

WAS 1947

1951^{1/2} Chief
Scientists Conference
Account of the
Establishment

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MINISTRY OF SUPPLY

1951

EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT
WALTHAM ABBEY

A brief account of the Establishment

INTRODUCTION

Until 1945 'Waltham Abbey' was a Royal Ordnance Factory. As such it had operated since the latter part of the eighteenth century, though its history as a gunpowder factory under private ownership goes back many centuries and is lost in the mists of medieval times. It is known to have participated in a re-armament drive during Elizabeth's reign. The monks of the Abbey of Waltham Holy Cross are believed to have made gunpowder for King Edward II.

The official title of the Establishment is still 'The Royal Gunpowder Factory'.

Immediately after the last war the Chemical Research and Development Department was created under the leadership of Dr. F.J. Wilkins, with the object of taking over and extending the functions of the chemical branch of the old Armament Research Department, Woolwich. A year or two later, during Dr.H.J.Poole's time as Chief Superintendent, the name was altered to the Explosives Research and Development Establishment, E.R.D.E. The

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The technical staff consists largely of chemists, with some chemical engineers and a sprinkling of physicists and engineers.

The Establishment occupies two separate areas, each of about 250 acres, connected by navigable streams and the main road, known as the North and South Sites, or alternatively, as Hoppit and Quinton (see map). The old Factory got along without roads, a remarkable system of waterways providing the means of transportation. The Old River Lea, which forms the Establishment's eastern boundary, links Waltham Abbey directly with the Thames and Woolwich.

For reasons dictated by official policy very little has been done since 1945 to implement the large programme of re-building and road-making required to give the new Establishment essential facilities and amenities. As a result, fully 30% of E.R.D.E. staff continue to work at Woolwich, and others journey to Waltham every day from the same district. The conversion of existing old buildings into laboratories has been carried out gradually during the past five years by the Establishment's labour force. Early in 1951, however, Contractor's boards appeared on site and building operations started in good earnest. A contract for staff houses is also being negotiated by M.O.W.

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The numbers of E.R.D.E. employees in the various categories are summarily as follows:-

Scientific Officers (all grades)	53
Administrative Officers	2
Experimental Officers (all grades)	93
Engineers	3
Assistants (Scientific)	55
Non-Industrial grades	101
Industrials (skilled and unskilled)	510
W.D. Constabulary	<u>24</u>
Total (July 1951)	<u>841</u>

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ORGANISATION AND FUNCTIONS

Executive Staff. Chief Superintendent,
Dr. C.H. Johnson, C.S./E.R.D.E.

Deputy, Dr. A. Forster.

Superintendent of Propellant Research, I,
Mr. A. Brewin (S.P.R.I.)

Superintendent of Propellant Research, II,
Mr. L.A. Wiseman (S.P.R.II.)

Superintendent of Explosives & Intermediates,
Dr. A. Lovecy (S.E.I.)

Superintendent of Chemical Engineering,
Mr. R.G. Ross (S.C.E.)

Senior Administrative Officer,
Miss V.A. Davidge, (S.A.O.)

Branches. The fields of work of the individual
Superintendents are as follows:-

(1) Propellants Research, I. The S.P.R.I. Branch
(Superintendent, Mr. Brewin) covers research and development
over a wide range of solid propellants required for all
types of cannon, and for rockets. The items of highest

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priority on E.R.D.E's. building programme are those concerned with the development of solid ~~rocket~~ propellants for Guided Weapons. Small scale manufacturing facilities exist at Waltham Abbey and at Woolwich (different processes) for the production of experimental charges of cordite. Knowledge of the Services' requirements is obtained mainly through the Ordnance Board, the Chief Superintendent Armament Research, the Chief Engineer Armament Design, and R.P.D. Westcott. The S.P.R.I. Branch includes specialised sections dealing with problems affecting materials, e.g. weather-proofing and storage of Service explosives and propellants.

Senior Staff: Dr. C.G. Lawson, Mr. G.L. Hutchison,
Dr. J. Gooding, Dr. W.G. Williams.

(2) Propellants Research II. The existence of a second Branch concerned with Propellants is indicative of the scope and size of the effort required. Broadly speaking (though not rigidly) S.P.R.I. and S.P.R.II. (Mr. Wiseman) divide as between Development and Research. During the past year S.P.R.II's exclusive interest in liquid propellants has been extended into the field of solid propellants because of the growing belief that these offer more acceptable solutions to the problems of providing boosts and sustained motors for guided and unguided rocket missiles. Most of the really basic research is done by this Branch.

One section carries out ad hoc and basic investigations of the 'sensitiveness' of explosives and propellants to thermal

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and mechanical shock, electric sparks and other stimuli, and attempts to relate the observed behaviour to hazards arising in manufacture and in operational use by the Services.

Senior Staff: Dr. G.H. Young, Dr. K.A. Cooper.

(3) Explosives & Intermediates. Dr. Lovecy's group which is located partly at Waltham Abbey and partly at Woolwich is responsible for carrying out research on possibly useful substances wanted either as starting materials for, or ingredients of, explosives and propellants. Also for evolving satisfactory processes by which to prepare them. 'Organic chemistry' is a brief description of their work. Another important task is that of developing manufacturing procedures for the capricious class of substances known as 'initiators' which, as the name implies, are used in caps and detonators to set off the high-explosive fillings in the warheads of bombs, shell, and other missiles. S.E.I. also examines the economics of proposed manufacturing processes. Traditionally they also form the link between E.R.D.E. and the Royal Ordnance Factories, though this responsibility is now shared with S.C.E.

Senior Staff: Dr. E. Roberts (S.P.S.O.), Dr. T.M. Walters, Dr. A.W.H. Pryde, Dr. G.W.C. Taylor.

(4) Chemical Engineering. This Branch, under Mr. Ross, came into existence with the setting up of the Establishment at Waltham Abbey where it is wholly located. The main effort is directed towards design, erection, and operation of pilot plants in which the processes worked out by S.E.I. Branch on

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the laboratory scale are engineered and transformed into something approaching manufacturing units. A small group is concerned with the design of small mobile types of liquid oxygen producing plants required by the three Services. As the Branch grows, the intention is to tackle fundamental problems in chemical engineering related to explosives production.

S.C.E. is also responsible for maintenance engineering services throughout the Establishment.

Senior Staff: Mr. S. Chard, Dr. G.A. Knight, Mr. W. Bancroft (engineering maintenance).

(5) Lodger Groups. E.R.D.E. is responsible for the administration of the Home Office Explosives Section at Woolwich and of the Inter-Services Research Group at Waltham Abbey, and for providing their personnel. Together they absorb some 13% of the total scientific staff. Neither contributes to the Establishment's programme of research and development.

The Officers in charge are Mr. J.S. Skelton (Home Office) and Mr. C.A. Meek (I.S.R.G.).

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E. R. D. E. Waltham Abbey.



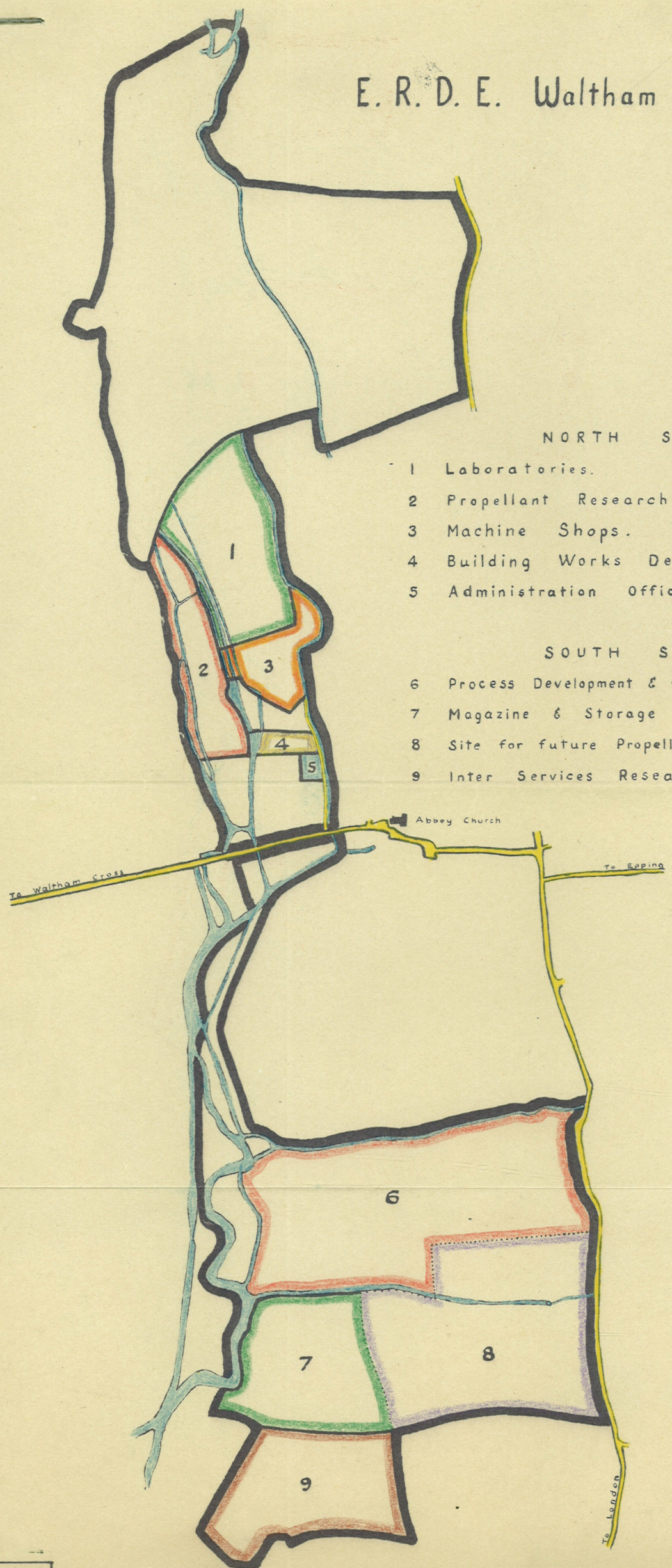
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E. R. D. E. Waltham Abbey.

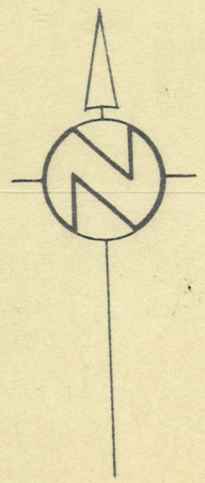


NORTH SITE.

- 1 Laboratories.
- 2 Propellant Research.
- 3 Machine Shops.
- 4 Building Works Dept.
- 5 Administration Offices.

SOUTH SITE.

- 6 Process Development & Chemical Engineering.
- 7 Magazine & Storage Area.
- 8 Site for future Propellant Development.
- 9 Inter Services Research Group.



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