'It is my thesis that airmen have always hoped to conduct EBO [effects-based operations], even if they did not use the term, and they sought to do so at the strategic level of war. There’s the rub, because up through most of World War II – and some would say even today – airmen did not yet have the analytical, cognitive or intelligence tools necessary to determine the effects or the effectiveness of their strategic air operations.'

Dr Phillip Meilinger, ‘Air Warfare: A Historical Perspective’, in Effects Based Warfare, p. 52

Warfare waged from the air has now been a fact for just over a century. From the early days of air power being employed as an instrument of military power, airmen have made attempts to measure the effect that their actions have had on the adversary and then to connect these effects to the success of the operations being undertaken. Viewed from this perspective it becomes apparent that effects-based warfare is not really a new concept as such.

Since the conduct and characteristics of war is continually evolving, and has been over the centuries, the concept of effects-based warfare has also evolved. On the other hand, not unexpectedly, the nature of war has remained unchanged in its pursuit of the desired political end-state, the accompanying violence and brutality, and in its unpredictability. In the factors that influence its evolution as well as its steadfast constancy in its nature, another factor has remained with absolutely no change—war is a human activity.

In the second half of the 20th century, modern technology enabled a revolution in military affairs that influenced the international strategic environment. This revolution brought about the ability to create highly enhanced situational awareness. Perhaps more importantly, it enabled a military force to predict, with a much higher level of assurance than before, the adversary’s probable actions and reactions to an emerging situation. In turn, the same technological advances made it possible to strike and/or neutralise the centres of gravity of an adversary. Air power heralded the assurance of precision, discrimination and proportionality to these offensive actions.

From the beginning of its employment as a military power projection instrument, air power has strived to create and sustain the effects necessary to subdue the adversary and ensure that no action inimical to one’s own interests are initiated by them. Air power has journeyed for the past century with this cardinal principle at the core of its conceptual development and employment.

Even before the outbreak of World War I and the induction of air power into the military triumvirate, its effect on the conduct of war was well-understood, at least by military professionals. The earliest were the effects created by balloons, which provided a ‘live’ and wider perspective of the battlefield either through direct observation or aerial photography. These observations provided the inputs necessary to improve the accuracy of artillery fire on the adversary. Essentially, as Lord Wellington put it, it gave the land forces the ability to see ‘the other side of the hill.’ By 1911, the Italians had ‘air-bombed’ Libya and although the damage done was miniscule, it was reported to have created a ‘dramatic’ effect on the adversary.
During World War I, as early as 1916 in Verdun, both the opposing militaries realised the criticality of having to obtain and maintain air superiority to achieving overall victory. Air superiority was required to have the freedom to carry out air reconnaissance that in turn facilitated accurate artillery fire in support of the infantry manoeuvres. Achieving air superiority had become the core effect necessary to ensure success in the surface battle. Effects-based application of air power—even though not termed as such—had become a reality. By 1918, when World War I came to an end, all the roles and missions that air power undertakes to this day had been attempted and their effect on the conduct of war was already being studied.

In 1917, the Zeppelin raids on London created what was perhaps an unintended effect. Even though the damage inflicted by the raids was insignificant, they led to the institution of the Smuts Committee and the subsequent formation of the Royal Air Force in 1918, the first independent air force in the world. The most important strategic effect created by the advent of air power as a military force in World War I was the acceptance of the concept of total war. This development was a classic case of operational effects creating strategic repercussions. During World War I, air power very clearly demonstrated that it could transcend land boundaries and thereby attack the adversary homeland, if so desired. The battle of fronts, as practised until then by the surface forces had been converted to one of areas, that could be chosen at will by the application of air power. Further, with the development and introduction of four-engine bombers into the air power calculus, the concept of ‘taking the fight to the enemy’ took on a new meaning.

The large bombers were introduced towards the very end of the War and therefore their impact on the conflict was minimal. Even so, the major lesson that was derived from their employment was the profound effect that the idea of ‘strategic bombing’ had on air power thinking and conceptual development. The other significant air power development that crystallised at the end of World War I was the emergence of the clear connection that had to be established between technological developments, tactical requirements and concepts of employment in order to create the necessary effect to achieve the desired military and political objectives. This trend has been enduring in air power development and doctrine since then.

Taking off from the concept of total war, in World War II, the quest for creating strategic effects—buttressed by the belief that air power could bomb a people/nation into submission—became intertwined with the Strategic Bomber Offensive against Germany. The less than optimum results of this campaign somewhat diffused the focus that air power had so far maintained on conducting effects-based campaigns.

Despite the diffusion in the creation of effects through strategic bombing, the employment of air power throughout World War II in terms of conducting effects-based campaigns had a common conceptual thread. It highlighted the need to identify the correct target set/system to be neutralised in order to generate the effect that was required to achieve the desired objective. Further, it was also realised that the ability to find, fix and hit the selected target was equally important to create the necessary effect. From 1942 onwards the two requirements were merged, which was the start of the development of effects-based targeting and the subsequent search for the centres of gravity of the adversary.

These operational requirements that emanated in World War II led, even as the War was being fought, to a concerted effort at a combined tactical and technical innovation level that refined air operations in such a way as to dovetail it into an enduring form of operational art and strategy.

**Key Points**

- In the second half of the 20th century, technological advances in air power made it possible to strike and/or neutralise the centres of gravity of an adversary with the assurance of precision, discrimination and proportionality to these offensive actions.

- As early as 1916, it was recognised that achieving air superiority had become the core effect necessary to ensure success in the surface battle since air superiority was required to have the freedom to carry out air reconnaissance that in turn facilitated accurate artillery fire in support of the infantry manoeuvres.

- It emerged in World War II that the conduct of an effects-based campaign required the identification of the correct target set/system to be neutralised in order to generate the necessary effect to achieve the desired objective.