Place Annihilation: Area Bombing and the Fate of Urban Places

Kenneth Hewitt

Department of Geography, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5

Abstract. Aerial bombardment in World War II brought devastation to innumerable settlements in the European and Pacific theaters of war. A distinctive development, however, was the area bombing of cities remote from the battle zones, particularly in Germany and Japan, where Allied bombing raids razed more than 750 km² of central built-up areas and involved nearly every city. Some 1.5 million civilian residents of those countries were killed in this way and more than 2 million were seriously injured. To the millions uprooted from their homes by official evacuation were added more than 16 million made homeless by bomb destruction. This paper examines these events as a process of place annihilation and immolation: the combined destruction of resident civilians, residential communities, their neighborhoods, and major features of the urban environment and civil ecology. The destruction of urban support systems, the nature of civilian injuries and death, the areal differentiation of damages, and the problem of their meaning for the interpretations of place are examined as essential features of this annihilation of urban places. Finally, some suggestions and questions are set down as to the significance of these events for both urban studies and the threat of area bombing in its projected form of thermonuclear devastation.

Key Words: urban studies, place, civil ecology, air power, strategic bombing, World War II, Germany, Japan, thermonuclear war threats.

T HE destruction of places has been a recurrent consequence of natural calamity and human violence. It may be a relatively infrequent phenomenon overall and has seldom been fully achieved. In wars, however, the rhetoric of place destroying becomes widespread. Attempts to wipe out settlements and their inhabitants are commonly pursued with an extreme thoroughness. From such acts flow "the disasters of war." In fact, there is no more apt introduction to my subject than the etchings of Francesco Goya (1746–1828) bearing that title. Sharing my concerns here, he depicts mainly the plight of noncombatants: the impact of war on the old, children, women, and ordinary men made destitute, mutilated, or summarily executed. In such civil settings warfare clearly concerns a broader group of geographers than those interested strictly in military geography. Goya's choice of material also prefigures the now-common notion of war as a threat to ecological or biological existence. Moreover, his vi-

sion is prophetic. Its message transcends the events he saw in Napoleon's Peninsula War. Whatever the changes in armies and weaponry, the atrocities he portrays could equally have come from more recent wars, including the bombed-out cities described below. In turn, the immediate significance of bombing casualties and urban devastation in World War II lies in its prophetic relation to the thermonuclear threat. Finally, Goya's genius conveys a sense of moral outrage and a gallows humor with respect to the champions and slogans of war (see Shikes 1969).

From the perspective of peacetime activity and civil society, nearly everyone treats war as a disaster. It shares much of the vocabulary and interpretive notions applied to natural calamities. If the impact on civil society is disastrous, however, war is still the occasion of highly organized, premeditated, and collective acts of devastation and killing. These acts are directed against persons and their means of support. Warfare intends the disorganiza-

tion of enemy space. During major conflicts the same is expected to happen to one's own space. Thus, war brings destruction and death through acts of men. Only too often, these acts involve the land, human settlements, and noncombatants. What we shall examine here was clearly understood, in the language of air force strategy, as planned destruction, although its apologists may charge that I dwell upon "unfortunate" or "unplanned" side effects.

Geographers have contributed much to the study of natural and other peacetime disasters. War we have given almost no treatment. Nevertheless, few of the phenomena we study are unaffected by past wars and by the organization for potential future wars (Hewitt 1979). Few of our interests are unaffected by the occasions and outcomes of violent encounters. Urban places and their geography, in particular, are deeply embroiled in preparations for and consequences of war making. There is even a certain direct reciprocity between war and cities. The latter are the most thoroughgoing constructs of collective life, containing the definitive human places. War is the most thorough-going or consciously prosecuted occasion of collective violence that destroys places. That the warring state depends vitally upon its own cities was the thesis upon which urban bombing in World War II was based. Today we tend to be transfixed by massive urbanization, by the growth in human numbers. That should not blind us to the scale of destruction of urban areas in past wars, notably of the twentieth century, anymore than to the threat to all of that urbanization and much or all of its citizenry by a World War III.

Here my concern is with World War II. A perusal of the geographical literature suggests little of the effect of this war in the shaping of modern geography. Its destruction of cities, as of much else, remains *terra incognita* for us. I shall look at only one part of it, namely the aerial bombing of populous cities more or less remote from the battlefields.

The Mortality of Places

I use the concept of place as the main point of reference. Although we cannot explore many of its larger meanings in relation to bomb destruction, I am consciously accepting their reality as rich and central to under-

standing in human geography. Thus place cannot be fully comprehended as merely a set of spatial relations, biophysical habitat, and impersonal socioeconomic functions. Its material attributes are indeed essential ingredients and vital clues to its larger meanings. However, the core of the concept is that those ingredients are *shaped* into places by the personal works, exchanges, and intelligent participation of resident communities. This view is expounded, for example, by Eliade (1959, 20–65), Bachelard (1964), Relph (1976), Tuan (1977, 1979), and Seamon (1979). In their various ways, these authors show human occupancy as the making and sustaining of places through coordinated actions, unceasing communication, shared experience, symbols, values, and identities. Hence, our places are literally composed and thereby endowed with an existence and a history that define the human attributes of a world. I do not say that an era of rampant individualism, mobility, and physical change, including violent change, raises no difficulties for the concept or for the phenomena that place tries to encompass. In part, the attempt to refine and legitimize the idea of our settlements as lived and living space is a reaction to rapid change. Yet, as a shared cultural phenomenon a place endures though individuals come and go or as some portion of the material setting changes or is consumed. To accept that is to perceive places as participating in the distinctive features of intelligent life, its creativity and search for order. But places also share the problems of survival and mortality in our biological existence.

Just as biological life may be called a set of activities intended to resist death, so our place and world are at least partly a means to resist psychosocial and cultural dissolution. That becomes more readily apparent when war or other calamities damage and threaten to destroy land and settlements. Unfortunately, war also mobilizes the highly charged and dangerous dialectic of place attachment: the perceived antithesis of "our" places or homeland and "theirs." Sustained in latent if not overt forms in peacetime, this polarization has produced unbridled sentimentalizing of one's own while dehumanizing the enemy's people and land. That seems an essential step in cultivating readiness to destroy the latter and bear with progressive devastation at home.

Rootedness is the fundamental metaphor

of place in human life. The derivation of the words we use is literally radical here, as they bear upon geography in general and upon my particular topic. Thus, to eradicate or extirpate, is not directly to destroy plant, animal, or person as individual detached organisms, but to uproot them. To exterminate is literally to kill by geography, not necessarily damaging an organism, but driving it beyond the bounds. Exiles, expellees, and others compulsorily displaced have often described their plight as tantamount to cultural starvation, if not death or worse. That may seem too subjective to situate the problem squarely within modern geographic scholarship. Nevertheless, the geographical impact of the uprooting and removal of tens of millions of people from their longtime homes in the wars, expulsions, and evacuations of this century cannot but be enormous. Moreover, such events constitute a large part of the other face of what Yves Lacoste (1973) calls "geographical warfare." In this case it is societal rather than physical vulnerability that is involved.

Precedents for Place Annihilation

The destruction of cities in World War II must be set within a long record of violence to places. It is a record, perhaps, of relatively rare events, but not as insignificant as its absence from our inquiries would suggest. War is probably the most common context.

In Western history, Carthage seems the epitome of a city's untimely end: a man-made blank on the map. Here, the political rhetoric of Cato was made an accomplished fact. After the successful siege of 146 B.C., the Romans plundered and burned the city, ploughed its ruins, and sowed them with salt. They dedicated the site to the "infernal gods" and forbade all human habitation there. Typically, there was propaganda suggesting that Carthaginian infamies had justified Rome's merciless action.

Few conquerors have been as maniacally thorough as the Romans at Carthage, but there are other examples. Even then, the Roman commander wept as he watched the destruction. The historian Polybius (c. 200−118 B.C.) tells us he recalled Troy's fate centuries earlier and foresaw a similar one for Rome in the future (Polybius 1927, Vol. 6, 433−39). Rome has been more fortunate,

though the eternal city barely survived destruction under Nero, the Visigoths, Vandals, and, during World War II, the attentions of British and American bombers.

In our century, the most publicized example of place annihilation is the Czech village of Lidice (Hutak 1957; Bradley 1972). Here, German forces of occupation were directed by Hitler to make an "example" and reprisal for Heydrich's assassination in 1942. The village was razed. All signs of its layout were disguised. Even the river was rerouted and the site "landscaped" to blend with surrounding fields and grazing lands. All males over 16 years old were taken out and shot. All women and older or "non-Aryan" children were separated and transported to concentration camps where few survived. Some small children were renamed and dispersed to orphanages or S.S. families to be "Germanized." Even more than Carthage, the insane thoroughness here gives us a full, if negative, picture of what place consists of: its more-than-physical reality and the farther reaches of what must be done to produce "placelessness."

Lidice is neither the only nor the largest example of such place-annihilating atrocities in our century. It does raise another issue of war that will be relevant to my discussion: intentions and acts going even beyond annihilation. This was place immolation, a word implying sacrifice, the harsh token of larger purposes, and allowing something or someone else to live. More disturbing still, we are confronted here with the apotheosis of power: the act of selecting victims.

World War II bombing is rarely cast in this light. Yet its civilian casualties are called victims, its devastated cities the awful sacrifices of war. Nor are the survivors of Hiroshima alone in going a step further, thinking of themselves as not only victims but guinea pigs (Lifton 1957, 343−45). The decision to bomb city areas indiscriminately, like most other uses of the airplane then, has been called experimental even by its defenders. However, the more conventional techniques used in place annihilation at Carthage and Lidice clarify where that decision led. Any policy of war that indiscriminately makes places its targets, whether settlements, political groupings, or whole nations, takes a large step toward the ultimate politico-biological crime of genocide, for the certain fulfillment

of such a policy is possible only through the annihilation of place and people. To pursue it inevitably sucks warfare even further into genocidal rather than just military actions. In practice, if not in initial intent, we will see how the strategy known by the seeming geographic title "area bombing" followed such a path. It became a form of extermination aimed at the whole spectrum of human or, more exactly, civil ecology.

Aerial Bombardment in World War II: Some Preliminaries[1]

Aerial warfare, though unique to our century and of unique destructive potential is not the only place-destroying strategy: and it has been used more commonly to extend well-tried military methods. The novelty of "dog fights," dive bombing, or *kamekazi* attacks is made much of, but all have close analogies to ancient fighting practices. The main use of aircraft in war has been for defense and in support of land and sea campaigns. Meanwhile, even without the bombers, modern warefare annihilates places in the course of normal battle operations.

In both World Wars, most direct damage to the environments of land and sea, to settlements and noncombatants, no less than to armies, was in the battle zones as conventionally understood. In most campaigns of World War II, large numbers of settlements, including cities, were razed and emptied of inhabitants. In this way almost total devastation occurred at, to name a few, Tripoli and BenGhazi, Cassino and Fiume, Caen and St. Lo, Wesel and Julich, Vyborg and Stalingrad, Mandalay and Myitkina in Burma, Tengchong in China, and Naha on Okinawa (see Hewitt 1982, *Figs. 1 and 2). Each suffered heavy* bombing, although artillery, naval bombardment, or armored attack sometimes did far more destruction.

Germany may have pioneered the "Blitzkrieg" or lightning war, the sudden thrust of armor and motorized infantry behind heavy air strikes, sometimes accompanied by massive artillery bombardment. In due course all major belligerents adopted similar practices, with similar or more destructive results. Such actions and the war at sea consumed the greater part of the bombs and occupied most of the aircraft in the European and Pacific theaters of war.

Though of unprecedented extent and intensity of destruction, this too was an extension of earlier forms of warring (c.f. Keegan 1976). Moreover, if war is, in von Clausewitz's much-quoted phrase," the continuation of policy by other means" (Howard and Paret 1976, 87), it inevitably concerns itself with cities as centers of industry and power. The reduction of cities by siege is an ancient form of war. It does blur the distinction between military and civilian involvement. It has customarily resulted in the sacrifice of civilians (Duffy 1979, 246−55). Yet it is difficult to exclude cities from war or to differentiate sieges wholly from other military engagements. Finally, in numbers at least, aerial bombardment or its threat had the greatest impact on civilians by uprooting them. Millions of Europeans spent months or years bombed out of their homes or as evacuees from strategically important cities (Iklé 1958; Calder 1969; Harrisson 1976). Millions more suffered the same treatment in the Pacific theater, though this has been little studied. That the threat of the bomber forced the evacuation of so many to avoid accidental injury and death and that bombing so often struck nonmilitary targets unintentionally are themselves huge civil consequences of war. The present concern goes beyond that. The raids we shall examine were actually directed against cities and their occupants.

Area Bombing

In World War II area bombing involved mass raids, usually by hundreds of heavy bombers arriving in waves, and it was intended to lay down as dense a carpet of bombs as possible. Even then, attempts at laying waste city areas with high-explosive bombs proved ineffective, so that area bombing increasingly involved fire raids, in which mainly incendiaries were dropped. In the end it was the spreading of the fires that caused most of the damage and casualties and that defines the essential character of area bombing (Bond 1946). For the victims, fire even more than explosion was the experience that also placed area bombing firmly in the category of terror bombing (Rumpf 1962; Daniels 1975).

A complicating and ironic part of our subject is the fact that terror bombing, raids to disrupt built-up areas and terrorize civilians, was mainly identified with air forces of the countries whose cities suffered most from area bombing in World War II: Italy, Germany, and Japan. Each had experimented with terror bombing in, respectively, the Ethiopian (1933−36), Spanish Civil (1936−39), and Sino-Japanese (1937−45) Wars. Without exception, the towns and cities they had bombed lacked aerial or antiaircraft defenses and rarely had air-raid shelters (see Stockholm Peace Research Institute 1975; Higham 1972). These atrocites played a role in Allied propaganda and in blunting public reaction to what happened in World War II. Two things should be noted here. First, some nations in the forefront of condemning those raids and demanding urban bombing be outlawed as methods of war were doing the same thing to undefended towns and villages in, usually, their own colonial territories. In 1921 Winston Churchill, on the advice of Air Marshall Trenchard and T. E. Lawrence, authorized punitive air strikes against "intransigent tribesmen" in Mesopotamia, a practice that also involved the Sudan, Somaliland, and the North West Frontier of India (Divine 1966). Aircraft were used for similar purposes by France in, for example, Morocco (Gottman 1943, 253). The moral climate that concerns us was already surprisingly widespread. Second, appalling as those terror raids were, their scope was trivial compared to the area bombing we are to consider.

Area bombing was a sharp, if not wholly distinct, escalation in the use of war to destroy people and place. First, it struck against populous cities remote from the battlegrounds and regardless of the likelihood of invasion by forces in the land and sea campaigns. Second, like terror bombing, it attacked civilian areas regardless of the ability and readiness of the cities to defend themselves. Third, it belonged to "strategies of annihilation" (Weigley 1973), attacking cities and their inhabitants almost regardless of what and who were destroyed so long as it was as much and as many as possible.

Area bombing arose within and is still often treated as synonymous with strategic bombing. It contrasts with precision or tactical bombing, whose targets are points of clear military, industrial, or communications value to enemy war efforts. However, air war realities have always been shakier than the concepts behind such terms. Problems of bombing accuracy produce indiscriminate damage in most tactical and precision bombing. Charges of atrocity have dogged aerial bombardment since its first use by the Italians in Libya in 1911 (Higham 1972, 21−23). An essential aspect of the area bombing story in World War II was its serious adoption only after the agonizing inability of bomber crews to make precision raids against well-defended or distant targets. In the early part of the war they often failed to find the targets. Throughout the war, heavy bombers could rarely hit targets they did find and generally suffered disastrous losses from antiaircraft and fighter defenses when going against militarily vital points (Webster and Frankland 1961; Middlebrook 1973; Hastings 1979; USSBS 1947a, 72; Craven and Cate 1951, Vol. 3; Bendiner 1981).

A geographer must also observe that area attacks are likely to be much less effective strategically than precision ones. Even when densely built up, an area carries less leverage than key facilities and points in the spatial (war) organization of a state (c.f. Liddell Hart 1946, 360). Not surprisingly, despite the devastation, military critics of area bombing could find much evidence that it rarely if ever achieved what its advocates claimed for it.[2]

However, as the bombers' targets became just the densest parts of city cores and as bombers attacked poorly defended urban areas with ever-denser carpets of bombs, the more they destroyed the city as living space. The human scale of places, their close texture and density in many city areas, makes them peculiarly vulnerable to the impact of area bombing. It is for this reason as well as the thermonuclear future of such warfare, that the geographer's attention is required.

From Table 1 it is apparent that the cities subjected to area bombing suffered enormous, life-destroying multilation. Even sober technicians of the postwar Strategic Bombing Surveys described the worst cases as "dead cities," "ghost towns," and "lunar landscapes" (e.g., Bond 1946, 92). Just when or whether a city or part of it "expires" may be impossible to specify in objective or subjective terms. Survivors often feel that even total

physical destruction has not finished their place forever. Folk who returned to the bombed-out remains of their cities, like many survivors of natural calamity (Oliver-Smith 1977), went on clinging to the site and vestiges of their places (Rumpf 1962). Some they rebuilt to look as closely like the prewar version as possible (e.g., Bieganski 1972). The robust significance of place is shown repeatedly by groups of survivors who remember, care for, and, if they have the means, resettle and recreate their place. In that sense, the bombed cities, if not their internal places, appear to have recovered and gone on to greater vigor and growth since the war. There is, however, a profound gulf between the place-making possibilities for survivors and the aim and use of place-annihilating strategies.

The need to remember civilian casualties is, to me, at least as compelling as the need to remember the soldiers who fell. But one should beware of poking about in such ruins of human places and lives without good reason. We have one such reason, which is both personal and "cosmic": we live under the shadow of the same threats, magnified many times. The rationalizations and the moral climate that led to Allied area bombing still surround us. What was militarily dubious, and a manifestly insane cultural and ecological policy then, has been enormously expanded in scope through developments in conventional bombing techniques, let alone thermonuclear ones. In light of such developments, I shall argue that area bombing in World War II was, to redeploy a phrase of Karl Kraus, "a proving ground for the destruction of the world" (Janik and Toulmin 1973, 63).

Area Bombing in Europe: the Destruction of German Cities

Urban devastation in air attacks throughout the European theater was very extensive. How far and how much of this was in method or intention area bombing as defined above is a moot point. The threat and practice of bombing to terrorize populations was a standard German Blitzkrieg approach; its early use against Warsaw and Rotterdam was widely publicized. Some devastating Luftwaffe raids on Beograd and Moscow (but not "Fortress Malta") were area bombing. So were the "blitzes" against London and some other British cities. However, most Luftwaffe bombing of Britain, like the Allied bombing that so devastated Italian and other European cities outside Germany, seems tactical, or strategic, but not in the area bombing sense. Likewise, the Japanese used preemptive and terror-bombing raids in their opening war moves. Except perhaps for Chinese cities like Chungking, they did not develop area bombing strategies. In turn, with the exception of the USAAF raid on Hankow in China, December 18, 1944 (Craven and Cate 1953, Vol. 5, 610; Stockholm Peace Research Institute 1975, 36), the Allied area bombing in the Pacific was restricted to Japanese cities late in the war.

Four nations stand out in the impact upon them of area bombing. In order of increasing destruction and civilian casualties they are Britain, Italy, Germany, and Japan. For the sake of perspective, if that is possible in such matters, a summary of the gross impact upon each of these is presented in Table 1.

I will focus most of my attention on Germany and Japan. In part, that is because the British case has been well served by studies in English, and Italy's experience seems to have received little attention even in Italian, except Bonacina (1970). In any case, with the possible exception of Messina, Milan, and Turin, the magnitude and completeness of urban devastation by heavy bomber raids in Italy never approached that of the cities described below.

Raids against urban centers within the prewar boundaries of Germany were carried out almost daily, if weather permitted, between May 1940 and May 1945 (Webster and Frankland 1961). Britain's first deliberate area-type raid was against Mannheim, 16 December 1940 (Hastings 1979 93). The showpiece raid against Lübeck, 28 March 1942 (Harris 1947), opened area bombing as RAF Bomber Command's major concern.

When they entered the war, America's bombers were generally used to carry out only "precision" raids. They suffered the same problems of inaccuracy and crippling losses as the RAF in such raids, and produced much indiscriminate destruction too, but only occasionally did they adopt an overtly area attack in the European theater. They did

Table 1. Comparative Figures for Area Bombing of Cities of Britain, Italy, Germany, and Japan in World War II*

	Britain[a]	Italy[b]	Germany[c]	Japan[d]
Civilian Casualties				
Deaths	60,595	59,796	c.600,000[e]	>900,000[g]
Injuries:				
Major	>86,000	—	c.800,000[f]	>1,500,000
Minor	>150,000	—		
Built Area Destruction				
(Number of Cities)[h]	c.45	c.50	70	62
Area Destroyed (km²)	c.15	(?) c.100	333	425
Proportion of Built-up Area	3%	(?) c.25%	39%	c.50%
Housing Losses: Housing Units	tens of thousands	tens of thousands	2,164,800	2,500,000
Persons Made Homeless	c.500,000	several million	7,500,000	8,300,000

* Major sources:
   [a] Calder (1969); Bidinian (1976).
   [b] Bonacina (1970).
   [c] USSBS (1945a, 1947e); Rumpf (1962); Irving (1963); Bidinian (1976).
   [d] USSBS (1946, 1947e); Craven and Cate (1945, Vol. 5); Kirby (1969, Vol. 5); Bidinian (1976); Ienaga (1978).

Notes
   [e] Does not include refugees, foreign-born labor, disabled ex-servicemen, or POWs.
   [f] USSBS, Area Studies Division Report (1947g) gave 420,000; but USSBS, Summary Report (1945a) gave 780,000. 800,000 is the minimum estimate from Rumpf (1962) and Irving (1963).
   [g] Ienaga (1978) gives 658,595 for all Japanese civilian casualties in all circumstances.
   [h] These represent the larger and more heavily raided towns, not all with civilian casualties nor, necessarily, those losing the greatest fraction of their built-up area or residents.

make coordinated raids with the RAF, greatly adding to the damage and difficulties of rescue work after the latter's area bombing.

More than half the bomb tonnages dropped by the Allies in the European theater fell upon Germany. Almost half of that, or nearly 550,000 tons, was employed in strategic bombing of cities (USSBS 1945, p. 608; Webster and Frankland 1961, Vol. 4, 454; Bidinian 1976, 1). Roughly two-fifths of this consisted of incendiaries, mostly "oil bombs." British bombers dropped in total about 50,000 tons on Berlin, nearly 40,000 on Essen, nearly 30,000 on Cologne and Duisberg, and more than 20,000 on Frankfurt and Stuttgart. In each case that is more than fell on London in the Great Blitz. In some months, such as March 1945, the weight of bombs dropped by British and American bombers on German cities was nearly twice that which fell on Britain in the entire war.

Civilian fatalities, excluding unknown numbers of refugees, foreign workers, and prisoners, were nearly ten times higher than Britain's or Italy's. The official German figure now stands at 593,000 (Rumpf 1962; Irving 1963; Bidinian 1975). That is greater than immediate postwar estimates (USSBS 1945).

Nearly 50,000 noncombatant Berliners died; in Hamburg the figure exceeded 55,000. Among 28 cities of the Ruhr-Rhine urban agglomerations, more than 87,000 civilians died. The most concentrated civilian mortality occurred in the three successive strikes upon Dresden, 13/14 February 1945. David Irving's study (1963, 224–27) leads him to a figure of at least 135,000 fatalities.

Evidence of the demographic distribution of mortality is incomplete but leaves no doubt of the predominance of women, children, the aged, and the infirm. That female casualties were generally higher than males is often obscured by the greater overall survival of women in the war. The ratios of female-to-male bombing casualties are known to have been higher in Hamburg (1.6/1), Darmstadt (1.8/1), Kassel (1.4/1), and Frankfurt (1.04/1) (Rumpf 1962, 160); in other cities, such as those in the Ruhr industrial areas, they appear to be somewhat lower. In such accounting, however, children and aged are included in the male as in the female totals. Given the high level of conscription late in the war, when most of the bombing occurred, it is inevitable that resident populations were largely those excluded from combat.

In the flush of victory, Britons may have *been impressed that German civilian casualties were ten times greater than among the bomber crews sent against them (55,573 killed), though the latter was itself a tragically high loss (Saunders 1975, 393).[3]

The amount of the built-up area that was bombed or burned out in Germany was unprecedented. In the 66 largest cities, some 333 km[2] were razed. The destruction in Berlin alone was several times that for all British cities in the war and constituted 60 to 70 percent of the built-up area. It amounted to some 62 km[2], compared to 2.3 km[2] for London, and was second only to Greater Tokyo. Hamburg's loss was also enormous, with 22.1 km[2] razed in the fire raids of July-August 1943

(Middlebrook 1980). In more than 40 German cities *the proportion of built-up area razed* exceeded 50 percent (Webster and Frankland 1961, Vol. 4, 284–86; USSBS 1945). Crude as such measures are, assessments of area destruction offer a preliminary indicator of the physical basis of place annihilation (Table 2, Figures 1 and 2).

Among other measures germane to our discussion is that of housing losses (c.f. Iklé 1958, Chapter 3). At the war's end it was estimated that nearly 2.5 million housing units had been destroyed in the major German cities, or some 39 percent of the national housing stock. The more intensively attacked cities had lost a far higher percentage: for example, Aachen (72 percent), Mannheim (59
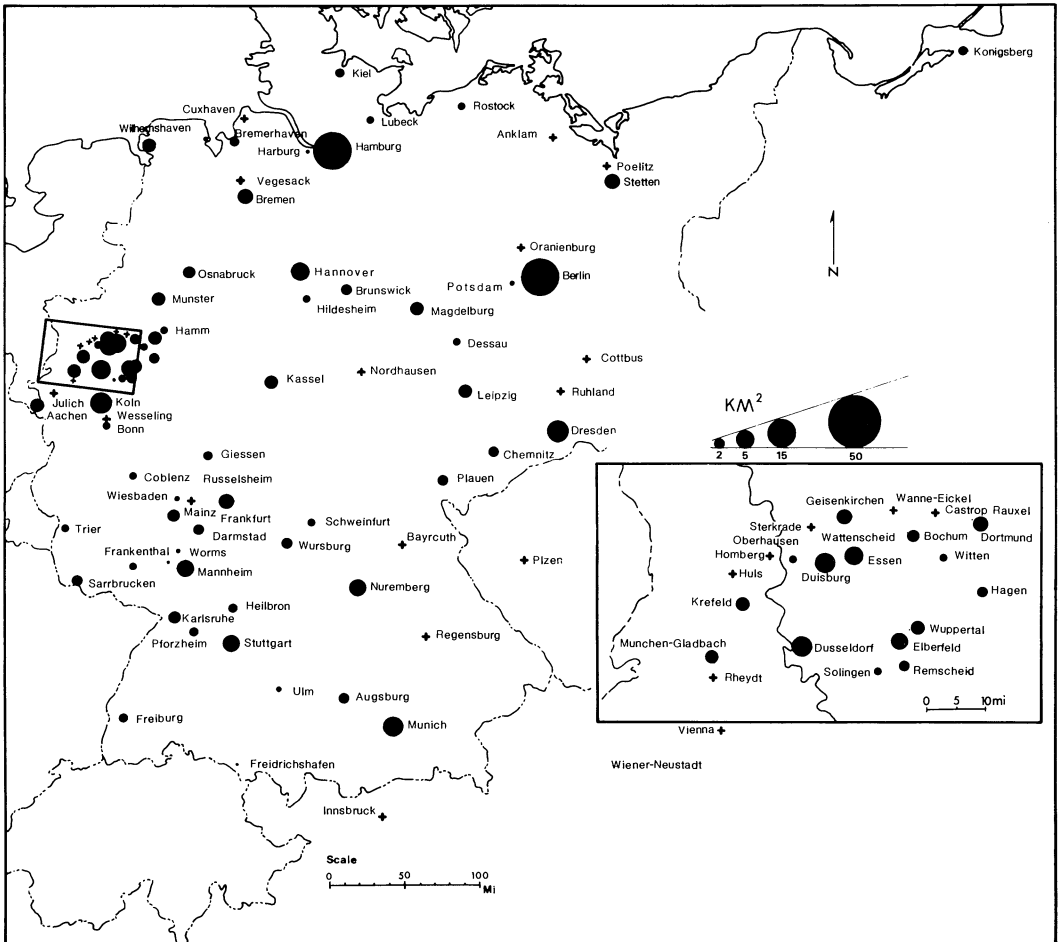

Figure 1. Built-up area destroyed by area bombing raids on German cities in World War II. (Data from Webster and Frankland, Vol. 4, 1961.)
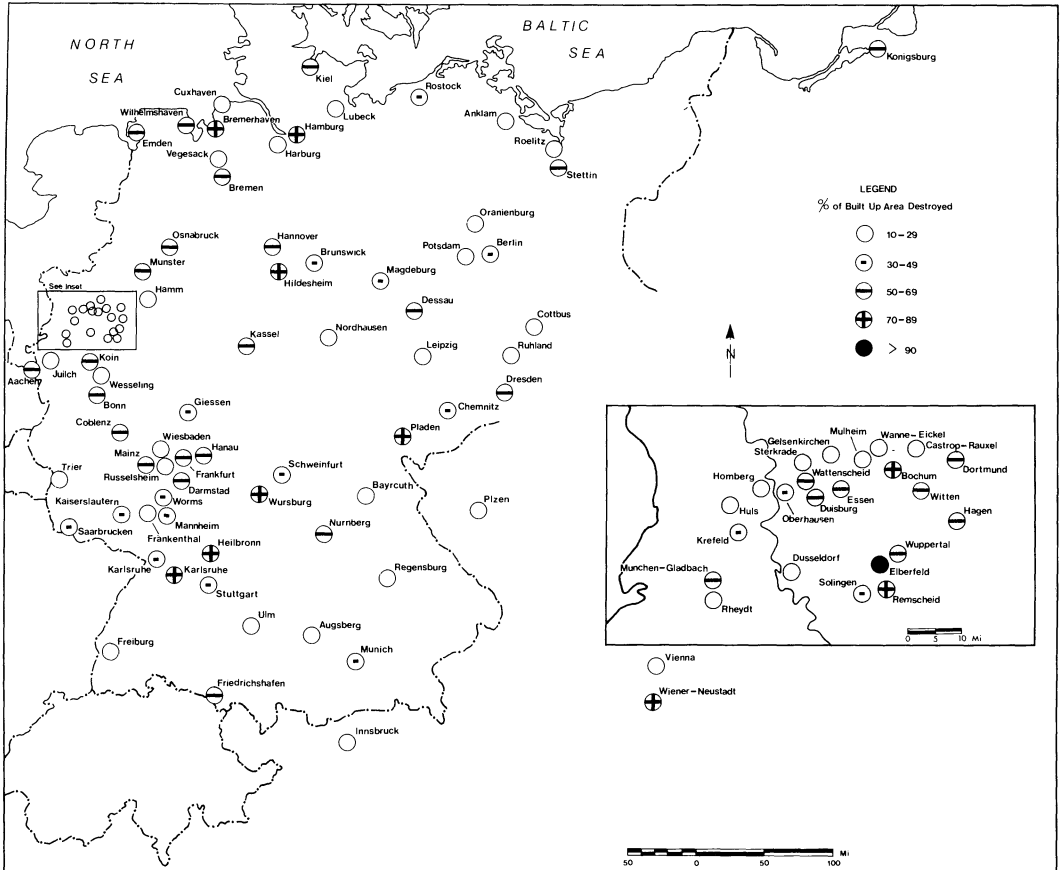
Figure 2. Proportion of total built-up area destroyed by area bombing of German cities in World War II. (Data from Webster and Frankland, Vol. 4, 1961.)

percent), Hamburg (56 percent) and Kassel (55 percent) (Webster and Frankland 1961, 487).

In at least four cities, beginning with the Hamburg raid of 24/25 July 1943, concentrated incendiary bombing generated a new dimension of devastation, the firestorm. Even earlier, efforts to create uncontrollable fires in urban areas were an objective of area bombing. That was part of the rationale for attacking central, congested, older city areas, with their greater amounts of combustible materials to stoke a fire. To achieve that as much as to reduce bombing inaccuracy, the old city centers were generally the "aiming points" in the raids (Harris 1947, 147; Middlebrook 1973). Thus was abandoned any pretense of avoiding damage to noncombatant or non-military structures, to residents old or young, to hospitals, or to works of art (La Farge 1946). Antipersonnel techniques, such as

delayed-action bombs, and second strikes with fragmentation bombs to harass fire fighting and rescue work, were well developed (USSBS 1945a, 72). The firestorm, however, was no more controllable by fire-fighting crews than by the operations planning that strove to start one. About half the civilian bomb casualties in Germany are attributed to the four firestorms at Hamburg, Kassel (22/23 October 1943), Darmstadt (11/12 September 1944), and Dresden. They were otherwise a small part of the total damage to urban places (see Gollancz 1947; Dickinson 1951, 108; Brett-Smith 1967; Böll 1977, 126).

The effect has been to create a huge physical and psychosocial discontinuity between the urban geography of Germany before and since the war. Geographers have said little about that, at least in English. Yet, were one to describe the cities historically, as Dickinson did in *The West European City* (1951),

Table 2. German Cities of More than 100,000 Persons in 1939 Subject to British Bomber Command Area Attacks, With Estimates of Built-up Area Destroyed and Civilian Deaths Where Available*

City	Population May 1939	British Area Bombing				Comments
		Number Main Raids	Built-up Area Destroyed		Civilian Deaths	
			Km²	Percent		
Berlin	4,332,242	24	26.0[a]	33*	49,000*	(a) Includes 1000 Acres, USAAF.
Hamburg	1,682,220	17	25.1	75	55,000	
Munich	838,235	9	6.2	42		
Köln	768,426	22	8.0	61	20,000	
Leipzig	701,606	3	2.5	20		
Essen	659,871	28	5.3	50	7,500	
Dresden	625,174	1	6.8	59	100,000+	Irving (1963)
Frankfurt-am-Main	546,649	11	4.6	52		
Düsseldorf	539,905	10	8.1	64	5,863	
Dortmund	537,000	9	3.7	54	6,000	
Hannover	472,527	16	6.1	60		
Stuttgart	459,538	18	4.6	46		
Duisburg-Hamborn	431,256	18	5.7	48		
Nuremberg	430,851	11	4.6	51		
Mannheim-Ludwigshafen	427,218	13	4.9	64		
Wuppertal	398,099	3[b]	6.1	75	7,000	(b) Includes Barmen and Eberfeld.
Königsberg[c]	368,433	2	1.7	53		(c) Today, Kaliningrad.
Bremen	342,113	12	4.2	60		
Chemnitz	334,563	2	2.3	41		
Magdeburg	334,358	4	3.1	44	15,000	
Gelsenkirchen	313,003	4	1.4	48	3,092	
Bochum	303,288	6	2.15	83	4,095	
Keil	272,311	10	2.9	50		
Stettin	268,915	4	2.9	53		
Halle	220,364	—	—	—		No British area attacks
Kassel	217,085	6	2.5	69	13,000	
Munchen-Gladbach (and Rheydt)	205,700	4	2.5	54	2,087	
Brunswick[d]	201,306	5	2.6	47		(d) Braunschweig
Oberhausen	191,305	11	4.6	51	2,300	
Karlsruhe	189,850	6	1.6	32		
Augsburg	185,704	1	1.8	29		
Wiesbaden	172,039	1	0.36	15		
Krefeld	169,485	2	2.8	47	2,084	
Erfurt	166,661	—	—	—	—	No area attacks, heavy precision bombing
Aachen	165,710	2	2.45	59	2,347	
Mainz	158,971	4	2.4	61		
Lübeck	153,630	1	0.76	30	312	Hastings (1979, 142)
Hagen	151,870	4	1.3	67	872	
Munster	143,748	6	2.6	65	1,595	
Solingen	138,587	2	0.68	49	1,700	
Mulheim	136,805	1	0.78	64	1,300	
Potsdam	136,165	1	0.3	13		
Saarbrucken	135,080	4	1.6	48		
Bielefeld	128,714	—	—	—		No British area attacks
Rostock	122,399	4	0.81	32		
Dessau	120,732	2	1.3	61		
Wilhelmshaven	118,193	9	.52	13		
Darmstadt	115,526	2	2.0	69	12,300	
Freiburg	111,860	1	1.0	37		
Plauen	110,342	1	1.4	51		
Würzburg	108,617	1	1.7	89	4,200	
Remscheid	103,437	1	1.1	83	1,346	
Bonn	101,391	5	0.97	34		

* *Notes* (i) Area destruction is based upon Webster and Frankland (1961) Vol. V1, pp. 484−86.
  (ii) The 1939 population figures are based on Geographical Handbook Series. *Germany,* Volume III, pp. 97−98.
  (iii) Civilian casualty estimates are based on Rumpf (1962), pp. 159−60. unless otherwise indicated.

their life, cityscapes, and culture would exhibit enormous and *irrevocable breaks with the past*, though the equally astonishing reconstruction since may hide the discontinuity.

The Aerial Bombardment of Japan

With few exceptions, . . . all Japan's major cities had been greatly damaged. Ninety had been targets of American raids, of which some twenty were more than half destroyed . . . The statistics were appalling: 8,045,094 people had been either killed or wounded; 2.5 million dwellings had been totally or partly destroyed. . . . In Tokyo alone, a total of 709,906 buildings were either wholly or partly gone. In 1940 the population of the capital had stood at 6,700,000; by 1945, that figure had dwindled to 2,800,000, and of these the majority were living in ramshackle, makeshift huts (Kosaka 1972).

Discussions of the bombing of Japan's home islands have been dominated by the two atomic raids. That is partly because such weapons now represent what the prophets of air power envisaged before the war: the swift and inevitable decider of future wars. Partly it reflects the medical, biological, and ecological threats of radiation exposure. Yet the atomic raids grew directly out of a massive program of area bombing, and the urban devastation and the larger fraction of A-bomb deaths were from blast, heat, and fire. They belong as much to our subject, in philosophy, practice, and impact, as to the prospect of a fully nuclear World War III. Meanwhile, the A-bombs caused only a small part of the total urban destruction, civilian casualties, and trauma of air raids. Indeed, not until later did most Japanese realize that these events were something special within the bombing activity.

Over several months of 1945, prior to the A-bomb raids and Japan's surrender, a series of massive incendiary raids was carried out against cities by the USAAF 21st Bomber Command (USSBS 1946; USSBS 1947a, 197−203). Initially, attacks were concentrated upon five major urban agglomerations. Tokyo suffered a series of attacks that left not less than 155 km² of its built-up area burned out (Craven and Cate 1953, Vol. 5, Chapter 20; USSBS 1947b). The raids on Yokohama, Nagoya, Osaka, and Kobe were equally devastating, adding a further 104 km² of burned out central-city area (USSBS 1947c, 1947d). The fire raids on larger centers were followed,

in the last weeks of the war, by a further series against 57 secondary cities (Craven and Cate 1953, Vol. 5, Chapter 21). They included 10 attacks on Kyushu, 6 on Shikoku, and 41 on the main island of Honshu. The sum of burned-out city area in these was 166 km². In some it approached the total destruction of their built environment. The two A-bombs leveled a further 16.8 km² (see Table 3 and Figures 3 and 4).

More than half the main built-up area of most lesser cities was burned out. There were 30 cities with more than 50 percent razed; 19 with more than 65 percent, and 4 with more than 80 percent. Among Japan's main towns, only Kyoto and Sapporo were spared the major fire raids.

One quarter of the national housing had been destroyed, making 8.3 million people homeless (USSBS 1946; Bidinian 1976, 161−65; Kosaka 1972). The larger part of many cities were empty ghost towns. The combustible nature of most buildings meant there were not even the ruined skeletons and rubble of a built-up area as in Europe; all that remained were great expanses of scorched, flattened wasteland scored by the trace of street patterns and a moonlike scatter of bomb craters (Craven and Cate 1953; Havens 1978, 187).

Even more sorties were carried out against specific industrial and military targets. These were made especially by carrier-borne aircraft, but also in 1944 by the 20th Bomber Command from its network of airfields in Asia. These raids used mainly high explosives against industrial and military targets. Thus, areas not burned out were often as severely damaged as were those towns in the European theater that had been subjected to tactical and pre-invasion bombardment. Civilian casualties in these bombardments may well have exceeded the total for Britain in the war, yet they account for a tiny fraction in the Japanese case.

The incendiary raids are conservatively estimated to have killed at least 780,000 civilians. The A-bomb raids added at least 120,000 (Bidinian 1976). Even without Hiroshima and Nagasaki, we are looking here at overkill in its fullest sense. The area bombing of Japan's cities did not destroy as many persons as some other phases of the war and associated privations or holocausts. But considering the spatial and temporal concentration of dam-

Table 3. Area Destruction of Secondary Cities in Japan by Incendiary Attacks,
June–August 1945 (after Craven and Cate, 1953, Vol. 5, pp 674–75)

Place	Attack Date	Area Destroyed (Km²)	Percent Destroyed	Population
Kyusho				
1 Kagoshima	June 17	5.46	44.1	190,250*
2a Omuta	June 17	0.56	4.1	177,000*
2b Omuta	July 26	5.3	38.0	
3 Fukuoka	June 19	3.5	21.5	323,200*
4 Sasebo	June 28	2.5	48.0	206,000*
5 Moji	June 28	0.78	26.9	139,000*
6 Nabeoka	June 28	1.3	36.0	79,426*
7 Kumamoto	July 1	2.59	20.0	211,000
8 Oita	July 16	1.4	25.2	61,000
9 Saga	Aug. 5	0.05	1.5	50,400
10 Yahata	Aug. 8	3.1	21.0	261,300*
Shikoku				
11 Takamatsu	July 3	3.6	78.0	111,200*
12 Kochi	July 3	2.3	48.0	106,650
13 Tokushima	July 3	4.4	74.0	119,600
14a Uwajima	July 12	.36	14.0	52,100
14b Uwajima	July 28	1.3	52.0	
15 Matsuyama	July 26	3.1	73.0	66,300
16 Imabari	Aug. 5	1.8	76.0	60,000
Honshu				
(a) *Inland Sea*				
17 Okayama	June 28	5.5	63	163,560*
18 Kure	July 1	3.3	40	277,000*
19 Ube	July 1	1.1	23	100,600
20 Shimenoseki	July 1	1.3	36	196,000*
21 Himeji	July 3	3.1	63.3	104,250
22 Akashi	July 6	2.0	57.0	90,000
23 Sakai	July 9	2.1	44.0	182,150*
24 Wakayama	July 9	3.4	52.5	195,200*
25 Tokuyama	July 26	1.1	37.0	38,400
26 Nishinomiya-Mikage	Aug. 5	7.2	29.6	111,800*
27 Fukuyama	Aug. 8	2.2	73.3	56,653
(b) *Sagami and Suruya Bay Areas*				
28 Shizuoka	June 19	5.8	66	212,200*
29 Shimizu	July 6	1.8	50	68,600*
30 Numazu	July 16	3.6	89.5	53,165
31 Kuwana	July 16	1.6	77	41,850
32 Hiratsuka	July 16	2.6	44.2	42,850
33 Tsu	July 28	2.1	57.0	68,625
34 Uji-Yamada	July 28	1.0	39.0	52,555
(c) *Interior*				
35 Kofu	July 6	3.3	65	102,400
36 Gifu	July 9	4.9	74	172,340
37 Utsonomiya	July 12	2.4	34.2	87,868
38a Ichinomiya	July 12	0.02	0.8	70,800
38b Ichinomiya	July 28	2.5	75.0	
39 Okazaki	July 19	1.6	68.0	84,070
40 Ogaki	July 28	0.6	40.0	56,100
41 Hachioji	Aug. 1	2.9	80.0	62,280
42 Maebashi	Aug. 5	2.6	42.5	87,000
43 Kumagaya	Aug. 14	0.7	45.0	49,000
44 Isezaki		0.42	17.0	40,000
(d) *Tokyo Bay Area*				
45 Hamamatsu	June 17	6.3	70	165,000*
46 Yokkaichi	June 17	3.1	60	102,000*
47 Toyohashi	June 19	4.4	52	142,700
48 Chiba	July 6	2.2	43.4	92,000*
(e) *South Coast (Northeast of Tokyo Bay)*				
49 Sendai	July 9	3.1	27	233,630*
50 Hitachi	July 19	2.2	65.5	82,700*

Table 3. Area Destruction of Secondary Cities in Japan by Incendiary Attacks, June−August 1945 (after Craven and Cate, 1953, Vol. 5, pp 674−75)

Place	Attack Date	Area Destroyed (Km²)	Percent Destroyed	Population
51 Chosi	July 19	1.0	33.8	61,200
52 Mito	Aug. 1	4.4	65.0	66,300
(f) *North (Sea of Japan) Coast*				
53 Tsuruga	July 12	1.9	68	31,350
54 Fukui	July 19	4.1	84.8	98,000
55 Aomori	July 28	2.7	64.0	100,000
56 Toyama	Aug. 1	4.8	99.5	127,860
57 Nagaoka	Aug. 1	3.4	65.5	67,000

* Cities also heavily attacked in other raids.
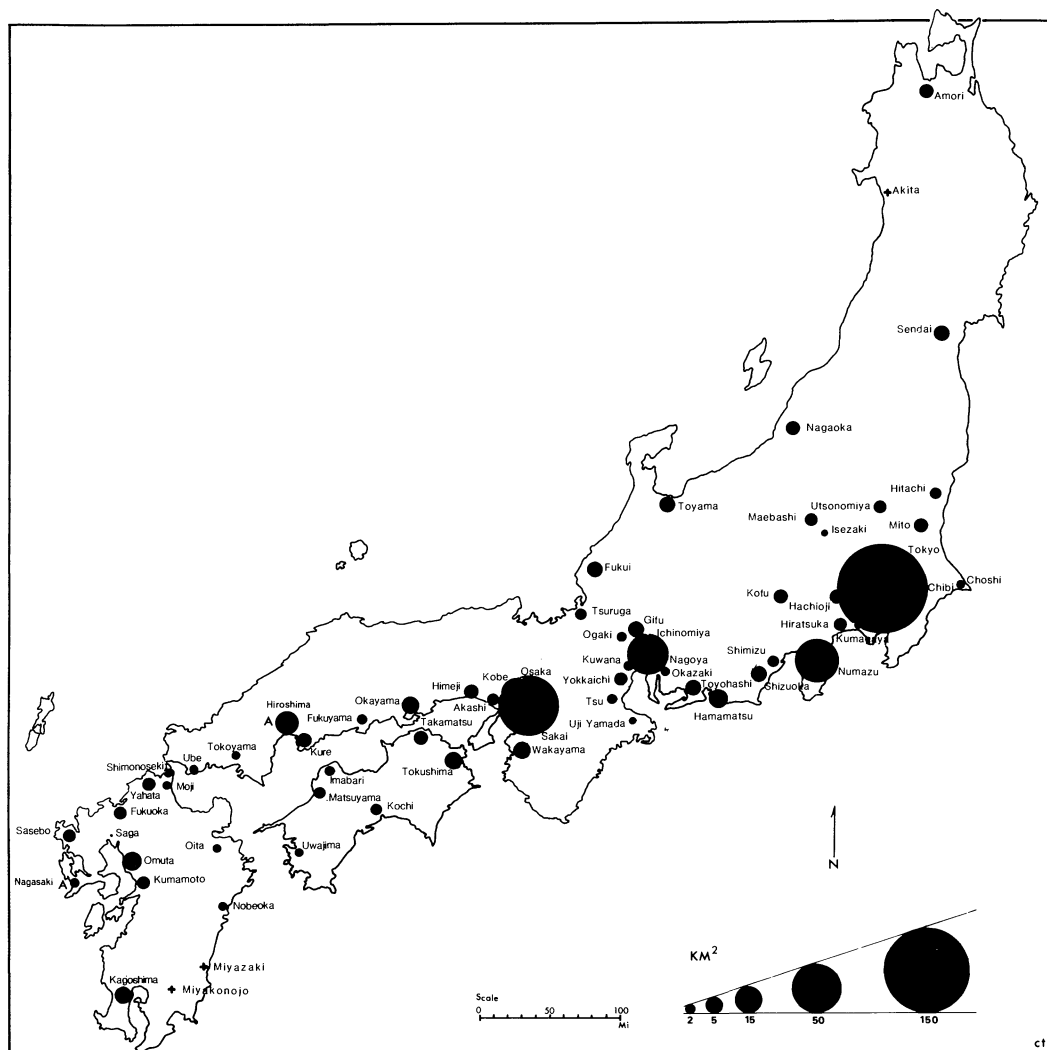
Figure 3. Built-up area destroyed by area bombing raids on Japanese cities in World War II. (Data from Craven and Cate, Vol. 5, 1953.)
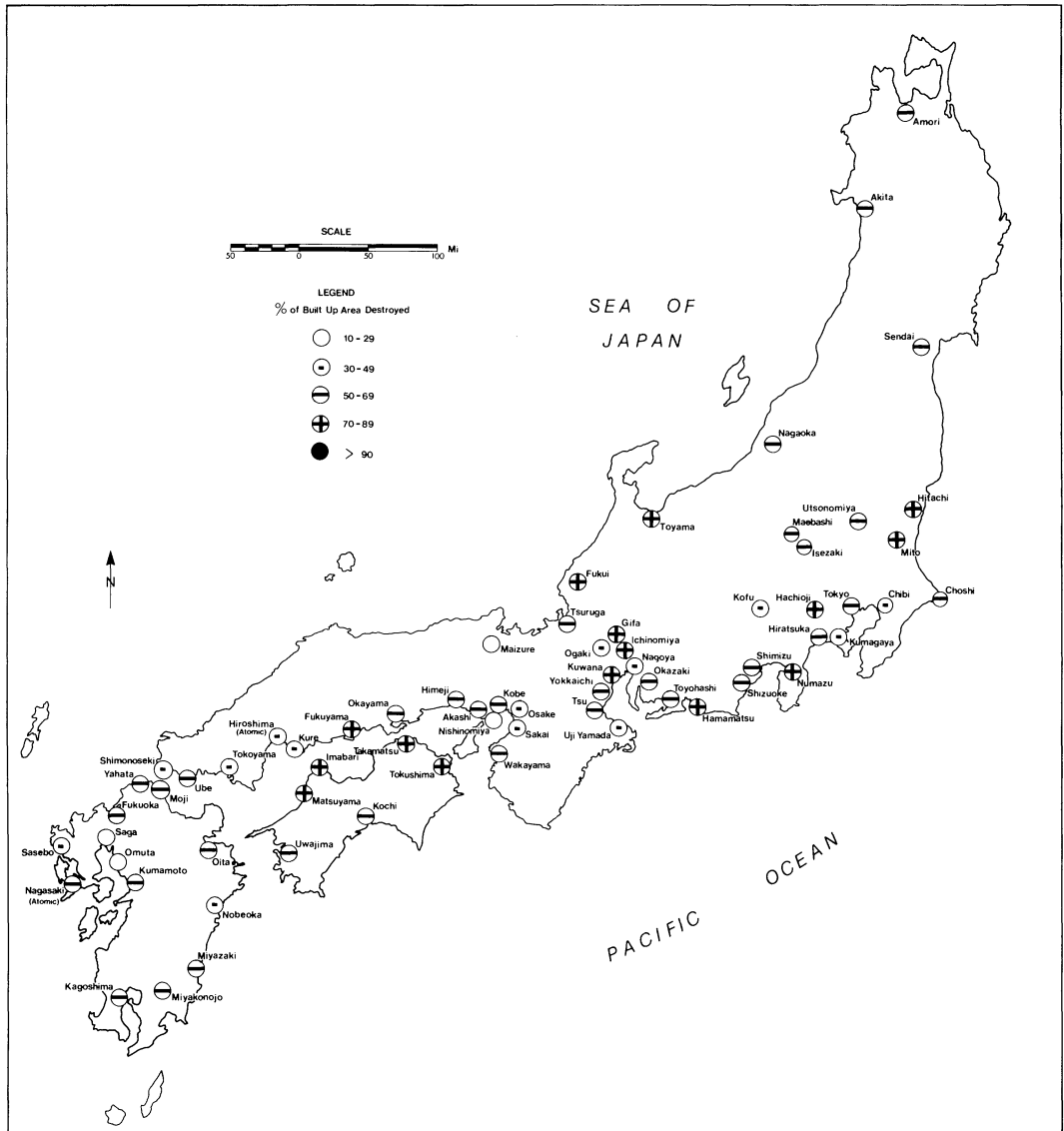
Figure 4. Proportion of total built-up area destroyed by area bombing of Japanese cities in World War II. Craven and Cate, Vol. 5, 1953.)

age (most of it on a dozen days of attacks, within a five-month period in 1945), nothing else to date compares with these raids as a death-dealing, place-annihilating "machine" (see Elliot 1972).

Discriminating Bombs: The Societal Space of Terror Bombing

We must now begin to distinguish between various possible meanings of "indiscriminate

destruction." Normally the term refers to the ethical and managerial problems of bombing. In these senses, the bombing of cities was indiscriminate. It could not be managed so as to ensure precision of attack, and any decision to bomb was to accept that items and persons other than those specified would be hit. Area bombing, which turned civilians and nonmilitary areas into targets, was indiscriminate warfare in an ethical sense. That does not mean, however, that it was undifferentiated with respect to geographical, human

ecological, or societal conditions. The results were not uniformly or randomly scattered across the whole land and society. As in natural disaster or industrial accidents, damage had a definite distribution and risk was not wholly uncertain.

At an early stage, Britain's bombing policy recognized the poor probabilities of hitting anything vital in suburban areas, in middle-class residential areas, or in newer industrial estates. These were all too spread out. Meanwhile, incendiaries were rarely fatal to industrial plant, and when fire raids were planned, bombs alone were still insufficient to start the sort of fire Civil Defense could not handle, a fire that would sweep through the city destroying industrial areas and other vital spots. The answer lay in targeting congested neighborhoods, likely to be full of old timbers and homes packed with carpets, furniture, and curtains with innumerable outlets for gas pipes, electrical wires, and possibly cellars full of domestic fuel such as the coal that did so much to stoke the Hamburg firestorm.

Mr. Churchill's science advisor is said to have advised expressly the bombing of working-class neighborhoods (c.f. Webster and Frankland 1961, Vol., 4, 331−32). The War Cabinet accepted it (see also Trenchard's Memorandum, quoted in Webster and Frankland 1961, Vol. 4, 194). The policy was, however, a closely kept secret until revealed in a book on science and government by C. P. Snow 16 years after the war (Snow 1961, 47−48). Its consequences are readily seen in bombing surveys, but the policy was masked for the general public and air crews in such phrases as "vital nerve centers," "industrial cities," "communications targets," or, at its least euphemistic, "the German industrial worker."

One begins to see, however, who were the majority of women, children, grandparents, and invalids "dehoused," burned, and killed: they were generally the poorer urban dwellers. Also important were the old, whose meager resources, infirmity, or simple nostalgia held them in the congested inner city. Mostly, however, these were families of manual, semiskilled workers and of the soldiers, sailors, and airmen in the lower ranks. We do not know if cultural advisors to bomber commands consciously thought of those neighborhoods as too ugly to worry about. Persons in high places may have recalled that these neighborhoods had been the hard-core areas of unemployment in the Depression and had been viewed as hot beds of disaffection and social unrest. People with the least knowledge of or say in the various nations' affairs were those whose morale was considered most worth unsettling. Their places were obliterated without restraint.

To be sure, other places and segments of society were affected. In the "Baedecker raids" against British provincial towns, widely considered less excusable than other raids, more affluent areas were in jeopardy. Even then, however, to judge from the example of Exeter, lower-income areas were the most heavily damaged or had more concentrated casualties (Davies 1973; Worral 1979). In the London Blitz, German bombing crept slowly from the poorer East End areas into the upper-class neighborhoods of the West End (Harrison 1976, 66). The dollar damage may even have been larger here, but the devastation was never so extensive as in the packed row housing and tenements of working-class areas (see Marwick 1976). Moreover, most hidden evacuation at the beginning of the war, was of the better-off noncombatants. One can gain some sense of that from Virginia Woolf's letters (1980, 406−529). This author's diaries also give poignant descriptions of her walks through familiar but bombed-out places in the more culturally admired areas of London (Woolf 1954, 348-50).

Anna Freud's reports from her Hampstead nurseries in London add another dimension on which I lack material for Germany or Japan: the impact upon the bombed-out child and also the social and economic origins of the bomb-orphans, which in London were again mostly lower class (Freud 1973). Psychological responses to air raids have received considerable attention in accessible literature (Janis 1961; Grosser, Wechsler, and Greenblatt 1964). However, to gain a better sense of the environment of devastation and its impact upon urban ecology and places we must turn to the processes of physical destruction and then how people suffered and died.

Beyond "Coventration": Urban Ecology Under Fire

The raid by 449 Luftwaffe planes on Coventry, England in 1940 presaged the new scope

of strategic bombing (Longmate 1976). It is remembered mainly because a cathedral was destroyed, as well as the inner, medieval city. There were concentrated civilian casualties, with 568 killed and 863 seriously injured.

The list of other damages is a measure of a city's metabolism of functioning. Two hundred thirty-three separate sections of water main were destroyed, impeding fire fighting and leaving most of the city without water. The energy supply system was totally disrupted. Almost all of the city lacked electric power, lights, and gas supply. There were 310 breaks in the main gas supply lines and 2,000 in consumers' service connections. Of 181 buses in the public transport fleet, 6 were destroyed and 77 damaged. Some service was soon restored, but the tram-car system was so badly affected it was never rebuilt. There were 77 destructive and disruptive strikes on railway stations, mainline connections, and goods yards. More than 75 percent of subscribers' lines and 1,800 trunk lines of the telephone system were out of action. Unexploded bombs, a great hazard in efforts to get a city moving again, numbered 210. The major loss of housing was in closely packed, working-class areas near the city core. Because mainly high explosives rather than incendiaries were used, only 12 percent of the damaged housing was demolished or too unsafe for further use. Unlike the later fire raids, large numbers of Britons could return to and spend months or years in partly damaged homes (Calder 1969; Harrisson 1976). One third of Coventry's factories were destroyed, another third took weeks to restore and most of the rest suffered some damage. Few of the Allied heavy bombers would achieve as much even in their precision attacks. Still, the raid became the epitome of indiscriminate bombing. "Conventration" entered Hitler's propaganda vocabulary and Britain's counterpropaganda as the word for city devastation until the attack on Coventry was dwarfed by later events. Like Carthage, a particular city became the symbol of annihilation for other urban places.[4]

On 24/25 July 1943 Britain opened "Operation Gomorrah," sending 791 heavy bombers against Hamburg. The British sent another 787 on 27/28, 777 on 29/30, and 740 on 2/3 August (Webster and Frankland 1961, Vol. 2, 138–67). Nine thousand tons of bombs were dropped in the so-called "battle of Hamburg"; about half were high explosive bombs, with 1,900 tons of liquid incendiaries and 1.5 million thermite stick bombs. More than 250 daylight strikes by American bombers were made at the same time. The first fire-storm generated in the history of war occurred (Middlebrook 1980).

Civilian deaths are estimated to have been between 35,000 and 50,000, with about 37,000 serious injuries (USSBS 1947d; Rumpf 1962). Iklé (1958, 16) notes that this was "only 3.3 percent of the population," whereas nearly half of the city's dwelling units were destroyed. In some congested residential areas around the city core, however, deaths were much more concentrated, exceeding 35 percent of the population in Hammerbrook and South Hamm. About half of all deaths occurred in Grossbezirk Mitte, which included the city center and nearby mostly low-income residential areas. Some 19 percent of the dead, or about 7,000 were children. About 10,000 resident children were orphaned in the raids. The civilian deaths were only 13 percent below those of soldiers from Hamburg on all fronts in the war (Rumpf 1962).

Also destroyed were 24 hospitals, 58 churches, 277 schools, 76 civic buildings, 83 banks, 2,632 stores, and a zoo with many of its captive animals. This was in addition to the more legitimate targets of 183 large and 4,113 small factories, 580 other industrial plants, 180,000 tons of shipping in the port, and 12 bridges.

Essential services were disrupted far more extensively than they were at Coventry, but they were restored very quickly. Railyards and rail services were operating within hours. Electricity supply exceeded demand within nine days. Industrial production rose swiftly almost to preraid levels. Dehoused inhabitants were evacuated or relocated in the city within a short time. The poor ability of area bombing to affect the industrial economy and war-making potential contrasts starkly with its huge impact on civilian lives, property, and urban culture.

At Dresden, the firestorm engulfed more than 95,000 dwelling units and razed some 85 percent of the main built-up area (Irving 1963, 258–60). This raid does seem to be widely known, thanks mainly to Kurt Vonnegut Jr. (1969). Instead of houses, shops, places of

business, amusement, or worship, for each citizen of Dresden "there were 56 cubic yards of rubble" (Irving 1963, 217). The rubble included 72 schools, 22 hospitals, 25 churches and chapels, 32 hotels, 25 large restaurants, 24 theaters and cinemas, 2 museums, 31 department stores, and, to add a touch of irony, 36 insurance company buildings.

There had been incendiary raids on Japanese cities prior to March 1945. The one against Tokyo on February 25 did considerable damage and burned out an area greater than that destroyed in the Dresden firestorm. Yet neither the Japanese nor the 21st Bomber Command had conceived what the "great fire" raid on Tokyo would do. The three-hour assault was focused on the crowded Asakusa district, northeast of the Imperial Palace. The general population density was 103,000 per square mile and in parts was considered to exceed 135,000 per square mile (Craven and Cate, 1953, Vol. 5, 615). Buildings in the main target area consisted largely of bamboo, wood, and plaster materials. The target area contained workers, commercial areas, and a multitude of small feeder plants or home industries upon which Japan's larger industries depended. More important, however, the congested residential area was being used to stoke a fire fierce enough to spread and damage surrounding industrial areas.

Almost 2,000 tons of incendiaries were dropped. A first wave of marker bombers started fires with M-47 Napalm-filled bombs. Others followed with the main load of 500-pound clusters of delayed-fuse, M-69 Napalm bombs. The bombing relied upon a new, low-level approach from between 1,500 and 3,000 m. An unprecedented concentration of incendiaries was dropped.

As predicted, the buildings in the target area kindled easily, and the blaze was fanned by strong winds. A vast conflagration developed (see Stockholm Peace Research Institute 1975, 81); it engulfed not only the immediate target area but also surrounding districts on both sides of the Sumida River. Though some 300 fire engines were quickly on the scene, their efforts were useless. It took 25 days to dig out the dead. Large areas were simply abandoned as survivors left the city, and maintenance workers saw no point in trying to restore services. An area no less than 41 km² was burned out. Tokyo Police reported 267,171 buildings destroyed (USSBS 1947b), including a fifth of the city's industrial and two-thirds of its commercial area.

What of the civilian casualties and nonmilitary impact? Crowds of people not killed in the bombing itself were unable to escape the fires. That was how the majority died. Thousands who tried to save themselves by jumping into the canals and rivers drowned in the melee or were boiled alive (Guillian 1947; Daniels 1975; Havens 1978). Civilian fatalities almost certainly exceeded 100,000. The Strategic Bombing Survey (1947e, 145) gave the figure 83,600. Some say 200,000 is more realistic (Salmaggi and Pallavisini 1979, 682). Whatever the exact figure, those killed were predominantly women, children, and the old and infirm.

Other raids would involve more bombers, larger bomb loads and even, as on 25/26 May, a larger area of Tokyo burned out. It is one measure of the effect of the March raid, and the times in which it occurred, that when later raids of the first series—against Nagoya (March 11/12) and Kobe (March 16/17)—burned out "only" 5.2 km² and 7.5 km² respectively, the reaction at the 21st Bomber Command was one of disappointment and failure (Craven and Cate 1953, Vol. 5), even though the former involved a greater area than the Kassel firestorm and the latter a larger area than that at Dresden.

The Bomber's Way of Death

It seems a far cry from today's oil crises to the invention of the jellied gasoline incendiary, napalm, in 1943, and its rapid exploitation (Feiser 1964). Napalm gives high coverage in proportion to cost and is very effective against troop concentrations sheltered by heavily wooded terrain. Use of this material seems to have come of age in the mountains of Luzon in the Philippines campaign of 1944−45 (Craven and Cate 1953, Vol. 5, Chapter 14). However, it was in Europe, specifically against the French seaside resort of Royan (Zinn 1970, 250−70), and in China at Hankow that it had its first uses in area bombing (Craven and Cate 1953, Vol. 5, Stockholm Peace Research Institute 1975, 36). One singles out napalm partly because of more recent excesses in its use against per-

sons, built-up areas, and rural ecology (e.g., Lewallen 1971). However, the Vietnam War has served to obscure how extensive was its application in World War II and its responsibility then for enormous civilian casualties.

Unlike the European raids, the raids on Japanese cities were actually publicized as "fire bombing" (Reischauer, 130). What is significant here is how the shift to incendiarism changed the patterns and extent not only of destruction to urban ecology, but also of the way people suffered and died.

In the early phases of the war, bombing impacts were largely from high explosives, essentially an extension of artillery. The process and pattern of those injuries and deaths were described by Zuckerman and elevated by him to the status of a bombing "model" through experimentation with live goats (1978, 131–48). It emphasized blast, flying debris, and the collapse or the shielding given by buildings. It applied to most casualties in Britain's cities, including the flying bomb attacks, but where incendiaries become predominant in area bombing his model was almost obsolete.

The German authorities were the first to realize that large numbers of civilians dying in air raids showed little or no signs of physical damage. From Hamburg on, there were many deaths in undamaged air-raid shelters. Research revealed that these were "oil age" casualties. For the Kassel firestorm only 15 percent of the deaths could be attributed to what Zuckerman would have called the primary, secondary, tertiary, and quaternary effects of explosions (Zuckerman 1978, 134; USSBS 1947f, 14–24). Some 15 percent were killed by severe burns or inhalation of hot gases. The remaining deaths (70 percent) were attributed to carbon monoxide poisoning. (Zuckerman 1978; Irving 1963, 49–50). Deaths from carbon monoxide and burns eventually become overwhelming in the area bombing of German and Japanese cities (see also USSBS 1947e, 142–58). The combustion of oil-based incendiaries was a major factor, but this was magnified by other inflammable materials. Shelters with forced ventilation and gas protection could become so hot these systems would fail. People would die from lack of oxygen, from toxic combustion gases, or from the heat itself (Stockholm Peace Research Institute 1975, 163–66).

Equally beyond all reason was the suffering caused by bombs. High explosives were bad enough, but the fire bombing introduced new forms of unnecessary suffering as well as increasing the amount of it. Burns were the major cause of injury in survivors and of lingering death. The exact role of burns in the World War II incendiary raids is among the least known aspects of the subject. Other evidence, and later wars, suggest that more than half the victims of serious burns die from them, usually within the first 48 hours (Stockholm Peace Research Institute 1975; Iklé 1958, 24–26; Falk, Kolko, and Lifton 1971, 278–84; 249–362). More than half the A-bomb deaths at Hiroshima are also attributed to heat, including flash and fire burns. The larger fraction of the people who died in the first few days were also among burn victims (Committee for the Compilation . . . 1981; Stockholm Peace Research Institute 1975, 134–36). Such mutilation of bodies merged with devastated surroundings to create an image of Armageddon, of worlds destroyed (Hachiya 1955; Japan Times 1978; Japan Broadcasting Corporation 1981).

Burn injuries and deaths were major scourges of airmen too. The wish to do everything possible for them led to great improvements in burn treatment and cosmetic surgery. These have helped modern cities where oil-age accidents involving automobiles and the like require a sophisticated setup for burn casualties in hospitals. However, none of today's cities could give even good first aid to the numbers of burn victims produced in the Second World War fire raids. It must also be recalled that the incendiary bombing routine deliberately reduced the possibility of quick, efficient help for survivors. Obviously, therefore, no city today could cope with the likely numbers of potentially recoverable burn victims in the next world war, let alone the vast numbers suffering radiation sickness (Iklé 1958, 24–27).

Given the continuing and expanded use of incendiaries against civilians in conflicts seemingly much less serious than a world war (Stockholm Peace Research, Institute 1975), we may be too numbed to think of it in terms other than "body counts." One must reaffirm, however, that we have been dealing not merely with unimaginable human suffering, but largely the suffering of children, students,

women, and old people. Often there were also hospital patients, forced labor cadres, prisoners of war, and sometimes, as at Dresden, huge numbers of refugees from bombing or warfare elsewhere.

Meanwhile, these cities remote from battlefields experienced other privations. As the war continued citizens suffered ever more shortages, hardships, and even life-threatening problems upon which those of bombing were superimposed. Most Japanese civilians appear to recall the war as months or years of unsatisfied hunger, of the struggle to obtain enough to eat, including that critical margin provided by black market items. By mid-1944 the official food supply provided an average of 1,405 calories a day, which may have reached 1,927 calories with hidden or black market supplements. However, there were many days when the latter would not be obtained (USSBS 1947e, 30−91; Havens 1978, 130; Kosaka 1972, 14).

We have already noted the official program to evacuate people before the war and in the early years of bombing offensives. Lives were saved, though many persons preferred to return to their city as the war dragged on. The most extensive depopulation at the war's end usually occurred following the main phase of bombing: a spontaneous fleeing when no other alternative remained. The tragedy of Dresden, Darmstadt, or Hiroshima was that their greatest devastation occurred in virtually the first, sometimes the only serious raid, when their citizens had believed their city could not be on the bombers' list (Vonnegut 1969, 129; Hastings 1979, 305−6; Hachiya 1955). Before the great fire raid, Tokyo had seen some evacuation but possibly even greater influx from an impoverished countryside, while Hamburg was thought to be well protected before July 1943, no doubt a factor in the number of children who were still in its central area.

"Welcome to the Ruins"

Biologists have prepared "red books" of extinct or endangered species; ecologists have their "green books" of threatened habitats. Perhaps we need our "black book" of the places of violence and places destroyed or nearly destroyed by human agencies.

Actually it would take many books and street maps packed with remembrances to record the settlements, neighborhoods, and buildings in those places destroyed in recent wars.

Dresden, Darmstadt, or Lübek may seem especially tragic. These cities made a minor contribution to the war effort, but were widely known as centers of peacetime administration and culture. Dresden was known as the Florence of the Elbe, with its famous Baroque and Rococo buildings that made a "prospect of cupolas, towers, spires, and copper green roofs of striking beauty" (Encyclopaedia Britannica 1929). Most of those buildings were destroyed in the firestorm. The remains of the most famous, the Frauenkirche of the early seventeenth century, irreparably damaged, now stand as a memorial.

The Geographical Handbooks (1945) show aerial and ground-level views of the medieval Hanse port of Lübeck, beautifully set upon its island in the River Trave, with "many fine buildings [that had] survived from the days of the great period of prosperity in the middle ages" (Geographical Handbooks 1945, 128). This city was used as a test of the area bombing approach (Webster and Frankland 1961, Vol. 1, Chapter 7; Hastings 1979) because it was relatively easy to find, was lightly defended (it had not been regarded a serious military target), and was "more like a firelighter than a human habitation" (Webster and Frankland 1961, Vol. 1, 391). It was also chosen because of a clearly circumscribed center city area and compact building blocks, from which reconnaisance air photography could provide unambiguous evidence of the results of the raid. Thus a fine historic town "did not attract the attention of the bombers because it was important, but became important because it could be bombed" (Hastings 1979, 173).

The incendiary bombing strategy over Japan left little possibility of avoiding the destruction of great historic and cultural products of urbanism. Today one cannot conceive what Tokyo and other cities were like before the war. Ienaga (1978) has noted the loss of the great historic castles at Nagoya, Okayama, Hiroshima, Wakayama, and Shuri on Okinawa. They were among the few that had survived the Restoration. Today, in the castles at Himeji or Matsumoto, one can see what they had been like.

Here we are touching upon the imagibility of cities (Lynch 1960, 9–13): visible, legible features and places of congregation that help impart social shape, that permit urban way finding and come to encapsulate the deeper meanings of human settlements. One of the thousands of such landmarks destroyed in the great fire raid on Tokyo was the Asakusa Kannon or Great Senso-ji Temple. A Buddhist foundation of the seventh century, named after the Goddess of Mercy, its five-storey Pagoda and Great Hall were major landmarks and centers of pilgrimage. During the raid hundreds of people converged on the temple grounds to escape the flames. Guillian (1947, 209) says they perished with their temple.

Strategies of Annihilation

We can now spell out what constitutes place annihilation and how this concept is applicable to area bombing.

First there are the objective consequences:

(1) The destruction of inhabited settlements, especially dense city core areas, in the continued presence of their longtime inhabitants.

(2) Large, concentrated fatalities and injury among resident civilian populations.

(3) A predominance of noncombatants among the casualties and, specifically, of children, students, women, the old, and the infirm.

(4) The destruction of the homes of civilians, areally and numerically the largest item in area bombing impacts (Iklé 1958).

(5) Indiscriminate "wall-to-wall" devastation of civic life support and culture: shops and markets, hospitals and schools, libraries, banks, theaters, churches, zoos and landmarks. Among these are items of great artistic significance for cultivated persons the world over.

(6) Practices that prevent or disrupt emergency measures for devastated areas and for aiding casualties (Rumpf 1962; Hastings 1979)

Second, we may cite the goals or justifications of area bombing that emphasize its place-destroying and immolating character:

(1) "Dehousing" as a strategy of war.

(2) "Barn door" targeting, which simply made the city centers or densely built-up areas the aiming points (Bidinian 1976, Chapter 2).

(3) Fire raids, intended to start uncontrollable urban conflagrations.

(4) Making civilian morale a target of war.

(5) Advertising the raids as retribution against the people or nation involved (see Reischauer 1945).

(6) Justifying the devastation and civilian casualties as leverage on the enemy war leaders.

(7) Treating place destruction as an inevitable outcome of total war.

(8) The oft-repeated purpose of area bombing to reduce casualties among one's own troops and to shorten if not to win the war.

Each of these represents an assault less upon the political and military bases of power than upon the continuing biological, psycho-social, and cultural foundations of human geography (Bunge 1973). These represent strategies of immolation, sacrificing civilians and urban areas for other purposes. Moreover, the leaders of European nations, if not of the United States, expected adoption of urban attacks to bring return raids against their own cities, and therefore were sacrificing these to war aims (c.f. Bailer 1980).

The Problem of Bearing Witness to Places Destroyed

With so much evidence of untimely death, unnecessary destruction, and meaningless suffering, one may well ask whether this concern with place is not superfluous. Perhaps it is a self-indulgent attempt to avoid facing up to harsh realities. Heinrich Böll has captured the problem exactly. In his essay "Which Cologne?" he recalls:

I broke out in a cold sweat when, after World War II, I saw my first undestroyed city: Heidelburg. In a dual sense, esthetically and morally, it seemed to me improper, a particularly deplorable form of disaster for a city to have escaped disaster in that way; I could not get rid of the suspicion that it had been spared not because it served as a military hospital town—Dresden was also a hospital town—and not for a reason that would make any human settlement worth sparing: because human beings were living there. The horrible suspicion was that this German dream was also a tourist dream that owed its world renown mainly to an operetta." (Böll 1977, p. 25).

Yet Böll's essay, like much of his fiction and the work of his serious contemporaries, could be described as a struggle to recover place, the sense and reality of it. He finds himself searching for Kölns of the past. He is troubled by the unreality of Köln present, but also of the photographs from his remembered pasts. His search is not only for the city of prewar days; it is even more for the lost city of dust, rubble, and privation after the war. His is no mere nostalgia for the romantically beautiful, cozy community or high culture. It requires us to value whatever places were or are inescapably present for us. That may include humanizing a ruined street or landscaping the craters of old battlefields (Böll 1977, 46−50).[5]

Rumpf (1962, 189) says that, for German citizens:

> Even in ruins, the towns were still their homes, and their magnetic attraction continued to operate strongly. Within less than a year 900,000 people were again living in the ruins of Hamburg, though it had been eighty per cent gutted. By their grim persistence they demonstrated that their town was still alive.

Suppose, on the other hand that Heidelberg, Florence, or Kyoto were spared for its looks. What of the sense of place behind such a decision? Presumably, these were to survive as examples of the most worthy eternals of culture, as collectors items. Meanwhile, there was the unrelenting sacrifice of the bodies, homes, and neighborhoods of millions of people and of less spectacular buildings and cityscapes. If this is the case, then we are in the presence of a sense of place that is irredeemably antihuman. Far from showing some residue of humanity, these unbombed cities symbolize the token gesture, the expression of a casual and elitist sentimentality that preserves objects while hiding from the public and even from itself, a ruthlessness that is ready to destroy all else cruelly out of some imagined technical or institutional necessity.

A Geography of Reconstruction?

We have reached a critical juncture in our inquiry. The tenacious place making of survivors is part of it, but the validity of employing the place concept at all here is at stake.

What can the notion of place annihilation tell us that the seemingly more concrete matters of demographic, economic, and cultural losses will not? Sensitive and mind-expanding as the sense-of-place literature is when in skilled hands, what light can it shed upon this abyss of inhumanity and human misery?

Look again at the devastation and human casualties caused by area bombing. Then consider the objective map of urban geography, its spatial organization, and measures of material function in today's Germany or Japan. In the locations where we know the destruction was greatest, the material record upon the land is least. The traveler or interpreter of air photographs is hard pressed to find any clear marks of the largest conflict in history. Anyone who has visited Nagasaki or Frankfurt, Tokyo or Milan in the past two decades will sense what is implied here. Moreover, many an urban geography text shows that if one omits data for the critical years 1943−46, or just a few months of 1945 (data rarely found anyway), then urbanization, industrial growth, energy consumption, and the shift of industry and population to the suburbs all seem to proceed like a smooth, upwardly concave curve (see Iklé 1950; Grebler 1956). Highly valued places or structures like the cathedral and the main street of Münster, the Asakusa Kannon Temple in Tokyo, or the medieval castle at Hiroshima have been rebuilt to replicate their prewar appearance.

Some scholars hold the view that the bombing was beneficial in that it allowed more rapid and rational modernization than was the case in cities or neighborhoods where it did not occur. By referring primarily to matters of function, system, economic theory, and planning, by working largely with government-collected statistics, by abandoning the historical emphasis of urban geography in favor of a futuristic perspective, we have been able to ignore the destruction of World War II. The result has been to create essentially a geography of reconstruction. One suspects the reconstructed cities seem more real because in the process they have come more closely to resemble the views and models that urbanists, in their most planning oriented of fields, have created in concert with that reconstruction.

Many do acknowledge that the reconstruc-

tion was necessitated by devastation. But there is the question of whether by so fully adapting to the climate of reconstruction, we have not also tacitly embraced the violence to places that it presupposes. Some have argued that our plans and models support a thousand episodes of appropriation, demolition, and rapacious construction in the name of improvement, episodes that in fact recall the bombing and the plight of its survivors (Jacobs 1961; Relph 1976, Chapter 6; Worthy 1976). One might also cite the recurrent backlash of local communities against the postwar styles of reconstruction in bombed-out cities (e.g., Breirley 1980; Hajdu 1979).[6]

Here then is our dilemma: the risk of basing human geography upon concepts such as landscape, place, community, and world may lie in the subjectivity of phenomena that are, after all, intersubjective. The dangers of anthropomorphism here are real. But what of the equally great risks of "mechanomorphism" in a human geography based upon census data, input-output models, graphs and network theory, or whatever other instruments and concepts of technocratic approaches are currently fashionable? Complete commitment to such approaches is not merely to accept a central-planning perspective on what is rational, scientific, and useful, but it serves to transform devastation (or construction) into neutral terms, mere processes or accidents (Hewitt 1983). Their trajectories and pattern variables may be special, but their impact and meaning in the life and death of victims are bled of all content. Moreover, such a view abandons what may be one of the few special and vital contributions of geography to human awareness and affairs, its traditional interest in actual human communities where and as they live (Lowenthal 1961).

In that respect, the tenacious if pathetic resumption of life amid the rubble and "killing ground" of their cities by bombed-out survivors seems more fully to measure our topic and its tragedy than all the statistics of what was lost or the prodigious reconstructions of the "new" Germany or Japan. And what better description of their activities than as "place-making"? Except in brief moments of crisis, human survival is never just individual biological persistence, but the need to have a communal place or to reestablish the continuity of past places. The air-raid victims made places even of air-raid shelters, against a backdrop of gutted buildings and rubble. Somehow, in extremity one discovers that the intersubjective reality of place has a more general and fundamental human significance than objective form and function or measures of the material setting. Thus one may say with Michael Godkin (1980, 73) that place or rootedness "lies at the core of human existence."

That, of course, does not detract from the proper employment of dispassionate scholarship in determining responsibility for the material conditions imposed on a given place. The tragedy of the tenacious place making of bombed-out city dwellers lay not in their places or pathetic struggle, but in the fact that it was required because they were victims. As Michael Harrington (1965, 138) has said of war and poverty, "It would be insane to wish to maintain [such] human misery in order to preserve the creativity born of despair."

However, we have a geography almost wholly turned away from the objective as well as the intersubjective experience of these and other war atrocities. In one respect such a geography of reconstruction accurately reflects a necessary concern in a century of massive and recurrent violence to people and place. In another sense it misses the point entirely. This is not just because today's scientific theories and techniques will be in tomorrow's trash can, or that ideals of urban planning like most others are notoriously creatures of fashion. The point is that our interest in human settlements occurs in the shadow of an area bombing that threatens to be larger and more profoundly destructive than World War II.

Concluding Remarks: Guides to the Future of Urbanism

The ghosts of the architects of urban bombing—Douhet, Mitchell, Trenchard, Lindemann—and the praxis of airmen like Harris and LeMay still stalk the streets of our cities and the corridors of power. Today it is almost universally accepted that area bombing on a vast scale will be the essence of the next World War. This is an ultimate threat to all cities, reconstructed, renewed, or decaying. The main weaponry is aimed primarily at

destroying the majority of civilian persons, housing, work forces, and places. What is not often remarked is that World War II may still tell us more about our predicament than the vision of sudden, decisive holocaust.

Given the horrendous results of nuclear strategy for people and places, I am disturbed by certain parallels with the old area bombing strategies. One aspect involves the large unknowns in limited, let alone all-out nuclear war (Office of Technology Assessment 1980). To reverse an old argument against area bombing's critics, we know that only the wisdom of hindsight will tell us what nuclear war involves, if anyone is around to care. Mainly, however, the evidence I have seen tells me that this escalated version of the area bombing scenario will also be military irrelevant.

The first- and second-strike ICBMs would destroy civilization as we know it forever. It might produce ecological Armageddon. Barring that, however, there will remain ample untouched natural resources, a sufficient industrial capability, and certainly enough conventional and nuclear forces to ensure the war is undecided. Today, as always in societies anticipating war, the military is better prepared and protected than any other part of society except its leaders. That the forces surviving major nuclear offensives will be oddly balanced and disoriented and surrounded by lands filled with deadly radiation and dying people should ensure that no quick, decisive assaults will be possible. Instead, one can foresee an agonizingly slow, inconsequential, but ecologically devastating warring continuing for years or decades. And, as in Europe in the previous two World Wars, powers now considered secondary or even small may prove decisive. Nevertheless, the Douhet vision of the sudden, mortal blow to the enemy through the cities reigns supreme, at least in public debate, and is unchastened by the excesses of the past.

Meanwhile, the cities of the most powerful states are less able to defend themselves, less defensible with existing weaponries, and less well sheltered than the Japanese citizenry was against superfortresses and napalm. Moreover, were we well defended, it would be impossible after a major nuclear exchange to sustain more than a tiny fraction of today's urban population with food and uncontaminated water, and certainly not with adequate medical treatment. Civil defense, so-called, is in these terms a token gesture, an abstract, statistical notion of survivability. The point here is, however, that if 80 percent, or 50 percent, or 20 percent of Americans or Europeans or Soviets survive—and proportionally less of their books, schools, hospitals, churches, art works—they and their cities will still have been sacrificed for a doubtful military result. Modern states will come as close as possible to being "nonplace realms" (Webber 1964) without their war-making potential having been crippled. As in World War II, it would be wishful thinking to imagine that political and military leaders will be so shocked and guilt laden by the vastness of death and destruction as to abandon the struggle or so "irresponsible" as to sue readily for peace with those who destroyed their nation. In World War II, disarticulation between the fate of cities or peoples and their defense establishments largely nullified any effects of lowered morale or losses among the former upon the conduct of the war. That was dealt with as a public relations problem through managing information for the survivors. It is unlikely to be different in the world of micro chips and artificial satellites.

Everything reinforces the sense that we remain in the same political, organizational, and moral climate that evolved through the two World Wars. The massive bombardment of cities from the air makes World War II the only, if not the definitive, test case from which to consider future wars. The machines are in place.

There is much talk of accidental triggering of a nuclear holocaust; the possibilities have been created by decades of escalating arms development and sales. Again, the Second World War is sobering in that respect. For, in the material we have examined, two aspects are perhaps more paradoxical and daunting than anything else, namely, when the bulk of the Area Bombing destruction occurred and by whom it was carried out.

Most of the bombs, heavy bomber sorties, civilian deaths, and urban area destruction in Japan and Germany occurred not when these countries were at their peak of power or merely on the defensive, but after mid-1944 and especially in 1945 when they were on their knees. In any month from May 1944 to May 1945 more tonnages were dropped on German cities alone than in all campaigns in

1939, 1940, 1941, or 1942. The attacks on a virtually paralyzed Japan were even later, heavier, and more compressed. I am not saying Germany or Japan had ceased to be serious military threats by late 1944, only that area bombing of their cities was too much, too late.

Here is another suggestive parallel between thermonuclear and conventional area bombing. For their time, there was behind the various bomber commands a great sophistication of technology, organization, and planning. Air crews generally were of high mental and physical caliber, performing tasks of considerable technical skill, often under stressful battle conditions. Yet, no instrument of war has been as clumsy, inexact, and uncontrollable in its effects, nor as irredeemably brutal. As early as 1942, the military analyst Liddell Hart could call an area raid "the most barbaric and unskilled way of winning a war that the modern world has seen" (quoted in Bond 1977, 145). And Liddell Hart had seen value in what he envisaged as strategic bombing. Nevertheless, the thermonuclear threat clearly exceeds area bombing in the profound gulf between its technical requirements and the crude brutality of its effects.

Remember, too, that those who carried out area bombing were supposedly fighting tyranny. Many were sophisticated individuals who readily spoke of freedom and dignity, who called upon the best scientists for advice. Yet, they planned and executed with a highly efficient detachment the annihilation of helpless civilian populations and poorly defended cities. Focusing upon their plans and maps, air photographs and targets, they apparently ignored or failed to perceive the places, their history, the masses of women, children, old people caught up in violent events outside their grasp or control. They merely saw, in Air Marshall Harris's words "the over-weening factors of strategy, tactics, and technicalities" (Webster and Frankland 1961, 224). And so, in the end, strategic bombing made use of the strategies of the most advanced nations and institutions— bureaucratic organization, industrial methods, public relations, psychology, even research and development—to carry out the extermination and annihilation of largely defenseless noncombatants (c.f. Kogon 1950; Alvarez 1964; Stone 1967, 92–104).

There is a case for arguing that the only real moments of decision about strategic bombing, or for considering alternative approaches, were early in the war or even before the war, as hinted by Spaight (1944). Once leaders were committed and opposition had been countered or silenced, the orders were placed, funds allocated, a public image defined, and research and manpower objectives laid down. Two to five years later the bombers and bombs were pouring off the production lines in quantity. Was it that they had to be used to justify the enormous investment, to show what the much-championed bombers could do, regardless of the new state of hostilities? And if the magnificent superfortress could not achieve the precision bombing intended for it, how else to use its huge bomb loads now that Japan was at its mercy? And how could help be given to other branches of the military, that had been denied funds in this strategy based upon air power?

Whatever the answers to these questions, the ruthless destruction of urban people and places, and also the postwar aggrandizement of this sort of war capability, seems an undeniable example of "Western technological ingenuity subverting Western economic, political, and social assumptions" (Harrington 1965, 142). And now, many more nations face the dilemma that, as Lewis Richardson put it in a 1939 dialogue, "In a roundabout way the bombing airplanes are [more of] a danger to the nation that owns them" (Richardson 1960, 229).

After World War I, even military men believed that if they would only not forget what happened in the trenches and the bloodbaths called battles on the Western Front, people would not let it happen again. They forgot. Or rather they were led to concentrate on other matters, and to believe that other forms of warfare, including Blitzkrieg and strategic bombing would save them from the horrors of 1914–18 (Fuller 1961; Liddell Hart 1947; Keegan 1976). We in our turn seem to have forgotten what happened to cities in World War II. The new diversion is "nuclear diplomacy," a high-class and very secretive game that also has uncanny parallels with the preliminaries of area bombing. The posturing and rhetoric, the duplicity and failure to take real actions to outlaw aerial bombing of cities by powerful governments before World War II

seem strangely like the nuclear disarmament fiasco since (Veale 1962; Bailer 1980). Meanwhile, the planes go on practicing by bombing civilian areas in Kampuchea, Afghanistan, and Lebanon.

Acknowledgments

Notes

1. For a more detailed account of the background and geographical scope of air power and urban bombardment see my Discussion Paper (Hewitt 1982).
2. That the enormous urban devastation had a relatively small and even, for a time, inverse effect upon industry, industrial workers, war production, and military supplies in Britain and Germany has been widely discussed. German as well as Allied analysts have expressed surprise at the speed of recovery of essential functions. This is described by Speer (1970, Chapters 20, 25 and 27); Webster and Frankland, (1961, Vol. 4 Section VII); Zuckerman (1978, Appendix 6); Rumpf (1962, Chapter 10); Bidinian (1976, Parts III and IV); and much of the materials in the Strategic Bombing Surveys.
3. Some reviewers thought I gave too little attention to the ethical and decision-making questions raised by area bombing and, especially, my civilian and place-focused treatment of it. These are important questions. Though military historians and jurists have dominated the study of these subjects, I believe geographers must consider them too. I cannot imagine anyone looking at my topic without a tremendous sense of moral revulsion, even if he or she finds justification for the decisions involved. I do not believe that war, being "hell," should be immune from moral restraint, least of all "total war." Sanctions against those who commit atrocities, and hindsight condemnation of leaders who foster a climate of atrocity seem to me quite in order. I do plead lack of space to do the problem justice here, and the desire to establish other considerations first. Elsewhere I shall set down the position I would be prepared to defend and the issues geographers must face if they enter this debate.
4. A bizarre link in our story is how terms for place, nurture, and peaceful travel entered the vocabulary of this destruction of geography. Major targets visited often were known as "milk runs." People in Chungking referred to the unfailing return of Japanese bombers as "registered mail" (Linsay 1975). One type of sortie called "gardening raids" entered the technical vocabulary (Hastings 1979). Bombs acquired names like "cookies," "Christmas trees," and "tallboy" (a chest of drawers). The "plate rack" was an incendiary bombing formation, such as was used over Dresden. In 1942 Hitler launched a series of attacks called "Baedecker raids" after the tourist guide book (Calder 1969). They included towns like Exeter, Canterbury, Bath, and York chosen because they were weakly defended but also because they were historic and cultural centers whose destruction was expected to hurt Britons' pride and make them regret what their bombers were doing to German cities. British Bomber Command had its "bomber's Baedecker" too. Perhaps one could find some unconscious motivations for these comforting ironies of terminology.
5. In this overview I have not attempted to reconstruct an insider's view of place annihilation. In any case that has been done in enormous detail and by the most authentic sources, namely survivors and inhabitants of the cities involved. The material is never well known or easily accessible outside the city concerned. The London Blitz and A-Bomb experiences are exceptions. However Rumpf (1962, 250−51) lists works on twelve German and Austrian cities, "chronicled by themselves," namely Brunswick, Dresden, Essen, Heilbronn, Hildesheim, Julich, Innsbruck, Kaiserslautern, Cologne, Nüremberg, Ulen, and Würzburg (his spellings); see also, Hastings (1979, 239). For Japan see Havens (1978, notes p. 248); Daniels (1975, notes p. 278 for Tokyo raids), and *Japan Times* (1978). For the A-Bomb experience, in addition to Hachiya (1955) and Lifton (1957) see T. Nagai (1951), A. Osada (1959), and Pacific War Research Society (1972). For Britain see especially Harrison (1976) and Calder (1969).
6. Dr. Alfred Hecht drew my attention to this useful discussion of reconstruction in Germany and its critics.

References

Alvarez, A. A. 1964. The literature of the holocaust. *Commentary* 38:65−69.
Bachelard, G. 1964. *The poetics of space*. Translated, M. Jolas. Boston: Beacon Press.
Bailer, V. 1980. *The shadow of the bomber: the fear of air attack and British politics, 1932−1939.* London: Royal Historical Society.
Bendiner, E. 1981. *The fall of fortresses*. London: Pan Books.

Bidinian, L. J. 1976. *The combined allied bombing offensive against the German civilian:* 1942–1945. Kansas: Coronado Press.

Bieganski, P. 1972. How Warsaw arose from the ashes. *Built Environment* 1:313–15.

Böll, H. 1977. *Missing persons and other essays.* Translated, L. Vennewitz. New York: McGraw-Hill.

Bonacina, G. 1970. *Obiettivo Italia:* I bombardamenti aerea delle citta italiane dal 1940 al 1945. Milano: U. Mursia.

Bond, B. 1977. *Liddel Hart: a study of his military thought.* London: Cassell.

Bond, H., ed. 1946. Fire and air war. Boston: National Fire Protection Association.

Bradley, J. 1972. *Lidice: sacrificial village.* New York: Ballantine Books.

Brett-Smith, R. 1967. *Berlin, the grey city.* London: Macmillan.

Brierley, J. 1980. *Exeter 1939–1974: the reconstruction of a city.* M.A. thesis, Department of Architecture, University of Manchester.

Bunge, W. 1973. The geography of human survival. *Annals of the Association of American Geographers* 63:275–95.

Calder, A. 1969. *The people's war: Britain 1939–1945.* New York: Pantheon Books.

Committee for the Compilation of Materials on Damage Caused by the Atomic Bombs at Hiroshima and Nagasaki. 1981. *Hiroshima and Nagasaki: the physical, medical and social effects of the atomic bombings.* Translated E. Ishikawa and D. L. Swain. New York: Basic Books.

Craven, W. F., and Cate, J. L., eds. 1951–1953. *The army air forces in World War II.* 7 volumes. Chicago: University of Chicago Press.

Daniels G. 1975. The great Tokyo air raid, 9–10 March, 1945. In *Modern Japan: aspects of history, literature and society,* ed. W. G. Beasley, pp. 113–31. Berkeley: University of California Press.

Davies, D. P. 1973. *The bombing of Exeter,* Regional Resources Center, Institute of Education, University of Exeter.

de la Croix, H. 1972. *Military considerations in city planning: fortifications.* New York: George Braziller.

Dickinson, R. E. 1951. *The West European city: a geographical interpretation.* London: Routledge and Kegan Paul.

Divine, D. 1966. *The broken wing: a study of the British experience of air power.* London: Hutchinson.

Douhet, G. 1942. *The command of the air.* New York: Coward-McCann Inc.

Duffy, C. 1979. *Siege Warfare: the fortress in the early modern world.* London: Routledge and Kegan Paul.

Earle, E. M., ed. 1943. *Makers of modern strategy: military thought* from *Machiavelli to Hitler.* Princeton, N.J.: Princeton University Press.

Eliade, M. 1959. *The sacred and the profane.* Translated W. R. Trask. New York: Harcourt, Brace and World.

Elliot, G. 1972. *Twentieth century book of the dead.* Harmondsworth: Penguin Books.

Encyclopaedia Britannica 1929. 14th ed., s.v. Dresden.

Falk, R. A., Kolko, G., and Lifton, R. J., eds. 1971. *Crimes of war.* New York: Random House.

Feiser, L. F. 1964. *The scientific method: a personal account of unusual projects in war and peace.* New York: Reinhold.

Freud, A. 1973. Infants without families. Reports of the Hampstead Nurseries 1939–1945. *The writings of Anna Freud, Vol. III.* New York: International Universities Press.

Fuller, J. F. C. 1961. *The conduct of war, 1789–1961.* London: Eyre and Spottiswoode.

Geographical Handbook Series, 1944. *Germany, III: economic geography.* Naval Intelligence Division. London: The Admiralty.

———. 1945. *Germany, IV: ports and communications.* London: Naval Intelligence Division of the Admiralty.

Godkin, M. A. 1980. Identity and place: clinical applications based on notions of rootedness and uprootedness. In *The human experience of space and place,* ed. A. Buttimer and D. Seaman, pp. 73–85. New York: St. Martin's Press.

Gollancz, V. 1947. *In darkest Germany.* London: Gollancz.

Gottmann, J. 1943. Bugeaud, Gallieni, Lyautey: the development of French colonial warfare. In *Makers of modern strategy: military thought from Machiavelli to Hitler,* ed. E. M. Earle, pp. 234–59. Princeton, N.J.: Princeton Univ. Press.

Grebler, L. 1956. Continuity in the rebuilding of bombed cities in Western Europe. *American Journal of Sociology.* 61:463–69.

Grosser, G. H., Wechsler, H., and Greenblatt, M., eds. 1964. *The threat of impending disaster: contributions to the psychology of stress.* Cambridge, Mass.: MIT Press.

Guillian, R. 1947. *Le People japonais et la Guerre.* Paris: Juillard.

Hachiya, M. 1955. *Hiroshima Diary: the journal of a Japanese physician, August 6–September 30, 1945.* Translated W. Wells. Chapel Hill: Univ. of North Carolina Press.

Hajdu, J. G. 1979. Phases of the post-war German urban experience. *Town Planning Review* 50:267–86.

Harrington, M. 1965. *The accidental century.* Baltimore, Md.: Penguin Books.

Harris, A. T. 1947. *Bomber offensive.* London: Collins.

Harrisson, T. 1976. *Living through the blitz.* London: Collins.

Hastings, M. 1979. *Bomber command.* New York: Dial Press.

Havens, T. R. H. 1978. *Valley of darkness: the Japanese people and World War Two.* New York: W. W. Norton.

Hewitt, K. 1979. *Some perspectives on the interpretation of war systems in human ecology.* Department of Geography, Wilfrid Laurier University, Discussion Paper, No. 7.

———. 1982. *Air War and the Destruction of Urban Places.* Wilfrid Laurier University, Office of Research. Discussion Paper No. 8244.

———. 1983. The idea of calamity in a technocratic

age. In *Interpretations of Calamity,* ed. K. Hewitt, pp. 3–32 London: Allen & Unwin.

Higham, R. 1972. *Air power: a concise history.* New York: St. Martin's Press.

Howard, M., and Paret, P., eds. 1976. *Carl von Clausewitz on war.* Princeton, N.J.: Princeton University Press.

Huntington, S. P. 1968. The bases of accommodation. *Foreign Affairs* 46:642–56.

Hutak, J. B. 1957. *With blood and with iron: The Lidice story.* London: Robert Hale Ltd.

Ienaga, S. 1978. *The Pacific War: World War II and the Japanese, 1931–1945.* Translated F. Baldwin New York: Pantheon Books.

Iklé, F. C. 1950. Reconstruction and population density. *American Journal of Planners* 16:131–39.

———. 1958. *The social impact of bomb destruction.* Norman, Okla.: University of Oklahoma Press.

Irving, D. 1963. *The destruction of Dresden.* London: William Kimber.

Jacobs, J. 1961. *The death and life of great American cities.* New York: Vintage Books.

Janik, A., and Toulmin, S. 1973. *Wittgenstein's Vienna.* New York: Simon and Schuster.

Janis, I. L. 1961. *Air war and emotional stress: psychological studies of bombing and civilian behavior.* New York: McGraw Hill.

Japan Times. 1978. *Cries for peace: experiences of Japanese victims of World War II.* Compiled, Youth Division of Soka Gakkai. Tokyo: Japan Times Ltd.

Japanese Broadcasting Corporation. 1981. *Unforgettable fire: pictures drawn by atomic bomb survivors.* New York: Pantheon Books.

Kalshoven, F. 1971. *Belligerent reprisals.* Leiden: Sijhoff.

Keegan, J. 1976. *The face of battle.* New York: The Viking Press.

Kirby, S. W. 1969. *The war against Japan.* United Kingdom Military Series. London: Her Majesty's Stationery Office.

Kogon, E. 1950. *The theory and practice of hell.* New York: Farrar, Strauss and Cudahy.

Kosaka, M. 1972. *100 Million Japanese: The post-war experience.* Tokyo: Kondansha International.

Lacoste, Y. 1973. An illustration of geographical warfare: bombing the dykes of the Red River in North Vietnam. *Antipode* 5:1–13.

La Farge, H. ed. 1946. *Lost treasures of Europe.* New York: Pantheon Books.

Lewallen, J. 1971. *Ecology of devastation: Indochina.* Harmondsworth: Penguin.

Liddell Hart, B. H. 1947. *The revolution in warfare.* New Haven, Conn.: Yale University Press.

Lifton, R. J. 1957. *Death in life: Survivors of Hiroshima.* New York: Random House.

Lindsay, M. 1975. *The unknown war: North China 1937–1945.* London: Bergstrom and Boyle.

Longmate, N. 1976. *Air raid: the bombing of Coventry, 1940.* London: Hutchinson.

Lowenthal, D. 1961. Geography, experience and imagination: towards a geographical epistemology. *Annals of the Association of American Geographers* 51:241–60.

Lynch, K. 1960. *The image of the city.* Cambridge, Mass.: MIT Press.

Mallory, K., and Ottar, O. 1973. *The architecture of war.* New York: Pantheon.

Marwick, A. 1976. *The home front: the British and the Second World War.* London: Thames and Hudson.

Middlebrook, M. 1973. *The Nüremberg raid, 30–31 March, 1944.* London: Allen Lane.

———. 1980. *The Battle of Hamburg: allied bomber forces against a German city in 1943.* London: Allen Lane.

Nagai, T. 1951. *We of Nagasaki: the story of survivors in an atomic wasteland.* Translated I. Shirate and B. L. Silverman. New York: Duell, Sloan and Pearce.

Office of Technology Assessment, 1980. *The effects of nuclear war.* O.T.A., Congress of the United States, Totowa, N.J.: Allanheld, Osmun Publishers.

Oliver-Smith, A. 1977. Traditional agriculture, central places and postdisaster urban relocation in Peru. *American Ethnologist* 4:102–16.

Osada, A., ed. 1959. *Children of the A-Bomb.* Tokyo: Uchida Rukakuho Publishing.

Pacific War Research Society. 1972. *The day man lost: Hiroshima, August 6, 1945.* Tokyo: Kodansha International Ltd.

Polybius. 1927. *The histories.* Translated W. R. Patton. London: Heinemann.

Reischauer, E. O., ed. 1974. *Japan: the great contemporary issues.* New York: Arno Press.

Relph, E. 1976. *Place and placelessness.* London: Pion.

Richardson, L. 1960. *Arms and insecurity: a mathematical study of the origins of war.* Ed. N. Rashevsky and E. Trucco. Pacific Grove, Calif.: Boxwood Press.

Rumpf, H. 1962. *The bombing of Germany.* Translated E. Holt Fitzgerald. New York: Rinehart and Winston.

Salmaggi, C., and Pallavisini, A. 1979. *2194 days of war: an illustrated chronology of the Second World War.* Translated H. Young. New York: Mayflower Books.

Saunders, H. St. G. 1975. *The fight is won.* In *The Royal Air Force 1939–1945,* Vol. III, ed. P. Richards and H. St. G. Saunders. London: Her Majesty's Stationary Office.

Seamon, D. 1979. *Geography of the life world: movement, rest, encounter.* New York: St. Martin's press.

Shikes, R. E. 1969. *The indignant eye: the artist as social critic.* Boston: Beacon Press.

Snow, C. P. 1961. *Science and government.* London: Oxford University Press.

Spaight, J. M. 1944. *Bombing vindicated.* London: Hodder and Stoughton.

Speer, A. 1970. *Inside the Third Reich: memoirs.* New York: Macmillan.

Stockholm Peace Research Institute (SIPRI). 1975. *Incendiary weapons.* Cambridge, Mass.: MIT Press.

Stone, I. F. 1967. *In time of torment.* New York: Random House.

Tuan, Yi-Fu. 1977. *Space and place: the perspective of experience.* Minneapolis: University of Minnesota Press.

———. 1979. *Landscapes of fear.* New York: Pantheon Books.

United States Strategic Bombing Survey (USSBS). 1945. *Overall report (European War).* USSBS, Washington.

———. 1946. *Summary report (Pacific War).* Office of the Chairman, USSBS, Washington.

———. 1947a. *Final report covering air-raid protection and Allied subjects in Japan.* Civil Defense Division, Washington.

———. 1947b. *Effects of air attack on urban complex Tokyo-Kawasaki-Yokohama.* Urban Areas Division, USSBS, Washington.

———. 1947c. *Effects of air attack on Osaka-Kobe-Kyoto.* Urban Areas Division, USSBS, Washington.

———. 1947d. *A detailed study of the effects of area bombing on Hamburg, Germany.* Area Studies Division, USSBS, Washington.

———. 1947e. *The effects of bombing on the health and medical services in Japan.* Medical Division, USSBS, Washington.

———. 1947f. *The effect of bombing on health and medical care in Germany.* Morale Division, USSBS, Washington.

———. 1947g. *Area studies division report.* Area Studies Division, USSBS, Washington.

Veale, F. J. P. 1962. *Advance to barbarism: the development of total warfare from Sarajevo to Hiroshima.* London: The Mitre Press.

Vonnegut, K., Jr. 1969. *Slaughterhouse five, or the children's crusade.* New York: Dell Publishing.

Walzer, M. 1977. *Just and unjust wars: a moral judgment with historical illustrations.* New York: Basic Books.

Wasner, E. 1943. Douhet, Mitchell, Seversky: theories of air warfare. In *Makers of modern strategy: military thought from Machiavelli to Hitler,* ed., E. M. Earle, pp. 285–503. Princeton, N.J.: Princeton Univ. Press.

Webber, M. M. 1964. The urban place and nonplace realm. In *Explorations in urban structure,* ed. M. M. Webber, pp. 79–153. Philadelphia: University of Philadelphia Press.

Webster, C., and Frankland, N. 1961. *The strategic air offensive against Germany, 1939–1945.* History of the Second World War. United Kingdom Military Series. London: Her Majesty's Stationery Office.

Weigley, R. F. 1973. *The American way of war: a history of United States military strategy and policy.* New York: Macmillan.

Woolf, V. 1954. *A writer's diary.* New York: Harcourt, Brace, Jovanovich.

———. 1980. *The Letters of Virginia Woolf, volume VI, 1936–1941.* New York: Harcourt, Brace, Jovanovich.

Worral, G. 1979. *Target Exeter.* Exeter: Express and Echo Press.

Worthy, W. 1976. *The rape of our neighborhoods.* New York: William Morrow.

Zinn, H. 1970. *The politics of history.* Boston: Beacon Press.

Zuckerman, S. 1978. *From apes to war lords, 1904–1946. An autobiography.* London: Hamish Hamilton.