EXPERIENCES WITH A DAY BOMBING SQUADRON IN THE INDEPENDENT FORCE IN 1918

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By Squadron Leader (later Air Commodore) John C Quinnell

Air Commodore John Charles Quinnell DFC transferred to the Royal Flying Corps from the Royal Artillery in 1914. Over the next 30 years he flew the RE8, DH9, Bristol F2B, DH10 and Vimy, and served in Iraq, Germany and India. He commanded numerous Squadrons and, later, Groups including No 1 Air Defence Group, No 31 (Balloon Barrage) Group, and No 28 (Training) Group. He retired from the RAF in 1945.

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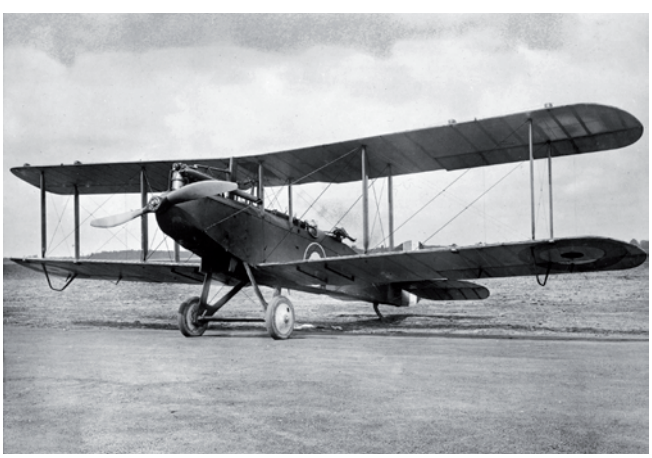

An unidentified DH9 two-seat day bomber as used by 99 Squadron during 1918 while flying as part of the Independent Force in France.
Image by Air Historical Branch;

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PAPER VII.

EXPERIENCES WITH A DAY BOMBING SQUADRON IN THE INDEPENDENT FORCE IN 1918.

LECTURE

by

Squadron Leader J. C. QUINNELL, D.F.C.

1. Introduction.—The experiences, with which this lecture deals, are those obtained in a D.H. 9 Squadron in the Independent Force.

2. Unsuitability of Aircraft.—Before proceeding further, a point I would like to emphasise here, and one which seems to be entirely forgotten when the work of the Independent Force is considered, is that the D.H. 9's were unsuitable for long distance bomb raids. The performance of these aeroplanes did not come up to expectations :—

(*a*) They were slow.

(*b*) They had only a limited ceiling of 14,000 feet with bombs.

(*c*) They only carried enough petrol to reach the nearest German towns.

It was realised before the Independent Force was supplied with these aeroplanes that they were unsuitable, but it was considered that 15 or so squadrons equipped with them would form a substantial bombing force, until a better aeroplane was forthcoming, and in the meantime they would enable pilots to gain actual experience of long distance bombing.

3. A. D.H. 9 Squadron in the Independent Force.—No. 104 Squadron was one of the squadrons equipped with 200 H.P. B.H.P. D.H. 9's, that worked in the Independent Force. It is just a matter of interest that this squadron was formed here at Andover. It left Andover on the 19th May, 1918, and flew to Nancy, *via* St. Omer and Paris, a distance of 387 miles, with the loss of only one aeroplane "en route." The function of this squadron was day bombing.

4. Conditions under which Bombing Squadrons Operated.—The conditions under which the bombing squadrons of the Independent Force operated will be appreciated when it is stated that they had to go long distances over the lines without any assistance from fighting squadrons or escort.

They had to rely solely on the efficacy of their machine-gunfire for protection against the enemy scouts.

5. Organisation for Bomb Raids.—(a) *Detailing Raids.*—It was laid down by H.Q. Independent Force that each Squadron raid should be carried out by 12 aeroplanes, consequently each Squadron detailed two flights of six aeroplanes for every raid. However, owing to engine failures, not more than 10 aeroplanes and often less crossed the lines. Engine failures with the B.H.P. engine were numerous. There was constant trouble with broken valve springs. On one occasion, out of 12 aeroplanes, nine returned with engine trouble. As a result of this experience the procedure for detailing aeroplanes for raids had to be altered. The procedure was as follows :—

(i) "A" and "B" Flights were detailed for the raid.

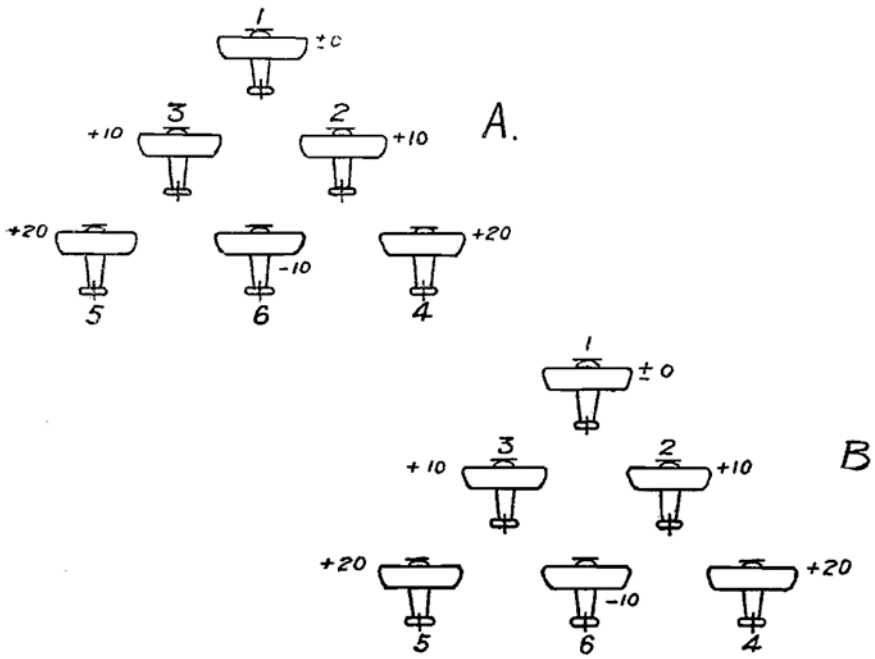
(ii) "C" Flight sent up two aeroplanes, one with each flight formation. These supernumerary aeroplanes of "C" Flight were to take the place of any aeroplane that fell out with engine trouble, in either of the other two flights. They did not return until the pilots saw that the formations were complete and across the line. To the everlasting credit of the pilots, it must be stated that not a single instance occurred where the supernumerary aeroplane returned when it should have made good a deficiency. On the contrary, there were frequent instances of where these aeroplanes went over with the formation when there was no need for them to do so. Having regard to the casualties suffered by the squadron this was remarkable.

(b) *Targets.*—The objective was sent to the squadron by H.Q. Independent Force through Brigade and Wing. An alternative objective in a different town was usually given. This was necessary in case the weather conditions prevented the raid reaching the town in which the first objective was situated. For instance, the raid might be on a munition factory at Mannheim and on approaching Mannheim it could be seen that the area was covered with fog or low cloud while the Karlsruhe area was perfectly clear. It was therefore necessary to know what should be attacked at Karlsruhe; whether it was to be the Railway Station, a Munition Factory, or a Manufactory.

(c) *Information concerning the objective.*—Each squadron had a special "Intelligence Office." An observer of the squadron was in charge of it. In this office were photographs, maps, plans and descriptions of all the objectives in the area. As soon as the objective was detailed, all pilots and observers went to this "Intelligence Office" and looked up all details concerning it. For instance, all the vulnerable

points of munition factories, blast furnaces, &c., were described. From studying these plans and photographs, and reading the details, there was no difficulty in locating the objective when the town in which it was situated was reached and aiming at its most vulnerable point.

(d) *Formations.*—(i) The formation adopted was as follows :—



(ii) No. 1 was leader of the "A" Flight, and in the case illustrated, the leader of the raid.

(iii) No. 6 was deputy leader in each flight and his aeroplane carried the camera. This machine flew the lowest in the formation.

(iv) If the leader of the raid fell out, the deputy in his flight directed the raid.

(v) "B" Flight flew about 100 feet above "A" Flight.

(e) *Replacement of Casualties.*—(i) Fourteen aeroplanes had to be serviceable for each raid in order to get 12 of them over the lines. It was, therefore, necessary that casualties should be replaced as quickly as possible. After each raid a wire was sent to the wing, giving details of the raid and casualties. The wing acted on the wire and a new aeroplane arrived that afternoon.

(ii) Casualties to flying personnel were usually made good in a similar manner.

6. Description of Raids.—(a) *The Start.*—(i) The squadron took off the ground in the formation as described in para. 5 (*d*), both flights taking off almost simultaneously.

(ii) The flights met over the rendezvous, which was agreed to between the flight commanders, at a pre-arranged height, usually 12,000 to 14,000 feet.

(iii) The lines were crossed generally within one hour of the formation leaving the ground and at the height at which the flights met over the rendezvous.

(b) *Opposition.*—As soon as the formation crossed the lines, it was attacked by enemy scouts. These scouts kept attacking until a new lot of enemy scouts were encountered and then they returned to their aerodrome to refuel and be ready to attack the formation on its return journey. Often, however, both lots of scouts combined on an attack on the bombers. The bombing formation was, as it were, handed on from one lot of enemy scouts to another, the whole time it was over the lines. In addition, a strong force of enemy scouts, 15 to 20, were invariably waiting over the objective to attack the bombers as they dropped their bombs.

Early in June, 1918, the opposition against the bombers by enemy scouts was nothing like what it was a month later. In June, there was often an interval when the bombers were not attacked as they passed from one scout barrage area into another. In July, there was no respite for the bombers. They were attacked continuously while over the lines.

(c) *Attacking the objective.*—When near the objective, " B " Flight got immediately behind " A " Flight. Each flight bombed independently. The leaders took aim and released their bombs. Immediately the pilots of the respective flights saw the bombs of the leaders leave the bomb racks, they released theirs. Bombs dropped in flight formation struck the ground simultaneously. The thing that impressed me most was the way the pilots concentrated on dropping their bombs, notwithstanding the fact that they were being heavily attacked. They ignored the presence of the enemy scouts, and left their observers to deal with them. When the objective had been attacked, " A " Flight took a slightly wider turn than " B " Flight so as to allow the latter to get into position again.

When bombing was first started, a Véry's light was fired by the leaders of each flight as a warning to pilots to " stand by " to drop their bombs. This practice was discontinued after a while, because the firing of the Véry's lights disclosed to the enemy the fact that bombs were about to be dropped, and it was usually a signal for them to attack. Instead, the leaders moved their aeroplanes from side to side. There was never any difficulty with this. Each pilot knew and could see when the bombs had to be dropped.

(*d*) *Photography.*—(i) When bombs were dropped, photographs were taken. These usually showed the bursts, and from them the damage caused by the raid could be estimated.

(ii) The position of No. 6 aeroplane, which carried the camera, in the formation was bad and it was hardly fair to expect the observer to get down in the fuselage and take photographs when he should have been fighting against the heavy opposition encountered over the target. This aeroplane was usually lost.

7. Particulars of Raids carried out by No. 104 Squadron.—(*a*) On 25th June, out of 12 aeroplanes that left to bomb the Munition factory at Karlsruhe, seven reached the objective. The other five returned with engine trouble.

(i) The squadron lost one aeroplane and two pilots and one observer were wounded.

(ii) Two enemy aeroplanes were driven down "out of control."

(*b*) On 26th June, out of 12 aeroplanes that left to bomb the same objective, only three aeroplanes, led by Captain Home-Hay, reached the objective, nine returned with engine trouble.

(i) The Squadron had no losses.

(*c*) On 30th June the squadron attacked Landau. They had to fight their way out and back with bunches of about 20 enemy scouts.

(i) The squadron lost one aeroplane and a pilot and observer wounded.

(ii) Five enemy were destroyed.

(*d*) On 24th August the squadron attacked Mannheim with 12 aeroplanes.

(i) The squadron lost seven aeroplanes and one observer wounded. Total: 15 casualties for the day. Both Flight Commanders were lost through the underslung radiators of the D.H. 9 being hit.

(ii) Three enemy aeroplanes were destroyed.

(*e*) On 29th September, while carrying out a bombing attack in connection with the American advance on the Meuse the squadron had a big fight. The formation consisted of 13 aeroplanes, and as the bombs were being dropped they were attacked simultaneously by 20 enemy aeroplanes, which came up in two formations. While these were attacking they were reinforced by two more formations of 20 enemy aeroplanes. The result of the fight was:

(i) The Squadron lost one aeroplane and three officers wounded.

(ii) Three enemy aeroplanes went down in flames, five out of control, and two forced landed.

8. Co-operation.—(*a*) On two occasions were the two D.H. 9 squadrons sent out on a combined bomb raid. On neither occasion was the co-operation really successful, and as a result there was feeling between the squadrons.

(*b*) One of the principal causes for the lack of proper co-operation between the squadrons was the fact that the two flight formations adopted by the squadrons did not permit a homogeneous combined formation. The result was that the rear squadron acted as a screen for the directing squadron and had to take the brunt of the attacks unsupported.

(*c*) The squadrons never trained together, and as a consequence did not understand each other or have any standard method of signals, &c. On one of the occasions in question the rear squadron had aeroplanes with engine trouble on the way home and as a consequence had to slow up. The directing squadron left them isolated.

(*d*) There is no doubt that squadrons will not co-operate successfully until they receive training in doing so.

9. Fighting.—(a) *Defensive.*—In the ordinary sense of the word there was no fighting in a bombing formation. There was no question of taking offensive action against the enemy. The bombing formation, in order to reach the objective, had, notwithstanding the vigorous attacks against it, to keep steadily on and defend itself with gun fire.

(b) *Enemy Tactics.*—The tactics adopted by the enemy were as follows :

(i) The enemy scouts would fly some distance behind the formation and " Brown " it. They got a bomber now and again.

(ii) Two enemy formations would combine against the bombers, one attacking it from above and the other from below. The scouts diving on the bombing formation seldom came really close in. Those attacking from below were the real danger, as occasionally one got right into the formation unobserved. When the opportunity occurred the enemy scouts attacked the leader of the formation.

(c) *Effect of Losses.*—(i) *On the enemy.*—It made all the difference in the world, if, while the enemy formations were making their combined attack, the bombers got " first blood " and shot an enemy scout down in flames. If they did, the attack was not pressed home and the enemy withdrew, flying behind the formation and " Browning " it until he regained courage to attack again.

(ii) *On the Bombers.*—No matter how great the loss sustained by the bombers, a formation was never broken up, and there was never any sign of panic amongst the pilots. As losses occurred, the formation closed up automatically, each pilot maintaining his station as steadily as ever. If one of the bombers went down under control it was followed down by two or three enemy scouts and the fight was continued to the ground.

(iii) I am certain many more of the enemy aircraft would have been destroyed, and, as a result, many a bomber would have been saved, if observers had had proper training in aerial gunnery and in the question of the conservation of their ammunition. It was absurd the way hostile aircraft that came into the formation were missed and the range at which fire was opened on others.

10. Casualties.—(*a*) For the period 8th June to 11th November 1918, the casualties suffered by No. 104 Squadron were :—

(i)	Killed or died of wounds -	8*
(ii)	Missing - - - -	66
(iii)	Wounded - - - -	41†
	Total - - - -	115

As far as I can remember, there was never a raid in which there was not a casualty of some kind.

(*b*) *Causes.*—(i) A large number of casualties were caused by the underslung radiator of the D.H. 9 being hit by the enemy who " Browned " the formation from a distance. It seems a remarkable fact that this underslung radiator should be hit so frequently, but nevertheless, it was a fact. Pilots, who were taken prisoners, and who discussed the matter after the war, all told the same story—hit in the radiator—engine seized up—fought all the way down—a prisoner. On one raid the squadron lost two of the best bombing Flight Commanders I have ever known—Captain J. P. Home-Hay, M.C., D.F.C., and Captain E. A. McKay, M.C., D.F.C., through the radiators of their aeroplanes being hit.

(ii) After a long raid nearly all the casualties in bombing formations occurred on the homeward journey, within 25 or 30 miles of the lines, and in my opinion there were due to the shortage of ammunition. It must be remembered that the bombers had to defend themselves for two and sometimes three hours against vastly superior hostile formations,

* 2 killed in enemy bomb attack on our aerodrome.
† 3 wounded " " " "

and although each aeroplane carried about 1,600 rounds, it was exhausted before the lines were reached on the return journey. For this reason, and also because it was less cumbersome to use, many observers preferred using the single to the double Lewis gun.

11. Leadership.—(*a*) The question of leadership was of the utmost importance. On the personality and judgment of the leaders, that is, the Flight Commanders, depended the success of the squadron. It was essential that pilots should have confidence in their Flight Commanders and that they should feel that when on a raid they would not be left behind to the mercy of the enemy. Any aeroplane that lagged behind or left the formation over the lines, to return, was invariably destroyed. Enemy Scouts were always ready to swoop down and take as their prey anything the Gods gave them in the way of a detached or lagging bomber. Even with engine trouble a pilot would try to hang on to the formation, for enemy scouts hovering round gave him warning of th fate that awaited him if he left it.

(*b*) The leader had ever to be on the watch for aeroplanes lagging behind, and he was usually assisted in this respect by his observer. The speed of a bombing formation was nothing more or less than a cruising speed. Now, if the leader saw one of his bombers lagging behind he had to slow up still more if he wished to save it.

Slowing up involved three considerations :—

(i) If the rate was continued at the reduced speed the objective could not be reached.

(ii) If speed was increased the aeroplane with engine trouble would be lost.

(iii) Reduced speed could be maintained, and a near objective bombed.

The course adopted depended on circumstance, and it was here that the question of leadership came. On the homeward journey every effort was made to save aeroplanes with engine trouble.

12. Bomb Dropping.—(*a*) The pilot aimed and dropped the bombs.

(*b*) The D.H.9's were fitted with the Lens bomb sight fitted in the floor of the fuselage. The disadvantages of this sight were as follows :—

(i) The sight had to be set before the aeroplanes left the ground. The speed and direction of the wind were known at the aerodrome before the raid left, but it was impossible to say what they would be three hours

later and at a place over 100 miles distant. In addition, it might be arranged to bomb from a certain height, but circumstances, such as clouds or an aeroplane with a failing engine, might make it necessary to bomb from a lower altitude.

(ii) It could be used for bombing up or down wind, but the course to be adopted had also to be decided before the raid left the ground.

(iii) It got covered with oil from the engine, and was useless.

(*c*) The C.F.S. bomb sight was also tried. This sight had to be used by the observer, who did the sighting and then tapped the leader on the shoulder as a signal to release the bombs. This method was unsatisfactory for the following reasons :—

(i) It was difficult for the observer to convey to the leader the change of course to get the aeroplane accurately sighted on the objective.

(ii) The observer did not know enough about air pilotage to be able to get the speed and direction of the wind while flying to the objective, but had to set the sight arbitrarily from the information received in the weather report. That information, as has been pointed out, was out of date.

(iii) By the time the observer had sighted and tapped the leader on the shoulder and the bombs had been released, the target had been overshot.

(*d*) As there was no efficient bomb sight, the rough and ready method of taking aim by using the leading edge of the lower plane as a sight was often adopted.

CONCLUSIONS.

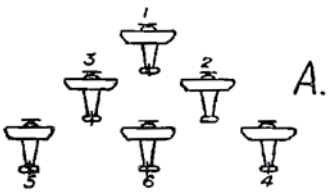
13. **Science of Bombing.**—(*a*) It is important that the science of bombing, which is very important now in view of the Home Defence Scheme, falls under three categories :—

(i) Getting the aeroplanes safely to the objective.
(ii) Placing the bombs accurately on the objective.
(iii) Design and armament of aeroplanes.

All three are inter-dependent.

14. **Getting the Aeroplanes to the Objective.**—(*a*) With regard to getting the aeroplanes safely to the objective :

It has been established that a good defensive formation must be symmetrical, *i.e.*, form 3 units.



(i) Now a good defensive formation is bad for bomb dropping, and *vice versa*. If the bombs are dropped in squadron formation on the signal of the leader of the formation, then those of the rear flights will miss the objective.

(ii) If the units form line ahead, which is the best formation for bombing, they are vulnerable to attack.

(*b*) In order to get the best results a compromise has to be effected and the best compromise is

(i) To have a good defensive formation to the objective.

(ii) When over the objective units to form line ahead for bomb dropping.

(*c*) Experience has proved—

(i) Formations are essential and that bombs dropped in formation give the best result.

(ii) A flight of six aeroplanes can hold its own against heavy opposition, but a smaller flight cannot do so.

(iii) Out of a squadron of 18 aeroplanes only 12 can consistently be expected to cross the lines.

(*d*) From the experience the following facts are established :—

(i) A bombing unit must be a flight of six aeroplanes in order that the flight may be able to defend itself during the period it is dropping bombs.

(ii) A bombing formation must consist of three flights of six aeroplanes each.

(iii) As a result of (*d*) (i) and (ii) a bombing squadron must consist of four flights each of six aeroplanes.

It may be all right in the case of twin-engined aeroplanes having a good arc of fire in all directions and a good supply of ammunition to have squadrons of 12 aeroplanes each and a bombing formation of nine aeroplanes, but in the case of single-engined machines, I feel certain the squadrons must consist of 24 machines so as to permit a formation of three flights of six aeroplanes each over the lines.

15. Bomb Dropping.—With regard to placing the bombs accurately on the objective :—

(*a*) Experience with the independent force shows that unless there is a good bomb sight, the target will not be conscientiously aimed at if it is situated in a town, and consequently the object of the raid is rendered useless.

(*b*) The problem of whether the pilot or the observer is to do the sighting and bomb-dropping is one of the utmost importance and can only be solved as the result of constant experiments. My own idea is that :—

(i) In the case of two-seater aeroplanes there should be officers qualified in air pilotage to fly in the leader's aeroplane of each flight to do the sighting and bomb dropping. An alternative sight easily set in the air should be available so that the pilot could use it in case the observer was killed or wounded. This sight is also necessary to enable the pilot to bring the aeroplane over the objective so that at the last moment only a slight alteration of the course will have to be made at the instance of the observer before the aeroplane is accurately sighted and the bombs are dropped. Duplicate bomb releasing gear should also be fitted.

(ii) Alternatively, bombing machines should be capable of carrying three passengers or the equivalent weight of the third passenger in bombs. The leader of each sub-formation to carry, in addition to an aerial gunner, a navigator to do the sighting and the releasing of the bombs. All the other aeroplanes to carry the equivalent weight of the navigator in bombs. As in (*b*) (i) above, duplicate sights and bomb release gear should be fitted.

16. Design and Armament.—With regard to design and armament of bombing aeroplanes :—

(*a*) It is clear that both these matters are of the utmost importance if good results are to be obtained and casualties avoided.

(i) There is a tendency to-day to leave the exhaust on the engine open. It was found in the D.H.9's in the Independent Force that the gases from these open exhausts seriously affected the observers and in the end long exhaust pipes had to be fitted. In view of this experience the question of fitting suitable exhaust pipes to all long-distance bombing aeroplanes should be considered.

17. Air Pilotage.—Air Pilotage plays one of the most important parts in the success of a bombing squadron, not only in the actual dropping of the bombs, but in getting the formation to the objective. The radius of action of aeroplanes is increasing as time goes on, and unless the question of supplying officers trained in air pilotage to bombing squadrons is taken in hand, bombing will not achieve the results that it should.

18. Deductions.—*The Independent Force.*—The result achieved by the Independent Force, having regard to the unsuitability of the aeroplanes with which it was equipped, was wonderful; but in considering the effect of bombing I think these results should be regarded as the minimum that could be obtained by a similar force equipped with modern aeroplanes, properly fitted with armament and bomb sights, and supplied with the necessary officers trained in air pilotage.