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It is my hope that you find the file of use to you personally – I know that I would have liked to have found some of these files years ago – they would have saved me a lot of time !

Colin Hinson

In the village of Blunham, Bedfordshire.

● BOMBER

BOMBER  
COMMAND

COMMAND  
CONTINUES

CONTINUES



**BRITISH ISLES**

LONDON

0 miles

IJMUIDEN

ROTTERDAM

OSTENDE

DUNKIRK

ANTWERP

**BELGIUM**

CALAIS

BOULOGNE

LILLE

CHERBOURG

LE HAVRE

CAEN

BREST

PARIS

LORIENT

ST. NAZAIRE

**F R A N C E**

150 miles

350 miles

# BOMBER COMMAND CONTINUES

THE AIR MINISTRY ACCOUNT OF THE  
RISING OFFENSIVE AGAINST GERMANY  
JULY 1941-JUNE 1942



*Issued for the Air Ministry by the  
Ministry of Information*

LONDON: HIS MAJESTY'S STATIONERY OFFICE

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WITH ELEVEN PHOTOGRAPHS, FACING PAGE 28,  
AND MAPS IN LINE INSIDE THE COVERS

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## 1. T. 2619 FLIES HOME

AT 11.30 P.M. on the 14th July, 1941, Wellington aircraft T. 2619, known to all concerned with it as T for Tommy, took off in thick darkness on an operational flight to Germany. It had seven 500-lb. bombs on board and its crew were all sergeants. Saich, who came from Dunmow, was the pilot; Telling, an Epsom man, the second pilot; the navigator was Smitten, a Canadian from Edmonton, Alberta, while the three remaining members were an Englishman, Trott, from Sheffield, and two more Canadians—Hocper from Vancouver, the front gunner, and English from Picton, Nova Scotia, the rear gunner. The target was in the German port of Bremen.

It seemed at first that it would prove hard to find, for the weather was very thick. Just before T for Tommy reached the city, however, it came out of the clouds into a clear sky carved by the sharp blades of searchlights. There was a slight haze over the roof tops 11,000 feet below, but Sergeant Smitten found the target and Sergeant Saich began his bombing run. It was just twenty minutes to two in the morning. One bomb was released, when the wheeling searchlights caught and held T for Tommy in a cone of light which grew in size and intensity as more and more beams concentrated upon the aircraft.

“It was immediately subjected,” runs the official report, “to the most intense and accurate light and heavy anti-aircraft fire.” Two shells arrived, one bursting just behind and below the rear turret, the other inside the fuselage itself level with the leading edge of the tail plane. The first shell wounded Sergeant English, the rear gunner, in the shoulder and the hand, and cut the hydraulic controls to the turret so that it could no longer be turned except by the slow process of cranking it. Fragments of the other shell riddled the rear part of the fuselage, and set on fire the fabric covering it and the tail fin which is the special characteristic of the Wellington. In a few seconds, therefore, T for Tommy wore the aspect of a flying torch and thus presented the kind of target for which anti-aircraft gunners pray. They seized their opportunity. “The flames,” said Sergeant Saich, “seemed to be the signal for every anti-aircraft gun in the target area to give full and uninterrupted attention to us.” And all this time, be it remembered, the rear gunner was in the blazing end of the torch.

Saich took violent evasive action and succeeded in throwing the German gunners momentarily off their aim. While he was doing

so, Smitten, the navigator, went to the help of English in the rear turret. He made his way down the rocking, shell-torn fuselage till he was brought up short by the fierce fire separating him from the turret. Here for the moment he could go no further. He crawled back a little way, snatched a fire-extinguisher and returned to the fire in the fuselage, which he presently subdued. Above him the fin still flamed. He sprayed it with all that remained of the methyl-bromide in the extinguisher, thrusting it through the hot framework of the fuselage from which the fabric had burnt away. He was at last able to reach the turret.

Sergeant English was still there, but he had made preparations to abandon the aircraft by swinging the turret round into the beam position. A rear gunner bales out by turning his turret until the steel doors, through which he enters and leaves it, face not the interior of the fuselage but the open air to port or starboard. He then opens the doors and throws himself out backwards. This was what Sergeant English was about to do when Sergeant Smitten reached him. He had opened the doors, and now they refused to close. Back went Smitten and returned with a light axe. He leant out through a hole beneath the fin, which he had just saved from burning, the wind of the slip-stream tearing at him, and hacked away at the doors till they fell off. English was then able to rotate his turret by means of the hand gear, and as soon as the gaping hole, where once the doors had been, coincided with the end of the fuselage, he extricated himself and entered the aircraft.

While this was going on astern more trouble broke out forward. The Wellington was hit again and a shell splinter set light to the flares carried in the port wing. These are for use in an emergency, when a forced landing has to be made in darkness. They burned brightly—so brightly that Sergeant Saich thought the port engine was on fire. He promptly turned off its petrol, opened the throttle fully and switched off. Soon, however, the flames died down, for the flares had burnt their way through the fabric of the mainplane and fallen from the aircraft. Realising what had happened, Sergeant Saich turned on the petrol again and restarted the engine. At his orders Sergeant Telling, the second pilot, was crouched beside the main spar behind the wireless cabin pumping all the oil which could be extracted from a riddled auxiliary tank. T for Tommy was still under intense anti-aircraft fire and the shell splinters, one of which wounded him, were described by Telling as “angry hail tearing through the aircraft.”

One further misfortune had befallen the Wellington. At the moment when the Germans scored their first hit, the bomb doors

were open, for the aircraft was completing its first bombing run-up and one of the bombs had just been released. The damage caused by the anti-aircraft shell was such as to make it impossible either to close the bomb doors or to release the remaining six bombs, since the hydraulic pipes had been punctured and the electrical wiring to the slips had been severed. As well as this, and the damage to the fuselage, the rear turret, the rudder and the fin, there was a large hole knocked by a shell in the starboard wing. It had just missed the petrol tanks.

In this condition T for Tommy was headed for base. The chances of making it did not appear bright. The aircraft with bomb doors open and a heavy load still on board was very hard to control, and Sergeant Saich's task was not made easier by the hole in the wing through which the draught rushed, blanketing the starboard aileron which was for all intents and purposes useless. Nevertheless he held sternly to the homeward course given him by Sergeant Smitten, and at 5.35 a.m. on 15th July T for Tommy crossed the English coast dead on track. Its speed had been much reduced, and the petrol gauges had been registering zero gallons for some two hours out of the four on the return journey from Bremen, over nearly three hundred miles of sea. With dry land beneath him once more Sergeant Saich determined to make a forced landing, for he thought that at any moment the engines would stop for lack of fuel.

*The word is "flew"*

The sky was now "pale as water before dawn," and he picked out a barley field where it seemed to him that a successful landing might be made. In the half light he did not see the obstruction poles set up in the field to hinder an airborne invasion. He set about making his perilous descent. The flaps would not work, and when he came to pump the undercarriage down with the emergency hydraulic hand pump he found that, owing to loss of oil, it would only push the tail wheel and one of the main wheels into their positions. T for Tommy came in to land, lop-sided a little to take full advantage of the one sound wheel. On touching down, the aircraft swung round, but its motion was violently arrested by an obstruction pole. It shuddered and then came abruptly to rest on its belly with its back broken. Save for many bruises none of the crew sustained further hurt. T for Tommy was little more than a wreck. It had flown to that East Anglian barley field with a huge hole in its starboard wing, with uncounted smaller holes in its fuselage, with nine feet of fabric burnt entirely away forward from the



rear turret, with half the fin and half the rudder in the same condition. Yet it flew home. The operative word is "flew."

The airframe number of the Wellington was T. 2619, the engine numbers—each engine of an aircraft has two:

Port Engine:           Maker's Number 8816.  
                              R.A.F. Number 185326.

Starboard Engine: Maker's Number 8122.  
                              R.A.F. Number 161206.

Sergeant Saich, the pilot, and Sergeant Smitten, the navigator, were awarded the Distinguished Flying Medal.

This story of Wellington, T for Tommy, is not unique. If it were, much of the point in telling it could not be made, for its successful homing would have been a striking exception to an unhappy rule. It is because very many other aircraft, not Wellingtons only, but Blenheims, Hampdens, Whitleys, Stirlings, Halifaxes, Manchesters and Lancasters have endured similar punishment and lived to fly again, that this record of one such perilous but successful return is here set down. It is a not unfitting prelude to the story of Bomber Command from the middle of July 1941, the point at which the tale of its earlier doings ended,\* to the earlier stages of its 1942 offensive now in full swing.

## 2. THE BUILDING OF A BOMBER

BEFORE TELLING that story, it is as well to enquire how such an offensive has been made possible. There are many reasons. The Home and Empire Air Training Schemes, which are providing thousands of trained crews, is one: the standard of efficiency of those crews when they join their comrades, who are already operational veterans, is another. A third is the construction of the aircraft, the way in which they are designed and built, the way in which they are serviced and maintained. This last reason deserves to be examined more closely. However well trained and gallant the pilots and crews, without aircraft of excellent workmanship to fly and without skilled ground staff able to keep those aircraft in excellent

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\* *Bomber Command*, September 1939–July 1941. H.M.S.O.

condition, their task would be impossible. How then, is a bomber built and how is it maintained in action?

A full answer to this question cannot be given within the limits of a contemporary pamphlet. Moreover, much of the process of manufacture is secret. The general principles, however, are clearly defined, and can be set down.

The basic principle is akin to that taught by Napoleon and practised by him in the conduct of war. Disperse to march; concentrate to fight: or, in terms of production, disperse to manufacture; concentrate to build. Thus the various component parts of a bomber are made by a number of sub-factories, and by sub-contractors. The partly or completely finished parts are sent to Assembly Factories where they are put together to form the finished aircraft. Sub or Dispersal Factories, as they are called, and sub-contractors, feed and are fed by the main Assembly Plant in the hands of a central control, which plans the whole operation or rather series of operations from beginning to end. It is the central control which allocates their tasks to the various sub-factories and sub-contractors, the making of undercarriages to one, of tail planes to another, of engine mountings to a third, and so on. Between the main and sub-factories and contractors there is a constant flow of raw material one way and of completed or semi-completed parts the other.

#### *From store into aircraft: the assembly shop*

The Main Assembly and the sub-plants have many details in common, of which one is of outstanding importance. To make or assemble a part, some kind of "jig" is nearly always used. A "jig" is a fixture which varies from a simple piece of shaped wood or metal to a complicated structure of accurately positioned steel members. Jigs control the manufacture of component parts so that they may be identical and interchangeable. All jigs, and all the detail tools, jig fixtures and machine tools for giving special treatment to particular materials used in the aircraft, are duplicated and dispersed so that, if a German bomb destroys one, there will be another available either in the factory itself or elsewhere. In other words, the eggs are not all in one basket; and machine tools and jigs are very precious eggs indeed.

So much for the general lay-out. Now come to an Assembly Factory. Since it is impossible to go to every one, let us choose two which may be regarded as typical of the rest. The first is engaged in making Wellingtons, the second Stirlings. The Wellington

is one of the oldest types of bomber in service. The Stirling was the first four-engined bomber to become operational.

Leaving the manager's office you cross a corridor, pass through a door and find yourself upon a small platform or gallery overlooking the floor of the Assembly Hall. In the daylight, pouring in from shuttered windows in the roof, it seems to be not very high but its extent is enormous. Yet its size is not immediately apparent, for the vast floor-space is cut up by numerous partitions—blast-baffle walls of naked brick, well buttressed and enclosing a series of roofless boxes, for they do not extend upwards so far as to reach the ceiling. If they did they would interfere with the electric cranes pursuing their path "in strange geometrical hinges" along steel guides which are part of the roof structure. They are stretched, a severe, symmetrical web, over the whole ceiling, so that the burden borne by any crane—a 14-cylinder double-bank, air-cooled, radial Hercules engine (Mark III), or the outer section of a wing, or whatever it is—may be delivered exactly where it is needed at exactly the chosen moment.

Looking down the hall to the right-hand side, we see the ordered stacks of stores, ranging from raw materials which have been sent to the main factory for inspection and distribution to the sub-factories, to the finished parts. These are kept in main stores where they remain in bulk, sorted and graded, till transferred as required to sub-stores from which they are handed out to the workers. Since the sub-stores are situated opposite the stage in the Assembly Line where the equipment they provide is wanted, it goes straight from the store into the aircraft.

The Wellington is built, or rather put together, in seven stages, along three parallel assembly lines occupying all the rest of the factory to the left of the stores and the wing shops. Come down to the floor and move with a Wellington from the point at which it is born, seemingly from a disordered mass of duralumin trellis work, to the far end of the hall where it is pushed through the great doors and stands outside, a finished bomber, with engines turning over ready for the test pilot to take it into the air from the aerodrome just beyond.

First you will see a pile of geodetic panels, for, as most people are aware, all the surfaces of the Wellington consist of trellis framework over which fabric of fine tested linen is stretched. The panels are being sorted according to the position they occupy in the fuselage. This work—indeed, a very great deal of all the work that is done in the hall—is being performed by women. They wear trousers and buff-coloured overalls. Some have handkerchiefs or caps on their heads; many are bare-headed, as there is no rotating machinery

with which they might come in contact. You will pass on rapidly to stage two, for here the Wellington is beginning to take shape and form. On special assembly jigs the sorted pieces of the fuselage are being fastened together. Here again are women standing on the platforms of the jig or inside the half-formed fuselage, looking like inhabitants of Lilliput drafted to work in a factory of Brobdingnag, or like children very busy with a new and gigantic Meccano set.

The Wellington now receives a number of inspection cards, on which is recorded each stage of the manufacture when it has been satisfactorily completed. The fuselage cannot pass on from one stage to the next until an inspector has made his check and signed on the card. These inspectors are to be seen in all parts of the factory. They belong to the Directorate of Aircraft Inspection of the Ministry of Aircraft Production or to the firm of Vickers Armstrong, who make the Wellingtons. The inspectors of the firm wear green overalls. A few wear purple. These are known as "progress men" (or women), and "chasers," whose job it is to watch over the smooth and ordered movement of parts in the whole manufacturing process.

The fuselage, now pinned together, has reached stage three; next, it begins to receive some of the instruments and equipment parts which the Wellington carries. The first that you will notice is the control column rising up in the forward part of the fuselage, in front of the, as yet non-existent, pilot's seat. Here, too, women are attaching strips of wood to the fuselage at different points to retain the fabric covering in streamline form. On either side the root attachments are added from which the wings will shortly spring, and fore and aft are bolted the rings which will hold the turrets.

### *Two and a quarter miles of cable*

At stage four the wiring of the aircraft begins. Two and a quarter miles of electric cable have to be inserted to carry the current operating all the electrical gear, such as the bomb release and fusing apparatus, the internal, navigational and signal lighting and the gear for charging the accumulators which supply the current for engine starting and wireless. At this stage, too, the flying controls operating the ailerons, elevators and rudder are inserted. The cabin of the Wellington is now beginning to assume its final form, for it is being covered with sound-proof material. At stage five the fabric is being put on to the gleaming skeleton. The pieces have been cut and shaped by hand on grooved tables in the sewing shop. They are made of fine linen and attached to the fuselage by fabric holders,

which are wooden strips each containing 144 screws. The preliminary holes for the insertion of each screw have been made by women seated at the side of the production line. A woman can drill as many as 40 holders in one shift. In covering the fuselage with fabric, it is essential that the seams should run the right way and that the screws for holding the covering should be properly inserted. Any mistakes made are written in chalk by the inspector on the fabric and subsequently set right.

Now the fuselage is ready to take the inner wing—that is, that part of the wing between it and the engine nacelles. This is carried out at stage six, and here also small electric mobile cranes stand fore and aft of the fuselage with gun turrets like huge, luminous eggs swinging from their chains. And so to stage seven, where the outer wings, the undercarriage, the bomb doors and finally, the tail unit are all added to the now complete fuselage. The wings themselves have been made in the wing shop beyond the stores. The final fabric sewing is carried out with curved needles, eight women to a wing, and the process takes about thirty woman-hours.

The wing is then passed to the doping shop where, like the fabric of the fuselage, it receives four coats of dope. This dope protects the fabric against weather and also causes it to shrink, thus tightening the skin of the Wellington. The workers in the dope shop live in an atmosphere strongly redolent of pear drops. They receive a pint of milk a day, as a prophylactic against the effect of the dope fumes which, although harmless to the health with the 12 changes of air per hour provided, are inclined to upset the digestion of those unaccustomed to them.

The Wellington is now almost ready to fly. Before the wings have been attached to the fuselage, the self-sealing petrol tanks have been slipped in, and as soon as the undercarriage has been bolted into place it is tested by attaching pipe lines from a mobile trolley with an electrically driven hydraulic pump. Then the overhead cranes, bearing the Hercules engine installations, lower their burden to each nacelle where they are bolted to their fireproof bulkhead. It must be borne in mind that any mechanism put into the Wellington has been tested in the shops. Thus, for example, in the Bomb Rack Section the beams are wired and tested before being attached below the fuselage, and so with every other part. In the Electrical Section all the electrical gear is made up and tested; in the Pipe Shop all the hydraulic and other pipes, and in the Test House all petrol accessories, hydraulic valves and pumps.

Once off the assembly lines the now almost completed Wellington is pushed through the great doors across a space and into a

smaller hall, where it receives its guns, its wireless equipment, its fire extinguishers and other operational gear. Then out it comes again and is at once flown off the ground for twenty minutes or half an hour by a test pilot. Everything which can be tested in flight is tested, special attention being paid to the intercommunication system whereby the members of the crew talk to one another, the bomb release gear and, of course, the controls and engine instruments. On landing, final adjustments are made and then the Wellington is handed over to a pilot of the Air Transport Auxiliary, to be flown to a central pool or perhaps direct to a bomber station.

### 3. GIANTS IN THE MAKING: THE STIRLINGS

THE METHOD of producing Stirlings, and for that matter Halifaxes, Lancasters, and all other heavy bombers, is much the same as that used to produce Wellingtons; but a Stirling assembly plant at first sight offers a marked contrast. There is much more noise, more artificial light, and the hall itself is even larger. Look down on it as you looked on the Wellington hall—from a balcony. It is so large that its further end is a blur under the fluorescent lighting which turns the faces of the workers green and their lips mauve. The noise of the machinery, too, produced mostly by the electrically or hydraulically driven tools, is intermittent but loud—loud enough to make it necessary to speak at the top of the voice and sometimes to shout.

Here everything seems on a larger scale. The fuselages, in their long rows, supported on bogies moving on a track which runs the whole length of the hall, look not unlike the bodies of Green Line buses. The wings, viewed from the end which will be attached to the fuselage, resemble dark, strutted tunnels into which a man may crawl with ease. Only the turrets appear the same size as those which you have already seen.

This, like the Wellington factory, was one of the many shadow factories before September 1939. Since then the shadow has become a reality. The layout is much the same in both factories; though, since the Stirling is a larger aircraft with four engines, weighing more than thirty tons, and containing more than 60,000 separate parts, the work of constructing and assembling takes longer

In order to ensure the maximum output and at the same time to avoid building complicated and costly jigs for which there are neither machine tools nor skilled labour available, large numbers of small, simple, easily made jigs are used, each jig or each group of jigs serving the main assembly section opposite which it is placed. The wide use of these sub-assembly jigs, as they are called, enables a new recruit in the factory to begin at once on an easy piece of work and thus to become proficient in a much shorter time than would be possible if the whole unit, fuselage or wing were built on a major jig. It is unnecessary and costly to make some dies and tools of steel in order to manufacture parts such as pipes and sheets of various shapes, whose material is thin-gauge light alloy. Many of these jigs and dies are therefore made of wood. Modifications in them can be made without delay.

More complicated machines, such as the big cutters for shaping the spars, or the presses and boring machines, are so built that one operation is performed by each, and so placed that the operations take place one after another in a certain order. It is impossible to omit one operation, for a semi-finished part would not fit the next machine. Thus error is reduced to a minimum.

### *The moving line of bombers*

Large though it be, the factory is not large enough to make and assemble all the parts which make up a Stirling. As with the Wellington, many of these parts are manufactured elsewhere and sent in a finished or semi-finished condition to the Assembly Plant. Line production has been instituted and is indeed the rule in all aircraft factories. With Stirlings, both wings and fuselage are produced in lines.

Before joining the line, the wing receives its first form on the building jig, where the leading and trailing edges and the engine nacelles are assembled. This wing shell is then carried by an overhead crane and placed on a specially constructed bogey running along a track which is the main assembly line and is parallel to a similar line on which the fuselages are being constructed. The wing then progresses stage by stage along the line till it reaches its fuselage. First the pipes and tanks are fitted into it, then the controls for the ailerons, then the landing and other lights, then the electrical equipment, then the engine controls. All the pipes in the various systems are pressure-tested after assembly.

While the wings are thus being built, the construction of the fuselage is being carried out in much the same manner, though it

is taken along the assembly line in sectional form. At each stage more and more items of equipment are incorporated into it, and finally the various sections of the fuselage—the nose, the forebody, the aftbody and the tail—are joined together. The turrets are then mounted, being dropped into position from overhead gantries. Then the testing gear is brought into operation, and everything in the fuselage and in the turrets is tested to make sure that it is in proper working order from the start. This testing at an early stage reduces the number of faults—or rather leads to their early discovery—and thus makes it possible for a test flight to be carried out immediately the building process is ended. Before the wing is attached to the fuselage, complete tests are made of all electrical circuits, fuel tanks, control cables, etc.

As with the Wellington, a schedule is attached to each main portion of the Stirling as it grows beneath the hands of the workers. This "Master Schedule" is a list of all parts and is added to as each part is inserted in the fuselage or wing. Thus at any moment the inspector or one of the supervisors, of whom there are three in the factory—one for the machine shops, another for the assembly lines, and a third for the press and detail shops—can see by a glance at the schedule whether the aircraft or details are progressing at the proper rhythm of speed through any particular stage. All stores are kept at the side of the main assembly tracks and the installations they contain are, as with the Wellingtons, taken from them and inserted in the aircraft while it moves slowly past their position in the hall.

After the fuselage and wings have been completed, the aircraft comes out of the main hall, and then passes into an adjacent block where it is painted, camouflaged and finally adjusted for flight. Then, black beneath and mottled above, it rolls slowly on to the tarmac of the aerodrome. There it is fuelled and taken up to the air. When the test flight is over, the compass is swung, any adjustments which may have proved necessary are made, and it is then taken over by a Ferry Pilot. Stirlings thus built have been in action within forty-eight hours of leaving the works, and on one occasion one of them was over a target in Germany only twelve hours from the moment it touched down after its test flight.

In this general account of the assembling of a heavy bomber there has been more than one reference to the part played by women. It is of great importance. Skilled labour, even in peace time, is very scarce compared with unskilled, and so the two must be mingled in order to produce quick and accurate results. In aircraft factories, therefore, the skilled workers—nearly all of them men—have been



given work which only they can do. They are the nucleus of each factory, the cadres of the great industrial army providing the Royal Air Force with the aircraft it needs for battle and for victory. The great majority of the army are dispersed throughout the factories and called semi-skilled, but in fact become exceptionally skilful in their own particular job. The larger proportion of these workers, women for the most part, have learned their job in factories. After a short period of instruction in the use of basic tools, the new worker is very soon engaged on the simpler production jobs and has the satisfaction of making something which is to be used in the aircraft, even if it is only an anchor nut assembly or riveting stiffeners to the sheets which cover the fuselage and wings, and she soon attains speed and dexterity. In addition to those who have learned their jobs in the factories, tens of thousands have received an intensive and progressive course of training in Government Training Centres and Technical Colleges, where they are rapidly trained for work requiring a considerable degree of skill. The training is given in close co-operation with industry and generally includes in its later stages suitable production jobs, so that the trained workers can go straight on to the job with a thorough grounding in their new occupation and with practical experience of the actual work they will be doing in the factory.

Looking after these thousands of women are a number of women supervisors who have reached this position by promotion from below. They have been through the "shops." They know every detail, and it is their task not only to teach the workers in their charge but to discover what particular piece of work each of them is best capable of performing. In many factories the supervisors submit a return each week in which they make recommendations for the promotion or "upgrading" of anyone who shews herself capable of doing a more skilled, and consequently a more highly paid job. This system of upgrading has proved very successful, and women as a whole show great keenness to move upwards till they reach a stage at which they can work on the fuselage or the main wing of a bomber. A use can be found for every man and woman in the factory, and they can be moved up and down according to their proficiency, the less skilful being given the simpler forms of work, the more intelligent the more complicated.

*Keep the green light burning*

The motto for aircraft factories might well be that beloved of Erasmus, *Festina lente*. In their wide, echoing halls there is no

seeming haste and, equally, no seeming pause. The work flows steadily on. A tall girl in a green overall writing in chalk on the discoloured side of a half-finished fuselage; an old woman, who lost her teeth in the year the Prime Minister escaped from the Boers, leading a girl of seventeen to her first day's work in the Wing Shop—she had been in the mineral water trade—"From ginger beer to Wellingtons," as the old woman said; the vapour rising from the anodising tanks in which lie strips of metal seemingly distorted by the movement of the chemical; the back view of two men thrusting into the hollow of a wing self-sealing tanks that look like an enlarged edition of those smart suitcases in purple linen covers that used to be seen in the corridors of the Golden Arrow; the shape of a huge wing swaying from the ends of half-seen chains and dripping tentacles of insulated wire and silvered cable; two small feet at the end of trousered legs swinging from the bottom of a half-finished fuselage; an ex-mannequin wearing her overalls with an air, holding a stuttering riveting tool to a burnished sheet of thin metal; an empty surgery with bottles on a shelf and rolls of bandages beneath them; a barber with splendid moustaches at work with his scissors in his haircutting booth at the end of the Assembly Line; the test pilot waiting by the finished aircraft for the last workman to climb out of it—the work goes on.

Inside, above the main entrance of more than one factory, is a large sign with the words "Target for the Month" written along the top of two pictures of Adolf Hitler. In one he is laughing and satisfied. That is when the red light shines to give warning that production is below the mark shown on the illuminated scale below. In the other he is morose and cast down, when the green light shows that production is above schedule.

It is the aim of all to keep the green light burning.

#### 4. THE STORY CONTINUED: THE ASSAULT ON THE SEA-BASES

WITH AIRCRAFT built in this manner, Bomber Command is continuing its attack on the enemy which began on 4th September, 1939. For a year now the strategic policy governing it has been dominated by an event which occurred on 22nd June, 1941. On that day Hitler invaded Russia. The campaign which then opened

soon assumed gigantic proportions, and as the dusty Russian summer gave place to a dustier autumn, which in turn yielded to the implacable cold of a Russian winter, it became evident that the Germans would not be able to repeat their long series of swift successes, of which Poland has been the first and Greece the last victim. The resistance of the Russians was, from the beginning, so tenacious and effective that the immense quantity of German men and material accumulated for the campaign presently proved insufficient. To meet the needs of the Eastern front, an ever-increasing number of men, guns, tanks and aircraft has had to be taken away from other theatres of war by the German High Command, as it becomes more and more obvious that upon the issue of the Russian conflict Hitler's chances of swift victory depend.

Within a few hours of the German attack on the Soviet Union the Prime Minister of this country promised our fullest support. Bomber Command has a very large share in the fulfilment of that pledge. To do so with effect has been, and is, its main preoccupation; another is the part it must play in an older struggle, the Battle of the Atlantic. In the pursuit of this dual object two phases may be distinguished. The first began towards the end of June 1941 and lasted well into February of this year, when it merged into the second, now in progress.

It will be convenient, however, to deal first with those operations of Bomber Command which, directly or indirectly, are being carried out in order to help the Royal Navy, the Merchant Navy and Coastal Command in their long struggle for victory on the high seas. That help has been of importance, for it has been necessary over certain periods to devote as much as 40 per cent of our bomber effort to targets such as submarine bases and building yards, capital ships, and factories where sea reconnaissance aircraft, mostly the Focke-Wulf Kurier, are under construction. All these targets are directly connected with the Battle of the Atlantic.

### *The battering of Brest*

Chief in importance comes Brest, where for so long the battle cruisers "Scharnhorst" and "Gneisenau" and the eight-inch gun cruiser "Prinz Eugen" found shelter. It is well, perhaps, to remember that these vessels, which are a considerable proportion of the striking power of the German Fleet, remained inactive in that port, the two battle cruisers from the end of March, the eight-inch gun cruiser from the beginning of June, 1941 to the night of 11th/12th February, 1942, a period of nearly ten and a half and eight and

a half months respectively, and that when they did put to sea, they went, not out into the Atlantic to prey upon our shipping, but home to Germany. Both the "Scharnhorst" and the "Gneisenau" eventually reached Kiel, where the latter appears to have suffered further damage from air attacks, as the result of which she has been removed to the Baltic port of Gdynia for repairs. The credit for keeping these warships in Brest for so long and so critical a period of the war must go to Bomber Command. A high proportion of its strength was used against that very well defended seaport, and many hundreds of tons of bombs—a hundred and seventy-three in one night in December 1941—were dropped.

"Brest was heavily attacked last night by a large force of aircraft of Bomber Command. A great weight of bombs was dropped in the dock area and bursts were seen to straddle the dry docks in which the battle cruisers 'Scharnhorst' and 'Gneisenau' are lying." . . . "Attacks were also made on the docks at Brest." . . . "Other forces attacked the naval base at Brest." . . . "The German naval bases at Brest and St. Nazaire were strongly attacked last night." . . . "The attack on Brest was continued last night by a strong force of aircraft of Bomber Command. Many fires were left burning." . . . "Bomber Command again attacked the docks at Brest last night. . . ." These laconic phrases of the Air Ministry communique of last autumn and winter record a tale of sustained effort to keep the German ships shut up in harbour if it were not possible to sink them.

The attacks were made mostly, but not always, by night. After an attack by a hundred and one aircraft on the night of 17th/18th December, 1941, for example, a strong force of heavy bombers, Stirlings, Halifaxes and Manchesters, went to Brest "in brilliant winter sunlight." They were accompanied by a fighter escort which had many encounters with Me. 109s. The Stirlings attacked first, followed by the Halifaxes with the Manchesters close behind. The attack was timed to begin at half-past twelve and to last no more than half an hour. The leader of the Stirlings saw Brest afar off, "looking very peaceful in the strong light. But when we were about four miles away, the whole sky was suddenly filled with shell bursts. We flew straight in . . . I have never seen such formation flying under fire. They were an unbroken line." One of them was "MacRobert's Reply" named after two sons of Lady MacRobert who have been killed in action with the Royal Air Force. She contributed £25,000 towards its cost. It was attacked five times and shot down one of its attackers as it arrived over the target.

The formation flying of the Halifaxes was so good that they beat off all attacks by enemy fighters, though one of them had to land in the sea on the way home. A shell had knocked out an engine which caused the Halifax to lose speed and therefore formation. Fighters destroyed two more of its engines and it could not remain airborne. Its navigator, Sergeant Corke, navigated the dinghy with the aid of a tiny compass for five hours, and succeeded in keeping it on the track on which the Halifax had been flying when it came down in the sea. The Air-Sea Rescue craft thus found the dinghy without great difficulty.

Photographs shewed that no bombs fell in the town of Brest or in the commercial port. Two landed between the "Gneisenau" and "Scharnhorst" and the sides of the dry docks in which they lay. Other bombs damaged the gates of the docks themselves.

### *Running fight in the channel*

Brest was attacked thirty-four times by Bomber Command between 1st August, 1941, and 12th February, 1942. On that day news arrived at Bomber Command Headquarters, soon after 11 a.m., that the "Scharnhorst," the "Gneisenau" and the "Prinz Eugen," accompanied by a strong escort of destroyers, R and E boats, fighter and bomber aircraft, were moving up the Channel. The German naval force were obviously making for their home ports. Bomber Command at once took the necessary steps to join with the Royal Navy and with Fighter and Coastal Commands in an attempt to sink or cripple the enemy. Its task was difficult, and in the event was only in part fulfilled.

The Germans had chosen their moment with care and had been well served by their meteorological services; for the weather, from the point of view of a bomber force whose target was swiftly moving ships, was vile. For almost all the time during which they were within range, cloud varying from eight to ten-tenths lay over the Channel and the entrance to the North Sea.

These weather conditions created two problems, one very difficult, the other almost impossible to solve. First, the German ships had to be found. The visibility was never more than 2,000 yards, often half that distance, and for much of the time was to all intents and purposes nil. Even in the most favourable circumstances, therefore, the bomb aimer of an aircraft flying at 200 miles an hour had at most 20 seconds in which to find the ships and drop his bombs. But this was not all. The clouds were not only thick and wide-spread; they hung low, in places 2,000 feet above the surface in

others only 700. Armour-piercing bombs dropped from either of those heights have not enough velocity to pierce the hulls of warships. They could not be used. Even if the ships were hit, therefore, there was no chance that they would be sunk. At best enough damage might be done to cause them to reduce speed.

Despite these known handicaps a large force of bombers set out to the attack. Some of them had returned only a few hours before from a night attack on Mannheim. A high proportion reached the area through which the ships were steaming, but very few saw them. A number succeeded in dropping mines on the forecast track of the ships. The attacks were kept up from a little before 3.0 in the afternoon to a quarter-past six in the evening, by which time it was almost dark. Icing, at times very severe, rain and hail were met with by most of the crews.

"We had orders to bomb from 10,000 feet if we could find a gap in the clouds," said the pilot of a Blenheim, "but we could find no gap and came down to 800 feet where the cloud was ragged. There we zig-zagged for some time over the presumed track of the ships and presently saw a destroyer for a fleeting moment." The Blenheim was attacked by an Me. 109 and sought refuge in the clouds, coming out again to see three more destroyers and three more Me. 109s. Back into cloud again it went and ice immediately began to form on the port engine, which stopped. The pilot dived steeply to 400 feet, came out into clear air, and saw either the "Scharnhorst" or the "Gneisenau" immediately beneath him. He was received with heavy fire, but his port engine started again and he got away. "One thing I am sure of," he said on his return, "No dive bomber could have done anything in those weather conditions," a view certainly shared by all who took part in the operation.

We lost in all fifteen bombers, some very probably owing to collision in the thick murk. That number would probably have been greater if the skies had been clear, for then the German fighters would have been able to make more interceptions. The German ships did not pass through unscathed, however. "In addition to the damage sustained . . . by torpedo and bombing attacks on February 12th," runs the joint Admiralty and Air Ministry communique of May 3rd, "it is probable that further damage was caused by mines laid by our aircraft." There, for the present, the matter must rest.

Attacks on Brest were by no means the only contribution made by Bomber Command to the Battle of the Atlantic. Other French ports in the hands of the enemy, and some in Belgium, Holland and

Norway sustained its assaults. In this period Le Havre and Boulogne were attacked 18 times, Dunkirk 15, Cherbourg 12, St. Nazaire 4, Calais and Lorient twice and Bordeaux once, while of the Belgian and Dutch ports Ostende was attacked 13 times, Antwerp twice and Rotterdam 5 times. Some of these ports, notably St. Nazaire and Lorient, are submarine bases; others are the haunt of E and R boats and of armed raiders, or places at which coastwise convoys call.

### *Pinning down the German Navy*

The heaviest attacks, however, were directed at naval bases in Germany itself. Emden, Hamburg, Kiel, Bremen and Wilhelmshaven were bombed twenty, twelve, ten and the two last seven times respectively. The importance of these bases needs no emphasis. It is there that the surface ships, U boats and aircraft engaged in the Battle of the Atlantic are built and repaired. They are all heavily defended. Of the many adventures which befell the crews who attacked them during last winter here are two.

On the night of 10th/11th January 1942, a Wellington was hit over Wilhelmshaven and a flare it carried was set alight. This in turn ignited the wooden catwalk that runs down the length of the fuselage and the fabric covering its geodetic framework. The fumes thus generated were such that the wireless operator was unable to get close enough to the seat of the fire to put it out. Dense quantities of smoke blotted out the control board. The Wellington, caught in the beams of thirty-five searchlights—they were counted by the rear gunner of another aircraft close by—began rapidly to lose height. Its captain gave the order to abandon aircraft. "Through the cloud of smoke somebody grabbed my hand. I heard the crew leaving. I thought it would soon be time for me to go too. I got up to see that everybody was out. The smoke seemed a little better. In the fuselage I saw my second pilot at work on the fire. He was wearing his portable oxygen set, for he could not breathe properly in the fumes." The second pilot eventually put out the fire with an extinguisher and his gloved hands. The pilot went back to his seat and got the Wellington under control again. He and his one companion brought it back in safety.

### *The window that would not shut*

On 21st January a Hampden, one of several, bombed Emden. The trip was uneventful save for the cold. The heating system failed soon after the take-off but the pilot did not turn back. Here

is what happened to the rear gunner. He had brought with him a few extra incendiaries intending to open the window of the "scuttle" and drop them. The scuttle is made of perspex and is curved. In order to open it a catch must be pulled and the window pushed up.

"Well, I got it open all right," said the rear gunner. "That brought a blast of air at 65 degrees of frost in at me. Then I had to fuse my incendiaries. It's rather a niggling little job—pulling out a pin and getting your fingers into a little wire loop. My big outside gloves had to come off, of course. But I pulled the thin ones off too, to try and get the job done quickly.

"This was a mistake. The moment my fingers touched the metal they went dead and powerless. It's a nasty sensation. I couldn't even begin to fuse those bombs. Then I realised I couldn't possibly work my guns either. I guessed the wireless operator was in the same boat—and he was, too. So I knew that if a night fighter came for us we were helpless.

"There was nothing to be done about it, though. So I tried to get my gloves on again, but I found I couldn't. I must say I thought that meant that my hands would be gone. Then I realised that the perspex was still open: that was why I was freezing up so quickly. I began to fumble with the catch to get it shut.

"For a long time I couldn't get any kind of grip on it. Then I knelt on my guns to get more purchase. The movement must have stirred me up enough to realise that if I didn't get the perspex shut I was done for: no one could stand it open for hours. I got one of my bent fingers round the catch and it came out. Now the curved perspex should push down shut. I heaved at it. It stuck. I heaved again. It was frozen fast. But the exertion was waking me up. I went on fighting it.

"You know how maddening it is when some gadget won't work. My life may have depended on my making this one work. I just went on heaving: then I tried to jerk it. Nothing happened. I couldn't think of anything else to do. I just went on at it. Then suddenly it shut."

Considerable damage in the German Naval Bases has been inflicted. Two examples must suffice. By the end of March 1942, Kiel had suffered appreciably. Two long sheds, probably the Torpedo and Gun Stores in the Deutsche Werke where submarines are built, had been destroyed. The jetty to the Northern Floating Dock had been broken, and was unusable for some time. A great deal of repair work has been observed in the Germania Works where the mould loft, one of the most inflammable parts of a shipyard, was heavily damaged, as also were buildings near the Naval



over the Hampden because it can lay a larger number of mines in one operation. Mine-laying on a large scale is being carried out simultaneously at vital points from as far south as Bordeaux, along the coasts of France, Belgium, Holland and Germany, right round to Danzig in the Baltic. From 1st January 1942, up to the end of May, as many mines were laid by Bomber Command as had been laid from April 1940 to December 31st, 1941. The sowing of much frequented enemy waters with sea mines dropped from aircraft is one of the quietest and also one of the most effective of the operations of Bomber Command. Here is the account of an eye-witness.

“You set off in the dusk, climb through a murky sky over the flat East coast of England. You climb through cloud; on the top is a brighter, clearer evening. You fly straight on your course by compass, with the navigator getting ‘fixes’ from the wireless operator to check his position every now and then. Night falls when you are half-way across the sea. Nothing happens until the rear gunner speaks into your ears on the inter-com, pointing out a splotch of light on the starboard beam. This is a searchlight shining up from below the cloud layer. You are nearing the enemy coast. That is either one of his flak ships, or a searchlight position on an island, or on the coast itself.

“Soon you begin to see more lights and then a barrage in the distance. The old hands who know their way about these parts can soon say exactly where they are from the shape of a familiar barrage, without any need for their scientific means of plotting their position. However, nothing is left to chance. You carefully check your position, going down to get, if possible, a sight of the actual enemy coastline. Now, usually, is the only point of danger in the whole business. You may be shot up as you come down through cloud or, if the cloud goes down to sea or ground level, an inexperienced pilot may fail to pull out his aircraft in time. She may stall, heavily laden as she is, and flop on her tail into the sea.

“When you have fixed your position exactly, which is the most difficult and most important part of the operation, you hear the pilot say ‘Bomb doors open.’ ‘Bomb doors open,’ repeats the bomb-aimer. ‘Over target now,’ you hear the navigator’s voice saying. ‘Mines gone,’ says the bomb-aimer. ‘Bomb doors closed,’ from the pilot. ‘Bomb doors closed,’ from the bomb-aimer.

“Up through cloud you go again, the searchlights groping for you. You may circle over an island or a flak ship, and a barrage prods its red fingers at you. But you will have to be very unlucky if anything comes uncomfortably near. ‘Set course for home,’ says

the navigator. ‘On course,’ says the pilot. The job is done, and there is nothing more except to seek for your base across the sea.”

Considerable damage has undoubtedly been inflicted by this form of warfare. Its exact assessment must always be a matter of considerable difficulty. It is useless to photograph the target area for it is covered by the moving waters of the sea. That very many ships have gone to the bottom and that of late their number has increased, there is little doubt. The sources from which information about their fate is obtained are secret and must remain so. It must suffice to say that the growing volume of results thoroughly justifies the considerable expenditure of effort entailed. Moreover, in addition to losing ships and their cargo and the crews who manned them, a great strain has been placed on the German mine-sweeping organisation. The Germans have almost certainly been compelled to expand this at a time when they are short of ships suitable as sweepers and short of trained men.

## 6. MASCHINEN FABRIK AUGSBURG

BOMBER COMMAND is still taking a share in the Battle of the Atlantic, and will continue to do so as long as the battle lasts. It has bombed units of the German Navy at Brest, it has pursued them to Kiel and Wilhelmshaven; and when one of them, the “Prinz Eugen,” joined the “Tirpitz” at Trondhjem, both were attacked two nights running on 28th and 29th April last, the attacks being pressed home with great determination in spite of bad weather and heavy defences. It has not confined its activities only to ships and their bases but has used the long range of its striking power to go far into Germany and deliver a blow at the production of submarines.

The Maschinen Fabrik Augsburg Nurnberg Gesellschaft—the M.A.N. factory, as it is called—manufactures many of the diesel engines which drive the U-boats on the surface. It is situated on the outskirts of Augsburg in Southern Bavaria. In the late afternoon of 17th April, 1942, a force of twelve Lancasters, flying in two formations of six, set out to attack it.

Very careful preparations had been made for this operation, which involved flying hundreds of miles in daylight over hostile territory. The factory covers a large area and the crews of the Lancasters were directed to drop their bombs on the main engine shops where they would do most damage. They were shown a pencil sketch of the

factory from which they had no difficulty in recognising their objective. They did so, in fact, when still some three miles away from it. Moreover, the situation of the factory in a fork made by the River Wertach and an *Autobahn* made it easy to identify. The Lancasters flew very low. Accurate map reading, notably by Flight Lieutenant Maclure and Pilot Officer Sands in the first flight, and Flying Officer Hepburn in the second, brought them to their destination.

The first flight, led by Squadron Leader Nettleton, ran into German fighters when well into France. In the battle which ensued, fought only fifty feet above the surface of the earth, four of the Lancasters were shot down. "I saw two or three fighters," said Squadron Leader Nettleton, "about 1,000 feet above us. The next thing I knew, there were German fighters all round us. The first casualty I saw was Sergeant Rhodes' aircraft. Smoke poured from his cockpit and his port wing caught fire. He came straight for me out of control and I thought we were going to collide. We missed by a matter of feet and he crashed beneath me. Two others went down almost at once and I saw a fourth on fire. At the time I was too much occupied to feel very much. I remember a bullet chipped a piece of perspex which hit my second pilot in the back of the neck. I could hear him say 'What the hell.' I laughed at that."

The combat lasted about a quarter of an hour. When it was over Squadron Leader Nettleton, undeterred by the loss of all but one of his companions, flew on towards Augsburg. Over France he noticed people working in the fields and cows and sheep grazing, and a fat woman wearing a blue blouse and a white skirt, and horses bolting at the roar of his engines, with the ploughs to which they were attached bumping behind them. But once in Germany nothing was to be seen. The fields appeared untenanted by man or beast, and there was no traffic on the roads. But "when we got near the target they started to shoot at us, but the heavy flak soon stopped—I think because the gunners could not depress their guns low enough to hit us. The light flak, however, was terrific. We could see the target so well that we went straight in and dropped all our bombs in one salvo." Flying Officer Garwell did likewise: but his Lancaster was hit and caught fire. He landed two miles from Augsburg.

The second formation of six, led by Squadron Leader Sherwood, encountered no fighters. All they saw was a single German Army Co-operation aircraft, which approached them and then made off quickly. Just inside Germany Flight Lieutenant Deverill noticed a man in the uniform of the S.S. Nazi Guards who took in the situation at a glance and ran to a nearby post office where there

was a telephone. A little further on the Lancasters passed over a squad of German soldiers doing P.T. Their physical exercises were enlivened by a burst of fire from one of the rear gunners, and "the speed with which they took cover did great credit to their instructor." Crossing a lake near the objective, the bombers passed over a small steamer and a German on deck discharged his *Mauser* at them without noticeable effect.

*No life was lost in vain*

They reached the target at a few minutes past eight and at once saw the two aircraft, which were all that remained of the first flight, dropping their bombs. They flew straight in through heavy fire. Contributing to it was a solitary German on the top of the main building of the factory, blazing away with a machine gun. He was shot off the roof by one of our rear gunners. When still three miles away the Lancaster piloted by Warrant Officer Mycock was hit and set on fire in the port wing. Warrant Officer Mycock was still far enough away to have turned and made a forced landing; but he carried on, dropped his bombs accurately on the target, and then, the flames having spread so as to envelop the whole aircraft, crashed to earth. The leading Lancaster, piloted by Squadron Leader Sherwood, dropped its bombs before it, too, was set on fire. It was last seen a pillar of flame on the ground ten miles from Augsburg. Another flew so low that it passed between two chimneys of the factory.

The Lancaster piloted by Flight Lieutenant Deverill, which had been hit in the starboard wing when approaching the target, was hit again over it and a fire started in the pipes leading to the aft and mid turrets. It was extinguished by the wireless operator as the bombs were dropped in a short stick. On turning away, the port outer engine stopped but was successfully started again on the way home. Squadron Leader Hallows' aircraft was hit near the port petrol tank when above the Assembly Shop, but his bombs reached the target.

Altogether seven out of the twelve Lancasters did not return. But they accomplished their mission. Photographs show that the main Diesel Engine shops were severely damaged by a number of direct hits and by the subsequent fire and that at least three other buildings next door to them were demolished and four more damaged. Production appears to have been seriously affected for some time. In the words of the Prime Minister: "No life was lost in vain."

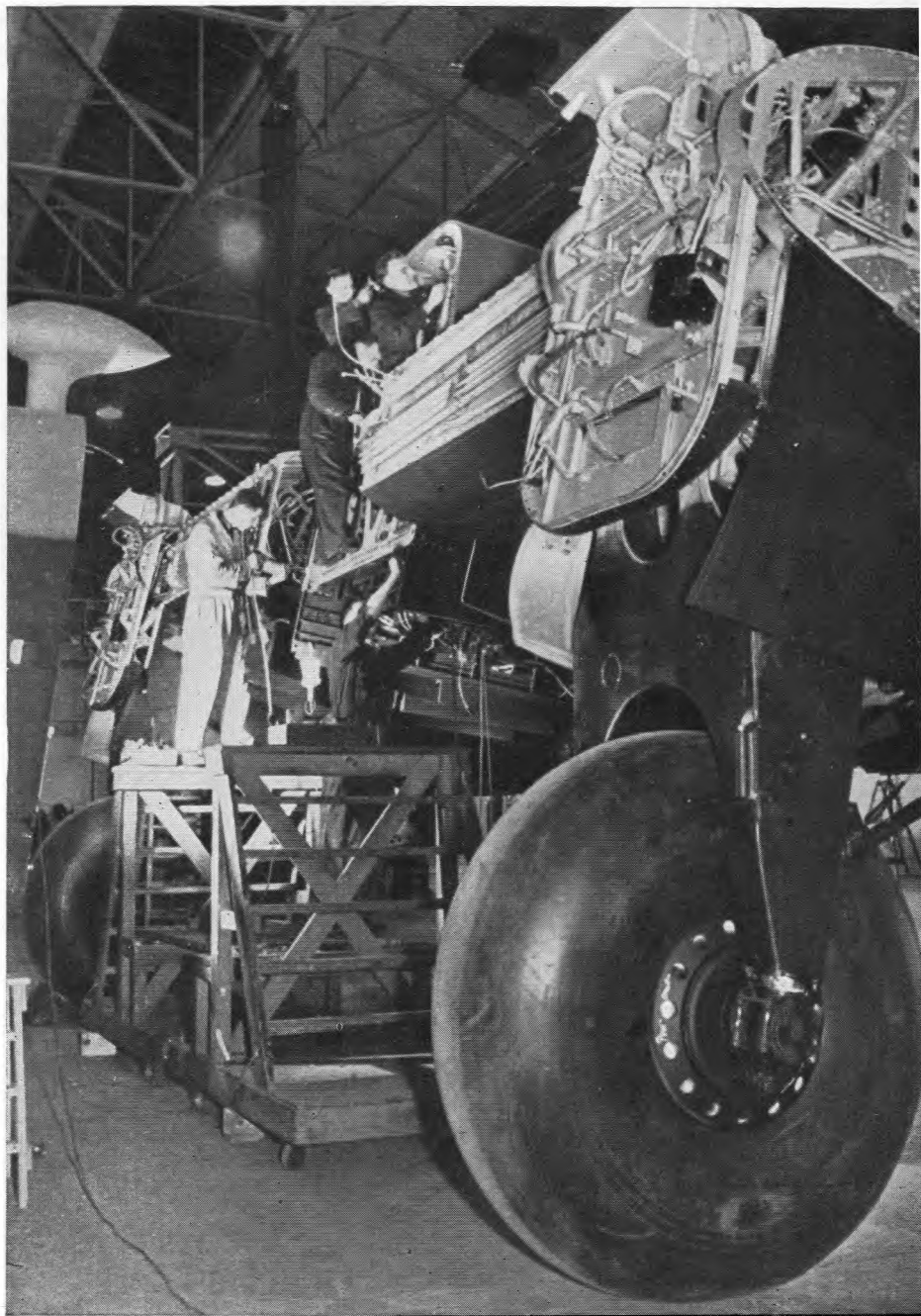
Among other awards the leader of the first formation, Squadron Leader Nettleton, was given the Victoria Cross, Squadron Leader Penman, D.F.C., and Squadron Leader Sherwood the Distinguished Service Order, Flying Officer Garwell and Warrant Officer Kirke of the Royal New Zealand Air Force the Distinguished Flying Cross, and Sergeants Dando and Watson the Distinguished Flying Medal.

## 7. HELP TO RUSSIA

THE KEYNOTE of our bombing policy has been the provision of all possible help to our Russian Allies in the common task of defeating the Germans and bringing about their complete and total discomfiture.

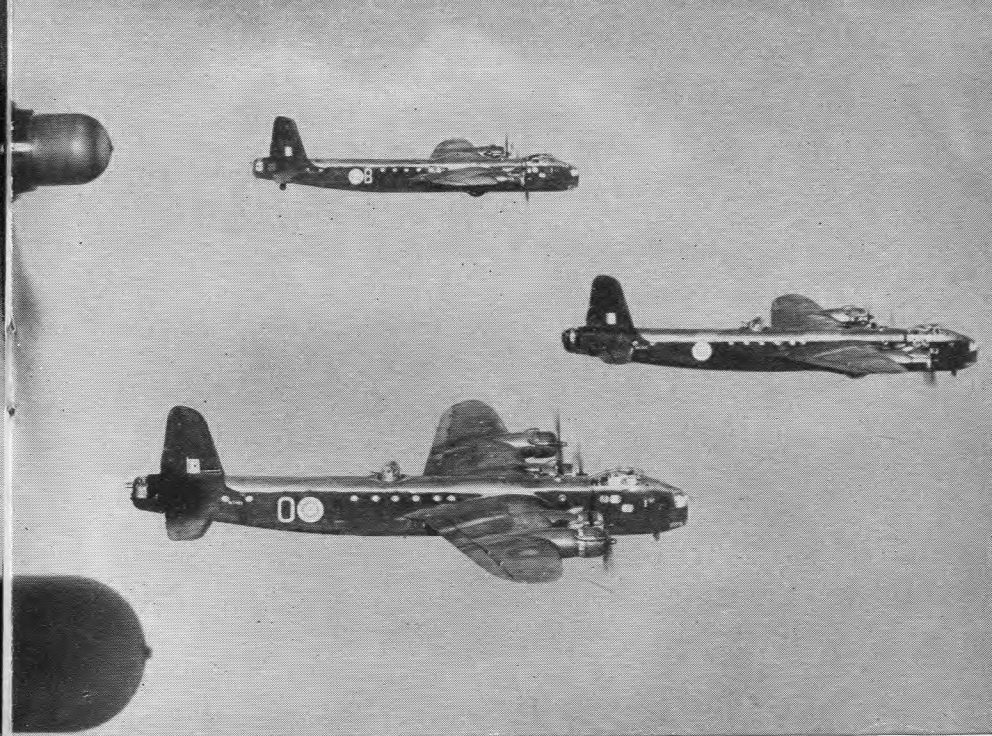
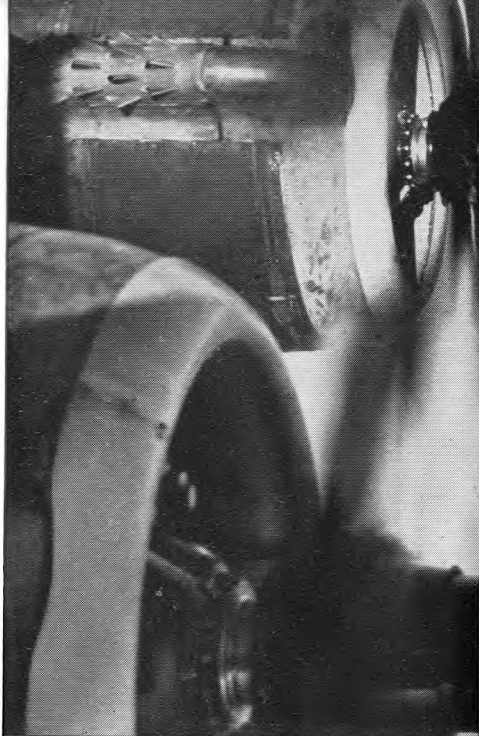
The phases through which operations conducted to that end have passed or are still passing must now be considered in greater detail. The first phase began at the end of June 1941 and lasted until about the middle of February 1942. During it our night bomber force was given as its objectives certain important centres of communication in Germany, with the primary object of dislocating the German transport system which found itself subjected to a constantly increasing strain as the campaign against Russia developed. The second object of this attack was to destroy war factories and stocks of war materials. Each success in this field of endeavour would lower the vitality of the German war effort.

A successful start was made by the attacks on Aachen, Munster and Cologne in the first half of July 1941, when considerable damage was done to railway and other communications. These were followed by a raid on Mannheim on the night of 21st/22nd July, which came as a complete surprise to its inhabitants. Many fires were caused in the Rhine harbour area and in nearby Ludwigshaven. The important electrical works of Brown Boveri were also hit and damaged. The attacks continued in the first week of August with damage to factories, notably the big I.G. Farben Chemical Works near Cologne, and to the railway. By the middle of the month, railway workshops in Cologne had suffered greatly. At Karlsruhe, attacked on 6th/7th August, the power station was put out of action for a week and the main railway station severely damaged.

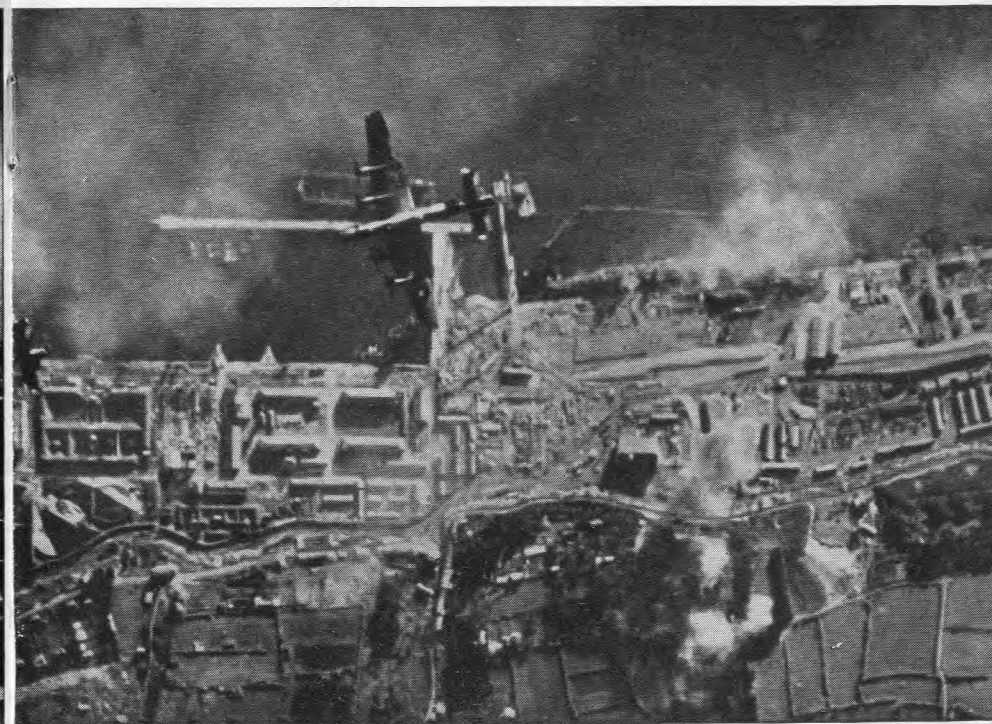
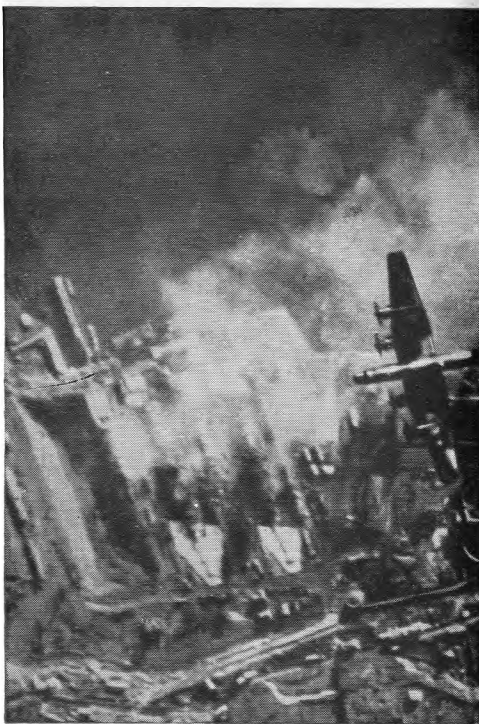


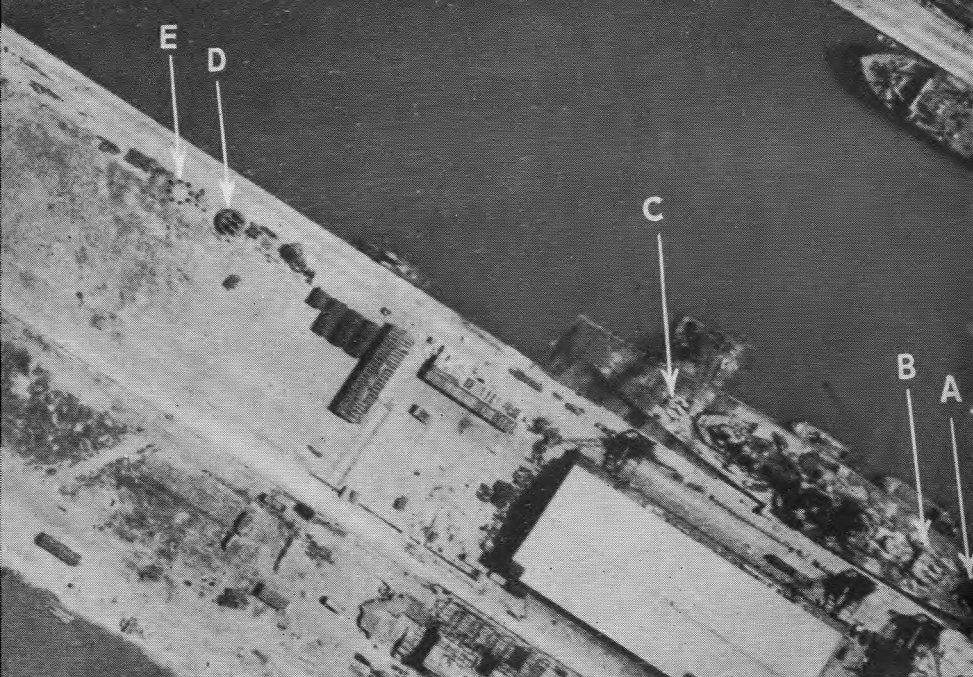
**The Giant Takes Shape.** A Halifax nears the end of the assembly line; the bulkheads are being prepared to receive the engines. Note the intricate detail of the mechanism and that the wheel is as tall as a man.

**The Giant Takes Wings.** Stirling bombers are swinging from test flight into action in rapidly growing numbers. They contain more than 60,000 separate parts and weigh over thirty tons.

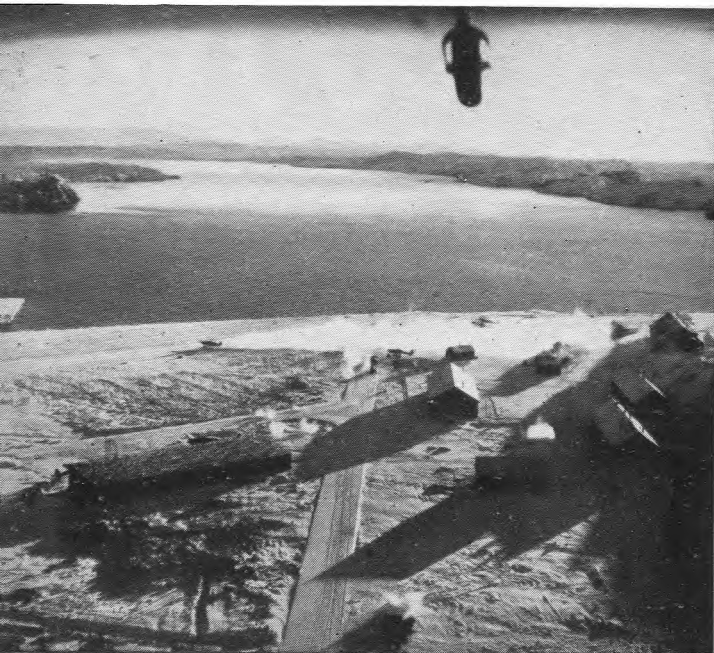


**The Attack on the Sea-Bases.** Halifax bombers over Brest by day. "Scharnhorst" and "Gneisenau," obscured by smoke screens, are in dry dock on the left. "Prince Eugen" is in the basin to the right, behind the second bomber.



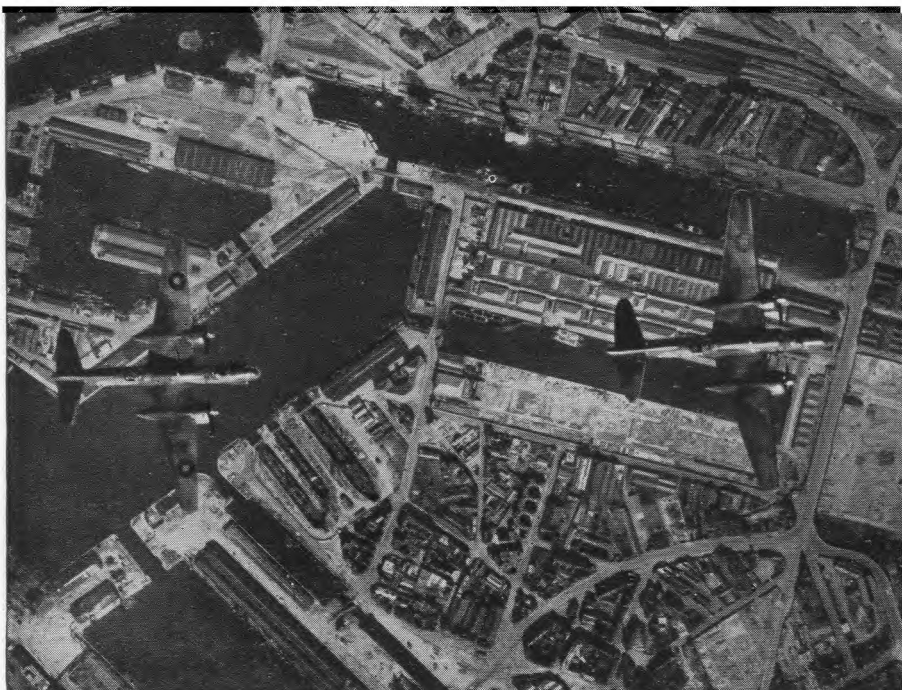


**"Gneisenau" at Gdynia.** The damaged German cruiser takes refuge in the Eastern Baltic. The turret at A has been removed from the ship to D, the ball bearings on which it revolves to E. Turrets at B and C are minus guns and armour.

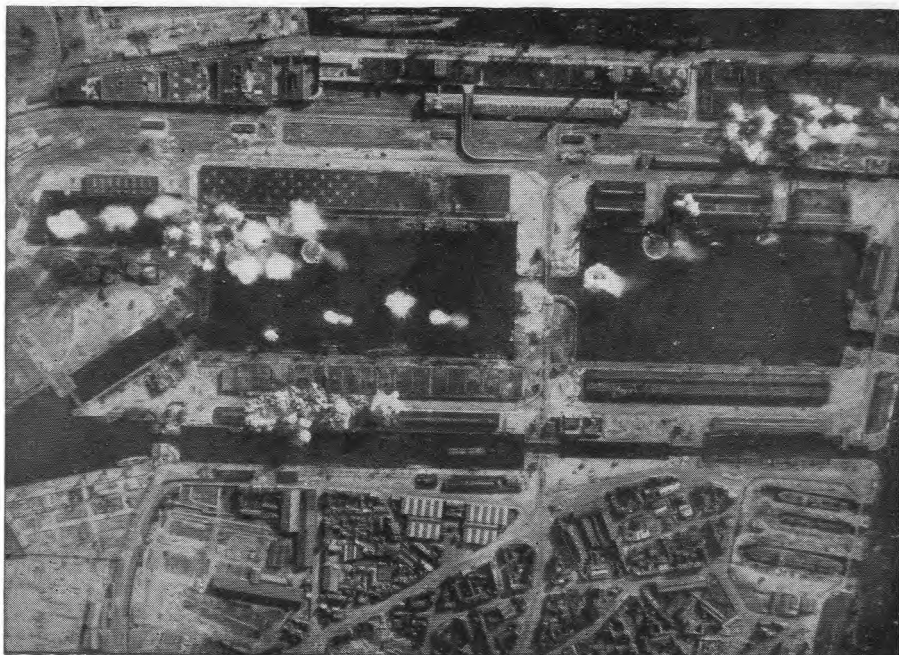


**Raid on the Luftwaffe.** The attack on Herdla aerodrome, to ground enemy fighters during the combined operation against Vaagso. An Me. 109, on the move down the runway, fell into a crater which appeared suddenly just in front of it.





**Bostons over Le Havre.** *Above*—A first stick straddles the bridge between the Bassin Vauban and the Bassin de la Barre. *Below*—The attack at its height, bombs burst in clusters among the quayside buildings, on the railway and across the basins.

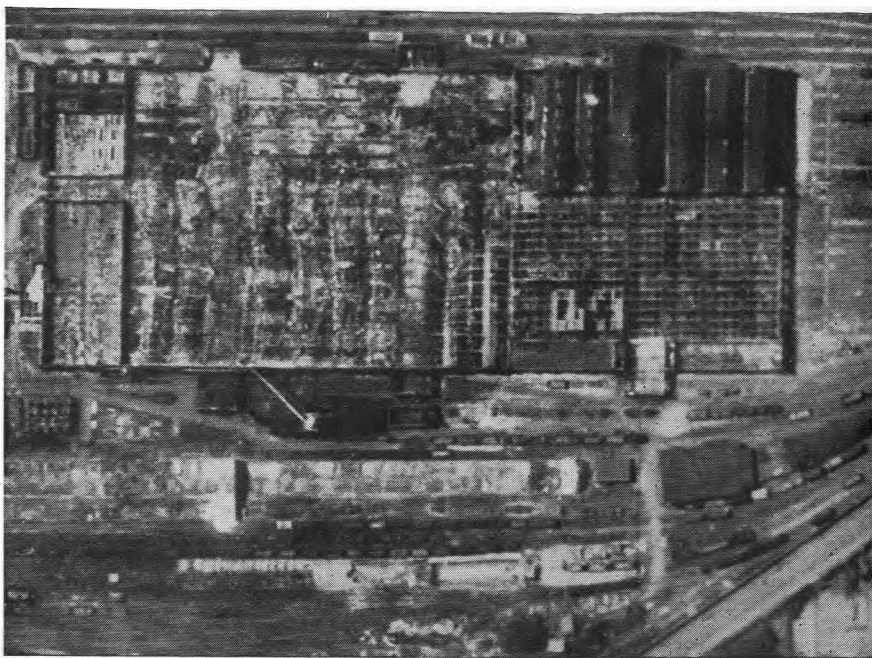
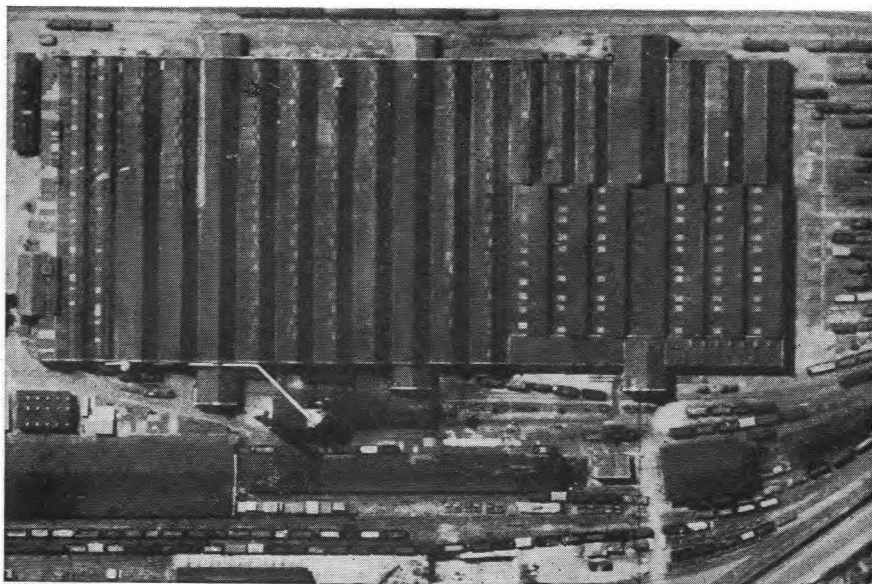




**Lubeck, Port for Russia.** Fire and bombs destroyed accumulated supplies intended for the Russian front. In the town the ringed sections show hundreds of honey-combed, roofless buildings.

**The Offensive Grows.** In March 1942, in bright moonlight, 457 tons of bombs rained down on the Renault works, busy on tanks and transport for the Nazis. The great workshops were torn open, finished lorries scattered like chaff.





**The Hammer strikes Cologne.** A pinpoint in the devastation from the 1,000-bomber raid. The Köln-Nippes railway workshops before and after; destruction is almost complete.

One attack on Knapsack and Quadrath, carried out in daylight on 12th August, must be specially mentioned. It was directed against the power stations and factories in those towns, which are near Cologne, by 54 Blenheims. The Blenheims were escorted on their way out by Whirlwinds of Fighter Command, and flew low over a choppy sea until they saw the sand dunes of Holland. There the fighters left them and they went on alone, in formation, for 150 miles to reach their targets. The leading aircraft bombed from a very low level, and, when those in the rear arrived, they found the industrial area well alight and could see thick smoke and steam gushing from the perforated boiler houses. By that time the anti-aircraft defences were awake and active. One Blenheim was hit ten times in the port wing alone before reaching the target. "We could see the twelve chimneys—a row of four and a parallel row of eight—standing dark against the sky," said its pilot, "The sun was on our port bow. We climbed to attack because the smoke and flames, some of which were licking to about 50 feet high, were already too thick for us to go through and bomb accurately. I could see my observer's elbow as he pulled back the release lever, and as he called 'Bombs gone' I did a steep turn over a belt of trees down into a sandstone quarry to escape the flak."

Coming out of the quarry the Blenheim, with others, ran into fighters. "It must have been then that the rear gunner was hit, because we heard no more from him. I went into nine boost for more evasive action and a bullet came in behind my head and broke the perspex, while another smacked the armour plating at my back and gave me a slight jerk." In seeking to avoid the fighters the pilot of the Blenheim chipped an airscrew against a telegraph post and hit a tree with the tip of his port wing. Nevertheless the Blenheim continued to fly.

"I gave the observer a shell bandage and he managed to creep through the hole to the rear gunner. I could see his legs waving about as he bound him up. We came back through a gap between two storms and made straight for base. Our undercarriage had been put out of commission and so the observer had to crawl back once again to hold down the rear gunner while we made a successful belly landing."

Prior to the attack on Knapsack, a Fortress had bombed Kiel docks in daylight from the stratosphere on 2nd August. On 31st of that month another Fortress bombed Bremen in a similar manner and the attack was repeated on 2nd September. The effect on German morale was reported to be serious, as the first intimation of our presence was usually the arrival of the bombs.

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Fortresses were subsequently used to attack shipping in Rotterdam on 4th September and in Oslo on 6th September and again on the 8th, when two fell victims to fighters. But the weight and scale of their attack could not be made heavy enough to justify the possible loss of a number of highly trained crews, and these daylight attacks from the substratosphere were discontinued.

### *Bombs on Berlin*

Night attacks from September to the end of January were made against a variety of targets in North-Western Germany and the Ruhr and as far as Stettin on the Baltic. They differed considerably in weight and success, those on Cologne and Essen on 10th/11th October, on Emden on 20th/21st, on Bremen on the next night, on Mannheim and Cologne on 7th/8th November, on Dusseldorf on 27th/28th, on Emden and Hamburg on 30th November/1st December and on Wilhelmshaven on 28th/29th being, on the whole, satisfactory. The raid on Nuremberg on 14th/15th October was less effective owing to bad weather. On that raid a Wellington flew 600 miles back to base on its port engine—a remarkable feat, creditable to pilot, crew and the engineers who made the engine. Berlin itself was attacked five times before the end of 1941, the two heaviest assaults being those on 7th/8th September, and on 7th/8th November.

To bomb Berlin means flying some 1,200 miles there and back, mostly over hostile territory. The enemy has not unnaturally concentrated very powerful defences round his capital and here, as elsewhere, makes extensive use of dummy fires. These may deceive a crew lacking in operational experience, but the practised observer can usually distinguish between the genuine and the *ersatz*. The German use of searchlight belts is well known. Nowhere are searchlights more concentrated than they are at Berlin and the flak is always very heavy. "We carried on until we got to Berlin, where we saw other bombers being engaged by searchlights and guns. The guns were shooting up into the main cones of searchlights," runs the report of the captain of a Stirling. "There seemed to be about fifty searchlights in one bunch alone," says the navigator of a Halifax. "Shells burst close, some of them sending out clouds of smoke which, in the night sky, looked almost like barrage balloons."

Berlin is not an easy place to attack. Nevertheless, the damage in those five raids was not negligible. In the attack on 7th/8th September, for example, 50 out of 65 postal wagons were destroyed in the Potsdamer Railway Station, which was itself severely damaged.

The railway lines leading to the Anhalter and Friedrichstrasse stations were hit in many places, and traffic was dislocated or brought to a standstill for some time. Warehouses were burnt to the ground near the Ost Kreuz station. A 4,000-lb. bomb completely demolished five large buildings in the Pariser Platz at one end of the Unter den Linden and killed more than a hundred persons. Some two hundred more are reported to have been scalded to death by the hot water system which burst and flooded the basement in which they were sheltering. - On 7th/8th November the Spandau Power Station was hit and damage was caused to a considerable area of Moabit, one of the working-class quarters of Berlin.

Losses that night were considerable—37 out of just over 400. Among them was a Wellington, but the crew reached England sixty hours after the aircraft was hit. Their high explosives had fallen, but the target was obscured by cloud before the incendiaries could be dropped. On the way home the pilot was looking for a suitable target for them when the Wellington was hit by A.A. fire. The incendiaries began to burn, and soon the bomber was ablaze along the whole length of the bomb racks. The bomb release gear had been smashed and the incendiaries could not, therefore, be released. They burned strongly and set light to the fuselage; the fire resisted all attempts made by the crew to put it out, first with the extinguishers and then with coffee from their thermos flasks.

The wireless operator took ten minutes to fight his way through the smoke and flames to reach the rear of the Wellington, whence he could let out his trailing aerial. This would give him a greater range and increase the chances of maintaining contact with base. The pilot remained at the controls but could speak to none of the crew, for the inter-com was broken. The blazing bomber flew on. Eventually the fire in the fuselage was subdued, but the incendiaries still burned. All this time flak was bursting round the aircraft, and the pilot decided to close the bomb doors in order to show as little light as possible to the German gunners. With fire in its belly the Wellington made out to sea, away from the coasts of the enemy, but it was now down to 1,000 feet. Twenty-five minutes later the petrol gave out and it landed on the water. The crew got safely into the dingy in which they remained 57 hours till they reached shore, near Ventnor in the Isle of Wight.

Throughout these months and well on into 1942 Bomber Command was faced by a series of heavy assaults from its ever-lurking foe, bad weather. That autumn and winter, it was the worst recorded for fifteen years. By the uninstructed, or by those possessed of but

a little learning, bad weather is often regarded as an excuse for failure or lack of action, The more thoughtful and better instructed however realise the very terrible obstacle it may prove to a heavily laden bomber moving through the dark spaces of the night to seek out its target and release its load. To such persons the observations which follow may appear superfluous.

*The ever-lurking foe: bad weather*

There are five aspects of the weather to be considered every night a force of bombers sets out to the attack—the weather at the time of the take-off, on the way to the objective, over the target, on the way back from it and over base at the time of landing. The longer the flight and the farther the target is from home, the more difficult it is to make a correct prediction and the more unlikely it is that the weather will be favourable throughout all these five periods of time and at all five places.

For a long flight to Berlin and back, for example, it must be possible to predict with reasonable certainty the weather over the whole Continent of Europe throughout a whole night. On the other hand, it is unlikely that there will be a great variation or that any surprise features may develop when the trip is a short one, such as to the Channel ports or to Rotterdam. There is, however, always the chance that there may be fog or low cloud over the aerodrome at the time of landing. That is, perhaps, the worst hazard.

Next to this and almost as important is the risk of icing. To fly through dense and cold cloud may and often does cause ice to form on the propellers and wings of an aircraft. When this happens it becomes heavy, loses height and may become uncontrollable. A Wellington iced-up over Munster on 28th January 1942, for instance, fell from 19,500 feet to 2,500 before control was regained. When this happens over a well defended area, the consequences are likely to prove disastrous.

Moreover, good bombing weather is not necessarily good flying weather and *vice versa*. While the man on the ground is enjoying an Indian summer, the man who must traverse the air is often praying for a stout gale to blow the morning fog away. Conditions which produce haze on the ground so that the target is hidden may occur on a night when there is perfect flying weather higher up in the sky. There are a great many factors which the Met. Officers of Bomber Command have to take into account. It is only when all or most of these are unfavourable—when, that is, there is everything to lose and nothing to gain, that an attack is cancelled.



On thirty-nine nights between 30th July and 31st December, 1941, our bombers operated in weather variously described as "bad," "extremely bad," "very poor visibility," "thick cloud," "icing and ten-tenths cloud."

## 8. BOMBING BY DAY

WHILE PURSUING these activities at night during this period, Bomber Command was also active by day. The attacks made by the Blenheims on shipping have already been described. There were also those made by them on fringe targets such as the docks at Rotterdam and Ijmuiden. These were of two kinds—with and without fighter escort. Let us first consider the attacks for which no fighter escort was available because of the distance of the targets from our shores. For these attacks to be successful the element of surprise had to be present. The Blenheims, singly or in formation, rushed in low from the sea and out again before the defences awoke. They usually opened heavy fire after a minute. The German defences, both ground and air, were not always ready, however. Had they been so, this form of attack would soon have proved too costly.

An action off Ijmuiden fought last autumn well illustrates this kind of warfare. Five Blenheims, led by Flight Lieutenant (now Wing Commander) Roe, D.F.C., searching for an enemy convoy, had approached within a mile of the Dutch port of Ijmuiden when they were spotted by an Me. 110. The enemy did not attack; but a few minutes later, when the British aircraft had turned for home, four Me. 110s were seen to be pursuing them, and battle was soon joined. The Blenheims were somewhat scattered. Three of them were in Vic formation but the other two were lagging behind. They were shot down by the Me. 110s, which then proceeded to attack the formation of three, two coming up in echelon to port and two to starboard. Pilot Officer Davies, Wing Commander Roe's rear gunner, directed the fight. If a Blenheim is attacked by a faster aircraft, such as the Me. 110, the obvious avoiding action is for it to turn towards its attacker. To do so forces the fighter to carry out a beam attack: at the speed at which modern aircraft fly, this brings the Blenheim into its sights for a very short time only.

The starboard Messerschmitts accordingly advanced to the attack,

The Blenheims turned to starboard, and by so doing had to present their tails to the Me. 110s coming in from port; these prepared to attack them from an angle at which the maximum amount of damage could be inflicted. They were about to rake them from stern to bow, when P/O Davies called upon his pilot to throttle back: he did so, and thus the Me. 110s to port were made to overshoot and failed to get their guns to bear in time, while those to starboard also overshot and presented their port side as targets for the front gunners of the Blenheims. This manœuvre was repeated several times, the Blenheim formation turning, now to starboard, now to port, with the result that they escaped unscathed and shot down one of the Me. 110s when it passed within 50 yards of them.

### *Thirteen Blenheims went to Herdla*

One attack is worthy of special mention—that on the Norwegian aerodrome of Herdla, carried out by thirteen Blenheims under the leadership of Wing Commander Pollard on 27th December, 1941. Its object was to ground the German fighter forces at Herdla while a combined raid by the Royal Navy and the Army, protected by long-range fighters of Coastal Command, was carried out on Vaagso. To achieve this purpose, it was necessary for the Blenheims not merely to hit the wooden runways of the aerodrome, but to hit them at precisely the right moment. The hour of noon was chosen, and the bombs from the British aircraft fell on the objective at one minute past that hour. Flying in formation across more than 300 miles of sea at a very low level requires navigation of a high order. It was the navigator of Wing Commander Pollard's aircraft, Flight Lieutenant Brancker, since missing, who took the Blenheims to their destination.

“The first thing we saw were the mountains of Norway some 70 miles away. It seemed an age before we reached them, but when we got close to the shore we turned to port and flew about ten miles northward some three miles from the coast line. We were looking for a little bay, the narrow opening into a fjord, and our landmarks were lighthouses. For some little time I was confused, for the landscape looked very different from what I had imagined it to be from a study of the maps and photographs shown to us before the attack. Presently, however, I realised that the mountains I had seen formed the background to the coast which had been depicted on the maps and charts. My navigator was never in doubt and distinguished immediately between the fore and the background.

“There were a man, a girl and a child on the edge of the fjord,

waving to us, just as we turned in to attack the aerodrome. I remember saying to myself, 'For God's sake get under cover—the shooting is going to start'; and indeed it did so as we swept in. The German anti-aircraft defences opened up, but they had been taken by surprise and for a very important minute we were not shot at. During that minute each section of the Blenheims made for that part of the runway assigned to it beforehand. The bombs were dropped 'according to plan.' I saw them dig into the snow where they stuck a moment like darts in a board before going off.

"There were a number of Me. 109s, with their propellers turning, about to take off. They failed to do so, and one which was on the move down the runway fell into a crater which appeared just in front of it. The runways themselves were hard to find because the whole countryside was covered with snow, but we picked them out because we could see a line of barrels and flags marking them, and we could also see furrows in the snow made by taxiing aircraft. We had some casualties. In my formation the port aircraft was hit, reared up over me, nearly collided with me, then sheered off and ran into another Blenheim. The ground staff of the aircraft were all round the runways. Most of them, I think, were killed by the bombs or the continuous barrage of machine-gun fire put up by our air gunners. We certainly wrote off a great many Germans. On the way back it was wizard to see the Norwegians waving to us. I felt I wanted to stop and pick them all up and take them back to Scotland."

#### *Attacks with fighter escort*

Attacks by Blenheims accompanied by escorts were, of necessity, directed on targets within the limited range of high-speed fighters, and could be carried out only in weather suitable for such fighters.

A start was made with this form of attack on 10th January, 1941, and up to 12th July 59 assaults had been delivered. The tactics were, and are, to send out a small force of bombers very heavily escorted. Having made a rendezvous, bombers and fighters proceed to the targets; the bombs are dropped; the fighters engage any enemy fighters who show a disposition to interfere, and the whole force then returns to base.

The method of "laying on" daylight attacks by escorted bombers is as follows.

Some hours beforehand, the bombers destined for the purpose are detailed and the number, kind and fusing of the bombs decided. The time, place and height of the rendezvous with the fighters are

fixed, the route and direction of approach to the target settled. Half-an-hour before the time of briefing, the Wing Commander whose squadron has been chosen for the attack obtains all possible details about the target from the Station Intelligence Officers, who have many sources of information. If shipping in harbour is to be bombed, the size and nature of the ships is indicated. The routes to and from the target are plotted on a map.

All these details are communicated to the crews by the Wing Commander at the briefing, and the target is displayed on a screen by means of an epidiascope. Assisting him at the briefing are the Signals Officer and the Met. Officer. Wireless silence is strictly enjoined and maintained. Since these are daylight attacks, the elaborate methods of navigation used at night are not necessary; the observers navigate by map reading, pin-pointing their position from time to time. The bombers then take off, reach the rendezvous with the fighters, and fly in formation to the target.

If possible, they remain in formation throughout, taking evasive action and dropping their bombs all together. The most perilous moments are naturally those during which the run-up to the target is made. Then the bombers have to fly on a steady course for a certain number of seconds, usually very crowded, in order to bring their bomb sights to bear. It is then that the anti-aircraft fire of the enemy reaches a crescendo. "It is a very splendid sight," writes a fighter pilot, "to see the bombers fly so steadily on, though the flak seems to be bursting all round them. They see but disregard it."

The Blenheims bore the brunt of the daylight attacks through the autumn and winter of 1941, operating both with and without fighter escort, though Stirlings and Halifaxes occasionally took a hand, notably on 18th December when they bombed the "Scharnhorst," "Gneisenau" and "Prinz Eugen" at Brest. As the autumn of 1941 merged into winter the attacks fell off; the weather was bad for fighters, which need a clear sky, and clear skies were conspicuously absent.

The most successful attacks during this period were those made on the steel works at IJmuiden on 21st August, on an aerodrome near St. Omer on the 26th, and on Rotterdam on the 28th, when hits were made on a large vessel in the harbour and bombs burst among warehouses and wharves. In September a motor vessel was sunk off the Belgian coast on the 2nd; a whale oil factory ship off Cherbourg set on fire, and a chemical plant at Mazingarbe severely damaged on the 4th; the power station at the same place hit on the 17th, and another at Rouen on the next day. On the 20th a supply

ship was fired and another left sinking, while the railway junction at Hazebrouck was hit and heavy explosions caused in the power station at Gosnay. On the 27th the power station at Mazingarbe was once more hit. In October the docks at Boulogne were bombed on the 12th, and on the 13th Mazingarbe again received attention, while two days later direct hits were made on the docks and warehouses of Le Havre and a large vessel blown up.

*“What’s the matter with Jerry?”*

The attacks died down from November to February. By then the Blenheims had suffered severely. They had proved themselves to be stout aircraft. In one attack on Ostend, for example, a Blenheim was hit by three bursts of flak which broke the stern frame, holed both engine nacelles and petrol tanks, shot off the knob of the petrol cock and peppered the bombs with splinters just before they were released. Another splinter, smoking with heat, was pulled out of the pilot’s back by his observer. “I had cause to remember that day,” said the pilot, “because just before the splinter hit me I had been saying over the intercom, ‘What’s the matter with Jerry? He seems asleep.’ This remark very nearly found a place in the list of famous last words.” Despite its injuries the Blenheim returned safely.

Blenheim squadrons have now become “intruders.” For some time they have been used in the dangerous and important task of bombing the aerodromes which the enemy has stolen or constructed in the Occupied Territories. This work they share with the Hurricanes, Havocs and Bostons of Fighter Command. They go out at night over such bases as Schipol, Leeuwarden, Vcchta and many others and drop their bombs on the flare paths. The number of enemy aircraft disposed of in this way is steadily increasing.

By the middle of February 1942, when the first phase of our bombing attack merges into the second, the general policy of dislocating Germany’s war supplies at the source of their production was beginning to have effect on the situation of the war in general and on the Eastern Front in particular. By then the steel works at Essen, Duisberg and Dusseldorf had been frequently hit; so had the I.G. Farben chemical works near Cologne, the E. Merck works at Darmstadt and eleven power stations in Germany. Severe damage had been caused to three tyre factories at Hanover and the synthetic rubber factory at Huls; the boot-leather factory at Worms had been burnt out, and the output of lorries at Antwerp seriously held up. In Northern France the attacks on power stations in daylight had

been successful, power having been reduced by at least twenty per cent. in the industrial regions of Lille and Lens.

So much for examples of material damage. It had not been as great or as widespread as had originally been hoped. Our bomber force throughout the autumn and winter was hampered by most evil weather; but, though it could not operate as frequently or on as large a scale as it desired, Bomber Command was not idle. Intensive training was carried on, and through those months our bomber force was steadily expanding, with results which are now becoming apparent. By February 1942 the increase in the proportion of heavy bombers in the Command, the vigorous training and the general all-round expansion of the force made it possible to undertake a more severe attack upon Germany. Moreover, the departure of the "Scharnhorst," "Gneisenau" and "Prinz Eugen" from Brest, and their arrival in their home ports, allowed the Commander-in-Chief to devote almost the whole of Bomber Command to this end.

## 9. THE GREATER OFFENSIVE OPENS: BOSTONS OVER FRANCE

AS WITH THE first phase, the second may be divided into two kinds of operations, those carried out in daylight and those at night. The daylight attacks have been made almost entirely against targets in Northern France and Belgium. By the beginning of 1942, the German attempt to make use of industry in the Occupied Countries in order to increase their own war effort had succeeded to such an extent that production of war materials in those countries could no longer be regarded as a negligible factor. It was accordingly decided to attack factories known to be engaged in working for the Germans, with the object of dislocating or destroying production. That the industrial population of France and Belgium have been steadily exhorted to "go slow" is common knowledge. The difficulties under which they are leading their unhappy lives are well known and have always been recognised. To attack the areas in which workers living under the domination of Germany carry out their tasks is distasteful. No one realises this better than the crews of Bomber Command. That they carry it out unflinch-

ingly is proof of their high sense of duty, even when that duty may entail death or injury to citizens of friendly but enslaved powers.

### *The raid on Poissy*

The beginning of our daylight attacks has already been described. With the advent of better weather Bomber Command resumed them, usually with fighter escort, at the beginning of 1942. By then it had received a sufficient number of Bostons, a fast American medium bomber, to make use of these aircraft in these operations. They made their debut on 8th March 1942, when two formations attacked the Matford works at Poissy, near Paris. They flew there and back at a very low level, seeing in the air on the way to the target only three Ju. 88s some 2,000 feet above them, who did not notice them. Flying at that height, navigation is a problem of quick and accurate map reading.

The leading aircraft, piloted by Wing Commander Butler, D.F.C., with Flying Officer Sayers as navigator, reached the target exactly on time. The others followed. Ten direct hits were made on the factory, and the formation turned for home. Wing Commander Butler's aircraft was evidently damaged by anti-aircraft fire, for a few miles from the factory it was seen to be in difficulties, struck a tree with its port wing, stood on its tail in a vain effort to clear more trees, and then crashed. "What I remember most about this raid," said one of those who took part in it, "was a house painted blue with the words *Dubo-Dubon-Dubonnet* on it. I wanted to get out and have one." With the exception of its leader, the flight returned safely, landing at one of our Coastal aerodromes just as three Me. 109s made an attack upon it. The bomber formation saw one of them shot down by the ground defences.

During the rest of that month the Bostons operated nine times, and in April they were out seventeen times—rather more than every other day. The weather was favourable and they scored marked successes on five occasions. On the 14th they hit the power station at Caen; on the 16th they went to Le Havre. There they hit a large ship in the harbour. While they were in the act of dropping their bombs, a shell burst in the middle of the formation, shattering the front window of Boston Z2295, whose observer was at the bomb sight. For a moment he thought his right eye was gone, so he switched over to his left and bombed. He found later, to his good fortune, that it was only the eyelid which was damaged.

The Boston had to come home on its starboard engine, the port engine having been hit. The airspeed indicator was also damaged,

and it was therefore impossible for the pilot to gauge the correct landing speed. This was given to him by the pilot of an escorting Spitfire whom he called up, and who flew alongside telling him from time to time over the wireless telephone at what speed he was flying, until he had reduced it sufficiently to land. On the next day the shipyards and power station at Rouen were hit, some of the bombs falling at the base of the cooling tower. On the 26th the Bostons were over the marshalling yards at Hazebrouck and twelve bursts were observed in their centre. They were out every day for the first nine days of May on the same or similar targets. Then the weather prevented operations, which were resumed as soon as possible. On 3rd June a power-station and barracks at Cherbourg received direct hits, and on the 5th power-stations at Ostende and Le Havre, and the aerodrome at Morlaix.

*Spectator in the air*

Here is an extract from a log in which a Public Relations Officer of the R.A.F. who took part in one of these attacks has recorded the impressions of a spectator not in the front row but on the stage itself.

**“3.50 p.m.** Quite suddenly it is intensely cold. I am not wearing gloves and my left hand is numb. I am in the under-gunner’s position now, looking out over a large hole. We have climbed to 12,000 feet. The sea looks completely stiff. I can see the waves clearly but they are motionless, like a solid mass of uneven grease.

**“3.55 p.m.** French coast on the horizon. Physically this is exhilarating and I keep saying to myself ‘Well, you’re not scared . . . yet.’

**“4.0 p.m.** We cross the coast. Here comes the flak. The white flak bursts are higher and nearer and more frequent. Goldy, the observer, calls out, ‘Don’t worry, Leslie, until you can see the red inside the white.’

**“4.03 p.m.** I can see the red inside the white,\* but quite honestly I am not worried. The whole thing seems too efficient to worry. . . . But I feel for the handle of the parachute and touch the dinghy.

**“4.04 p.m.** Bomb doors open on every Boston in the formation.

**“4.05 p.m.** Bombs gone. In my excitement I put my head as far

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\* This is possibly an open question. Some maintain that really close bursts contain orange and not red inside the white.



out of the hole as I can reach and watch them going down, down, down. The first bursts are in the dock water, but then I see the direction for which the stick is heading. White mushrooms of smoke suddenly spout on the dock side. Good.

“4.06 p.m. Flak is now very intense. Black puffs as well as white. Violent evasive action. I can see Hun fighters coming in. But I have a wonderful impression of immunity, a sort of godlike feeling that nothing can touch us. I should know better than this.

“4.07 p.m. Hell. There goes a Boston. Quite slowly, but he’s going down into the sea in a controlled dive. Johnny tells me who the pilot is. I know him. He pulled my leg about the raid in the briefing room and wished me luck. Well, good luck to you now. The Spitfires are fussing about us more than ever. Some of them seem to be flying sideways and others belly first.

“4.20 p.m. No sign of England yet. I wonder how long before we’re out of the Hun fighter zone.

“4.29 p.m. England. Down a bit and it’s warmer. I never felt better. I suppose it’s the oxygen.

“4.50 p.m. We’re landing.”

### *The fighters know their job*

Every Boston carries a camera which takes pictures automatically—one every few seconds. It is switched on by the observer, and thus a complete pictorial record of the run up, release of the bombs and the spot where they fell can be made. The photographs are at once developed, and are available two hours later. No claims to have hit the target are allowed without such evidence, which is examined with the greatest eagerness by the crews who have taken part in the attack.

Up to 15th May, 1942, one hundred and forty attacks with fighter escort have been made by aircraft of Bomber Command. The object of these daylight attacks is not only to inflict material damage but also to keep the *Luftwaffe* busy. This aim has so far been successfully accomplished. The German Air Force evidently feels unable to allow British bombers to fly unchallenged over the ill-gotten gains of their master. Its fighters swarm to the attack, and then they find the Spitfires of Fighter Command awaiting them. Combat is joined. The prize is the formation of bombers moving steadily through the shell bursts to their target and thence back

to England. Rarely is it attained. The Spitfire defence is very good and most stoutly maintained. The bomber pilots have the utmost confidence in their comrades of Fighter Command, and it is based not merely on belief in their resource and sagacity but on what they see with their own eyes. "The fighters knew their job. . . . They were grand. . . . Wizard fighting. . . ." Expressions such as these fall often from the lips of the bomber crews during their interrogation and in the mess afterwards. They should know.

## 10. BOMBER COMMAND BUILDS UP ITS STRENGTH

ATTACKS ON objectives in France have also been carried out by night. The damage inflicted by Bostons on the Matford factory at Poissy on the afternoon of 8th March was increased by Whitleys and Wellingtons on the night of 1st/2nd April and by Wellingtons and Stirlings on 2nd/3rd April. Production—about 1,000 lorries a month—has almost, if not entirely, ceased. Before that, a heavy raid on 3rd/4th March had been carried out on the Renault works at Billancourt on the outskirts of Paris. A strong force, a high proportion of it being composed of Stirlings and Halifaxes, dropped 457 tons of bombs on the factory in 110 minutes. It had been in full production for our enemies for some time and had been turning out 100 tanks and 200 lorries a month, and 150 aircraft engines a week, besides diesel and petrol engines and aircraft components.

The attack, delivered in moonlight, can only be described as devastating. The works have been rendered useless for many months. It was a striking and terrible example of what can be achieved by a heavy force concentrated on a small and vital target easily seen and, in this case, ill-defended. Though the exact target, for obvious reasons, had not been specified in the frequent warnings sent out by us over the radio, neither the French nor the Germans could have been in ignorance of our intentions. Yet the opposition met with by our bombers was negligible.

Other attacks on targets of a similar nature in France have been the three delivered against the Gnome and Rhône works and the Goodrich Tyre works at Gennevilliers on the nights of 5th/6th April, 29th/30th April and 29th/30th May. Here, too, the damage has

been very considerable. But here the defences were more active. The wireless operator of a Whitley had a narrow escape during the first attack. A piece of shell knocked his torch from his hand as he was picking up a flare.

The attacks on French targets have gone on steadily, 21 having been delivered in May last by day and night. They will continue so long as the Germans seek profit from what they have stolen and aid from those whom they have enslaved.

### *New tactics in attack*

The intensity of operations at night began to take an upward curve towards the middle of February. Before then Bomber Command had, of course, not been idle. In January, in addition to heavy attacks on Brest, Wilhelmshaven, Bremen, Emden and Kiel, which were directly connected with the Battle of the Atlantic, Munster was attacked twice on 22nd and 28th January, Hanover on the 26th and Mannheim on 11th and 14th February. Objectives in these cities were the principal targets among several others in North-Western Germany. A new technique was employed, its chief characteristic being the concentration of large numbers of bombers for a short time over a single target. The effect of this has so far been, if not to paralyse, at least to dislocate the ground and A.R.P. defences.

The first example of these new tactics was the attack on the Renault works on 3rd/4th March. In March and April the Ruhr suffered eight heavy raids in which 1,555 aircraft took part, besides three small attacks. In the same period Cologne was visited four times by a total of 559 aircraft. The hurt caused to this city was considerable. By the end of April, in the Nippes district—an industrial part of the town—about 75,000 square yards occupied by workshops had been damaged. Heavy bombs had completely destroyed buildings near by covering an area of 6,000 square yards. The Franz Clouth rubber works, covering 168,000 square yards, had been rendered useless, much of them being level with the ground. To the East of the Rhine a chemical factory and buildings beside it, occupying 37,500 square yards, was almost entirely destroyed. Severe damage had also been caused to the centre of the city. All this was confirmed by the evidence of photographs.

Dortmund was twice heavily bombed, on 14/15th April, and again on the next night, a group of factories in the Weissenburger Strasse being extensively damaged. Hamburg endured five raids, those on 8th/9th April and 17th/18th April being especially severe.

A particularly effective raid was made on Lubeck, the old Hanseatic port, on 28th/29th March. 304 tons of bombs were dropped in 180 minutes. Soon after the attack began at 10.30 p.m., one crew reported that there were a few small fires. Twenty minutes later others reported that the fires seemed to have spread right across the island on which the old part of the town is situated. The greater part of it was burnt to the ground. Great quantities of stores accumulated during the winter for use in the Russian campaign were destroyed.

### *Fires raged in Rostock*

The next targets to suffer severely were Rostock, bombed four nights running from 23rd to 26th April, and Warnemunde, attacked on 8th/9th May. Rostock is the home of a big group of aircraft factories forming part of the great Heinkel concern. In the first attack the concentration was very heavy, all the bombs falling within the space of an hour. From about 2.0 a.m. onwards, fires raged in the harbour and the Heinkel works, and smoke presently rose to a height of 8,000 feet. The navigator of a Lancaster arriving towards the end of the raid told his captain that the fire he saw seemed "too good to be true" and that it was probably a very large dummy. Closer investigation showed that it was in the midst of the Heinkel works, and the Lancaster's heavy load of high explosives was dropped upon it from a height of 3,500 feet. Damage to the factory was considerable. The walls of the largest Assembly Shed fell in and destroyed all the partially finished aircraft within. Two engineering sheds were burnt out, and in the dock area five warehouses were destroyed by fire and seven cranes fell into the dock. By the end of the fourth attack two large areas of devastation had been caused in the old town. All the station buildings of the Friederich Franz Station had been gutted and the Navigational School and the town's gasworks destroyed. Photographs taken in daylight after the second attack on Rostock show swarms of black dots near the main entrance to the station and thick upon two of its platforms. These were persons seeking trains to take them away from the devastated city.

After the attacks on Rostock came those on Stuttgart, carried out on 4th and 5th May and on Mannheim on the night of the 19th/20th. Mannheim is the second largest inland port in Europe. Its docks are continually full of raw materials, tank parts, armour plating and other war supplies, which come to them down the Rhine from the Ruhr. There are also many industrial plants

situated in or near the city. In this attack one detachment of Stirlings dropped more than 4,000 incendiary bombs, which left many fires alight.

The foregoing is a specimen page in the catalogue of attacks made and damage slowly but surely being inflicted on the Germans. It is not an exhaustive list. Nor is it final. Little by little Bomber Command has been building up its strength. Hampered by the weather it stuck to its task throughout last autumn and winter. Since the beginning of the war it has been a hammer in the hands of this country, which is using it to batter the walls of Germany. Slowly that hammer has grown in size and weight. On the night of 30th/31st May, 1942, it was swung with deadly effect. On that night 1,043 aircraft of Bomber Command attacked Cologne for an hour and a half. So large a force had never yet been used by any country in a single attack.

## 11. THE MEN ON THE GROUND PREPARE

THIS ATTACK was the culmination of months of training, weeks of planning and days of organisation; but it was only the beginning of an intensified effort which will cause the Germans, in the words of Air Marshal Sir Arthur Harris, the Air Officer Commanding-in-Chief, Bomber Command, "to look back to the days of Lubeck, Rostock and Cologne as men lost in a raging typhoon remember the gentle zephyrs of a past summer."

Days of organisation—they were full and strenuous. The ground staffs worked as never before. It is appropriate at this point to give some explanation of their labours, for without the expert and unremitting toil of the electricians, fitters, riggers and armourers, and of the repair and maintenance parties provided by the firms which build the aircraft, no bomber would be able to take the air.

Let us once again take the Wellington as an example. Each day a thorough inspection of both engines and the airframe is carried out by the ground crew responsible for it. The ground crew normally consists of a fitter for each engine, and two fitters or riggers who attend the airframe. The ancillary equipment, such as the instruments, electrical gear, guns and so forth, are all checked by specialists in each trade. When all have finished—the inspection

may take two hours—the aircraft is certified airworthy on the proper form. This form is a log containing the details of each daily inspection, and every “tradesman” initials the column in which his part of the inspection has been recorded. The aircraft is not allowed to leave the ground until every column has been so initialled. Its crew, who will be flying in it on operations that night, then take it over and carry out a night flying test during which all the work of the ground crew is put to the test in the air. On landing, any complaints are entered in a book, usually known as the “flight snag book,” and immediately set right by the waiting ground crew.

During the remainder of the day, before the aircraft takes off for its target, the fitters, riggers and other “tradesmen” prepare it for its special task. The riggers apply de-icing paste to the leading edges of the wings and of the tail plane and to the propellers. The paste applied to the propellers looks not unlike the thick cream used by actors when removing their make-up. It is spread on the leading edge, and as the blades revolve, a thin film is formed which covers them. The electricians test all the electrical equipment and the condition of the storage batteries. The armourer checks the hydraulic turret system for oil leaks, while the air gunner himself sights the guns.

If the turret is a four-gun turret it is trained on a target bearing four discs painted green, red, blue and brown on its surface, with a smaller yellow disc in their midst. The four discs are arranged on the target according to a pattern worked out in practice so as to provide the most effective cone of fire. Each gun is sighted in turn on one of the discs, the fitter standing outside the turret and moving the barrel of the gun in accordance with the instructions of the air gunner inside. The fitter and gunner then put the ammunition belts back into place. In modern bombers they run lengthwise along the fuselage to the ammunition pans situated about half-way down it. While this is being done, the armourers are fitting the bombs to the bomb beams, the tanks are refilled and the aircraft is now ready to take part in the night's operations. Just before the take-off, the Engineer Officer of the Station visits each aircraft and carries out a general check to ensure that it is absolutely ready.

In addition to servicing the aircraft, the Servicing Flight also change engines, fit and repair airframes, maintain the rubber dinghies in good condition, and fit out the new aircraft when they are delivered from the factory. Every forty hours each aircraft undergoes a special inspection, when it is thoroughly examined.

In addition to the Royal Air Force personnel who form the

ground crews, there is at each Station a repair party made up of staff belonging to the firm manufacturing the type of aircraft with which the squadrons at the Station are armed. With Wellingtons these men are the employees of the firm of Vickers Armstrong. There are some twelve of them to a station. All are experts, and each man is capable of performing the work of the others. Their work differs from that of the ground crews, for it is their task to carry out major repairs. They can deal with anything which does not require a "jig" to set right. They can change a wing, or put in a new section of geodetics to take the place of a damaged section. Only when, for example, the fuselage has been twisted out of alignment, must the aircraft be sent back to the works.

### *Happy band of experts*

The spirit of these civilian workers can be compared only with that of their colleagues in uniform. All work, if necessary, a seven-day week, and the hours of each day's labour are determined, not by any set rules, but by the amount of work to be done. Only when there is nothing more left to do will they relax. They work in all weathers. The repair party is perhaps luckier than the ground crews for they deal with damaged aircraft in hangars, while the ground crew service M for Mother or P for Peter far out beyond the edge of the great perimeter of the aerodrome. They live, for the most part, in Nissen huts near to their work, cut off for many hours from the central life of the Station. This isolation seems to strengthen their strong sense of duty. Each man in each ground crew regards his own particular "kite" with the esteem—it is almost possible to say the affection—which the groom has for his horse.

They seem a singularly happy band of men, perhaps because in an age of mechanism it is their good fortune to have to do with mechanical things. Their mouths are full of a language of their own, in which expressive slang and the Greek and Latin hybrids used by modern engineers mix and mingle. The mid-under turret is the "Dustbin"; the pilot's cabin is the "Greenhouse"; while the Astro Dome, from which observations of the heavenly bodies are made, is known as the "Observatory." The 4,000-lb. bomb in the racks beneath is called "the Big Noise"; the workers, who deal with the instruments, are known as "Clock Bashers"; an airman in charge of a gang as the "King Pin." A recruit is a "sprog," a W.A.A.F. officer a "ladybird."

It was upon men such as these that was placed the burden of preparing the aircraft used in the undertaking against Cologne.

They proved equal, and more than equal, to the strain. To put more than a thousand bombers into the air in one night meant the use of a large number of Stations in each Group of the Command. At each of them the ground crews were very busy for several days before. Their routine work was intensified and they had much extra work, for they found themselves with an increasing number of aircraft to be made ready.

*Special effort for a special job*

Here is what happened on a Station from which Wellingtons have operated since the beginning of our bombing campaign. It was one of the many in action that night and is typical of all. A few days before the attack, the Station Commander informed his Engineer Officer that a maximum number of aircraft would be required for a certain night, and asked that at least 36 should be prepared. During the next few days Wellingtons kept coming in and the number on the Station gradually grew. The Station Engineer Officer held conferences with the Squadron Engineer Officers and then told the ground crews what was in the wind. "I could only say," he reports, "that we were to make a special effort for a special job and that we were to put out everything with wheels on. . . . Soon the enthusiasm began to spread. All trades concerned got the fever and work went on every day until midnight and began again at 6.30 the next morning. The aircraft wanted for nothing. If spares were not available on the Station, then we found out where they were to be had and soon our 'Tiger Moth' was battling through rain and storms to bring back the goods."

Nothing was left to chance. The ground crews, numbering about 200, worked eighteen hours a day for five days, fitting and testing every detail—engines, armament, electrical gear, instruments and other equipment. "As I went round I was repeatedly asked, 'How do we stand now, sir? Have we time to get through another eighty hours' inspection?'" As a result 44 Wellingtons took off at dusk on 30th May for their targets in Cologne. While the armourers were still bombing up, the crews attended the briefing at 6.0 o'clock. It was then that they were informed what the target was and heard a message from the Commander-in-Chief. "Press home your attack," it ended, "to your precise objective with the utmost determination and resolution in the foreknowledge that, if you individually succeed, the most shattering and devastating blow will have been delivered against the very vitals of the enemy. Let him have it—right on the chin."



## 12. THE HAMMER FALLS: ONE THOUSAND BOMBERS OVER COLOGNE

AT THE HOUR of the take-off, the whole staff of the Station was assembled round the aerodrome. The aircraft were sent off by the Station Commander himself. Two flare-paths were laid and the Wellingtons were dispatched, with only 300 yards between them, simultaneously from both paths. The first eleven got away in eight minutes. Some miles to the North, 43 Halifaxes became airborne a little later. A few miles to the East, an Air Vice-Marshal climbed into a Stirling and took his seat as second pilot. Scenes such as these were being played throughout the length and breadth of Eastern England as the late dusk of that May day faded into night.

The Wellingtons arrived first over Cologne, followed closely by the Stirlings. "When we got there," said the Wing Commander of a squadron of Wellingtons, "we saw many fires which had not yet taken real hold, but I thought it had all the makings of a successful raid. It was easy enough to see the city, for we could pick out the Rhine and the bridges quite clearly. There was little or no opposition over the target, I think because there were so many aircraft that the ground defences could not cope with them. We did meet with opposition on the outskirts but it was very indiscriminate. Before I left I saw the fires growing larger and larger."

It was then that the Stirlings arrived on the scene. Flying with them was Air Vice-Marshal Baldwin, commanding the Group to which they belong. "The weather forecast," he said, "made it uncertain almost up to the last moment whether we should start. We had not been flying very long before we met much low cloud, and this depressed me. The front gunner got a pin-point on an island off the Dutch coast but the weather was still somewhat thick and there was an Alpine range of cloud to starboard. Suddenly, thirty or forty miles from Cologne, I saw the ground and then the flak. It grew clearer and clearer until, near the city, visibility was perfect. First I saw a lake, gleaming in the moonlight, then I could see fires beginning to glow, and then searchlights which wavered and flak coming up in a haphazard manner.

"The sky was full of aircraft all heading for Cologne. I made out Wellingtons, Hampdens, a Whitley and other Stirlings. We sheered off the city for a moment, while the captain decided what would be the best way into the target. It was then that I caught sight of the

twin towers of Cologne cathedral, silhouetted against the light of three huge fires that looked as though they were streaming from open blast furnaces. We went in to bomb, having for company a Wellington to starboard and another Stirling to port. Coming out we circled the flak barrage and it was eight minutes after bombing that we set course for home. Looking back, the fires seemed like rising suns and this effect became more pronounced as we drew further away. Then, with the searchlights rising from the fires, it seemed that we were leaving behind us a huge representation of the Japanese banner. Within nine minutes of the coast, we circled to take a last look. The fires then resembled distant volcanoes.”

### *Extreme devastation*

When the Halifaxes arrived, the raid had lasted for an hour. By this time Cologne was visible to late comers sixty miles away, first as a dull red glow over a large area of ground. The captain of one Halifax had the same experience as the observer of the Lancaster over Rostock. He and his navigator thought that the fire towards which they were flying was too large to be anything but a specially elaborate dummy. The pilot of another Halifax thought that a heath or a whole forest must be blazing. Ten miles off, however, they perceived that the glow came from a town on fire, and as they drew near they could see more and more loads of incendiaries burning in long, narrow rectangles made up of pin points of bright, white patch, which swiftly blossomed each into a rose of fire. Like the others, the Halifaxes identified the target easily by means of the bridges over the Rhine.

One captain reported: “So vast was the burning that ordinary fires on the outskirts of the city or outside it, which I should usually have described as very big, looked quite unimportant. It was strange to see the flames reflected on our aircraft. It looked at times as though we were on fire ourselves, with the red glow dancing up and down the wings.”

For several days reconnaissance aircraft were unable to obtain photographs of the city. The smoke of the burning was too thick. It was not until 5th June that good pictures were taken. When they were examined, the damage revealed was seen to be very great. It may be of interest to compare the extreme devastation caused to Cologne on the one night of 30th/31st May with that described in broad outline on page 43, which was the result of the four previous raids.

Cologne is a city of nearly 800,000 inhabitants and is the third largest in Germany. The total area of complete destruction caused

on 30th/31st May amounts to 2,904,000 square yards, which may be compared with the 286,500 square yards damaged or destroyed in the four previous attacks. Of the area laid waste that night, about half is situated in the centre of the city. The cathedral appears to be unscathed except for damage to windows; but 250 factory buildings and workshops were either destroyed or seriously damaged. A significant feature of the photographs taken on 5th June is that they reveal what appears to be a dead city. An air-raid warning, which was doubtless sounded, would have cleared the streets while the photographs were being taken; but it is significant that there is absolutely no transport visible—no trains, trams, 'buses or motor cars. The casualties among the population were certainly heavy. All the public utility services were interrupted, for how long it is not yet possible to say.

The attack on Cologne of 30th/31st May was followed two nights later by an attack in much the same force on the Ruhr. Here, too, enormous fires were caused and the damage was very great. In these large raids our loss was under four per cent. of the aircraft used. In the attack on the Ruhr a Halifax was caught over Essen by searchlights and heavily shelled. The port outer engine was put out of action and the aircraft held for fifteen minutes in a cone of fifty searchlights. A shell splinter broke the window in front of the captain and blinded him in one eye. On the way home an Me. 110 attacked the crippled bomber, but the rear gunner drove off the German, setting its starboard engine aflame. Near Dunkirk, searchlights once more picked up the Halifax and flak knocked out the inner starboard engine. The bomber got back on two engines.

On the night after this, the Ruhr was again attacked. On the next night Bremen, then a night's pause, then the Ruhr again, then Emden, then on 25th/26th June another thousand to Bremen. So it goes on. . . .

## 13. THE BLOW STRIKES HOME

WHAT EFFECT are the sustained attacks by Bomber Command producing on the enemy? The answer to this question, under eager discussion in the public prints and resorts of this country and elsewhere, cannot yet be given with certainty. It is possible, by the examination of photographs and by other means, to arrive at an estimate of the material damage they are causing. Some examples of it have been included in this account.

Of an importance as great, if not greater, are two other effects. The assaults of Bomber Command which, despite the most evil weather of last autumn and winter, have steadily increased, have kept in the Western theatre of war a growing proportion of the German A.A. defences, both ground and fighters. A shortage of searchlights and A.A. guns was being felt on the Russian front as early as November 1941; and as the attacks have continued, the Germans have found it necessary to reorganise the ground defences, which are now manned by more than 1,000,000 men. A high proportion of these have had to be kept in the Ruhr, in Northern France and elsewhere to ward off our bombers and fighters, if they can, though they are urgently needed to support the hard-pressed Luftwaffe at grips with the Russians from the White to the Black Sea. Moreover, it has been necessary for the Germans to recruit and maintain a huge A.R.P. system with an army of firemen, Observer Corps personnel and others, and this at a time when the supply of men to the factory and the field is becoming a problem more and more difficult to solve. Germany's labour troubles are also increased by the amount of labour she must employ in repairing damaged houses and in constructing an elaborate system of dummies and decoys.

There is also German morale to be considered. It is a strange plant, more sensitive perhaps than is sometimes imagined. In the Nazi greenhouse, where the promise-crammed air is kept at a high temperature by the ceaseless attention of Goebbels to the propaganda furnaces, it grows well and even expands; but when the panes of the greenhouses are broken by the bombs of the Royal Air Force, it wilts and droops away, one day to expire.

In July, August and September of 1941 German morale, especially in Hamburg and Cologne, had recovered and was good. In Munster close by, where, it was said, 3,000 people had been killed in air raids it was poor. The raids of 7th/8th September and 7th/8th November on Berlin lowered morale for some time in the capital, and there were stories current in the streets and cafes of the effect of our 4,000-lb. bombs—their explosion was said to have caused many cases of burst lungs. The Berliners had time to recover during the winter.

Morale in Lubeck and Rostock fell to a very low level after the heavy and destructive attacks made on them in March and April of this year. Evacuation of both towns was on a large scale, especially in Rostock. The population of the Ruhr is becoming increasingly uneasy. It would appear that there is a tendency to quit the towns, for orders have been issued forbidding workers to move

more than ten kilometres from their place of employment. In March and April the Ruhr newspapers published warnings against the spreading of rumours in which, they said, the number of air raid casualties was grossly exaggerated. It was the duty of every good citizen to refrain from such talk. The most common rumour appears to have been that the relief organisations and the Nazi Party were slack in coming to the aid of persons trapped in cellars, with the result that mortality had been high.

*Stout hearts or concrete shelters?*

In Kiel, too, all was far from well in the spring, and there is no reason to suppose that morale has since improved. The *Kieler Neueste Nachrichten* for April 2nd is of interest. "The best protection for a soldier is a stout heart not a concrete shelter," it says, quoting a saying of Admiral von Schroeder, and then continues: "The same applies to the civil population. It is no wonder that our town, the Reich naval base of Kiel, is frequently a target for the R.A.F. The fate of those who suffer is hard enough: if they escape death they lose their property. And they do put up with their lot, for Germans are resolute and can take it. Usually, however, it is the other people who eternally moan and complain.

"To them the British civil population may be held up as an example. . . . But who would like the enemy to be held up to him as an example? When the enemy, for example, broadcasts that the British bombers had to fly through a 'curtain of steel' and that during the attack on Kiel on the night of 13th March eight bombers were lost, such news should be heard with satisfaction. Instead, after every raid gossip-mongers of both sexes run round the town, not only to see the enemy's work of destruction—which is heartless and undignified—but also to spread rumours, one more foolish than the other. Loss of life is multiplied tenfold, or it is said that the heavy flak has been removed from the town. . . .

"A little thought should convince these gossip-mongers that it is not possible to move the flak when the guns are fixed, as in Kiel. Such people are stupid enough, and apparently have time to run round the town spreading rumours. They should be given more useful work to do. The busy man has no time for such highly superfluous and extravagant activity. He despises it. Therefore, more dignity, more resolution, and above all a stout heart; for we must expect many more air attacks on Germany and on our town."

German writers and broadcasters have lately been expressing their conviction that the offensive of Bomber Command cannot be

sustained indefinitely. Other authorities, however, do not seem to be so optimistic. In Essen, for example the War Damage Bureau has been divided up into twelve separate bureaux in view of "the serious consequences for the civilian population of British attacks."

When an air raid alert sounds in Germany, almost everyone is sent at once to the shelters. This is another factor which affects morale. Much loss of sleep results, with consequent absenteeism which is increased by the steadily mounting casualties to houses. A worker without a home is usually unable or unwilling, or both, to give of his best day after day in the task of furthering the war effort.

### *The oppressed stirred to action*

In addition to native German workers, there are some two million foreign workers drawn from the many nations which have the misfortune to enjoy the protection or friendship of the *Herrenvolk*. These, too, are a source of low morale. The "go slow" movement is spreading, especially in France and other countries exposed to the attacks of the Royal Air Force. Workers in factories which have not yet been attacked fear that their turn will come, and are beginning to lend a more and more attentive ear to the radio and to the pamphlets showered upon them, which exhort them to do as little as possible for their masters.

Pamphlet dropping over Occupied Countries and over the territory of the Reich has increased substantially of late. This form of propaganda should find a fruitful field in France, where the accession to power of Pierre Laval has brought opposing political views into sharp conflict. Restlessness, always considerable, is growing in Holland, Belgium and Norway. Acts of sabotage and other forms of resistance are on the increase, and this seems to show that the shooting of hostages is not proving a deterrent. Portraits of the Dutch Royal Family dropped on Holland have been collected and treasured by its gallant inhabitants. *The Courier de l'Air*, a small illustrated French booklet, falls frequently on France and serves to keep the French informed of the true facts about the war. Thus Bomber Command is taking a hand in political warfare—playing the role of a postman who delivers the letters at the risk of his life. About 250 million leaflets have been dropped on Germany and the Occupied Countries from the beginning of the war to the middle of May, 1942.

Those in authority in Germany have also to consider the effect of our bombing offensive on the minds of the men at the front—more especially the Russian front. There is evidence that they do

so. Germans are exhorted to write in a cheerful strain to their fathers, husbands or brothers not yet in Leningrad or Moscow. As the civilian casualties mount, as mount they must, the fighting men are beginning to wonder and then to worry and, when no letter comes, to remember that towns and cities are built not only of insentient brick but also of living stones, and it is not they alone, but their home and family—that *Heimat* so beloved of the Teutonic heart—which may be in jeopardy.

Finally, there is the shaken faith of the German people in the might and power of the Luftwaffe. For two and a half years it has been dinned into their heads that the German Air Force is invincible. Faith in this dictum—axiom is perhaps the word—was shaken somewhat after the Battle of Britain, but was fully restored when Greece and Jugoslavia were overpowered and Crete captured. The Luftwaffe's failure to annihilate the Russian Air Force revived certain doubts; and now the German public has been bluntly informed by, among others, the editor of the *Frankfurter Zeitung* that its air force cannot retaliate on Great Britain because "its forces are scattered from Africa to Norway and on the Russian front."

To estimate the morale of the enemy under bombing attacks is always difficult. In general it can safely be said that, as German morale falls, that in the Occupied Countries rises. This is not the platitude it may appear to be. Both oppressors and oppressed are being bombed—the former certainly more severely—but in the abodes of the guilty each bomb is becoming a symbol, if not of approaching doom, at least of the might of a foe as yet unsubdued, while in France, Belgium, Holland and Norway, it is a harbinger of deliverance.

### *They shall be utterly discomfited*

Bomber Command is in the midst of a great and sustained offensive which began on the second day of the war. This attack has passed, and will continue to pass, through periods of varying but steadily mounting intensity. It began modestly against German warships with bombs and German citizens with pamphlets. Its efforts increased when Norway was overcome in April 1940, and its aircraft had to fly seven or eight hundred miles there and back to attack the invaders. During the German onslaught on Holland, Belgium and France its whole strength engaged the enemy ever more closely and suffered very heavy losses. Its attacks later in the year on the invasion ports made when the Battle of Britain was in full swing,

were such that the three thousand barges collected never put out to sea. It then began its assaults on German industry and communications which it has maintained on a fluctuating and now heavy scale for more than two years.

Between 11th May, 1940, and 31st May, 1942, of the principal targets in the Ruhr, Essen has been attacked 89 times, Duisberg 93, and Dortmund 33. Of the main German cities outside that great industrial area, Bomber Command has been to Cologne 144 times, to Mannheim 68, to Hannover 64 and to Magdeburg 26. The four German ports most directly concerned with the Battle of the Atlantic are Bremen, Wilhelmshaven, Kiel and Emden, while Hamburg, the second city in Germany, is a base not only for that battle but also for the Russian front. Targets in the first of these cities have been attacked 110 times, in the second 88, in the third 82, and in the fourth 82. Hamburg has been attacked 115 times.

All this Bomber Command has accomplished with aircraft designed and built in Great Britain. With the exception of the Flying Fortresses, which operated for a short time in the summer of 1941, no aircraft other than British-built has as yet bombed targets in Germany, though American Bostons have been engaged against targets in occupied countries since March 1942. It was British Aircraft—Wellingtons, Hampdens, Whitleys, Stirlings, Halifaxes, Manchesteres and Lancasters—which bombed Cologne, the Ruhr and Bremen a thousand strong. If so much can be achieved by a force armed with British aircraft manned nearly all of them by British and Empire crews, it is surely possible to hope great things when the Air Force of America begins to fly side by side with them towards the same targets.

This is an interim report. The deeds, of which it is a summary record, began before the period of time it covers, and will doubtless continue long after it has appeared in print. Those who are performing them, the pilots and crews of Bomber Command, engage upon their stern duty with a resolution as stern. They have much to face and to endure. The enemy is not defeated—yet. He is certainly no longer exultant. It may be that he is beginning to feel doubtful what the end will be. His moods, however, do not matter to them. They live their secluded, their dangerous, their consecrated lives for one purpose—his utter discomfiture. One of them, back from Stettin on the far Baltic, once ordered his gunners to fire a salute to the English dawn as it came up out of the sea. That was a symbol of victory.



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N. FRISIAN IS.

KIEL

ROSTOCK

LUBECK

STETTIN

HAMBURG

WILHELMSHAVEN

BORKUM IS.

E. FRISIAN IS.

EMDEN

BREMEN

BERLIN

HANOVER

G E R M A N Y

IJMUIDEN

ROTTERDAM

HOLLAND

MUNSTER

RUHR

ESSEN

DUSSELDORF

COLOGNE

RHINE

BELGIUM

ANTWERP

DARMSTADT

MANNHEIM

NUREMBERG

KARLSRUHE

STUTTGART

AUGSBURG

FRANCE

150 miles

350 miles

550 miles

**BOMBER COMMAND CONTINUES**

is the Air Ministry account  
of a growing assault

at the heart of the enemy.

Beginning June 1941, it tells of  
the men and their aircraft,

daylight sorties

and night operations.

It ends with the 1000-bomber raids  
on Cologne and the Ruhr.