book is in circulation, some fresh feature in the operation of the railways may have been observed. It is especially desired to take this opportunity of acknowledging the co-operation of the chiefs of the various sections or departments in the preparation of the original manuscript. Grateful acknowledgment is also due to Mr. D. R. Lamb, the Editor of *Modern Transport*, who has been good enough to edit the work.

J. P. THOMAS,
Operating Manager.

London Underground Railways,
55 Broadway, Westminster, S.W.1.
August 1928.

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APPENDIX
*
PERTINENT FACTS
CONCERNING LONDON'S
UNDERGROUND

POWER

745 tons of coal consumed daily, leaving
54 tons of ash.
76 boilers, delivering
1,250,000 lbs. of steam each hour to
11 turbo alternators of
102,000 k.w. capacity, and an output of over
1,032,900 k.w. hours daily, at a pressure of
11,000 volts.
431 miles of high-tension cable deliver this
current to
43 sub-stations, ranging from
1,800 to 10,000 k.w. capacity and supplying
91 miles of railway and
49 miles of tramway carrying
2,000,000 passengers daily.

TRACK

79 route-miles owned or leased.
128 " " including mileage of other
companies' lines run over
by Underground trains.
62 " " in tunnel.
66 " " in open.

SIGNALS

1,839 installed, of which
868 are automatic.
269,000 signal-movements are made daily.

ROLLING STOCK

1,950 cars owned, or operated.
261 trains are worked daily, totalling
1,615 cars in service, which provide
72,671 seats, or
11,375,000 seat-miles daily.

STATIONS

125 stations are owned.
194 stations are served by the company's trains.
56 of those owned are equipped with lifts, and
33 are equipped with escalators.
6 of a mile is the average distance between
stations owned.
171 lifts are in service, varying from
30 ft. to 181 ft. in depth of shaft and travelling
800 miles daily and making
63,000 stops each day.
85 escalators will shortly be in service from
17 ft. to 60 ft. in depth, and travelling at the
rate of
90 to 100 ft. per minute, or
603,146 miles per annum, and capable of trans-
porting
765,000 passengers per hour.

LIGHTING AND VENTILATION

90,000 lamps are used in the trains, or
102,000 lamps in all, varying from
18 to 200 candle-power each.
230,000,000 cubic feet of purified air are pumped into
the tunnels daily.

SERVICE

80,000,000 car-miles are run per annum, or
255,000 car-miles each week-day.
101,405 station stops are made daily, and
1,020,000 passengers a day are carried.
273,366,341 tickets are issued annually, of which
160,000,000 are issued mechanically from
220 booking-office machines and
350 slot machines.
86,000 season tickets are in use.
40 trains an hour, or one every 90 seconds, are
scheduled on each of the tracks between
Mansion House and South Kensington
Stations, capable of transporting
20,000 seated and standing passengers per hour
in each direction, an increase of 120 per
cent. since the old steam days.
18 miles per hour is the average speed of the
trains,
22 " " " the average speed of non-
stopping trains, and
31 " " " is the maximum scheduled
speed between any two
stations.
108 trains per hour are handled at Kennington
Station and
100 " " " " " " Camden
Town Station
1,721 " " week-day pass through Oxford
Circus Station.
2,815 " " " " " Charing Cross
Station.

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