

# The psychology of children: Twisting the Hull-Birmingham survey to influence British aerial strategy in World War II<sup>1</sup>

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*Zusammenfassung:* Nach einem kurzen Überblick über die Luftmacht-Strategie, die ergibt, daß bei Beginn des Zweiten Weltkriegs die strategische Wirkung der Luftbombardements hochspekulativ waren, stellt der Beitrag die Entwicklung der politischen Beziehungen zwischen Winston Churchill und seinem späteren wissenschaftlichen Berater, F. A. Lindemann (Lord Cherwell) im Vorkriegs-England dar. Kurz nach Beginn des Krieges, als beide Seiten das Luftbombardement beabsichtigen, schlägt Solly Zuckerman, einer von Lindemanns Wissenschaftlern, Lindemann eine psychologische Befragung der Städte Hull und Birmingham vor, um die Wirkungen eines Luftbombardements auf die britische Moral zu ermitteln. Zuckermann empfiehlt, daß als ein Element in die Befragung das psychologische Profil der Jugendlichen in den Ziel-Städten ermittelt werden soll. Die Genehmigung, eine solche Untersuchung einschließlich der Ermittlung der Profile von Jugendlichen zu erheben, wird erteilt und Zuckermann kommt zu dem Ergebnis, daß Luftbombardements eindeutig nicht den Willen der Bevölkerung brechen; dies teilt er Lindemann mit. Dieser ignoriert – vermutlich aus politischen Gründen – die Befunde von Zuckerman und legt Churchill nahe, daß Luftbombardements den Durchhaltewillen der Zivilbevölkerung brechen. Churchill benutzt Lindemanns Bericht, um die Britische Luftkampfstategie fortzusetzen.

*Abstract:* After a short survey of the development of air power strategy, in which it is observed that at the onset of World War II the strategic effect of aerial area bombing was largely speculative, the article recounts the development of a political association in pre-war Britain between Winston Churchill and his future chief scientific advisor, F. A. Lindemann (Lord Cherwell). Shortly after the start of the war, as both sides pursue area bombing, one of Lindemann's scientists, Solly Zuckerman, suggests to Lindemann a psychological survey of the cities of Hull and Birmingham to determine the effect of area bombing on British morale. Zuckerman recommends that one element of the survey include a psychological profile of adolescent children in the target cities. Given permission to undertake such a survey, including the children's profile, Zuckerman concludes that area bombing was clearly not breaking the will of the people to persevere, and reports so to Lindemann. Lindemann, probably for political reasons, ignores Zuckerman's analysis and apprises Churchill that area bombing will break a civilian population. Churchill uses the Lindemann report to justify continuing the British area bombing strategy.

## **1. The Philosophical Antecedents for the Hull-Birmingham Psychological Survey**

Before the advent of the world wars of the twentieth century, there was considerable speculation and prophesizing about the significance of air power. Professor Michael Sherry of Northwestern University has documented an „age of fantasy,“ when the possibility of aerial war was the domain of futurists like H. G. Wells.<sup>2</sup> But after World War I, while the technological evolution of the airplane proceeded at breakneck speed, the military decisiveness of air power became a question of vigorous debate. Some military strategists believed that the implications for warfare were immense. This period of strategic debate Sherry has aptly called the „age of prophesy.“

The prophets of military aviation—men like American Brigadier General William „Billy“ Mitchell, Italian Giulio Douhet, Englishman Basil Liddell Hart, and Russian Alexander P. De Seversky—heralded a new kind of warfare. World War I began as an essentially two-dimensional conflict: Troops were deployed in trenches facing a similarly deployed enemy, on a well-defined „front.“ Rear areas were relatively safe from the attacks of the enemy, and unless a breakthrough or flanking action occurred, the enemy could not readily attack population centers, industrial complexes, transportation centers, and lines of communication. But aircraft added a third dimension to warfare—a vertical dimension—and changed the implications for the prosecution of war. The potential obsolescence of strategies based on long-held geo-political presumptions suddenly compelled their reassessment.

For example, when German Zeppelins bombed Britain as early as 1915, the significance of the isolation provided by the English Channel was obviously diminished. The Zeppelin bombings were of little strategic significance, but manifested a considerable psychological impact—a fact not lost on post-war military analysts. The import of these initial attacks was reinforced by German airplane attacks on British cities in 1917, which „ . . . did more than kill a few civilians. . . . The public demanded action which led to the establishment of the Royal Air Force. The only reason for having an air force separate from naval and army command was to be able to mount strategic bombing offensives.“<sup>3</sup>

It was now possible for strategists to envision large-scale, potentially decisive attacks on enemy cities.<sup>4</sup> This prospect prompted considerable philosophical debate on the nature of war. Were civilian population centers legitimate targets? Military strategists argued that the destruction of industrial targets would destroy the capacity of the enemy to wage war. By extension, it seemed logical that by bombing population centers, civilian housing could be destroyed

to the point where the work force, sufficiently displaced, would cease to be productive. Civilian morale would crumble, the military-industrial production necessary to wage war would be interrupted, and resistance would be dealt a fatal blow. Even if the entire population was not rendered homeless, great numbers of displaced civilians would strain the enemy's ability to wage war by taxing both the political bureaucracy and the industrial infrastructure. Moreover, population centers were surely an easier target to locate and bomb than individual industrial targets.

These ideas represented a departure from the traditional prosecution of war. Although there are historical exceptions, for centuries European-style wars had customarily been fought by professional soldiers and mercenaries who recognized rules of chivalry and gallant behavior. While armies were not adverse to invading a country to intentionally live at the expense of the enemy's agricultural economy, nor was a navy likely to be reluctant to bombard a coastal city, the advent of air power meant that an armed force could target virtually all civilian and industrial targets. Strategists saw a new implication for warfare—such a tactic might defeat an enemy while avoiding a decisive battle of armies. Developments in the technology of war just prior to the advent of air power provided a kind of philosophical precedent upon which the new warfare depended.

By the mid-nineteenth century—in, for example, the Crimean War and the American Civil War—the progressive depersonalization of battle due to advances in weaponry was well established. Technology offered the rifled gun to replace the musket, the repeating rifle, and the machine gun. As the nineteenth century gave way to the twentieth, the tank, submarine, and chemical warfare in their turn contributed to a new kind of warfare, where the range and efficiency of the new weapons made mass killing of the enemy easier. As an extension of this technological evolution, the airplane offered the ultimate method by which to conduct indiscriminate and impersonal warfare.

At the heart of the argument of the air power strategists was the assumption that aircraft were unstoppable. They asserted it was impossible to protect every military, civilian, or industrial target, and that wars of attrition, as exemplified by the trenches of the First World War, would therefore be obsolete. Ultimately they asserted that war was not waged only upon the army of the enemy, but upon his entire population. It was the enemy population that through its political assent, industry, and moral support provided the means by which war could be waged. This prosecution of „total war“ against the civilian population could only result in a swifter decisiveness. However, to the extent that this idea was accepted as military dogma, it marked a change in the traditional, Clausewitzian object of

war; that is, rather than the pursuit of diplomatic or territorial advantage, the object of war became political-philosophical triumph and unconditional surrender.<sup>5</sup>

There was a contrary view, however. In the view of some, air attacks on civilian populations would constitute a barbaric and indiscriminate attack upon the defenseless elements of society, especially the traditionally non-combatant parts of society—women and children. Moreover, an attack on civilian targets would destroy not only military-industrial targets, but cultural and educational centers, landmark architecture, and humanitarian institutions. They further pointed out that the submarine warfare of the First World War, which had sufficiently enraged the Americans to precipitate their entry into the war, constituted a dark precedent for the indiscriminate killing of innocents that unrestricted aerial warfare implied.

This theoretical debate continued as airplane capability developed: Thus, in the period shortly before the outbreak of World War II, the question of the prosecution of war by airplanes remained unresolved. Some doubt persisted over the potential of air power to be decisive in war, and how airplanes could best be utilized to achieve a swift victory. It was fairly well understood by all the military powers that airplanes would be a significant element in warfare, whether in the tactical support of armies and navies, the transportation of troops and material, the strategic bombing of military-industrial sites, or the area bombing of population centers. But the number and type of aircraft needed to pursue such missions, and the potential effect on enemy troops and civilians, was unclear. In naval warfare, for example, the conservative view was that the airplane would never change the fundamental balance of naval power defined in terms of ships-of-the-line: Only the ultimate domination of the aircraft carrier in World War II naval operations would at last convince reactionary admirals that the airplane had rendered the battleship obsolete.

In preparing to wage war on land, the armies of the various military powers adopted diverse aerial strategies. The Luftwaffe, for example, was essentially conceived as an adjunct to blitzkrieg-style warfare—that is, as a tactical element supporting a swiftly advancing army. The most successful German airplane at the beginning of the war was the Stuka dive-bomber, which often served, in effect, as highly mobile long-range artillery. The Stukas were most productively utilized in close support of troop movements, and not for the strategic bombing of enemy territory. Thus, when the Wehrmacht found itself confronted by the English Channel, the assurances of Hermann Goering that the Luftwaffe could bomb the British into submission exhibited a rather sanguine bravado. The Luftwaffe was not well equipped to prosecute a strategic bombing war, especially

when faced by stiff fighter plane resistance and the need to overcome new detection technologies like radar.

The British, for their part, fared so badly at the outbreak of hostilities that there were precious few alternatives for prosecuting the war other than by strategic bombing. In England it was politically necessary to retaliate against the enemy, if simply in order to stiffen morale and to demonstrate the national will. The British army had been pushed from the continent, Britain's allies were defeated, and the prospects for meaningful counteraction were grim. The aerial Battle of Britain finally resulted in a British victory after the Luftwaffe, assigned a mission for which it was ill prepared, met firm British opposition, was forced to fight in Britain's airspace, and suffered from the disadvantage of British radar intelligence.

Thus, after the Battle of Britain established English domination of the air - at least sufficient to prevent the invasion of the British Isles- the British were faced with the implementation of a bombing strategy. Heavy losses in the Battle of Britain and during initial daylight bomb runs over Europe dictated conservation of the remaining strategic bombers. Later, with the arrival of their American allies, it was necessary to coordinate separate bombing strategies and to reconcile differing philosophies. In general, early in the war the Americans advocated a strategy of „pinpoint“ attacks on key military, industrial, and transportation centers. To facilitate target identification, these raids would be carried out by day in high-altitude heavy bombers. British strategists, on the other hand, lead by the Prime Minister himself, now argued for the area bombing of population centers by night. Two practical considerations augmented the usual arguments for area bombing: RAF bomber groups were already battle-depleted, and night bombing could be pursued against much less resistance. British heavy bombers could not fly as high their American counterparts, making them more vulnerable in daylight raids.

Following the fall of Dunkirk, Goering tried mightily to make good on his boast of domination by air. His initial strategy was to bombard military-industrial targets, but this plan was later replaced by the area bombing of civilian districts. In the onslaught of this relatively new military strategy, the British quite naturally turned to its scientific community for countermeasures. But the scientists were hard-pressed to respond as quickly as the need required.

## **2. Lindemann, Zuckerman, and Pre-War Politics**

Like other citizens, many British scientists sensed the imminence of war in the latter part of the 1930's. Nonetheless, only a partial mobilization of the scientific

community had been effected when war came. One of the most significant attempts to focus scientific endeavor was that related to the defense of Britain against air attack. Winston Churchill, in the pre-war era he later characterized as „The Gathering Storm,“ was an apparent political has-been who often attacked what he considered irresolute national efforts at defense. His public speeches, however, helped to provide the impetus for the creation of two committees to advise and direct scientific research in air defense. The first of the air defense committees was called the Tizard Committee after its chairman, physicist Henry Tizard; the second was called the Swinton Committee, and was also named for its chairman, Lord Swinton. The former committee, in the assessment of novelist and historian of science C.P. Snow, was the central administrative authority for recommending and implementing scientific research in air defense; it originated from within the Air Ministry. The Swinton committee, on the other hand, was an essentially political assembly engaged in public debate on policy. It was established by Prime Minister Stanley Baldwin as a sub-committee of the Committee for Imperial Defence, in the assessment of Snow to deflect criticism of the Tizard committee. Both committees were established in 1935.<sup>6</sup>

Winston Churchill obtained a seat on the Swinton Committee, and managed to have physicist F. A. Lindemann (Lord Cherwell) installed on the Tizard Committee. Lindemann was a contentious enemy of Tizard, and the two had engaged in a vicious, *ad hominem* battle as Oxford University dons.<sup>7</sup> In this earlier battle, Lindemann had leaned heavily on Churchill for political support, and found in Churchill a loyal and sympathetic patron. In the face of growing ugliness in the Tizard affair, Churchill may well have saved Lindemann from irretrievably disgracing himself. This alliance is a significant element in understanding the subsequent relationship between the two; when Churchill became Prime Minister, Lindemann would become his chief scientific advisor, owing the Prime Minister a significant debt of gratitude.

Tizard and the rest of the committee on which Lindemann served identified radar as the best hope for the successful anti-aircraft defense of Britain. While they sought to obtain large sums to support its research and development, Lindemann adopted an obstructionist attitude: He was a devil's advocate, refusing to accede to any plan that the committee proposed to adopt, and countering with preposterous alternatives, like floating „aerial mines.“ Why he did this is not entirely known, though Snow cites jealousy of Tizard and Lindemann's „ . . .habit of getting self-blindedly attached to his own gadgety ideas...“<sup>8</sup>

Despite Lindemann's obstructions, the labors of the Tizard Committee (which finally used a parliamentary trick to remove Lindemann) resulted in a small but significant British lead in the deployment of radar. In the Battle of

Britain this early British adoption of radar would prove to be a significant factor contributing to victory. However, radar and the at-best marginal superiority of the British fighter planes was not sufficient to stop the ferocious German air attacks on Britain when the war began. As Prime Minister Stanley Baldwin had predicted in 1934, „The bomber will always get through.“<sup>9</sup> The German bombers hit both military and civilian targets, and, especially early in the war, the effect of such bombing was unclear. Some pre-war air power strategists had predicted that as the infrastructure was destroyed, the will of the people to resist would collapse. It was, of course, of considerable interest to know whether there were any actual signs of such an occurrence materializing. That is, could any change in the national will to fight be scientifically detected and documented, and could a causal relationship be established between any reduction in morale and the German bombing?

One scientist particularly interested in this question was Solly Zuckerman, later Lord Zuckerman. Zuckerman, born in 1904, was a Jewish Englishman of South African origin, trained as a primatologist and a medical doctor (he never practiced).<sup>10</sup> He enjoyed a brilliant scientific career characterized by research in anatomy and several other fields; he virtually invented the science of forensic ballistics, and in the pursuit of data in this field during World War II, he conducted some rather macabre experiments on animals and cadavers. At the outbreak of the war Zuckerman became interested in the design of high explosive bombs, and after measuring the effects of blasts both controlled and inflicted by the enemy, he was able to suggest improvements for British ordnance.

The relatively youthful Zuckerman's catholic scientific interests and promising abilities in research made him a desirable addition to the cadre of professional scientists mobilized to pursue war research. Though he was essentially trained in anatomy, Zuckerman easily and successfully applied the scientific method to subjects far afield of his formal training. His empirical and pragmatic approach to problem-solving was a characteristic quickly appreciated by the military; consequently, Zuckerman established his credibility and utility as a scientist capable of significant inquiry outside his field. Still, particularly near the beginning of the war when the Hull-Birmingham survey was conceived, Zuckerman's scientific work was undertaken by approval: Though Zuckerman was in charge of the research of other scientists in various pursuits, his investigations were both authorized by and passed up the chain of command to F. A. Lindemann, Winston Churchill's scientific advisor.<sup>11</sup>

### 3. „How Do You Measure the Will of the People?“

In 1941, though he was involved in several other scientific inquiries, Zuckerman became interested in the psychological effects of bombing on the British population. He basically wanted to know whether German area bombing was having a deleterious effect on British morale. In August 1941, Zuckerman met with Lindemann at Cambridge. Lindemann, who was an advocate of the areabombing of the civilian population of Germany, was, according to Zuckerman, „. . . much concerned by the hostile reaction in official and unofficial quarters to [the British] bomber offensive.“ Zuckerman recalled that:

. . . we discussed the possibilities of finding a more objective basis for the strategy of a bomber offensive than was implied by the simple belief that Germany could be bombed into submission. The idea I put to him was that what was needed was a survey of the overall effects of bombing on some English cities. I suggested that we choose for study Hull and Birmingham, first because the Bomb Census had an almost complete tally of the bombs that had fallen on them, and second because they could be regarded as typical of manufacturing and port towns. The Prof [Lindemann's nickname] agreed the job was worth doing. . . .<sup>12</sup>

Among the specific questions Lindemann wanted Zuckerman to address were „how many tons of bombs does it take to break a town?“ and „how should the bombs be delivered—should it be in one sharp attack, or in what ratios should the total load be distributed and over how many nights.“<sup>13</sup> Zuckerman's colleague, J.D. Bernal, recalled that „It was a most elaborate combined military, economic and social study of a large city [Birmingham] ever carried out, for we had to measure on one hand the degree of bombing, the casualties and destruction and to compare them, on the other, day by day, with the effects on munitions production and morale in the city.“<sup>14</sup>

During a conversation with Lindemann at Christ Church College, Cambridge, Zuckerman received the go-ahead to conduct as an element of the Birmingham-Hull survey a general psychological investigation. The general objects of such an inquiry were set out in a memorandum of 2 January 1942, which stated that the inquiry was set—

To determine the incidence of excessive anxiety during the raids, & of neurosis at least partly due to raids during the period of the Hull raids [sic]; then for these groups as well as for all the groups investigated to determine the incidence of constitutional factors predisposing to such developments, conditions of living likely to predispose to neurosis of anxiety, and actual raid experiences; and in the case of actually

abnormal cases to try and assess the relative importance of any factors found to be present in each individual case -both factors causing the neurosis and also those causing its recession (if any).<sup>15</sup>

As a concomitant component of his psychological investigation into the effects of area-bombing on morale, Zuckerman suggested that schoolchildren aged 10 to 14 in Hull (and some in Birmingham) write essays on a particularly terrifying raid that they had experienced. It would appear from the archival record that the purpose of the essays was to establish a composite morale profile based on the observations of children, though in his autobiography Zuckerman claims only to have wanted to produce a picture of an air raid as seen by children. In a recent interview, Zuckerman was asked, „What was your intent [in ordering the children’s study]?” He replied, „It was part of an indication of whether or not the population was really scared. . . . One of his [Lindemann’s] beliefs was, provided you put all of our resources into a bombing fleet, you could break the will of the German people to continue. But the question is, how do you measure the will of the people?”<sup>16</sup>

Zuckerman asked for the compliance of the appropriate schools, who apparently were only too happy to cooperate. Hundreds of essays were written by the schoolchildren of Hull and Birmingham—some 14 schools from Hull and two from Birmingham participated—and they now form a considerable mass of manuscripts in the Papers of Solly Zuckerman at the University of East Anglia.

Psychiatrist Dr. Russell Fraser, of the Mill Hill Emergency Hospital, London, was enlisted by Dr. Tom McKeown, Rhodes Scholar and former Zuckerman pupil, to support Zuckerman’s investigation. On 15 February 1942, Fraser wrote to Zuckerman suggesting a method of analysis for the essays, which were written by the children the previous week.<sup>17</sup> Fraser noted that:

I think it is an interesting suggestion of yours about analysing these essays, and hope that you may find these suggestions of some use in deciding on a method of analysis. I take it that the object would be to determine how the children were impressed by raids—what springs in their imaginations were touched. It would of course be impossible to use them as a basis for determining any of the facts of how it altered their lives, or what actual experiences they had. But both these and any abnormalities in their mental state, as determined by subsequent interviews, might in selected instances provide interesting material to compare with the essay material.<sup>18</sup>

Zuckerman, however, a non-psychologist, clearly aspired to derive military intelligence on the effect of area bombing on morale, a far more ambitious product than that suggested by Fraser.

In a meeting at Cambridge on 15 March 1942, Zuckerman consulted with Susan Issacs, a leading child psychologist, on the best method for analyzing the essays. Issacs was the editor of *The Cambridge Evacuation Survey: A Wartime Study in Social Welfare and Education* (London: Methuen, 1941) which dealt with the psychology of children evacuated from blitz cities to the more sheltered west country. In fact, chapter five of that book describes the use of children's essays to collect evidence of the emotional effect of evacuation. Such a scholarly book, which vested the psychological study of children in war with considerable significance, could well have been the original inspiration for Zuckerman's notion, particularly given that the book was published just prior to Zuckerman's foray into child psychology. (When queried Zuckerman did not remember the book). It is not clear why Issacs, as a respected authority on child psychology who would have lent credibility and expertise to such an undertaking, had no further contact with the project.

On 23 February 1942 Zuckerman received word that „Two bales of children's letters left Hull by passenger train for your address on Saturday last...“<sup>19</sup> The analysis of the essays was presumably to begin immediately upon their arrival, under the direct supervision of Fraser. The children were instructed to recount their experiences under the title, „What Happened to Me and What I Did in the Air Raids.“ Each child gave his or her name and address, age, and school, in case some follow-up investigation was later deemed advisable.

As might be expected, some essays are articulate and poignant, while others reflect no particular interest other than the completion of a school assignment. The essay of a thirteen-year-old resident of Hull is representative of the former: It is a terrifying tale of a night of bombing in which the boy's mother was slightly injured and his home rendered uninhabitable. Upon evacuating his shelter, he discovers the body of a child, legs severed and dying. It is, the boy realizes, a neighbor, whose mother is „stricken with grief.“ He recounts finding overnight shelter in a church, and arranging for new lodging with the family landlord until repairs can be effected on his damaged house. The boy's essay ends with guarded optimism, as he reflects that „we feel alright now and time heals all worries and shocks.“<sup>20</sup> An eleven-year-old, also of Hull, observed that „When a bomb and a landmine hit the saw mill it made our shelter shake like an earthquake. There was nobody in our shelter who made a panic.“<sup>21</sup> This was Zuckerman's point: The bombing was not causing panic, nor breaking the will of the people to persevere. But Zuckerman's opinion was formed intuitively, not by scientific analysis.

It seems apparent that an attempt to quantify such subjective material would result in an unreliable general profile grounded in anecdotal evidence—yet there is no evidence of any attempt to provide a control group of essays as a basis for

comparison. (This would have been difficult, but probably not impossible.) The two essays mentioned above, for example, are dramatic testimony, but whether they (and others like them, some of considerably less interest) present the opportunity for greater generalization is questionable.

The criteria by which these essays were to be evaluated were revised several times. It was envisioned that technicians—probably social workers—would make assessments of the children's emotional state by scanning the essays for certain key factors. For example, under the category „severity of raid,“ the reader was expected to check for possible revelations in ten categories:

1. Experienced some injury or hit by plaster, glass, etc.
2. House damaged beyond repair.
3. Window, ceiling and door damage.
4. House undamaged.
5. No bomb within 1/4 mile.
6. Member of family killed.
7. Member of family injured.
8. Friend killed or injured.
9. Knowledge of other people nearby being hurt.
10. Driven by destruction of a raid from one shelter to another on a particular night.

Whether these factors were intended to suggest or reflect a hierarchy of emotional distress is unclear. Indeed, whether „member of family injured“ is somehow more emotionally distressing or psychologically damaging (or even revealing in the sense of determining morale) than say, „friend killed or injured,“ is also unclear. On the face of it, the factors seem uncomparable. Other categories that presented long lists of subjective or arbitrary sub-groups and categories included „personal emotional reaction,“ „other people's emotional reactions,“ „attitude to authority,“ „differential fear reactions of adults and children,“ and „antisocial behavior.“<sup>22</sup>

In the end, it would appear that very little actual evaluation of the children's essays finally took place, despite the considerable effort expended to refine the method of analysis. (The effort to prepare a suitable basis for assessment is reflected by the many revised drafts of data-gathering instruments extant in the Zuckerman Papers.) Undoubtedly, the fact that the essays eventually received little actual analysis (at least based on the criteria established to assess it) was due to the limited personnel available to read and analyze them, and the pressure from Lindemann to obtain quickly results from the greater psychological investigation. The psychological survey itself was an element of the evidence developed for the

larger report for Lindemann, namely, the total effect of air-raids and the breaking point of resistance based on surveys of Hull and Birmingham. Lindemann was anxious to make his recommendations to Churchill.

The report itself, number 2770 of the Ministry of Home Security, Research and Experiments Department, was submitted 8 April 1942. In it Zuckerman stated: „In neither town [Hull or Birmingham] was there any evidence of panic resulting either from a series of raids or from a single raid. . . . In both towns actual raids were, of course, associated with a degree of alarm and anxiety, which cannot in the circumstances be regarded as abnormal, and which in no instance was sufficient to provoke mass anti-social behavior. There was no measurable effect on the health of either town.“<sup>23</sup>

When in an interview Zuckerman was reminded of this passage, and was asked whether, „That conclusion [that] was drawn—the children’s psychological survey was a part of it?“, he replied, „The little I read, or recall having read, ...there wasn’t a single [essay] that said ‚I was terrified or horrified‘.“ The questioning continued:

So they [the essays] supported your view [as written in Ministry of Home Security Report 2770]?

Lord Zuckerman: „Had there been one or two of the let’s say twenty or thirty or fifty that I scanned which said ‚I was terrified out of my wits and what I did in the air raid was got under the bed“ or went off and all that; and ‚I was shaking all over“ and all that; if there had been one or two I would have gone on looking at them...there was absolutely no indication...“

So it did have an effect on your feeling that the will of the people was not broken?

Lord Zuckerman: „Oh, undoubtedly. Undoubtedly from that point of view.“<sup>24</sup>

The report—Ministry of Home Security No. 2770—has been the subject of considerable historical interest, because the psychological survey of which the children’s essays were a part, and which was used by Zuckerman to support the conclusions of that report, was ostensibly the basis for a controversial minute prepared by Lindemann for Winston Churchill. The Lindemann minute, dated 30 March 1942, even before the official report of the Birmingham-Hull survey was submitted, stated that:

„Investigation seems to show that having one’s house demolished is most damaging to morale. People seem to mind it more than having their friends or even relatives killed. At Hull, signs of strain were evident, though only one-tenth of the houses were

demolished. On the above figures we should be able to do ten times as much harm to each of the 58 principal German towns. There seems to be little doubt that this would break the spirit of the people.<sup>25</sup>

However, Zuckerman's report said no such thing, and supported no such conclusion. In his memoirs Zuckerman points out that „although the Prof [Lindemann] used the results of our study to claim that bomber raids of the intensity that Hull and Birmingham had experienced were ‚most damaging to morale,‘ this was the very reverse of what we had stated.“<sup>26</sup>

In fact, when questioned on the subject, Zuckerman was contemptuous: He was asked: „. . . what you had to say with the psychological survey of Hull and Birmingham didn't have any effect on [Lindemann] whatsoever because he was going to make that recommendation to Churchill no matter what you said?“ Lord Zuckerman: „That's right. He continued all the way through. He was arguing in 1944 that way. I mean if your mind's already made up you don't need any facts. . .“<sup>27</sup>

This affair was nearly made public some thirty years ago: The 1960 publication of C. P. Snow's *Science and Government* (followed by a further commentary, *Postscript*), inspired a debate in the *London Times* concerning the effects of the Cherwell-Tizard animosity. Prof. J. D. Bernal, Zuckerman's colleague working on the bombing survey, wrote a draft letter to the *Times*, and sent a copy to Zuckerman. In it, Bernal concluded that „To an ordinary scientist this report [of Zuckerman's] would hardly have been taken to support the thesis of the strategic value of industrial bombing but Lord Cherwell claimed that it proved that as German bombing of Birmingham had produced very little effect, a very much heavier bombing of German cities must produce a decisive one and he took action accordingly with the results we all know now.“<sup>28</sup> Interestingly, Zuckerman found this analysis „unfair,“ because Tizard once wrote that „he did not disagree fundamentally with the bombing policy.“<sup>29</sup> Zuckerman was able to persuade Bernal not to publish his letter.

Were there other, perhaps ulterior motivations for Lindemann's rubber-stamping of the government's policies? Winston Churchill was already an advocate of night-time area bombing when Lindemann submitted his minute. Churchill was no doubt influenced by factors such as political expediency and tactical pragmatism—the bomber squadrons were battle-depleted and more vulnerable in daylight raids. Churchill would certainly have been happy to have the support of his chief scientific advisor to justify his approach; moreover, Lindemann would have been quite aware of Churchill's views on area bombing. In view of Lindemann's own political inclinations and personal debt to Churchill, his objectivity was probably compromised. When the data from his scientific

team did not support the pursuit of an areabombing strategy, Lindemann simply insisted that the data could be interpreted in another way.

#### 4. Conclusion

To Zuckerman's thinking, Lindemann was merely mirroring the public reaction to „bomb them back,“ though he also allowed that so early in the war, there was little other choice. But these decisions had wide-ranging implications, including the allocation of industrial resources. For example, there was sentiment among some scientists (including Zuckerman) that less emphasis should be placed on building long-range bombers, and more on anti-submarine defense and control of the seas. This Lindemann strongly opposed, as the pursuit of other strategies would have reduced the resources available for strategic bombing.

Thus, because F. A. Lindemann was predisposed to make the recommendations contained in the 30 March 1942 minute, the children's essays, and indeed the overall Hull-Birmingham psychological study of which it was a part, were intentionally misinterpreted to support the government's strategic bombing policy. It is perhaps ironic that because of the questionable scientific rigor with which the study was undertaken, and the incomplete analysis to which the data were subjected—especially the children's essays—the entire project could have been dismissed as simply inconclusive. But the very subjectivity of a psychological survey, especially one so incomplete and unexamined, may have encouraged Lindemann to take liberties with his interpretation of the findings.

On the other hand, the collection of essays now comprise a remarkable collective remembrance of aerial warfare as experienced by the children of two English cities. The vividness with which some of the essays convey the horror of war is both riveting and heartbreaking. Whether the essays could ever have been an important tool for measuring morale is doubtful; but instead we are left with a poignant record of total war from a unique perspective. This unintentional legacy finally renders a measure of what the essays were intended to impart. Through the anecdotal evidence of so many children, we obtain a window into the collective experiences of the most vulnerable element of a society at war. The picture one may form by reading these essays is perhaps not psychological, but it is historically relevant. These are eyewitness reports, and though innocently written, often ring of truth.

If nothing else, the essays serve as a counterpoint to the pre-war advocacy of total war, and of the strategy that predicted the ease with which the will of an enemy could be broken by area bombing. For just as Zuckerman observed, the essays are a testament to courage and perseverance. The strategists, in their

visions of wars to come, saw waves of unstoppable bombers blackening the skies; but they never envisioned the resilience with which even the children could respond. The essays are one bit of supporting evidence that the kind of area bombing to which both sides were subjected in World War II was, by itself, not decisive. The sages of air power, in this respect, perhaps overestimated the effect of strategic bombing, by underestimating the steadfastness of civil resistance.

## Footnotes

- <sup>1</sup> I am especially grateful for the assistance of Drs. Siegfried Jaeger and Irmingard Staeuble of the Free University of Berlin, Dr. Jeffrey Cohen of the American Philosophical Society, and Dr. Frank Steckel of the University of Alabama for their kind assistance and useful criticisms of this article. To Dr. Steckel, who suffered a severe injury in a car crash during the final preparation of this work, this paper is respectfully dedicated.
- <sup>2</sup> Michael Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven: Yale University Press, 1987), pp. 1-21. H. G. Wells wrote *War in the Air* (1908), which helped to popularize the phrase „air power.“
- <sup>3</sup> Frank Field, „What of the Unsung Hero?“ *The Independent*, 25 May 1992, p. 17.
- <sup>4</sup> A concise history of air power theory may be found in David MacIsaac, „Voices From the Central Blue: The Air Power Theorists“ in *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*, Peter Paret, ed. (Princeton: Princeton University Press, 1986), pp. 624-47.
- <sup>5</sup> An excellent treatment of the relationship of air power to morality and the changing nature of war may be found in Louis A. Manzo, „Morality in War Fighting and Strategic Bombing in World War II,“ *Air Power History*, Vol. 39, No. 3 (Fall 1992), pp. 35-50.
- <sup>6</sup> See C. P. Snow, *Science and Government* (London: Oxford University Press), 1960.
- <sup>7</sup> See The Earl of Birkenhead, *The Prof in Two Worlds* (London: Collins Press, 1961). Also of some interest is Harrod, R. F., *The Prof* (London: Macmillan and Co., 1959).
- <sup>8</sup> C. P. Snow, *Science and Government* (London: Oxford University Press, 1960), p. 33.
- <sup>9</sup> Cited in Snow, p. 24.
- <sup>10</sup> Though Lord Zuckerman was interviewed in the course of the preparation of this article, he died shortly thereafter, on 1 April 1993.

- 11 Solly Zuckerman, *From Apes to Warlords, 1904-1946: The Autobiography of Solly Zuckerman (1904-1946)*, London: Hamish Hamilton, 1978.
- 12 Zuckerman, *From Apes to Warlords*, p. 140.
- 13 Cited in Zuckerman, *From Apes to Warlords*, p. 141.
- 14 Bernal to the editor *London Times*, 27 April 1961, unpublished. Zuckerman Papers, The University of East Anglia Archives, Norwich, England, SZ/OEMU/35/1. Hereafter referred to as Zuckerman Papers.
- 15 Zuckerman Papers, „Psychiatric Enquiry,“ SZ/OEMU/35/5.
- 16 Martin L. Levitt’s taped interview with Lord Zuckerman, conducted at the University of East Anglia, Norwich, England, 16 March 1992. Hereafter referred to as „Zuckerman Interview.“
- 17 Zuckerman Papers, RF to SZ 15-2-42, SZ/OEMU/35/5.
- 18 *Ibid.*
- 19 H. Smith to Solly Zuckerman, 23 February 1942, Zuckerman Papers SZ/OEMU/35/8.
- 20 Zuckerman Papers, SZ/OEMU/36/2.
- 21 Zuckerman Papers, SZ/OEMU/36/2.
- 22 Zuckerman Papers, „Analysis of Schools Essays,“ SZ/OEMU/35/8.
- 23 Ministry of Home Security Research and Experiments Department report: Quantitative Study of the Total Effects of Air-Raids, p. 3, Zuckerman Papers, SZ/OEMU/35.
- 24 Zuckerman interview.
- 25 Cited in Webster, Charles and Noble Frankland, *The Strategic Air Offensive Against Germany 1935-1945*, (London: Her Majesty’s Stationery Office, 1961), I:332.
- 26 Zuckerman, *From Apes to Warlords*, p. 146.
- 27 Zuckerman interview.
- 28 Zuckerman Papers, Bernal to The Editor, *The Times* (unpublished), 27/4/61, SZ/OEMU/35.
- 29 Zuckerman papers, SZ to JDB, 30 April and 1 May 1961, SZ/OEMU/35.

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