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# 216 VOLKER M. WELTER

## FROM THE LANDSCAPE OF WAR TO THE OPEN ORDER OF THE KAUFMANN HOUSE: RICHARD NEUTRA AND THE EXPERIENCE OF THE GREAT WAR

*"Wer spricht von Siegen? Überstehn ist alles."  
(Who speaks of victory? Survival is everything.)*  
/ Rainer Maria Rilke, *Requiem*, 1908

In 1946, a decade after hiring Frank Lloyd Wright to design Fallingwater, the Pennsylvania weekend home that would become an icon of American architecture, Edgar Kaufmann, Sr retained the services of Richard Neutra to design a house for him at Palm Springs in the California desert [Figure 1]. While visiting the Kaufmann desert house with a group of students, I was asked about an intriguing architectural detail: angular metal gaskets that were mounted as weather seals on the edges of the guest bedrooms' doors.<sup>1</sup> When the doors are closed, the metal strips interlock with others fixed inside the doorframes. When the floor-to-ceiling windows are shut as well, the guest

rooms are no longer parts of a continuous environment that encompassed house and garden as well as the wider landscape, but interior spaces hermetically sealed off from the exterior. This makes sense, considering that these doors open directly onto a passageway that is bordered on its opposite side not by a solid wall but only by a series of vertical aluminum louvers mounted on a low parapet. These louvers, which pivot on a vertical axis, may offer protection against some of the winds blowing down from Mount Jacinto behind the house, but not against the desert sands.

Viewed as a whole, the structures that comprise the Kaufmann House appear as a harmonious merger between architecture and nature; the two intertwine so closely that it is nearly impossible to draw a dividing line between the natural and the architectural environment. On the level of architectural detail, however, the doors' metal seals establish

a firm barrier between inside and outside, revealing that the relationship between the natural world and the human-made one is a hierarchical order: architecture is an artificial addition to the site that creates spaces for humans in a constant state of defensive alert with regard to their surroundings.

Such a realization may appear at odds with the prevalent conception of Neutra's architecture as a manifestation of the architect's belief in the cosmos as a continuum and of humanity's ineffable place not 'apart from' but 'a part of' nature — suggesting harmony rather than dissent. It appears at odds as well with Neutra's opinion that his generation "more than any before, [was] attracted by nature, landscape, and the out-of-doors".<sup>2</sup> Indeed, Neutra, a proponent of the 'natural garden' — plantings based on nature's cues — was a skilled horticulturist and landscape architect, having worked both in the nursery trade and in the office of the Swiss landscape architect Gustav Ammann. It was Ammann, he later wrote, who "intensified my understanding that architecture was a production intimately interwoven with nature and the landscape in which it was inserted".<sup>3</sup> In Neutra's work, the architecture may be viewed as an integral part of an overall landscape design. Yet the simultaneously defensive or adversarial character of his architecture is not only manifest, it is fully comprehensible in light of Neutra's life experiences. In fact, the close relationship between humans, architecture, and the natural environment that characterizes much of Neutra's mid-twentieth-century architecture was influenced by his military service during the Great War, which placed Neutra into the mountains of the Balkans, a harsh and hostile environment in its own right, especially during winter, but then infinitely

made worse by the military use of the land.<sup>4</sup> Thus for a prolonged period at the outset of his architectural career — his architecture studies and military service closely intermeshed between 1910 and 1918 — Neutra experienced nature as a malevolent rather than a benevolent force.<sup>5</sup>

## NEUTRA AT WAR

Neutra was 22 years old when the Great War began and 26 when it ended in 1918 [Figure 2]. His military files have not survived, but his duty as a young officer of the Austrian-Hungarian Imperial army can be reconstructed from other sources.<sup>6</sup> His autobiography *Life and Shape* provides some information.<sup>7</sup> Although broadly correct with regard to chronology, the text is occasionally difficult to verify, as it freely mixes recollections with retrospective reflections. Watercolors and sketches produced during the war offer additional information regarding Neutra's whereabouts, as some are inscribed with locations and approximate dates. In addition, from early December 1915 until the end of April 1916, Neutra kept a war diary.<sup>8</sup> This essay draws primarily on the diary, a single, small volume into which Neutra wrote in German, mostly using a pencil. Some entries are written with the book resting on a firm surface like a table top; in others, the impressions on the pages are faint, as if noted while supporting the diary on a soft surface such as one's thigh. The war diary reveals that once Neutra was a soldier, his visual comprehension of his surroundings changed: landscapes once perceived as remote backdrops to human action were viewed as 'enclosing' environments in which one needed to survive.



Figure 1/ Richard Neutra, Kaufmann House, Palm Springs, CA, 1946. Distant view of the west elevation rising from behind rocks and boulders. Reproduction courtesy of Dion Neutra, Architect ©. Photograph © J. Paul Getty Trust, Julius Shulman Photography Archive, Research Library at the Getty Research Institute (2004.R.10).



Figure 2/ Richard Neutra (seated in center) with fellow soldiers in front of a fieldstone shelter on Mount Glumina to the east of Trebinje, Herzegovina, not dated. Image courtesy of Richard and Dion Neutra Collection, Archives-Special Collections, College of Environmental Design, California State Polytechnic University, Pomona, CA.

From a European perspective, the Mediterranean war theater was on the margins of the conflict, and the stretch from southern Herzegovina to Montenegro and northern Albania, where Neutra spent a large part of his active duty, was of even lesser importance.<sup>9</sup> The Austrian-Hungarian Army's *Militärschematismen*, regularly-published volumes listing office holders according to their military units and ranks, record the official stages of Neutra's military career. He was a member of the *Feldkanonenregiment* (FKR, Field Artillery Regiment) Nr 12, which, in turn, was part of the fortieth *Honvédinfanteriedivision* (Hungarian Infantry Division), stationed in Budapest.<sup>10</sup> The loss of his personnel records means that we do not know in which of the five battalions of FKR 12 he served, nor do we have details of the events leading to his military decorations.<sup>11</sup> Thomas Hines, Neutra's major biographer, argues that the relative quietness of the front between Herzegovina, in 1914

part of Austria-Hungary, and Montenegro, an ally of Serbia, meant that Neutra's war experience was mainly one of "illness and transience, ... [and] of trial"; "the only armed combat Neutra saw was with Slavic partisans in Albania and Montenegro", and "the most painful aspect of the war for Neutra was witnessing the misery of the uprooted civilian population".<sup>12</sup> While Neutra's service was certainly much less intense over longer periods than that of those soldiers stationed in trenches at the Western Front, a closer investigation of the time Neutra spent on the Balkans unveils a more complex picture of his duties and his experiences.

Neutra's service as a soldier can be broadly divided into four periods. The first began just before the Great War and lasted until almost the end of 1915. The second period coincides with Neutra's participation in the Austrian-Hungarian offensive against Montenegro from the end of 1915 until

the fall of the kingdom about a month later. During the third period, from around the end of January 1916 to the end of April 1916, Neutra was a member of the occupying forces of Montenegro. By the end of this time Neutra was in Cilli (Celje), Slovenia, on his way back to Vienna. At some point during the occupation, which included extensive travels into Albania, Neutra contracted malaria. Repeated outbreaks of the disease characterized the fourth period, which began with the temporary return to Vienna and ended together with the war in late 1918. This period is the least well documented, but in any case lies outside of Neutra's experiences of active military service in the war zone.

When the assassination of the Austrian Crown Prince and his wife on 28 June 1914 triggered the Great War, Neutra was already on his way to the garrison town of Trebinje in the south of Herzegovina to fulfill his peacetime duty of about four weeks of service every other year [Figure 3].<sup>13</sup> Located close to the border with Montenegro, Trebinje was part of a series of fortresses and military ports, like Sarajevo, Mostar, Bilica, and Cattaro, which formed the southern defense of the Austrian-Hungarian territory. Around Trebinje a network of smaller forts existed, some without permanent military personnel. Neutra was ordered to man Fort Kravica, "a desolate, neglected spot, a building with four ancient 70-mm field guns standing, forlorn and out of order, at the side of an emplacement under construction" which was "the farthest south ... halfway to the border of Montenegro".<sup>14</sup> Occasionally, Neutra was called back to Trebinje, for example, when he participated in offensives into the territory of Montenegro. In late August 1914, he relocated temporarily to an old Turkish military post high above the Adriatic port of Gruz (Gravosa) adjacent to Dubrovnik (Ragusa). His orders were to prevent a possible landing of the joint French-British Mediterranean navies traveling up the Adriatic Sea — and this with a single horse-drawn field gun, 27 pieces of ammunition, and a small group of men.<sup>15</sup> Later, Neutra returned to the same spot for a second stint of duty, now as "first officer of a more regular field battery", indicating that provision of military equipment had improved with his rise in rank.<sup>16</sup>

The wit and irony with which Neutra describes this task in his memoirs mask serious concerns. The opening entries of Neutra's war diary repeatedly refer to difficulties arising from outdated equipment, shortages of material and ammunition that hindered adequate training, exercises dominated by harsh commanders, lack of provisions, and communication issues arising from the ethnic diversity of the soldiers of the Austrian-Hungarian empire who did not all share a common language.<sup>17</sup>

Neutra's perception of the enemy was shaped by his awareness of an imbalance between modern weaponry and more traditional techniques of warfare. The commanding, but exposed mountaintop position of Fort Kravica was juxtaposed with "a savage guerrilla-trained enemy", which, in the night,

burned down farm buildings and "frontier hamlets".<sup>18</sup> When the barbed wire defenses around his company's position were supplemented with wired dynamite charges, Neutra wondered — at least in retrospect — about their effectiveness against enemies who were "mountaineers of Montenegro, who had knives with which to cut our throats, pistols, guns, and matches".<sup>19</sup> Neutra's doubts were not limited only to the drawbacks of stationary weapons and defenses that aimed at keeping the enemy at distance versus more flexible, moveable, simpler weapons which required attackers to get close to their targets. He also noted that the former did not work well in the topography of Montenegro. When the dynamite charges went off during night, it was impossible to tell if this was caused by animals or spying enemies. A new searchlight may have flooded the foreground with bright light but also gave away the location of their position.<sup>20</sup> Accordingly, the landscape that crept right up to the small outpost was Neutra's main concern. His gaze remained fixed on that immediate danger zone from which a partisan attack might emerge.

The second period of Neutra's war service was dominated by Austria-Hungary's decision to conquer the kingdom of Montenegro after defeating Serbia by the end of November 1915.<sup>21</sup> The attack began on 8 January 1916, and ended on 26 January, when Montenegro surrendered; to occupy all major towns took until the end of the month.<sup>22</sup> Neutra was part of a broad western move into Montenegro; the garrison of Trebinje was ordered to march towards the city of Nikšić, from where all inessential troops were then to proceed south towards



Figure 3/ Map of the Austro-Hungarian and German attack on Montenegro in early 1916. Neutra was stationed near Trebinje, from where he moved towards Nikšić (center). The approximate location of Šavnik, the destination of Neutra's mountain march on 30 January 1916, has been added to this map. Image from Immanuel Friedrich, *Serbiens und Montenegros Untergang: ein Beitrag zur Geschichte des Weltkrieges*, Berlin: E. S. Mittler & Sohn, 1917, map nr. 8. Courtesy of E. S. Mittler & Sohn, Hamburg.

the city of Podgorica.<sup>23</sup> On 6 January, various units left the fortress of Trebinje. Among them was the artillery battery of a Captain Endlicher to which Neutra belonged, according to the many diary entries recording his disagreements with "Hpt. E". Neutra marched across the mountainous winter landscape with faster moving infantry, but traveled back and forth between the first units and the slower progressing battery of guns. The latter reached Nikšić only on 28 January.<sup>24</sup>

In the time leading up to the invasion, Neutra observed numerous inefficiencies and a lack of planning. On 2 January, he noted that astonishingly many soldiers were occupied with non-military tasks like repairing the horse-drawn light carriages of local dignitaries. He expressed surprise about Captain Endlicher's statement that ammunition would not be taken along. Neutra's more systematic way of preparing for the invasion, as recorded in the pages of his diary, culminated in a four page list that addressed numerous logistical issues including the all important calculation of the number of animals required to carry a daily supply of 80 liters of wine.<sup>25</sup>

More existential concerns surfaced along the way. When occupying a position near Pecine West, Neutra studied the terrain and concluded that their position was potentially exposed to enemy fire directed at them from flanking positions. He recommended that traverses should be created to the right of their location. A second diary entry later the same day states that, thanks to this precaution, only four people were wounded when the enemy fire hit as he had anticipated.<sup>26</sup> During this period, reflections about inadequate weapons again gave way to 'strategic' concerns—in this case, adapting to the quickly varying situations while moving in large numbers into enemy territory.

During the third period Neutra was a member of the forces that, without encountering much military resistance, occupied Montenegro. He writes about endless travels across Montenegro, mostly in order to fetch captured Montenegrin artillery guns from high up in the mountains, to transport ammunition, to organize supplies, and to obtain vehicles and animals as means of transport. One particular journey provides an exemplary instance of Neutra's close interaction with the natural environment at this time. On 30 January 1916, Neutra received orders at 3:30 am to march with 34 soldiers and 25 horses towards Šavnik, a small town 55 kilometers north-east of Nikšić [Figure 3]. His task was to fetch captured mountain guns. The group went first to Luvnok, 13 kilometers away, and then to Gvozd, 14 kilometers and an ascent of up to 1,570 meters away. The next leg was 31 kilometers long to Šavnik while descending 750 meters. On 31 January, the transportation of the guns back to Nikšić began, though Neutra himself traveled on to Bokovica to inspect more guns. While this village was only ten kilometers away, it meant climbing 800 meters through a frozen waterfall.<sup>27</sup> Neutra describes the journey from Gvozd to Šavnik as follows:

Then upwards to a height of 1570 meters. Forests of beeches and oaks, pastures, in between grotesque rock promontories and gigantic snow drifts. By noon time in Gvozd. From then onwards the path was completely snowed in. Descent of 700 meters. Heroic landscape. Rocks, hundreds of meters tall, snow filled *Dolines* [sinkholes], inclines of up to forty degrees, footpaths across expanses of snow, numerous cadavers of dead horses. Beech forests, wild fruit trees, greenish, soaked humus soil. Finally, 300 meters below, a small town, quite similar to our own towns, at a river fork deep down at the bottom of a valley: Šavnik. Difficult final descent.<sup>28</sup>

It is instructive to compare Neutra's observations of a mountainous scene on the island of Corsica, where he visited at the turn of 1913 to 1914:

A very soft breeze carries with it a scent, a barely noticeable, tender, fine fragrance that becomes far more concentrated on the streets further down and might originate, I think, from the ashen hillsides full of burned bushes: a scent as of a fairytale coffee made from figs. Usually rarely noticed, it is the sole sensation here under the sky's blue dome. The rocky precipices to the right of the middle ground, in the direction of Nice, show a play of shadows that seem to follow the layering of the rock and, complementing the violet of the burned hillsides, are of roughly the same or a slightly lesser tonal value than the sky.... They seem to float in azure.<sup>29</sup>

In contrast to the verbal staccato of the landscape of war, the peacetime landscape is captured in a colorful, painterly mode. There are many similar entries in the diaries Neutra kept while traveling in Italy and along the Adriatic Eastern Mediterranean during 1913.<sup>30</sup>

It is true that even in the war diary, entries of comparative painterly qualities can be found. In February 1916, for example, Neutra observes that, "At the center of the city of Nikšić lies a large square cattle market, which is bordered by the better stores." He continues:

One street cuts across longitudinally; two streets frame the shorter ends. Trees of medium age define its borders, and now in the evening a single lit petroleum gaslight sheds its soft greenish light over the curb onto the cobblestones of the sidewalks. One side of the square displays one-story buildings having reasonably steep roofs of the same height, each building painted in a different color. Along the opposite, longer side, single-story and two-story buildings alternate.<sup>31</sup>

Neutra effortlessly integrated the local war-scarred population into this picturesque scene of a quaint town square almost as if the image needed some human staffage: "Small, weak children, very pregnant women, old people, sick people carry

the most sorry household goods — with lamentation or in sorrowful resignation — out into the night.”<sup>32</sup> Regardless if painted with words or brush strokes, Neutra’s observations portray him as a sympathetic observer of a country and its citizens during war.

Here the images remain wedded to a painterly point of view; Neutra’s perspective is that of an observer who confronts scenery in a manner similar to that of a painter in front of both landscape and canvas. Yet to identify these impressions as the essence of Neutra’s war experience is to miss the qualitatively new perception of space that is captured in the extract from Neutra’s march to Šavnik.<sup>33</sup> In that entry the landscape is a surrounding space into which Neutra is immersed and of which he takes measure primarily with regard to physical characteristics that may hinder or help his traversing it in pursuit of both the accomplishment of his mission and his own survival. There appear to be no examples of this kind of immersive environment in the pre-war travel diaries, but more instances of this experience of space are recorded in Neutra’s war diary.<sup>34</sup> Later, this immersive perception of space, rooted in the war experience, would become a source of Neutra’s novel approach to architecture.

## LANDSCAPES OF WAR

The precarious positions of individual soldiers in the landscape of war are central to many accounts of the Great War. Yet the particular environments described typically appear as part of the accidental circumstances into which men were thrown rather than those consciously reflected upon.<sup>35</sup> A rare exception is the essay “The Landscape of War” (1917), in which the Gestalt psychologist Kurt Lewin reflected (while recovering from battlefield wounds) on the spaces of a battlefield from the perspective of an individual soldier — in his case as a field artilleryman — and the fundamental changes in the perception of both details and characteristics of a landscape that the war brought about.

The essay opens with the difference between seeing a hill as a distinct spatial form rising upwards from below a flat plain and the same hill perceived primarily as a continuation of that plain, a “bump in the ground” or a “planar form” (*Flächengestalt*).<sup>36</sup> The former perception constitutes the phenomenological truth about the hill; the latter, indicates the view of a soldier gauging the formation of the land with regard to possibilities of military maneuvers and enemy positions on the crest or, increasingly common in modern warfare, the rear slope of a hill.<sup>37</sup> The soldier’s perspective offers a more integrated view of the landscape, but the gain in coherence is paid for with a loss of comprehensiveness. The peacetime landscape is “round, without front and back” and offering space

that is infinitely larger than what is immediately visible, which depends on topography and the laws of optical perception.<sup>38</sup> The landscape of war is no longer limitless, as it is “bounded” and appears “to be directed”. “Up ‘ahead’” was the border zone, a stretch of land leading to the foremost frontline, from which point onwards it ran parallel to the front.<sup>39</sup> It was overlaid by a danger zone that comprised random danger points and islands of danger like snipers’ and artillery’s target areas. The latter were often found far back in the hinterland at a great distance from the front; Lewin points out that the active war zone could encompass anything between two and ten kilometers.<sup>40</sup> In part, battles were being conducted across ever broader and deeper areas as the result of the use of more powerful weapons and, correspondingly, new military tactics.

Over the nineteenth century, rapid advances in weapons technology improved the range, power, and accuracy of weapons like rifles and artillery guns. One tactical response was the creation of new battle orders, most notably the substitution of “open order” deployment for “close order” formations”, which after much trial and error culminated during the Great War in the German army’s concept of elastic defense.<sup>41</sup> This was the last stage of the gradual dissolution of formal battle orders, a process that expanded the battlefield and revolutionized the position of individual soldiers within it. In earlier centuries, Western armies mostly fought “shoulder-to-shoulder ... in tightly packed formations”. Conspicuously dressed in colorful uniforms, “soldiers marched lockstep and loaded and discharged their weapons in unison” at an enemy who responded with like action.<sup>42</sup> Modern weapons increasingly rendered formal battle orders obsolete, not least because a mass of soldiers in formation was an obvious target. The alternative was to place “soldiers on the battlefield ... farther apart from one another than had been custom for most of recorded history”.<sup>43</sup> Implementing such insights in appropriate tactics involved a prolonged seesawing between traditionalists and visionaries within almost any army that fought a war during the decades flanking 1900.<sup>44</sup>

The military historian John A. English calls “open-order tactics” the “decentralization of infantry”.<sup>45</sup> Skirmishing, the most extreme form of such order, appealed as the best way to counter the effects of modern weaponry, but caused concerns regarding command and control of the more widely dispersed soldiers. More moderate tactical reforms tried to combine new and old methods. Regardless, most versions of open-order tactics shared certain characteristics. Among them was the re-organization of armies into smaller entities, especially at the bottom of the command hierarchy, where soldiers form small units. These now became even smaller and more numerous in order to gain greater flexibility for action. At the same time, battlefields expanded in width and depth. Strictly linear arrangement and densely packed single trenches at the front lines were superseded by staggered, overlapping, and widely-spaced lines, nodes, and positions for both defense



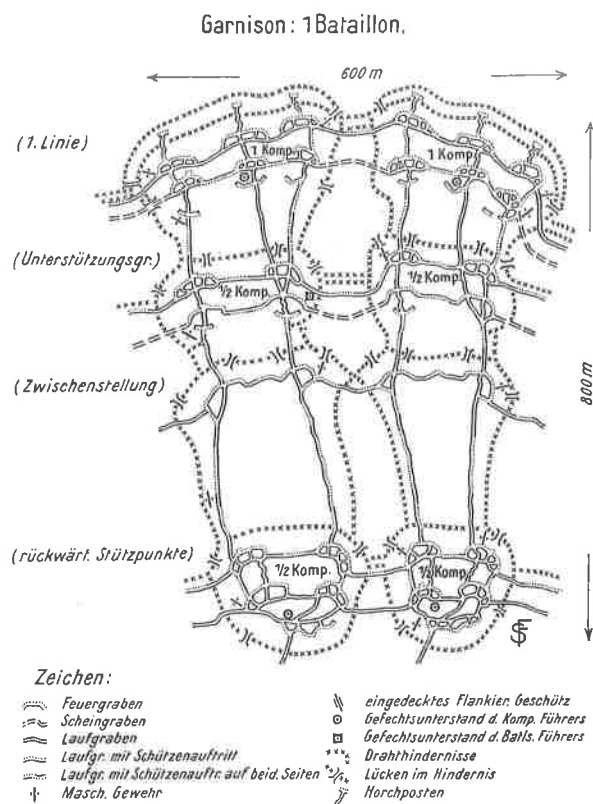


Figure 4/ Beginnings of the extended, open order battlefield — which in this example from Belloy, France, covers an area of 800 meters by 600 meters. Image from Friedrich SeeBelberg, *Der Stellungskrieg 1914–1918 auf Grund amtlicher Quellen und unter Mitwirkung namhafter Fachmänner technisch, taktisch und staatswissenschaftlich dargestellt*, Berlin: E. S. Mittler & Sohn, 1926, p. 221. Courtesy of E. S. Mittler & Sohn, Hamburg.

and attack, dispersing equipment and soldiers over a broader area and further apart within trenches in order to minimize losses [Figure 4].

Consequently, the modern battlefield became emptier, and soldiers had to learn to fight differently. They had to maneuver more, scan the landscape for even the slightest cover offered by topography and nature, crawl and hug the ground while moving forwards or backwards. All of these activities imposed close physical contact with nature.<sup>46</sup> To defend terrain required that soldiers be alone or in small groups in the foremost trenches, in hidden machine gun positions, or in shell holes that sometimes were converted into sophisticated tactical positions.<sup>47</sup> Once the German army had perfected their elastic defense, which was defined as thinly populated front lines that “temporarily evade the annihilating [artillery] fire — if possible by moving forward as far as the entanglements

— followed by a rapid attack by the reserves”, small-scale attacks and raids were conducted in units of just a few soldiers (*Stoßtruppen*).<sup>48</sup> Moreover, elastic defense matched the fast-paced character of the space of the battlefield, as both gaining terrain and holding on to it were no longer ends in themselves but means to achieve larger strategic goals.

As previously noted, Neutra did not serve at the Western Front, one of the fiercest war theaters. Yet as contemporary sources point out, the war conducted in the mountainous regions of the Alps and the Western Mountain Barrier of the Balkans was second only to the Western Front with regard to the demands it put on soldiers.<sup>49</sup> War in a mountainous terrain spatially expanded the battlefield even more than on flat land, as the geological situation often only allowed for positions that were separated by distance and height, and foremost trenches that were just short, unconnected segments.<sup>50</sup> According to William Balck, German general lieutenant and author of studies of modern tactics,



Figure 5/ Austrian troops climbing a steep mountain during the Great War. Central News photograph. Image from Douglas Wilson Johnson, *Topography and Strategy in the War*, New York: Henry Holt, 1917, facing page 78.

mountain war was harder because it was both a struggle with the enemy and a “fight against nature”. The latter was a consequence of the topography, the addition of height to distance, and the unpredictable swings of the weather. In addition, “troops had to learn a different way of ... breathing” as the geographical conditions forced soldiers to interact more intensely on a physio-psychological level with the environment [Figure 5].<sup>51</sup>

In short, the modern battlefield, especially the open order, demanded a new type of soldier. Mass psychology ensured the forward movement of shoulder-to-shoulder formations because individual soldiers could hide within the larger group that created the illusion of invisibility and invulnerability. The open order, however, required soldiers “who were self-reliant and selfless and possessed of both loyalty and initiative”. In addition, they had to rapidly judge topographical, tactical, and other situations in order to adjust to fast-changing circumstances, even when cut off from the chain of command. These demands stood in sharp contrast to the sensibilities of emerging modern societies, since “men raised in the increasingly predictable and orderly environments of nineteenth-century towns and villages could not be expected to be at home on the empty battlefield”.<sup>52</sup> For some individual soldiers, meanwhile, the latter may have constituted the ultimate modern space, surroundings in which they could experience themselves as individuals in an environment that was theirs to master.

## UMWELT, THE ENVIRONMENT SURROUNDING HUMAN BEINGS

The new soldier in the open-order battlefield, Lewin traversing the landscape of war, and Neutra immersed in the mountains of Montenegro — they all employ a gaze radiating outward from a position central to their larger surroundings: their *Umwelt*. This German word combines the word ‘Welt’ (world) with the prefix ‘um’, which in this case signifies something that wraps around something else. Accordingly, *Umwelt* is the world that surrounds a subject or object at its center.

This *Umwelt* conception harks back to nineteenth-century psychology and biology. Early psychologists like Wilhelm Wundt, whose physio-psychology Neutra appreciated, were concerned with the physiological reactions of the human body to external stimuli. Thus a relationship between human beings and the environment was set up that placed the former at the center of the latter. A sketch in one of the books by physicist and philosopher Ernst Mach illustrates this nicely [Figure 6]. It shows a man whose gaze wanders outward from the eye,



Figur 1.

— Figure 6/ Man surveying his *Umwelt*. From Ernst Mach, *Beiträge zur Analyse der Empfindungen*, Jena: Gustav Fischer, 1886, p. 14.

past the tip of his mustache, down his body, along his lower limbs, then across an interior filled with bookshelves, and, leaving the architectural space, through a window into the wider surroundings.<sup>53</sup> This human-centered worldview was confined neither to psychologists and physicists, nor, indeed, to German writers.

Already in the late 1870s, Thomas Huxley pointed out that to grasp the world required viewing it from the inside rather than looking at the globe from the outside, as if it were an object separate from the viewer.<sup>54</sup> A little over half a century later, philosopher Edmund Husserl argued that the earth is best comprehended by adding up impressions of the environment obtained by a series of individuals, each at the center of a smaller sliver of space bordered by that viewer's individual horizon.<sup>55</sup>

The most prominent formulation of such a view from the inside out onto the world came from Jakob von Uexküll, who coined the term *Umwelt* in order to distinguish it from *Umgebung* (surroundings).<sup>56</sup> Animal organisms, including human beings, exist in the same *Umgebung*, the objective world that surrounds them as ‘a given’, to paraphrase the German word. Within this larger entity, individual organisms live within their own *Umwelt*. This is subjective, as it is created in the interplay between the organism's needs — projected

outwards into the environment via sensory organs — and the stimulations that the *Umwelt* provides for these organs. Sending signals and receiving stimuli are interactive acts, which bind organism and *Umwelt* in a feedback loop.<sup>57</sup>

Thus by the time Neutra studied architecture and served in the war, contemporary psychologists, scientists, and philosophers had envisioned *Umwelt* as a concept of space that was universal, even if non-Cartesian — and objective, even though based on subjective observations and perceptions. Most importantly, it did not confine individuals to abstract, geometrical space — comparable to the 'Vitruvian man' caught in a tight framework of circle and square — but envisioned them at the heart of a sensory environment.

Throughout his career, Neutra always emphasized the importance of a physiognomic reading of a landscape when pondering a site and a new design. This approach has roots in his fascination with the nexus between human perception and humans' physio-psychological responses to their surroundings, a legacy that harks back to his reading Wundt's *Grundzüge der physiologischen Psychologie* (*Principles of Physiological Psychology*) as a student.<sup>58</sup> As an architecture student, Neutra was spatially aware and perhaps pre-destined to enjoy a fine-grained perception of the environment. Yet the landscape of war made all of Neutra's preexisting knowledge about space tangible in a far more existential manner. Now he was forced to 'read' landscapes in order to survive.

## FROM THE LANDSCAPE OF WAR TO THE OPEN ORDER OF THE KAUFMANN HOUSE

There are at least three 'defensive' attitudes towards the natural environment, presumably resulting from Neutra's experiences of the Great War, that reverberate through the spaces of the Kaufmann House. First, the environment of war was best mastered with an active approach that relied on human interventions into the landscape. Military installations, temporary and permanent, were inserted into the landscape in locations determined by strategy and tactics. If necessary, they were placed apart from each other, thus circumscribing the ground in-between as friendly, but contested territory. Second, nature was not benevolent. Instead, the existence of a soldier was intimately tied to a malevolent natural environment, even though that malevolence was to a significant degree human-induced rather than inherent. Third, self-preservation in the landscape of war, if anything other than accidental, required deliberate,

continuous, and close physio-psychological engagement with the environment, drawing on all senses in order to track changes in the terrain, weather, and other circumstances.

When Neutra arrived in California in early 1925, he was finally in a position to design his version of the utopian promises of architectural Modernism. He was closely acquainted with the visionary aspirations of the Modern Movement. From October 1920 onwards, he had lived and worked in Berlin, then one, if not *the* center for Modern architecture's drive to order anew the entire surroundings of contemporary society. Conceptually, projects from Neutra's early time in California continued that Modernist longing for a new, well-ordered world to be created by tackling the rational redesign of cities; proposing urban apartments, prefabricated housing, and social building types; and reinvigorating domestic architecture with structural and spatial innovations.<sup>59</sup> Neutra's experiments with the plans of houses were, however, still mostly confined within a tightly controlled volume.<sup>60</sup> Formally, horizontal windows and stucco bands, flat roofs, and structures and window frames made of steel dominated in his projects and thus contributed to the emerging language of international Modernist architecture. A good example from this period is the Miller House (1937), Neutra's first commission in Palm Springs. While large expanses of glass, a screen porch, and an adjacent reflecting pool open the house to views of the desert, the volume remains cubic and contained; in fact, the composition has been compared to Pueblo architecture.<sup>61</sup>

According to Esther McCoy, Neutra's California oeuvre falls into two distinct periods. The first began around 1927, while the second dates to the design of the Nesbitt house in Los Angeles, on which Neutra worked from 1941 to 1942.<sup>62</sup> This period coincided with the Second World War, which (from an American perspective) had come much closer to home, especially to the West Coast, when Japanese forces attacked Pearl Harbor, Hawaii, on 7 December 1941, leading the US to enter the war the next day.

Neutra called the Nesbitt home a "war house" in which "life [was] reduced to simplicity".<sup>63</sup> Wartime rationing of building materials determined that brick and wood were used, which may have simplified the construction, yet the plan was anything but simple. Rather, with another world war menacing the US, Neutra's designs acquired a new complexity, which was innovative while harking back to his own experiences of the Great War.

The Nesbitt house achieved "a new kind of transparency" by juxtaposing a glass entrance with floor-to-ceiling windows on opposing sides of the same space [Figure 7].<sup>64</sup> Part of this openness was the arrangement of the interior spaces into pavilions — a larger one for the main living areas and a smaller one to serve as guest quarters or an office — which were connected by walkways under projecting roofs and pergolas but otherwise open to the surroundings.<sup>65</sup> The plan pulls



Figure 7/ Richard Neutra, Nesbitt House, Los Angeles, CA, 1941–1942. View of the main pavilion, seen from the garden side, the all-glass entrance into the house in the middle ground to the left. Reproduction courtesy of Dion Neutra, Architect ©. Photograph © J. Paul Getty Trust. Julius Shulman Photography Archive, Research Library at the Getty Research Institute (2004.R.10).

architecturally-defined rooms apart to form smaller units without creating two stand-alone buildings, and links these units with walkways. This distribution of the architectural components expanded the house's space in a manner comparable, though on a much smaller scale, to the Great War's transformation of ever larger slices of territory into potential battlegrounds through the dispersal of military installations and the use of further reaching weapon systems.

On an extended, open-order modern battlefield even an experienced soldier was at times hard pressed to precisely locate the dividing line between friendly and enemy territory. Similarly, at the Nesbitt house it is not easy to decide the exact line separating inside and outside, a task made more difficult by a brick wall that runs along the front of the main house

[Figure 8]. The wall, which has a low planter at its front, spans the distance between the pavilions, while open walkways on either side of it link them. The wall adds depth to the house's facade and its height evokes a breastwork underneath a sheltering roof overhang, like a fortification providing protection to one who fires over it from a standing position. Yet Neutra's intention was not to build houses that evoked military installations and shelter-like spaces. Rather, as the Kaufmann House illustrates, the goal was to offer safe homes in hostile environments.

Although built after the Second World War had ended, the Kaufmann House, too, was a product of the war, as building restrictions were still in place and about to be tightened when construction started.<sup>66</sup> The house continued



Figure 8/ Richard Neutra, Nesbitt House, Los Angeles, CA, 1941–1942. View of the front facade, with the brick wall linking the two pavilions on the left and the entrance into the main pavilion in the background to the left. Reproduction courtesy of Dion Neutra, Architect ©. Photograph © J. Paul Getty Trust, Julius Shulman Photography Archive, Research Library at the Getty Research Institute (2004.R.10).

the pavilion theme and transformed Neutra's "unusually relaxed" floor plans from the early 1940s into an open order arrangement, to borrow the military-historical term [Figure 9].<sup>67</sup> The pinwheel plan comprises four wings with the main entrance and adjacent garage, the servants' quarters, the guest rooms, and the master bedroom at their respective ends. An outlying small building for mechanical services extends the plan well past the master bedroom wing. And an additional pavilion sits on top of the main house, accommodating a sun- and lookout deck that was roofed over and partially shielded by vertical aluminum louvers.

The large living room with its fireplace appears to be the center of the house. Yet the architectural details counter the impression of a central hearth as a focus towards which both architecture and domestic life can gravitate (as they do, by contrast, in the open plan living quarters that Frank Lloyd Wright had designed from the turn of the century onwards). Instead, the reflections of the polished terrazzo floor in the Palm Springs house remind occupants that the house "sat upon the desert", and the visibly thin facing stone of the fireplace is too insubstantial in format and pattern to evoke protective coziness.<sup>68</sup> Neutra's plan merges traditional inside and outside spaces — and all transitions between the two — into a spatial continuum. Within that continuum, units of rooms like the guest rooms, built-in and freely distributed moveable furniture, and architectural and landscape objects like the swimming pool, a water channel, and outdoor terraces (equipped with underfloor heating and cooling) are arranged in a way that requires the occupants to maneuver around and between these elements when traversing the space.

Consequently, almost everywhere within the environment of the Kaufmann House, the occupant is placed into the open order of modern space without, however, being exposed to the dangers of the modern battlefield. Situating his subject into such an exposed, but now safe position might suggest that Neutra was re-enacting his own positions, and consequent need for prospect and refuge, in the dangerous landscapes of the Great War. Neutra was, however, more interested in the potential of the Kaufmann House as a prototype than in any therapeutic effect it might offer for past trauma. The house exemplified how "to extend the habitable area of the planet into places not yet inhabited and thus unendowed with any tradition of civilized design". Rather than being merely a masterpiece of regional Modernism, its intended reach was universal; Neutra projected that "there will be many other examples necessary in the jungles of the upper Amazonas [sic] or Congo, the Arctic regions, the arid sand wastes of Arabia."<sup>69</sup> Nonetheless, the language here of exploration, if not conquest, of unforgiving physical environments is inextricably linked to the notion of a 'malevolent nature' and, accordingly, reflects the second 'defensive' attitude gained by Neutra through his war experience.

When Neutra published *Wie baut Amerika?* (*How Does America Build?*) in 1927, the last image at the bottom of the final page shows "the primitive desert landscape to the north of the Oasis hotel in Palm Springs".<sup>70</sup> This desert photograph, which is similar to the one included in Figure 9, thus presents the Colorado Desert, one of the most challenging natural environments in California, as the ultimate destination of Modern architecture's efforts. If the camera had moved westward it would have captured the area where the spurs of Mount Jacinto meet the desert and where the Kaufmann House would later rise in a landscape visually recalling the Karst of the Balkans.

The Great War had introduced modern technology and buildings in the form of artillery gun positions, defensive structures, and other installations into the landscape. Whatever topographic and geographical circumstances the fighting armies faced in the mountains and valleys of the Alps and the Balkans, engineering skills could overcome them [Figure 10]. Friedrich Seeßelberg — architect, soldier on the Western front, and author of a 1926 study of the built environment of the battlefield — provides numerous examples of mountain tops and slopes reengineered according to military needs, including, for example, multi-story barracks for soldiers built into subterranean limestone caverns naturally occurring in the Karst.<sup>71</sup> Neutra's fascination with human settlements in hostile natural environments relied equally strongly on modern technology in order to overcome the challenges set by nature. Writing about the Kaufmann House, he states:

A building is frankly and clearly an artefact [sic], a construct transported in many shop-fabricated parts over long distances into the midst of such rugged aridity. It is as little local as the much needed water which is piped to its site over many miles. The lawns and the blooming shrubs around this dwelling are imports just like its aluminum and plate glass.

Military installations tried to blend into the land, hoping that detection would be impossible or at least delayed; the modern house's relationship with its environment is more complex:

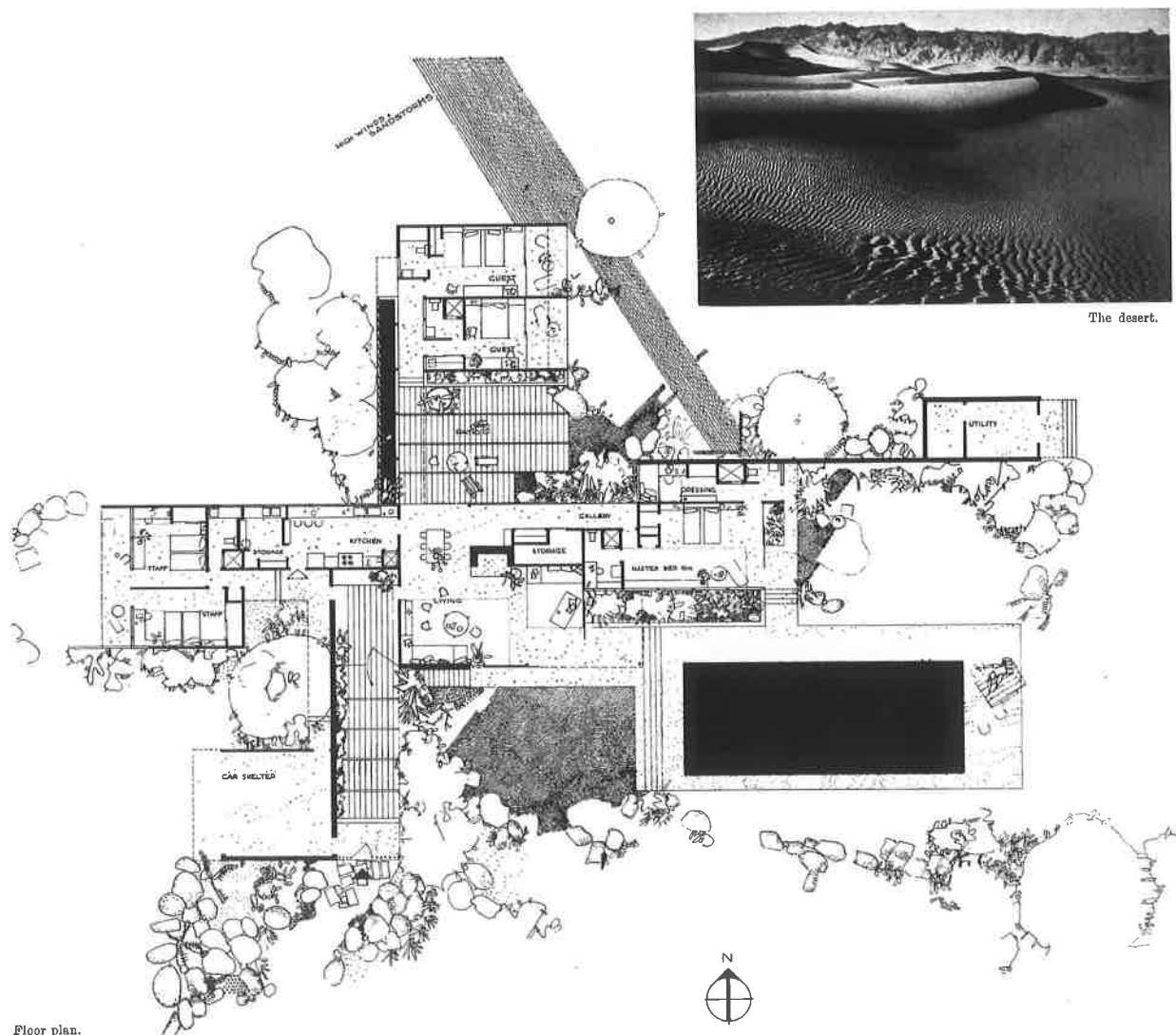
A desert house cannot be 'rooted' in the soil to 'grow out of it' ... the building nevertheless fuses profoundly with its setting, partakes in its events, emphasizes its character. The structure exhibits no spectacular pseudo dynamics of its own, but with a serenity of truly human planning assimilates itself to the dynamics of the place from hot radiation to hectic sandstorms and the nightly cold under the starry sky.<sup>72</sup>

This quote invites another comparison with Frank Lloyd Wright, in particular with Fallingwater, the other Kaufmann House that, exemplifying an organic approach to architecture, nestles deeply into nature. The important difference between



both houses is not their architecture but the concept of nature underlying their designs. Neutra does not mention nature in the quote above (or in the source text), indicating that the Kaufmann House and its setting were not conceived of holistically, in accordance with the transcendentalist concept of nature that informed the organic school of American architecture. Instead, Neutra references mostly factual environmental changes in temperature and air movement. This points to a view of nature as physical terrain upon which to site a building. Elsewhere, Neutra strengthens this impression: "Once upon a time the natural landscape had a face as familiar to man as that of his

mate" — but this face had been threatened by human activities as soon as humans began changing the surface of the earth; civilization eventually destroyed it.<sup>73</sup> All that was left for individuals in the modern world was to read nature's physical, physiological, and physiognomic forms.<sup>74</sup> This approach made it possible to build in the most extreme landscapes, even on the moon with an environment formed in prehistoric time and which, in addition, had no cultural past to which architecture could refer.<sup>75</sup> Nature unencumbered by cultural references and memories thus leaves situational responses to sense stimuli originating from within a person's surroundings as the only



Floor plan.

The desert.

Figure 9/ Richard Neutra, Kaufmann House, Palm Springs, CA, 1946–1947. Floor plan published together with a photograph of the desert similar to the one that Neutra included as the last illustration on the final page of *Wie baut Amerika?* (1927). From Richard Neutra, *Bauten und Projekte*, Zürich: Girsberger, 1955, p. 74. Reproduction courtesy of Dion Neutra, Architect ©.

means of comprehending the environment. This brings back physio-psychology, the third 'defensive' aspect of Neutra's experience of the Great War.

As Neutra explains in a section in *Survival Through Design*, mastering one's position in the open order of modern space was a deliberate act of physio-psychological interaction with the environment that comprised at least four stages.<sup>76</sup> Composed in the first person and relying on the language of perceptual psychology, the short passage is remarkable as it draws on events from the time of the Great War — apparently recalled by the Second World War, in the course of which the book was compiled — while envisioning how to negotiate a site in the design process in terms of a series of impulses and (re)actions.<sup>77</sup>

Neutra defines the first of these, the "Orientation Response", as readying himself for "acting to gain a position so that I can be fully aware of a particular event which I must face". Subsequently, he raises his head and body indicating that he might be surveying a dangerous situation, as when occupying a lonesome outpost surrounded by partisan fighters, while actually determining a site for a building. The following "Defense Response", offers two options, both involving structures. One is termed, "Escape"; some structure, perhaps a trench, has apparently collapsed, for Neutra ideally envisions himself "not surrounded by an obstructing enclosure or any other obstacles impeding escape". The other, "Protection", is more 'constructive'; in this case Neutra expresses the desire to be "well surrounded by an enclosure to shelter me safely". He next lists the "Control Response", which also involves alternatives. Here the architect, perhaps ultimately envisioning a well-laid-out, practically arranged modern interior, projects a circumstance in which "everything that I might want to use is handy", that "none of it seem to be out of reach". Yet the preceding sentence — "I desire ... to have full control of my limbs and of all objects or tools" — points equally to the moment when a soldier checks his own body for injuries after a blast. Finally, there is the "Precision Response", which continues the process of gaining increasing control of the environment, for Neutra has "succeeded in eliminating all vagueness, all blurred uncertainty from my sensuously accessible surroundings or from their impressions on me... everything ... is well in focus and defined".<sup>78</sup> These four 'responses' constitute a process that requires perpetual exchange between sensory stimulation and the corresponding reaction. Individual human beings thus exist at the center of an Uexküllian *Umwelt*, or as Neutra states elsewhere, "Man is always in the middle of something — this ineluctable presence, enveloping and permeating our lives, is called environment.... It determines who we are, how we feel and what our outlook is."<sup>79</sup>

Accordingly, the Kaufmann House is conceived as a human-made *Umwelt* providing a variety of spatial situations (enclosed, half-enclosed, open, covered, exposed, etc.) that place the occupant either inside, outside, or in transitional

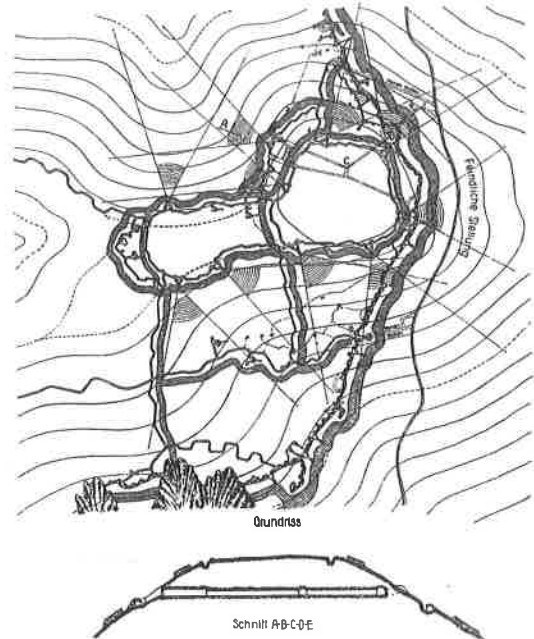


Abb. 115. Ausbau einer überhöhten Ruppe im Hochgebirge. (Die schraffierten Streifen bedeuten Drahthindernisse vor den Schützengräben. Man beachte die eingezeichneten M. G.-Befestigungswinkel.)

Figure 10/ Plan and section of a mountain top re-engineered into extended, open-order military installation above and below ground. Hatched bands indicate barbed wire, hatched angles show areas covered by machine guns. The enemy position is to the right of the continuous black line drawn from top to bottom. Image from Friedrich Seeßelberg, *Der Stellungskrieg 1914–1918 auf Grund amtlicher Quellen und unter Mitwirkung namhafter Fachmänner technisch, taktisch und staatswissenschaftlich dargestellt*, Berlin: E. S. Mittler & Sohn, 1926, p. 187, Courtesy of E. S. Mittler & Sohn, Hamburg.

zones. Within each setting, means of control (windows, curtains, aluminum louvers, heating and cooling elements in the terrace floors, water, etc.) offer numerous possibilities to vary the kind and degree of sense stimulation, depending on individual and environmental circumstances.<sup>80</sup> In one of the bathrooms off the master bedroom, for example, Neutra placed a mirror perpendicular to a large window above a low storage cabinet [Figure 11]. This put the inhabitant into a state of visual alertness when looking at a picture puzzle that oscillates between reflection and reality, while unconsciously also scanning the middle ground (or danger zone) surrounding the house (conceptually, one's 'military position').

Humans may have been placed at the center of the open order of modern space, yet they still required protection and isolation — as the interlocking metal gaskets of the guest room doors, with which this essay began, indicate. Further,





— Figure 11/ Richard Neutra, Kaufmann House, Palm Springs, CA, 1946–1947, View from one of the bathrooms adjacent to the master bedroom. —  
The mirror is on the right side of the image, the glass corner further beyond encloses the living room. Reproduction courtesy Dion Neutra, Architect  
©, Photograph © J. Paul Getty Trust, Julius Shulman Photography Archive, Research Library at the Getty Research Institute (2004,R.10).

deep inside the Kaufmann House, Neutra provided for yet another, hidden shelter. Tucked away behind the other bathroom adjacent to the master bedroom, and accessible only through a small dressing area, is a private den. Located off the geometric middle of the plan, the room is nevertheless the center of house. It was fitted with a desk, a day bed, and, originally, a teletype machine with which Mr. Kaufmann conducted business remotely.<sup>81</sup>

Similar to the view of March's sketch of a man surveying his *Umwelt*, the room's sole window invites one to look over a sequence of indoor, outdoor, and transitional spaces [Figure 12]. Among them are, to the left, the living area with the door into the servants' quarter and the corner of the upstairs pavilion; straight ahead, the heated and covered terrace next to the guest rooms; and beyond the aluminum louvers and water channel in front of those rooms, the outdoor patio followed by the desert leading up to the mountain. Returning once more to the landscape of war, within the open-order floor plan this room recalls a dugout from where to strategically observe the one point where the highly differentiated environmental settings that the house offers most visibly intersect. The gaze from the little shelter onto that important junction is a permanent reminder that a person's survival at the center of his or her *Umwelt* requires constant caution and care.

The experiences of the Great War became an important source that, during the time of another world war, influenced Neutra's radical re-envisioning of Modern architecture. The open-order floor plan of the Kaufmann House gives a new meaning to the Modernist credo of designing from the inside out. Rather than outwardly expressing an inner essence or function of a building misunderstood as either an organism or a machine, Neutra designed from the perspective of a person at the center of his plans outward toward the latter's *Umwelt*. It would appear that the sudden emergence of the open plan in the aftermath of the Great War had closer links to many Modernist architects' firsthand experiences of the hostile landscapes of war and the open order of the modern battlefield than thus far known to us.

#### NOTES

- 1/ Many thanks to the owner of the Kaufmann house for making this visit possible.
- 2/ Neutra, Richard, "Landscaping — A New Issue", *Contemporary Landscape Architecture and its Sources*, exhibition catalogue, San Francisco: San Francisco Museum of Art, 1937, p. 21.
- 3/ See Johannes Stoffer, "Pflanzenverwendung auf Transatlantisch. Richard Neutra als Gartengestalter", *Topiaria Helvetica*, 2012, pp. 28–38. The quote is from page 29.
- 4/ In the context of the Great War and Modern architecture, historians have to date looked primarily at the importance of air warfare on Modern architecture's gaze at space and at architects who as pacifists resisted the war. The different experiences of those architects who

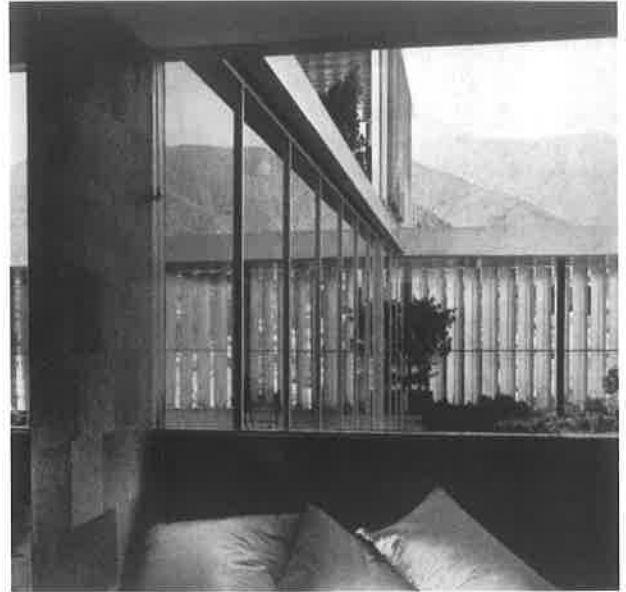


Figure 12/ Richard Neutra, Kaufmann House, Palm Springs, CA, 1946–1947. View from the den next to the master bedroom across the patio with aluminum louvers at the far end into the desert landscape and the mountains behind the house. From Richard Neutra, *Bauten und Projekte*, Zürich: Girsberger, 1955, p. 77. Reproduction courtesy Dion Neutra, Architect ©.

- actively fought in the battlefields still await analysis. My focus on Neutra's participation in the war as one influence on his mid-twentieth-century architecture offers an exemplary case study of how the Great War may have shaped the development of the works of a Modern architect. See Christopher Asendorf, *Super Constellation. Flugzeug und Raumrevolution. Die Wirkung der Luftfahrt auf Kunst und Kultur der Moderne*, Vienna: Springer, 1997; David Leatherbarrow, *Uncommon Ground. Architecture, Technology, and Topography*, Cambridge, MA: MIT Press, 2000, chapter 1. Bruno Taut is a good example of the second category. See Iain Boyd Whyte, *Bruno Taut and the Architecture of Activism*, Cambridge: Cambridge University Press, 1982. Erich Mendelsohn is an exception. The importance of his wartime sketches for his post-war architecture is recognized, though little of his military service is known except for the different war time letters included in the German and English editions of selections of his correspondence. See Erich Mendelsohn, "Gedanken zur neuen Architektur [Im Feld 1914–17]", in "Erich Mendelsohn. Bauten und Skizzen", *Wasmuths Monatshefte für Baukunst*, vol. 8, 1924, p. 3; Oskar Beyer ed., *Briefe eines Architekten*, Munich: Prestel, 1961; Beyer, Oskar ed., *Erich Mendelsohn: letters of an architect*, Geoffrey Strachan trans., Nikolaus Pevsner intro., London: Abellard-Schuman, 1967.
- 5/ Neutra's peace time military service lasted from 1910 to 1911, his active war service from 1914–1918. He studied architecture from 1911–1912 to 1913–1914, and again 1917–1918 when he was on special leave. (Hines, Thomas S., *Richard Neutra and the Search for Modern*

- Architecture, New York: Oxford University Press, 1982, p. 20). Scholarship on Neutra has argued for the important influences that he absorbed from both California and cognate disciplines. Most recently, the analytical focus has rested on Freudian psychoanalysis; other approaches concentrated on psychology and consumer culture, physio-psychology, the Southern Californian environment, and, especially in the earliest publications, nature in the most general sense. See for example: Sylvia Lavin, *Form Follows Libido. Architecture and Richard Neutra in a Psychoanalytic Culture*, Cambridge, MA: MIT Press, 2004; Todd Cronan, "'Danger in the Smallest Dose': Richard Neutra's Design Theory", *Design and Culture* 3, issue 2, 2011, pp. 165–182; Sandy Isenstadt, "Richard Neutra and the Psychology of Architectural Consumption", *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, Sarah Williams Goldhagen and Réjean Legault eds., Cambridge, MA: MIT Press, 2001, pp. 97–117; Leatherbarrow, *Uncommon Ground*, chapter 2; David Leatherbarrow, *Topographical Stories: Studies in Landscape and Architecture*, Philadelphia: University of Pennsylvania Press, 2004, chapters 2 and 3; Barbara Lamprecht, *Richard Neutra 1892–1970: Survival Through Design*, Cologne: Taschen, 2006; *L'Architecture d'aujourd'hui* 16, no. 6, May–June 1946, American Edition [special issue on Neutra]; Museu de Arte de São Paulo, Brasil, *Neutra Residências*, São Paulo: Todtman & Cia., 1951.
- 6/ Letter Hadtörténelmi Levéltár és Irattár (Hungarian War Archive), Budapest, Hungary, to author, 3 March 2011.
- 7/ Neutra, Richard, *Life and Shape* [1962], Los Angeles: Atara Press, 2009.
- 8/ Neutra, Richard, Diary, vol. 4, 1915–1916, Richard and Dion Neutra Papers, Department of Special Collections, Charles E. Young Research Library, University of California at Los Angeles. All translations from the Neutra diaries and other German language books are mine, except where otherwise noted.
- 9/ Hickey, Michael, *The First World War, Vol. 4, The Mediterranean Front 1914–1923*, New York: Routledge, 2003, p. 7.
- 10/ In 1914 Neutra was a *Kadett* with *Feldkanonenregiment* (FKR) Nr. 12; in 1916 *Leutnant der Reserve* with *Feldhaubitzenregiment* Nr. 31; in 1918 *Oberleutnant* with *Feldartillerieregiment* (FAR) Nr. 131, decorated with the *Karl-Truppen-Kreuz* and a *Bronzene Militärverdienstmedaille mit Schwertern*. Letter, Österreichisches Staatsarchiv, Abteilung Kriegsarchiv, Wien, to author, 17 February 2011. The three regiments were the same unit which was renumbered twice during re-organizations of the Austrian-Hungarian army. See Georg Sobička, *Gliederung und Entwicklung der Batterien der österreichisch-ungarischen Feld- und Gebirgsartillerie im Weltkriege 1914–1918*, Vienna: Karl Harbauer, 1920, p. 6.
- 11/ Letter Hadtörténelmi Levéltár és Irattár, Hungarian War Archive, Budapest, Hungary, to author, 3 March 2011. With regard to Neutra's medals see Johann Stolzer and Christian Steeb eds., *Österreichs Orden vom Mittelalter bis zur Gegenwart*, Graz: Akademische Druck u. Verlagsanstalt, 1996, pp. 244–245, 238–240.
- 12/ Hines, Neutra, p. 25.
- 13/ Neutra, *Life*, p. 100.
- 14/ Neutra, *Life*, p. 106.
- 15/ Neutra, *Life*, pp. 109–115.
- 16/ Neutra, *Life*, p. 115.
- 17/ Neutra, Diary, vol. 4, 1915–1916, entries for 12/9/1915, 12/11/1915, 12/13/1915, pp. 1–3 (see note 8).
- 18/ Neutra, *Life*, p. 106.
- 19/ Neutra, *Life*, p. 107.
- 20/ Neutra, *Life*, p. 107.
- 21/ Friedrich, Immanuel, *Serbiens und Montenegros Untergang: ein Beitrag zur Geschichte des Weltkrieges*, Berlin: E. S. Mittler & Sohn, 1917, pp. 52–56, 65–69; Glaise-Horstenau, Edmund, ed., *Österreich-Ungarns letzter Krieg*, vol. III, *Das Kriegsjahr 1915 von der Einnahme von Brest-Litowsk bis zur Jahreswende*, Wien: Verlag der Militärwissenschaftlichen Mitteilungen, 1932, pp. 187–337.
- 22/ Friedrich, *Serbiens und Montenegros Untergang*, pp. 68–69.
- 23/ Glaise-Horstenau, Edmund, ed., *Österreich-Ungarns letzter Krieg*, vol. IV, *Das Kriegsjahr 1916, erster Teil: die Ereignisse von Jänner bis Ende Juli*, Wien: Verlag der Militärwissenschaftlichen Mitteilungen, 1933, p. 33.
- 24/ Neutra, Diary, vol. 4, 1915–1916, entries 1/8/1916 (p. 19), 1/12/1916 (p. 22), 1/5/1916 (p. 15), 1/26/1916 (p. 30); 1/30/1916 (p. 35) (see note 8).
- 25/ Neutra, Diary, vol. 4, 1915–1916, entries 1/2/1916 (pp. 9–10), 1/5/1916 (p. 13), 1/5/1916 (pp. 14–17) (see note 8).
- 26/ Neutra, Diary, vol. 4, 1915–1916, entries 1/8/1916, 10 am (p. 19), 1/8/1916, 6:45 pm (p. 20) (see note 8).
- 27/ Neutra, Diary, vol. 4, 1915–1916, entries 1/30/1916 (pp. 35–40), 2/1/1916 (pp. 40–44) (see note 8).
- 28/ Neutra, Diary, vol. 4, 1915–1916, entries 1/30/1916 (p. 37) (see note 8).
- 29/ Neutra, Diary, vol. 2, 1912–1917, pp. 124–125 (see note 8).
- 30/ The later journey included visits to places which Neutra would see again as a soldier, for example Ragusa, Gravosa, and Cattaro.
- 31/ Neutra, Diary, vol. 4, 1915–1916, entry 2/7/1916 (pp. 48–49) (see note 8).
- 32/ Neutra, Diary, vol. 4, 1915–1916, entry 2/7/1916 (p. 49) (see note 8), translation from Hines, Neutra, p. 25.
- 33/ For example, Hines, Neutra, p. 25.
- 34/ Neutra, Diary, vol. 4, 1915–1916, entries 1/26/1916 (pp. 31–32), 1/31/1916 (pp. 39–40), 2/1/1916 (pp. 40–41) (see note 8).
- 35/ For an environmental history of the Great War, see William Kelleher Storey, *The First World War: A Concise Global History*, Plymouth, UK: Rowman & Littlefield, 2009.
- 36/ Lewin, Kurt, "The Landscape of War" [1917], Jonathan Blower trans., Volker M. Welter intro., *Art in Translation*, vol. 1, issue 2, 2009, p. 201, italics in original.
- 37/ English, John A., and Bruce L. Gudmundsson, *On Infantry*, rev. ed., Westport, CT: Praeger, 1994, pp. 26–27.
- 38/ Lewin, "Landscape", pp. 201–202.
- 39/ Lewin, "Landscape", pp. 201–202, italics in original.
- 40/ Lewin, "Landscape", p. 202.
- 41/ English and Gudmundsson, *Infantry*, p. 1; and William Balck, *Entwicklung der Taktik im Weltkriege*, second ed., Berlin: R. Eiseenschmidt, 1922, p. 120; English and Gudmundsson, *Infantry*, chapters 1–2. The following relies also on John A. English, *A Perspective on Infantry*, New York: Praeger, 1981.

- 42/ Xerxa, Donald A., "Enduring Battle: An Interview with Christopher H. Hamner", *Historically Speaking*, vol. 13, January 2012, p. 12.
- 43/ English and Gudmundsson, *Infantry*, p. 1.
- 44/ Balck, *Taktik*, p. 8; English and Gudmundsson, *Infantry*, p. 3.
- 45/ English, *Perspective*, p. 4; chapter 1 "An Epoch-Making Change. The Decentralization of Infantry Tactics", pp. 1–36.
- 46/ Balck, *Taktik*, pp. 9, 52–53.
- 47/ Seeßelberg, Friedrich, *Der Stellungskrieg 1914–1918 auf Grund amtlicher Quellen und unter Mitwirkung namhafter Fachmänner technisch, taktisch und staatswissenschaftlich dargestellt*, Berlin: E. S. Mittler & Sohn, 1926, pp. 173–181.
- 48/ Balck, *Taktik*, p. 120, also English and Gudmundsson, *Infantry*, p. 21.
- 49/ Balck, *Taktik*, pp. 164–172; Seeßelberg, *Stellungskrieg*, pp. 183–197; Johnson, Douglas Wilson, *Topography and Strategy in the War*, New York: Henry Holt, 1917, pp. 144–176; Johnson, Douglas Wilson, *Battlefields of the World War: Western and Southern Fronts. A Study in Military Geography*, New York: Oxford University Press, 1921, pp. 605–632.
- 50/ Seeßelberg, *Stellungskrieg*, pp. 185–186.
- 51/ Balck, *Taktik*, p. 165.
- 52/ English and Gudmundsson, *Infantry*, p. 21.
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