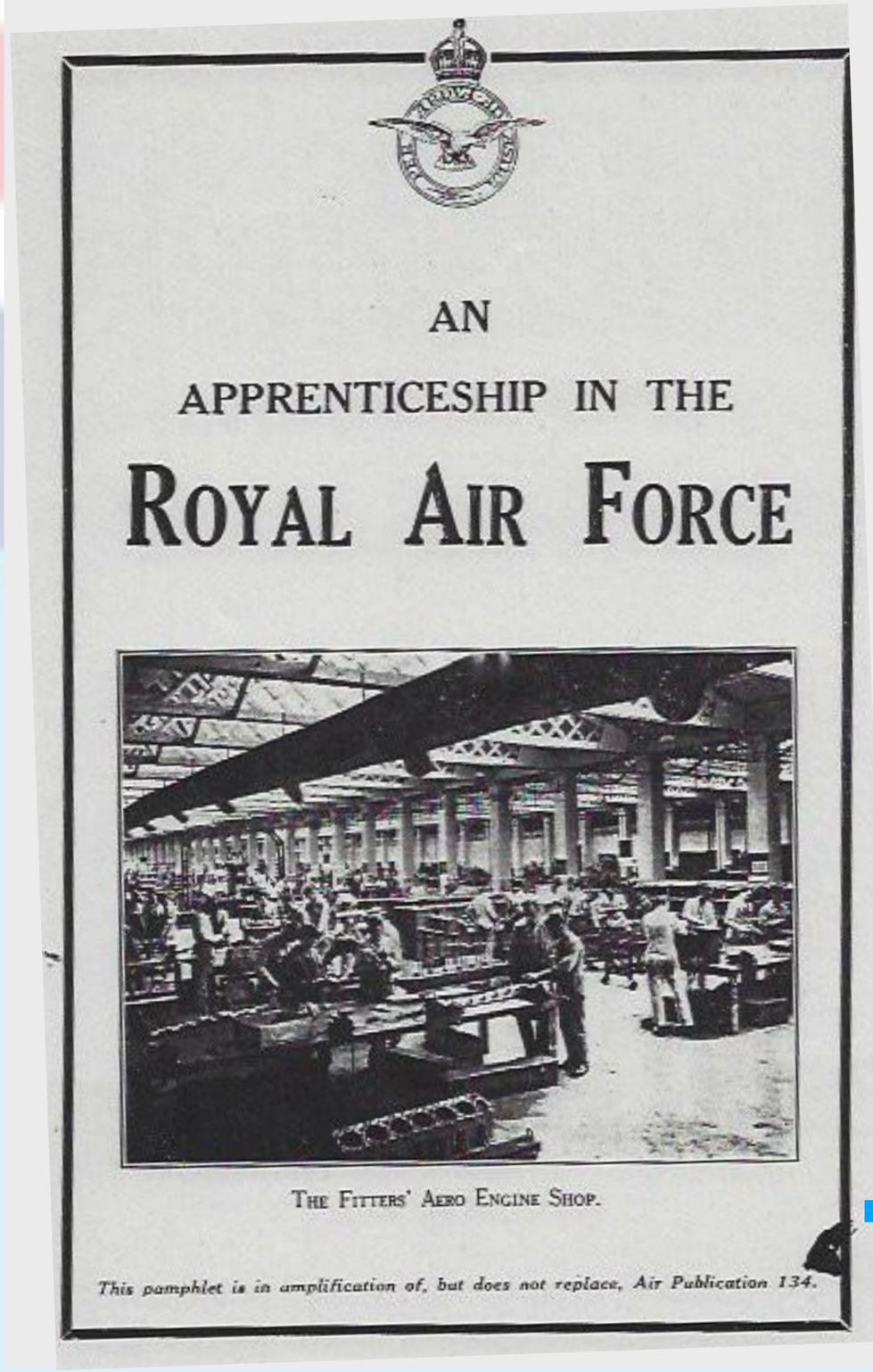
RAF COLLEGE CRANWELL

Group Captain Bill Wilkinson RAF (Retd)

Wishing him a Very Happy 100th Birthday
2018

College Records: E&W School No 26 Entry No 39



AN

APPRENTICESHIP IN THE

ROYAL AIR FORCE

THE FITTERS' AERO ENGINE SHOP.

This pamphlet is in amplification of, but does not replace, Air Publication 134.

E & W School No,26 (Entry No,30 Sept,34 to Jul,37,)

7J7's
Instrument Makers,

567239	Allen	P,				
567086	Cameron	L,A,				
567237	Campell	J,F,				
567964	Campbell	A,		139219	Com,	MID,
566962	Chapman	H,		143784	Com,	
567078	Curtis	A,			Medical Discharge,	
566976	Ware	S,E,				
567026	Wilson	G,		45294	Com,	
567238	Wynne	R,		48999	Com,	
567082	Wood	L,A,		40776	Com,	

Wireless Operator Mechanics,

567235	Allan	J,		89855	Com,	
567056	Armstrong	Laurence	Missing 15/11/42	161581	Com,	
567017	Armstrong	W,				
567166	Barnes	P,C,		47313	Com,	Died 1948,
567046	Boon	E,J,	* Ernest	50048	Com,	
567107	Booth	J,R,P,B,	Pilot,			
567015	Breeze	R,D,				
566989	Bricewood	R,			Com,	
567058	Cordes	J,A,				
567009	Davies	J,E,		158117	Com,	
566975	Dodds	W,	Ag,			MiD,
567083	Edwards	C,		110218	Com,	
566973	Fazey	Frank,	*	50201	Com,	
566987	Graham	G,A,		50423	Com,	
567057	Haire	Oscar,	Missing 77Sqn	12/4/40		MiD,
566995	Hill	W,		138940	Com,	
567059	Hind	J,				
567001	Holliday	J,W,				
566936	Humphrey	R,				
567242	Hunter-Rowe	D,H,				
567108	Kennedy	D,C,		101471	Com,	
566983	Knight	V,B,J,			Com,	
567002	Lawes	W,F,				Deceased,
567078	Leddra	E,			Com,	
566969	Lewis	R,		47238	Com,	Australia,
566979	MacDonald	A		113042	Com,	
566988	May	A,	* Alan	48929	Com,	
567076	Moreman	T,K,				
566970	Parker	K				
566991	Ridd	G,B,			Com,	
567073	Rowbotham	P,V,		46797	Com,	
566984	Scott	N,A,		109147	Com,	Died 1938,
567149	Smith	C,E,H,			Com,	
567007	Smitheman	G,D,	* Oliver			
567039	Spells	H,				
567062	Thompson	A,N,				
567090	Treford	A,				
567080	Vanstone	D,J,	* John	51818	Com,	MiD,
567189	Wilkinson	W,	* Bill	51626	Com,	
567082	Wood	L,A,				

567038 MITCHELL R.J. 46700 Com.

Gp Capt Bill Wilkinson recalls……

In September 1934, 50 young hopefuls arrived at RAF Cranwell, initially known as the 7J Entry, and formed 2 Classes (7J1 and 7J2) to train as Wireless Operator Mechanics plus one Class (7J9) to train as Instrument Makers. Subsequently under a revised Entry Numbering System they were known as the 7M7 Entry (WOMs) and 7J7 Entry (IM). During their training they gained 1 from an earlier Entry, 2 were discharged, and 1 was re-classed to a later Entry. This left 48 to Pass Out in July 1937.

Bill Wilkinson advised that:
"We were the last of the small entries before the expansion. Reasonably good at all sports we were less evidently distinguished in our professional studies, as revealed at our graduation. No cadetships were awarded and there was only one LAC (Humphrey from an earlier entry). The rest of us made AC1 or AC2.
We all hankered after becoming pilots and this meant that we had to qualify to LAC under our own arrangements after we left Cranwell.
To achieve this we had to sit a paper and then to spend a week at West Drayton undergoing practical tests and a few of us did this. Unfortunately having qualified as LAC we became eligible for posting to the Fleet Air Arm, as some of us were to our chagrin. Although some of us had been recommended for pilot training, the RN would not release us to return to the RAF and when we did eventually get back during the war we were told to go away because it was easy to get pilots but there was a great shortage of Wireless Operator Mechanics. So we never fulfilled our ambitions apart from John Vanstone who later received pilot training under a short lived scheme whereby some were selected to become Engineer officers."

Cranwellian Association Records of 7M9

The following photographs were provided by Bill Wilkinson

The 7J, subsequently renamed the 7M7 / 7J7 (30th) Entry

Class 7J1 - Wireless Operator Mechanics - Became 7M7A

Back Row: Lewis, Smith, Brickwood, Vanstone, Wilkinson, Edwards, Davies, Humphrey, Breeze and Dodds
Front Row: Leddra, Rowbotham, Moreman, Scott, Macdonald, Armstrong (017), Boon, Ridd and Lawes

Class 7J2 - Wireless Operator Mechanics - Became 7M7B

Back Row: Trelford, Mitchell, Spells, Smitheman, Thompson, Allan, Haire, Armstrong (066), Hunter-Rowe, and Hill.
Front Row: Cordes, Kennedy, Holliday, May, Booth, Hind, Fazey, Graham, and Barnes.
Not on Parade: Knight.

Class 7J9 - Instrument Makers - Became 7J7

Back Row: Allen, Wood, Campbell A, and Campbell J
Front Row: Cameron, Wilson, Chapman, Ware and Wynne
Not on Parade: Curtis (CT'd) and Richards (FT'd 31st)

E&W School - Entrance Exams - PART 1 Maths

A.A.E.
34 (1)
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ROYAL AIR FORCE

EXAMINATION FOR THE ENTRY OF AIRCRAFT APPRENTICES

5TH JUNE, 1934

PAPER I.—MATHEMATICS

Time allowed—Two hours

Read carefully the instructions on the front page of your answer book.
EIGHT *questions to be answered. Answers should be sent in to* ALL *questions in Part I, and to any* FOUR *questions in Part II, but not to more.*
Failure to show method and working will involve loss of marks.

PART I

Answer ALL *questions in this Part*

1. During a continuous voyage the log of a ship recorded that the number of miles sailed on each of 6 successive days were as follows:—498, 515, 510, 483, 517, and 501. Calculate the average speed of the ship in miles per hour.

On the *seventh* day engine trouble developed, so that by the end of that day her average speed for the 7 days was 19·75 miles per hour. How many miles did she sail on the seventh day?

2. From the formula—

$$h = r - \sqrt{r^2 - c^2}$$

(*a*) Calculate the value of h when $r = 37{\cdot}5$, $c = 30{\cdot}0$.
(*b*) Calculate the value of c when $h = 16{\cdot}0$, $r = 26{\cdot}0$.

3

7. (*a*) Using logarithms, evaluate—

$$1350 \times \sqrt{\frac{D^2 H}{SL}},$$

where $D = 0{\cdot}75$; $H = 1{\cdot}25$; $S = {\cdot}45$; $L = 100$.

(*b*) Using logarithms, solve the equation—

$$(2{\cdot}46)^x = 10.$$

8. A, B, and C, are three aerodromes. A pilot flies in a straight line from A to C, and then in a straight line from C to B. C is distant 100 miles from the direct route between A and B, the angle $CAB = 40°$ and the angle $CBA = 25°$. By how many miles does the length of the pilot's route exceed the length of the direct route between A and B.

(This question is to be solved by trigonometry, *not* by scale drawing.)

9. A rectangular sheet of tin is 30 inches long and 14 inches wide. Four equal squares of side x inches are cut out from each corner and the sides are then turned up so as to form an open rectangular box. The following table shows the volume of the box (V cubic inches) for different values of x:—

x (inches)	1·0	2·0	2·5	3·5	4·0	4·5	5·0	5·5	6·0
V (cubic inches).	336	520	562·5	563·5	528	472·5	400	313·5	216

(*a*) Plot the above values of x horizontally against V vertically and draw a graph to show how V varies as x varies from 0 to 7 inches.

Use the following scales:— x: 1 inch represents 1 inch.
V: 1 inch represents 100 cubic inches.

(*b*) Find from your graph—(i) the greatest volume the box can have; (ii) the size of the pieces which must be cut out so that the box may have a volume of 270 cubic inches.

10. (*a*) Prove that opposite angles of a quadrilateral inscribed in a circle are supplementary.

(*b*) $ABCD$ is a quadrilateral inscribed in a circle and the diagonals AC and BD intersect at right angles. The angle $ADC = 108°$ and the angle $ABD = 20°$. Find, by calculation (not by drawing and measurement), the number of degrees in each angle of the triangles BDC and ADB.

2

3. A and B are two wireless receiving stations on a straight coast-line, B being 5 miles due East of A. A ship at sea sends out a distress signal, which, to an observer at A, appears to come from a direction 50° E. of N. and to an observer at B appears to come from a direction 40° W. of N.

(*a*) By drawing a diagram to a scale of 1 inch = 1 mile, show the position of the ship assuming the above observations to be accurate. Find, by measurement, how far she is from the coast-line.

(*b*) If, however, the above observations are liable to an error of 10° either way, show on your diagram the locality within which the ship must lie; and find by measurement her greatest and least possible distances from the coast-line.

4. $ABCD$ is a field with four straight sides. B is 40 yards North and 30 yards East of A; C is 60 yards due North of A; D is 10 yards North and 20 yards West of A.

(*a*) From the above data calculate the area of the field in square yards.

(*b*) Two paths AC and BD run diagonally across the field. Prove, by calculation, that they intersect at a point 22 yards North of A, and, *assuming this result if you cannot prove it*, calculate the areas of the triangles ABD and BCD.

PART II

Answer any FOUR *questions in this Part. All questions carry the same number of marks.*

5. Solve the equations—

(*a*) $\frac{x-4}{3} + \frac{x-3}{4} = 2.$

(*b*) $(x + 2)(y + 5) = (x - 1)(y + 3)$;
$x - 6y = 1.$

(*c*) $\frac{4}{6x-11} = \frac{x}{18}.$

6. (*a*) P and Q are the points of contact of tangents drawn from a point O to a circle, whose centre is C. Prove that $OP = OQ$ and that OC bisects the angle POQ.

(*b*) Using a point A as centre draw a circle of radius 2 inches. Draw two radii AL and AM so that the angle $LAM = 80°$. State the steps of a geometrical construction for finding the centre of a circle which shall touch AL, AM, and the smaller arc LM. Perform the construction, draw the circle, and measure its radius.

4

11. (*a*) 31·5 cubic feet of sand are heaped in a corner O of a shed with a horizontal or and vertical walls at right angles to each other. The two walls intersect in a line l and the floor intersects the two walls in the lines OB and OC. The sand reaches up to oint P in OA, and extends along the floor to points Q and R in OB and OC respectively, e exposed surface of the sand being a plane triangle PQR. If $OP = 3{\cdot}5$ feet and $) = 9{\cdot}0$ feet, calculate the distance OR.

(*b*) The above sand is removed and piled in a conical heap in the middle of the floor, a vertical height of 2·5 feet. Calculate the radius of the base of the cone.

$$\left(\text{Take } \pi = \frac{22}{7}\right)$$

12. An open square box, of internal dimensions 4 inches by 4 inches, stands on a rizontal table. Four equal spheres, each of diameter 2 inches, are placed on the bottom the box so that they fit each other and the sides of the box closely. A fifth sphere of ameter 3·5 inches is placed symmetrically on top of the others.

Either by drawing suitable full-size diagrams, *or* by calculation, find the vertical ight of the centre of the uppermost sphere above the bottom of the box.

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E&W School - Entrance Exams - PART 2 Science

A.A.E.
34 (1)
2

ROYAL AIR FORCE

EXAMINATION FOR THE ENTRY OF AIRCRAFT APPRENTICES

5TH JUNE, 1934

PAPER II.—SCIENCE

Read carefully the instructions on the front page of your examination answer-book.

Answers are to be sent in to any FIVE *questions, but not more. Answers should be illustrated by sketches or diagrams whenever these will help to make the meaning clear.*

All questions carry the same number of marks.

Time allowed—1½ hours

1. Define the *moment of a force about a point*, stating clearly how it is measured.

Weights of 8, 12, 16 and 20 lb. are hung at distances of 2, 4, 6 and 8 feet, respectively, from one end of a uniform horizontal rod supported by a vertical string at each end. If the rod is 10 feet long and weighs 6 lb., find the tension in each string.

2. What do you understand by the *resultant of two forces acting at a point?* How is this resultant determined?

A balloon with a vertical lifting force equal to 1,640 lb. weight is held to the ground by a cable, the weight of which may be neglected. If the horizontal force due to wind is equal to 500 lb. weight, find the magnitude and direction of the pull in the cable.

3. What do you understand by *kinetic energy* and *potential energy?* Give an example of each.

A bomb weighing 90 lb. is dropped from a stationary airship at a height of 1,200 feet. Determine *by two methods* the energy of the bomb at the moment it reaches the ground.

(Take $g = 32$ feet/second^2.)

4. How would you test the correctness of the freezing and boiling point marks on a thermometer?

An accurate Centigrade thermometer reads 35° when a Fahrenheit thermometer placed alongside reads 94·8°. Is the Fahrenheit thermometer correct? If not, what correction must be applied?

5. What is meant by the *latent heat of vaporisation of water?*

A current of dry steam at 100° C. was passed into 142·0 grams of water at 14·5° C. contained in a copper calorimeter weighing 25·0 grams. The temperature of the water rose quickly to 35·5° C., and the current of steam was cut off. The calorimeter and water now weighed 172·0 grams. Determine the latent heat of vaporisation of water.

(Specific heat of copper = 0·1.)

6. A platinum wire is 0·1335 cm. longer at 70° C. than at 20° C. If the coefficient of linear expansion of platinum is 0·000089, what is the length of the wire at 20° C.? Determine to the nearest millimetre the length of the wire at 100° C.

7. State *Boyle's Law.*

If 1,650 cubic cm. of air at a pressure of 1,197 mms. of mercury are further compressed to a pressure of 2,850 mms. of mercury at constant temperature, what volume will the air then occupy?

If the valve of the containing vessel is now opened to the atmosphere (pressure, 760 mms. of mercury), find to the nearest cubic cm. what volume of air at atmospheric pressure will escape.

8. State *Ohm's Law.*

What current will be taken from a series battery of 5 accumulators, each of E.M.F. 2 volts, connected with resistances of 30 and 60 ohms, (*a*) in series and (*b*) in parallel?

9. Draw a diagram of the magnetic field produced by an electric current flowing in a long cylindrical coil of wire. Give a rule for determining the polarity of the coil.

(*The diagram must show clearly the direction of the current and of the magnetic field.*)

10. State *Joule's Law* for the heating effect of an electric current

Assuming that there is no loss of heat to the surroundings, find how long it will take to raise the temperature of 12 litres of water from 18° C. to 30° C. by passing a current from the 220-volt mains through a resistance of 121 ohms immersed in the water.

11. How is hydrogen prepared in the laboratory? Give a diagram of the apparatus you would use for this purpose.

State the more important properties of this gas and mention any industrial uses to which it is put.

12. Write down the chemical equation for the action of heat on limestone. How many cwts. of quick-lime are obtainable from 1 ton of pure limestone? (*Express your answer in decimals.*) What weight of pure slaked lime can be prepared from this weight of lime?

(Atomic weights: Calcium = 40, Carbon = 12, Oxygen = 16, Hydrogen = 1.)

13. Give the chemical equations for the reactions that take place when—

(*a*) carbon dioxide is passed into lime-water,
(*b*) common salt is heated with concentrated sulphuric acid,
(*c*) dilute hydrochloric acid is added to sodium carbonate,
(*d*) a solution of silver nitrate is added to a solution of calcium chloride, and
(*e*) sal ammoniac is heated with caustic soda.

14. Compare and contrast animal and plant respiration.

15. Describe with sketches the method of reproduction of ferns.

16. How is a rainbow produced? Why is a second bow sometimes observed?

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E&W School - Entrance Exams - PART 3 General

A.A.E.
34 (1)
3

ROYAL AIR FORCE

EXAMINATION FOR THE ENTRY OF AIRCRAFT APPRENTICES

5TH JUNE, 1934

PAPER III.—GENERAL PAPER (WITH ENGLISH COMPOSITION)

Read carefully the instructions on the front page of your examination answer book. Candidates must attempt Part I, to which about ONE HOUR *should be given. In Part II answers are to be sent in to any* FIVE *questions, but not to more.*

Time allowed—2½ hours

PART I

ESSAY (100 marks)

1. Write an essay on *one* of the following subjects :—

(*a*) Electricity in the service of man.
(*b*) The use and misuse of leisure.
(*c*) Queer ways of making a living.
(*d*) A camping holiday.

PART II

GENERAL PAPER (100 marks)

Answers to be sent in to any FIVE *questions in this part. All questions carry the same number of marks.*

2. Write a description of *either* (*a*) a typical "manor" of the Middle Ages, *or* (*b*) Merchant and Craft Gilds in a medieval town.

3. Write brief notes on any *four* of the following :—Ship Money ; Habeas Corpus ; the Seven Years' War ; the Chartists ; the Lollards ; the Court of Star Chamber ; the trial of Warren Hastings ; the Charge of the Light Brigade.

4. Write an account of the career of *one* of the following :—Cardinal Wolsey, the Duke of Marlborough, Lord Clive, Lord Nelson, the Duke of Montrose.

5. Describe the physical features of *either* South Africa *or* Canada, and give a brief account of the climatic conditions and economic resources of the region you select.

Illustrate your answer with a sketch map.

6. Explain the importance and describe and account for the position of any *four* of the following towns :—Valparaiso, Rangoon, New Orleans, Teheran, Simla, Aden, Marseilles, Freetown, Singapore.

Trace the route of a sea-trip which would call at any *five* of them.

(*Note.*—These need not include the four selected for the first part of the answer, but they should be mentioned in the correct order.)

7. Draw diagrams to explain the difference between an eclipse of the sun and an eclipse of the moon.

Say why it is impossible for the two events to occur a week apart.

8. Select *four* of the following, name the book (with author) in which they appear, and then describe an adventure of any *one* of them :—

Jim Hawkins, Ulysses, Falstaff, Gerard, Hereward the Wake, D'Artagnan, Don Quixote, Kim, The Artful Dodger, Moses Primrose, Cedric the Saxon, Inigo Jollifant.

9. Read carefully the following poem and then express its meaning in your own words. Explain also the meaning of the words in italics.

Four Seasons fill the measure of the year ;
There are four seasons in the mind of man :
He has his lusty Spring, when fancy clear
Takes in all beauty with an easy span :
He has his Summer, when *luxuriously*
Spring's honey'd cud of youthful thought he loves
To *ruminate*, and by such dreaming high
Is nearest unto heaven : quiet coves
His soul has in its Autumn, when his wings
He furleth close ; contented so to look
On mists in idleness—to let fair things
Pass by unheeded as a threshold brook.
He has his Winter too of pale misfeature,
Or else he would forego his *mortal nature*.

10. How can you account for the fact that a painting by a famous artist of an old thatched cottage may be worth £2,000 while the cottage itself is worth only £200 ?

11. What important events have occurred in any *four* of the following countries during the past year :—

France, Austria, Germany, China, Spain, the United States, the Irish Free State ?

12. Describe briefly the kind of work performed by any *four* of the following :—

An accountant, a civil engineer, a rural dean, a magistrate, a barrister, an Inspector of Factories, an under-writer, a purser, a chef, a stockbroker.

13. State what materials and tools you would use, and describe exactly how you would proceed to make *one* of the following :—

(*a*) A mouse-trap.
(*b*) A picture frame.
(*c*) A fish slice.
(*d*) A piece of apparatus to illustrate the expansion of solids.

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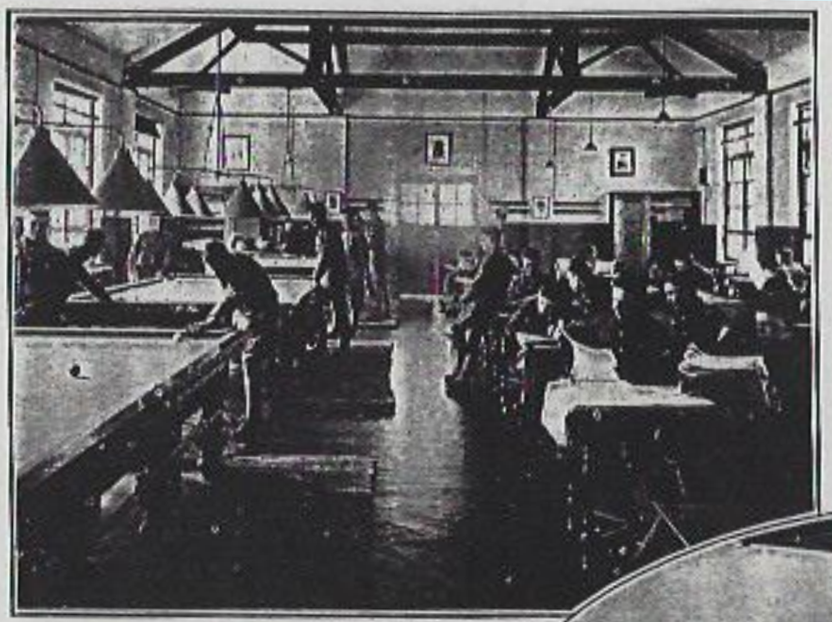
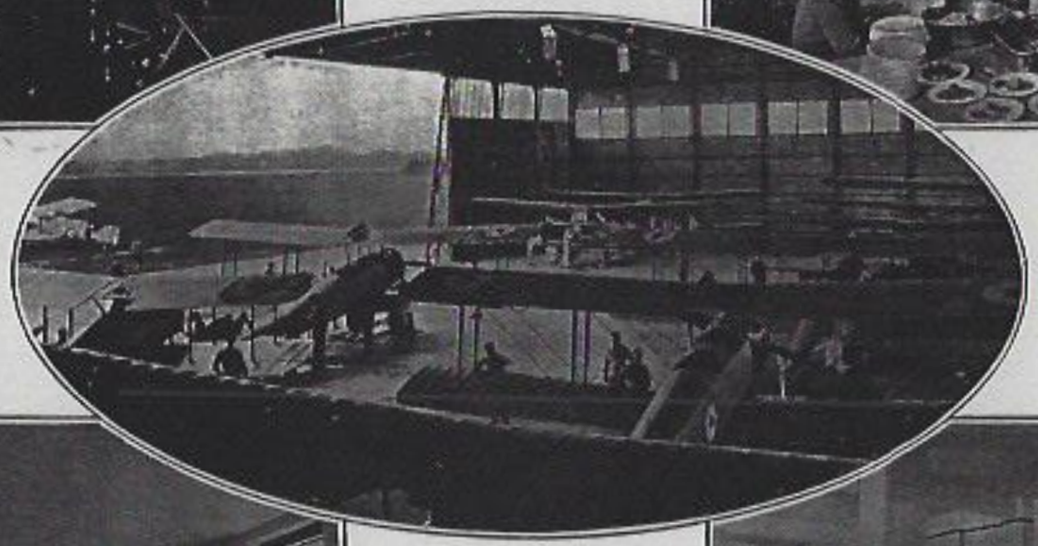
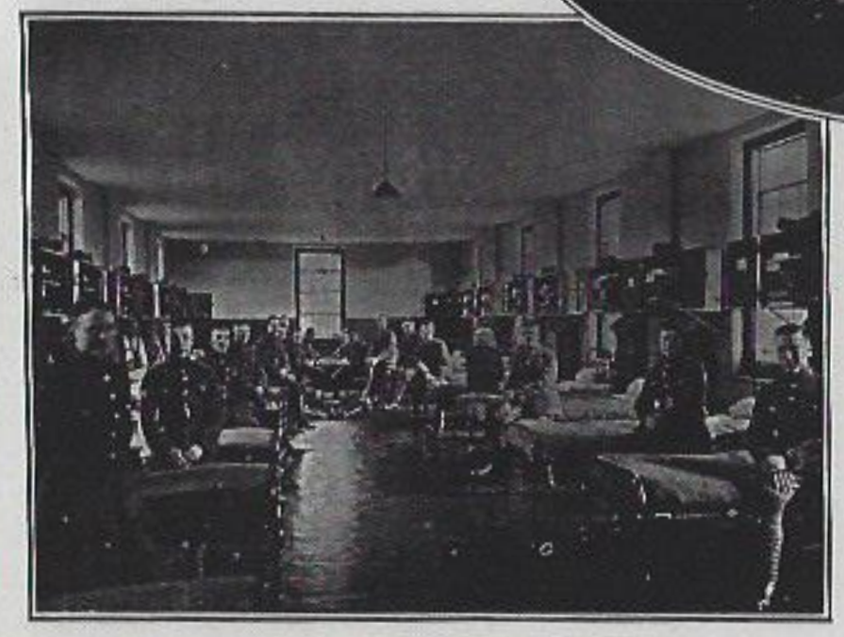
E&W School - Environment



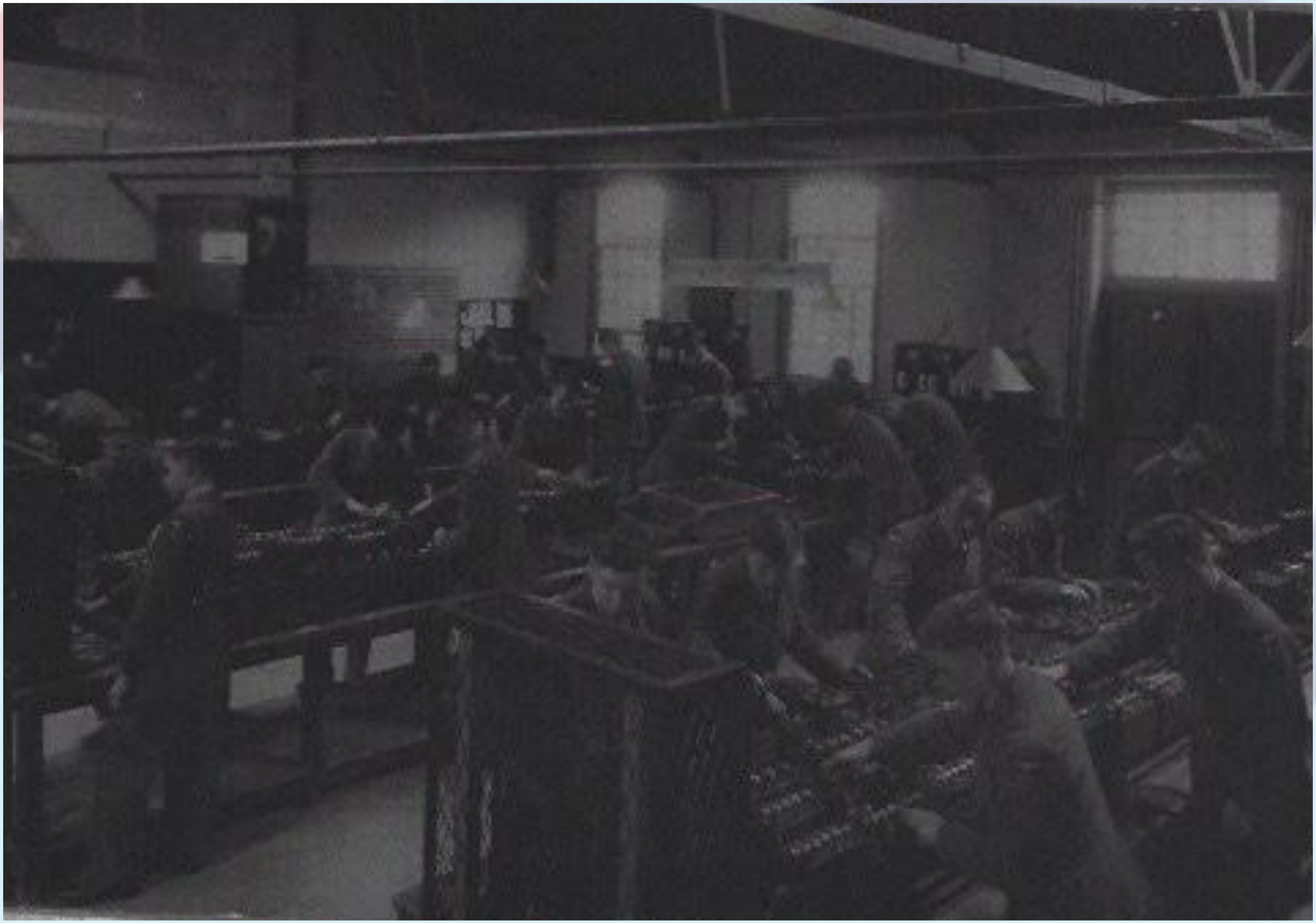
The Billiard Room.



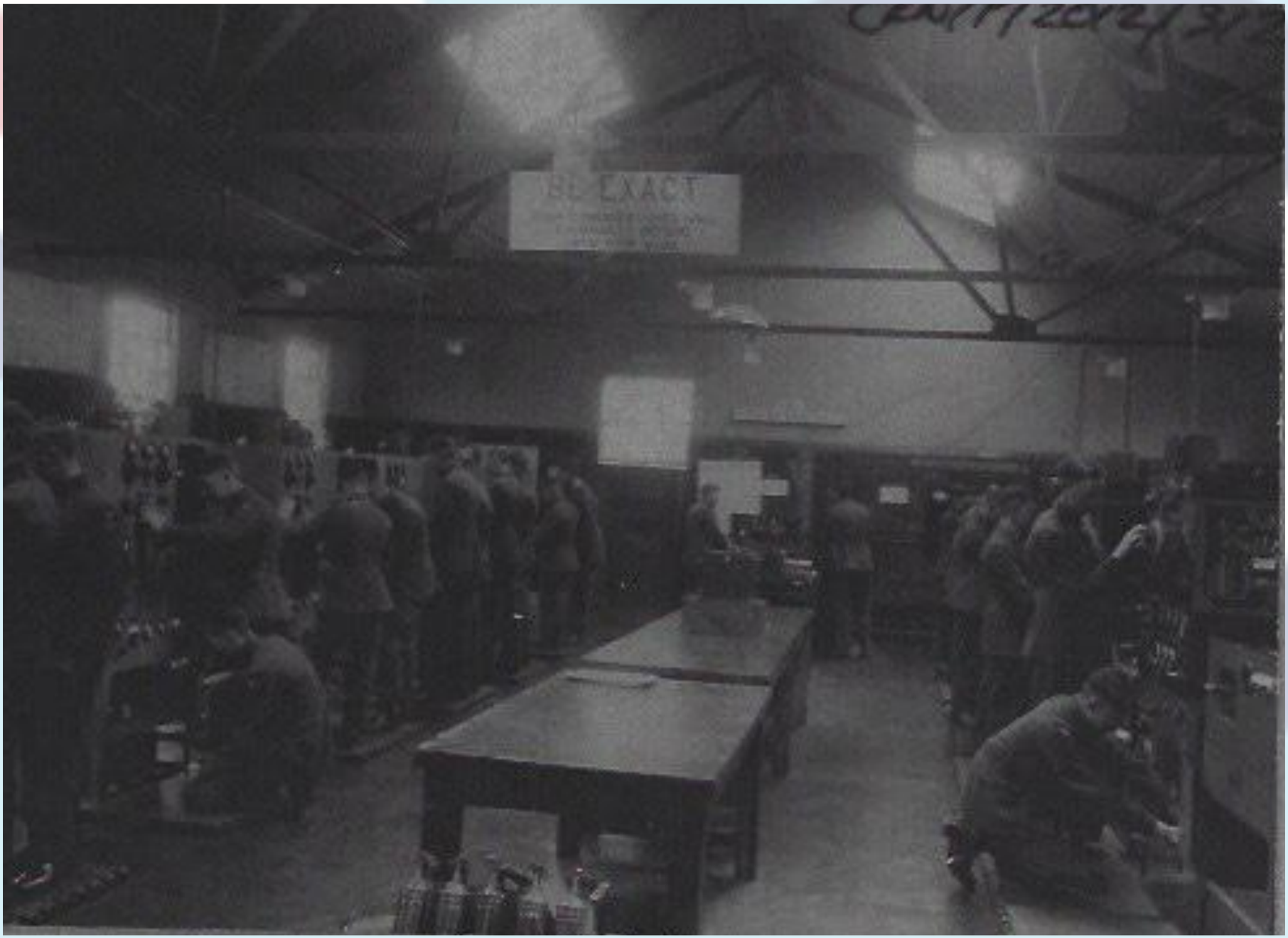
The Dining Hall.



E&W School - Workshops



E&W School - Workshops



E&W School - Workshops

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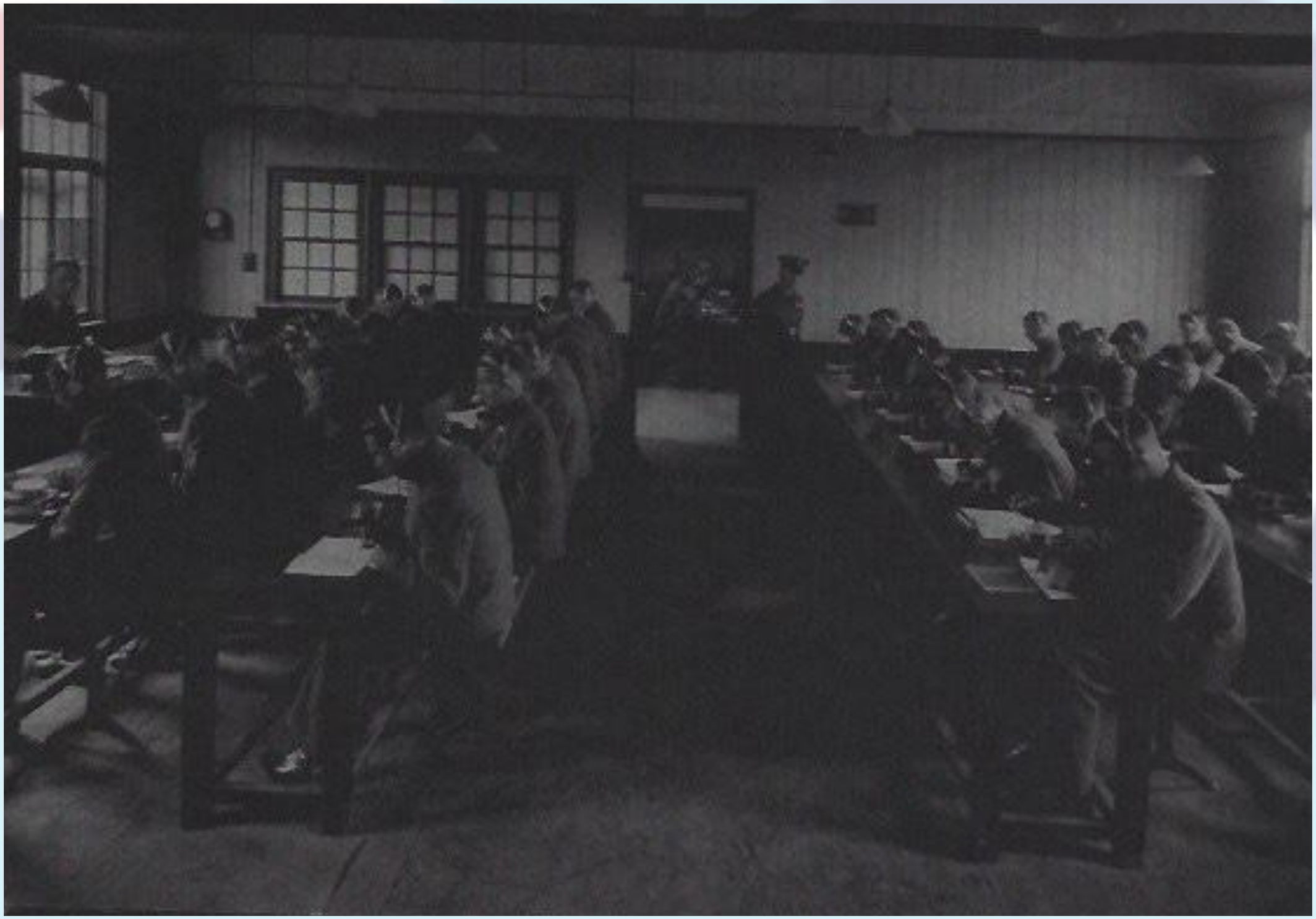
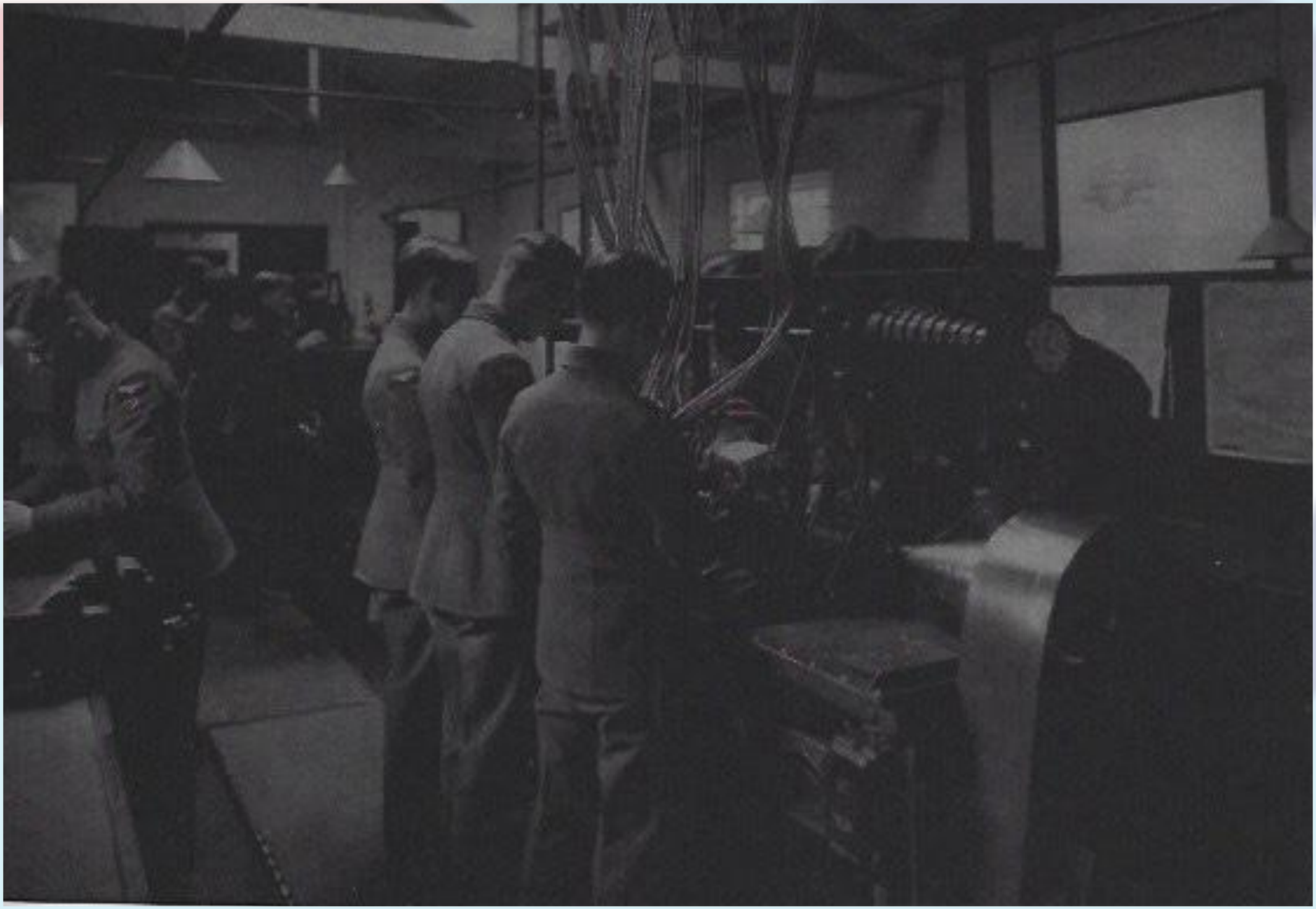
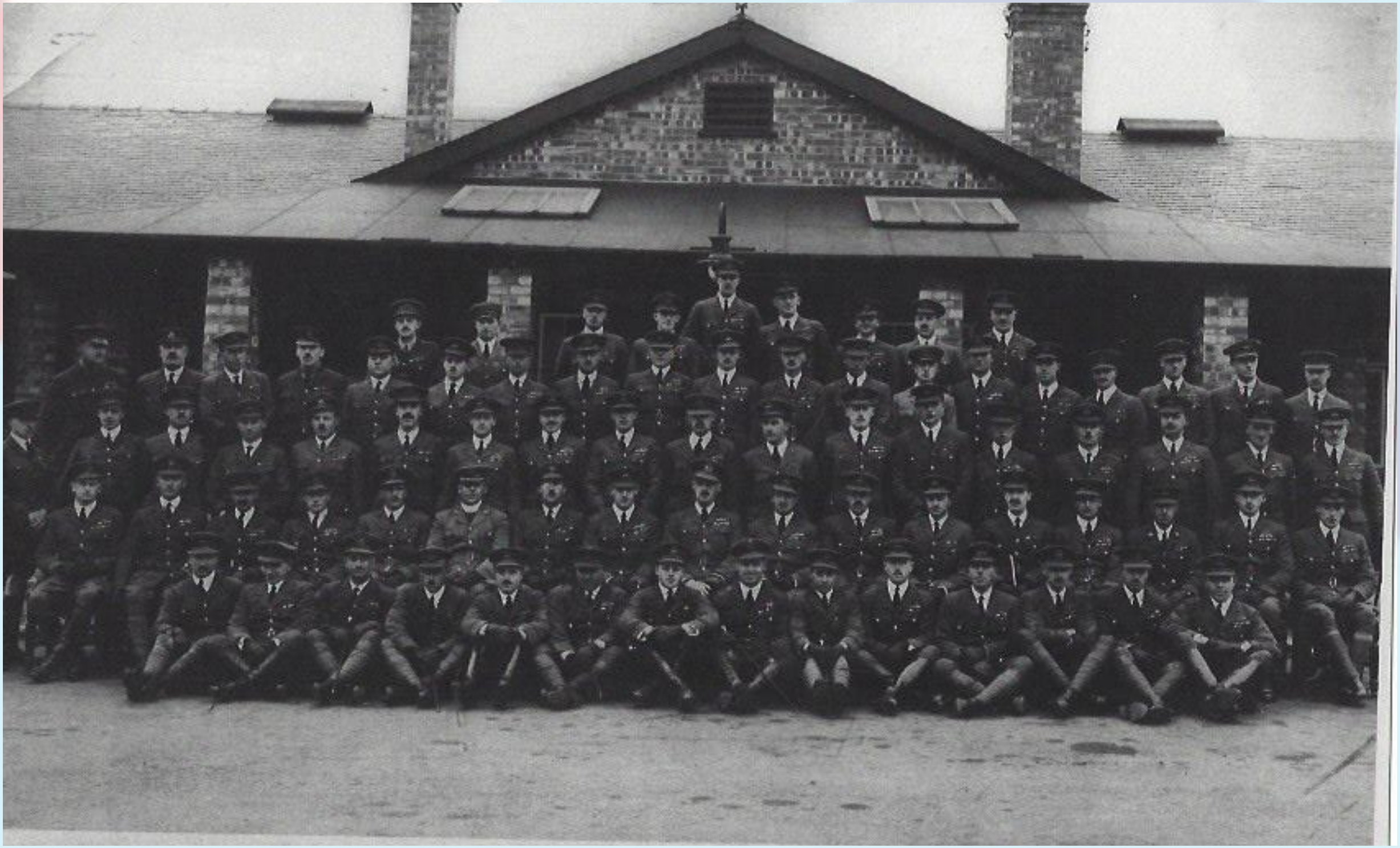


E&W School - Workshops



E&W Staff - Only Remaining Photo