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MINISTRY OF AVIATION

CHIEF SCIENTIST'S
SUMMER
CONFERENCE

8 JULY, 1966

EXPLOSIVES RESEARCH AND
DEVELOPMENT ESTABLISHMENT
WALTHAM ABBEY
ESSEX

CONTENTS

	Page
Transport Arrangements	2
Programme	3
General Information	4
Arrangements for seeing the work of the Establishment	5 - 6
List of Exhibits in Laboratory Areas	7 - 9
Map of Laboratory Area, North Site	10 - 11
Arrangements for Afternoon Tours	12 - 16
Evening Diversions	17
Blank Pages for Memoranda	18 - 20

TRANSPORT ARRANGEMENTS

For visitors travelling from the London area a coach will leave Victoria (S.R.) Station (Hudson's Place, Wilton Road (opposite the Continental Platform)) promptly at 8.45 a.m. and another from Oakwood Station (Piccadilly Line) at 9.30 a.m. The journey by Tube from Piccadilly Circus takes approximately 45 minutes.

Maps showing the approach roads to Waltham Abbey and the access to E.R.D.E. are provided (loosely enclosed) for the convenience of those travelling by private car.

At the end of the day coaches will leave from the Canteen for Victoria Station, via Turnpike Lane Station (Piccadilly Line), at the following times:—

Departure	Arrival (approx.)
5.30 p.m.	6.45 p.m.
9.00 p.m.	10.00 p.m.
9.30 p.m.	10.30 p.m.

Anyone wishing to make special transport arrangements after their arrival at E.R.D.E. should apply at either of the Enquiry Desks in the Canteen or Library Building.

PROGRAMME

9.30 - 10.20 a.m.	Reception and Coffee in Staff Canteen.
10.20 a.m.	To Lecture Theatre in Library Building.
10.30 a.m.	Opening Address by Sir Walter Cawood, C.B.E., C.B., Chief Scientist, Ministry of Aviation. Introductory remarks by Dr. L. J. Bellamy, Director, E.R.D.E.
11.00 a.m.	Talk on simulated sonic booms.
11.15 a.m. - 12.15 p.m.	Exhibition of the work of E.R.D.E. on Ground Floor of Library Building.
12.15 p.m.	Demonstration of sonic boom test outside Library Building.
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12.45 - 1.45 p.m.	Luncheon in Staff Canteen (The bar will be open from 12.15 p.m.)
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1.50 - 5.00 p.m.	Tours of laboratory and plant exhibits.
5.00 p.m.	Tea in Staff Canteen.
5.30 - 6.30 p.m.	Optional diversions as listed on page 18.
6.40 for 7.00 p.m.	Informal Dinner. Aperitifs included in the dinner menu will be available in the main dining room at 6.40 p.m.

GENERAL INFORMATION

Visitors will be received at the Staff Canteen on the North Site. They will then be given badges corresponding to the parties which will be touring laboratory areas in the afternoon. Coffee will be served in the Canteen.

Cigarettes, pipes, matches, etc., may be carried and may be used in the Canteen and the Library and Lecture Theatre Building except in the Propellant display room marked with No Smoking signs. Smoking can also be allowed inside the coaches (on North Site only) and in a small number of laboratories on North Site. These will be clearly designated. Regrettably, but for obvious reasons, smoking cannot otherwise be permitted in the open or in the laboratories in general. Those parties visiting the South Site or Building 92 on the North Site will be going into 'contraband areas' where the presence of tobacco, matches and lighters is normally strictly forbidden as contributing a real hazard. In such areas it is most important that visitors leave their cigarettes, matches, etc. in the coach and do not take them into laboratory or process buildings. The guides accompanying each party will remind visitors to do this when necessary as they disembark.

Lunch, tea and dinner will be provided in the Staff Canteen where there will also be a bar. A charge of 15/- to cover lunch, coffee and tea, or of 52/6d. for those also staying to dinner, will be collected on arrival.

In the Library building an office has been set up to deal with enquiries, small vacant offices are available for those wishing to make telephone calls and there is a small visitors' lounge on the first floor.

In order to help our visitors pass the time between tea and dinner a number of optional diversions have been arranged. These are detailed on page 18.

ARRANGEMENTS FOR SEEING THE WORK OF THE ESTABLISHMENT

E.R.D.E. is in two parts, North Site and South Site, connected by a private road. The origins of this are historical as we operate on the sites of the old Royal Gunpowder Factory, but the arrangement is less inconvenient than it sounds as we effectively concentrate all our research and small scale work on the North Site and use the South Site for development and production work involving greater quantities and therefore more hazard.

The buildings on both sites are largely converted factory buildings but the conversions have been well done. Here again they are somewhat scattered on the site. This is an advantage from the safety point of view, but makes a comprehensive tour almost impossible.

For these reasons we are proposing to devote some part of the morning to a comprehensive exhibition in the Lecture Theatre building. All branches of the establishment will put on display a representative selection of their work so that our visitors can get an overall view of our activities. After lunch the conference will be divided into coach parties for which lettered badges will be issued on arrival.

The tours have been planned with the intention of giving each visitor an opportunity to see a representative selection of our activities. The separation of our facilities on the South Site makes it impossible to organise anything other than a guided tour of this area with stops at selected points. This is true in part for the North Site also, but in some areas at least we have tried to give the visit more of the character of an open day to encourage our visitors to wander through a series of signposted laboratories. Optional talks and demonstrations will be given in these areas at fixed times which will be announced by the party guides. Arrangements of this kind will present additional problems in marshalling and our visitors are asked to endeavour to adhere as closely as possible to the set times for moving on to the next series of exhibits.

All the parties cannot see the same things and much must be left out. However, we will try to meet the individual wishes of visitors in regard to seeing work in which they are specially interested if they apply at the enquiry desk in the Lecture Theatre building.

LIST OF EXHIBITS IN LABORATORY AREAS

SOUTH SITE

SOLID PROPELLANT AREA TOUR

- Plastic propellant small scale manufacture
- Solventless cordite
- Plant for Rubbery Propellant production
- Double base propellant development
- Combustion laboratories

CHEMICAL ENGINEERING AREA TOUR

- Fibrous asbestos processing
- Nitric ester drying plant
- Remote control laboratory for hazardous preparations
- Advanced explosives research facility

NORTH SITE

- H.16 Heat Transfer and Thermal Properties Laboratories:
 - Conductivity measurements at high pressures
 - Convective heat transfer to super critical kerosine
 - Radiation measurements from high pressure H_2/O_2 combustion chamber
- H.16 Instrumentation and Glass Engineering Workshops
- H.10 Fluorescence spectroscopy of rare earth chelates
- Field emission microscopy

- H.67 Ballistics Laboratory:
 Propellant calorimetry
 Strand burning rate measurement
 Smoke assessment on solid propellants
 Micro-rocket performance tests
- Two Phase Materials Research:
- L.157 Research on whisker growth
 Thermodynamics of crystal growth
 Fibre processing and production of fibrous composite materials
 Measurement of Young's Modulus for whiskers
 Electron microscopy for fibres
- L.168 Furnaces for batch production of silicon nitride whiskers
- Explosives 2 Branch:
- L.153 Kinetics of nitric ester decomposition
 Rubbery explosive compositions
- S.92 Remote controlled explosive processing
- L.148 Adhesion and Rheology :
 Mechanical properties testing
 Strength in relation to strain rate
 Surface chemistry of propellant ingredients:
 surface wetting and mechanical stability

Analytical Services:

- L.145 Thin layer, column and gas chromatography; application to analysis of plasticisers and stabilisers in propellants
- L.145 Compatibility and stability tests for propellants and & L.191 explosives
- L.198 Differential thermal analysis and calorimetry applied to explosives, propellants and polymers
- L.146 X-ray crystallography; characterisation of explosives, initiators and other materials

Materials Research:

- L.134 Polymer chemistry
 Thermal degradation of polymers
 Joint Tropical Research Unit exhibit
 Nuclear magnetic resonance and infra-red spectroscopy of polymers
- L.137 Autoxidation of polymers
- L.143 Polymer applications

Explosives 1 Branch:

- L.143 Initiators and pyrotechnics:
 New explosive initiating materials
 Assessment of performance of initiators
 New pyrotechnic igniting compositions for rockets
 Control of polymorphism and crystal habit
- L.159 Explosives preparative chemistry
- L.155 Properties of explosives

ARRANGEMENTS FOR AFTERNOON TOURS

Coaches will leave from the Staff Canteen at 1.50 p.m. and will return visitors there at 5.00 p.m.

They will be available for transport between laboratory areas at the points and times listed for each party.

A list of items on exhibition in laboratory buildings is given on pages 7 - 9. Additional information on the location of the items available on each tour will be distributed by the guides.

The location of the main buildings to be visited on the North Site can be found from the map on pages 10 - 11.

PARTY A

2.00 - 3.30 p.m. Conducted tour of propellant and chemical engineering facilities on the South Site

3.30 - 3.40 p.m. Return to North Site

3.40 - 4.00 p.m. L.168 Whiskers production and
L.157 Two phase material research

Coach leaves L.157 Car Park at 4.00 p.m.

4.00 - 5.00 p.m. L.145 Analytical Services and
L.134 Materials 1 laboratories
L.137
L.143

Coach leaves L.137 Car Park at 5.00 p.m.

PARTY B

2.00 - 2.30 p.m. L.168 Whisker production and
L.157 Two phase materials research.

Coach leaves L.157 Car Park at 2.30 p.m.

2.30 - 3.00 p.m. L.145 Analytical Services

Coach leaves L.145 Car Park at 3.00 p.m.

3.00 - 5.00 p.m. Tour of remote controlled processing facility
(S.92) and propellant and chemical engineering
areas on the South Site

PARTY C

2.00 - 3.00 p.m. H.67 Ballistics laboratory
H.16 Heat transfer and thermal properties
laboratory, Instrumentation and Glass engineering
H.10 Fluorescence and field emission microscopy

**Coach leaves H.16 from Hoppitt Road side
at 2.55 p.m. picking up at H.10 and H.67**

3.00 - 3.30 p.m. L.168 Whisker production and
L.157 Two phase materials research

Coach leaves L.157 Car Park at 3.30 p.m.

3.30 - 4.00 p.m. L.134 Materials I laboratories
L.137
L.143

Coach leaves L.137 Car Park at 4.00 p.m.

4.00 - 5.00 p.m. Tour of chemical engineering and propellant
facilities on South Site

PARTY D

2.00 - 3.20 p.m. Tour of remote controlled processing facility (S.92) and chemical engineering and propellant areas on South Site

3.20 - 3.30 p.m. Return to North Site

3.30 - 5.00 p.m. L.148 Adhesion and Rheology

L.153 Explosives 2 laboratory

L.168 Whisker production and

L.157 Two phase material research

L.155 and L.159 Explosives 1 laboratories

Coach leaves L.159 Car Park at 5.00 p.m.

PARTY E

2.00 - 3.00 p.m. L.134 Materials 1 laboratories

L.137

L.143

L.143 Pyrotechnics and Initiators

L.146 X-ray crystallography

Coach leaves L.137 Car Park at 3.00 p.m.

3.00 - 4.00 p.m. H.67 Ballistics laboratory

H.16 Heat transfer and thermal properties laboratory, Instrumentation and glass engineering

H.10. Fluorescence and field emission laboratories

Coach leaves H.16 along Hoppitt Road at 3.55 p.m. picking up at H.10 and H.67

4.00 - 5.00 p.m. Tour of remote controlled processing facility (S.92) and propellant and chemical engineering areas on South Site

OPTIONAL EVENING DIVERSIONS

MEMORANDA

(5.30 - 6.40 p.m.)

Coach tour to Waltham Abbey Church
(Founded 1060)

Coach leaves Staff Canteen at 5.45 p.m.

and if fine Coach tour of Epping Forest

Coach leaves Staff Canteen at 5.45 p.m.

Short motor launch trips embarking by Building
H.16

5.40 - 6.20 p.m. Comedy film programme in Library Lecture
Theatre
Lounge and bar open in small dining room in
Staff Canteen from 5.30 p.m.

6.40 for 7.00 p.m. Informal dinner in Main dining hall of Staff
Canteen. Aperitifs included in dinner menu will
be served from 6.40 p.m.

Coaches will leave for VICTORIA (S.R.) STATION via
TURNPIKE LANE STATION (Piccadilly Line) at 9 and 9.30 p.m.

MEMORANDA

