

Dead Birds: The “Theater” of War among the Dugum Dani

Paul Roscoe

ABSTRACT Thanks in part to the film *Dead Birds*, the theatrical and largely innocuous battles fought by the Dugum Dani of New Guinea are regarded as a classic instance of restrained or “ritualized” combat. This impression is misplaced. Participants were trying to kill one another, but the waterlogged terrain of the mid-Baliem Valley blunted their ability to do so. If they were to engage on a large scale, Dani armies had to prearrange confrontations on one of two narrow ribbons of raised land; the tight confines of these strips lent their fighting its nonserious or “sporting” air; and the surrounding, waterlogged terrain made it hazardous to chase after and massacre a defeated side. The case highlights the importance to an anthropology of war in small-scale societies of attending not just to “cultural” or symbolic landscapes and “rules” of war but also to military scale and terrain. [*anthropology of war, Dead Birds, Dani, ritual battle, ritualized fighting*]

ZUSAMMENFASSUNG Zumindest teilweise dank des Filmes ‘Dead Birds’ werden die theatralischen und überwiegend harmlosen Schlachten der Dugum Dani in Neuguinea als klassisches Beispiel eingeschränkten oder ‘ritualisierten’ Kampfes angesehen. Dieser Eindruck ist unangebracht. Die Teilnehmer dieser Kämpfe versuchten vielmehr sehr wohl, einander zu töten; das versumpfte Terrain des mittleren Baliem-Tales stand diesen Bemühungen aber im Wege. Für großangelegte Kämpfe mussten sich die Armeen der Dani an einem der zwei zur Verfügung stehenden schmalen Streifen höher gelegenen Landes verabreden, deren enge Grenzen den Kämpfen den unernsten, ‘sportlichen’ Charakter verliehen, denn das umgebende sumpfige Gebiet machte eine Verfolgung und Niedermachung der unterlegenen Partei zu einem waghalsigen Unternehmen. Für eine Anthropologie des Krieges bei Gesellschaften geringer Bevölkerungszahl unterstreicht der Fall der Dani die Notwendigkeit, nicht nur ‘kulturelle’ und symbolische Landschaften und die ‘Regeln’ des Krieges zu betrachten, sondern auch seine Abhängigkeit von der Grössenordnung der beteiligten Gruppen und dem Gelände, auf dem er gefochten wird.

ABSTRAIT Grâce au film *Dead Birds*, les batailles théâtrales livrées par les Dugum Dani en Nouvelle-Guinée sont prises pour un exemple classique d’un combat restreint ou ritualisé. Cette impression est inadéquate. Les combattants essayaient de tuer leurs adversaires, mais le terrain marécageux de la vallée centrale du Baliem les empêchait d’agir ainsi. Pour lutter des batailles de grande envergure, les armées Dani étaient forcées d’arranger leurs confrontations sur une des deux bandes de terre étroites plus élevées. La limitation de ces bandes donne l’impression qu’il s’agissait de combats non sérieux ou ‘sportifs’. Cependant, c’est plutôt le terrain marécageux des alentours qui rendait dangereux de poursuivre et massacrer le parti battu. Ce cas des Danis souligne l’importance de ne pas s’occuper uniquement des paysages ‘culturels’ ou symboliques et des règles de guerre, mais il s’agit aussi de veiller à la dimension militaire et au terrain où les batailles se déroulent.

Since at least the early 1940s, anthropology has entertained a notion that war in small-scale societies like those of New Guinea is qualitatively different from that of industrial states that have transcended the so-called “military horizon.” Where war in small-scale societies is personal, targeted, and restrained, this view holds, the technological and organizational capacity of the nation-state enables a far more indiscriminate, depersonalized, even genocidal warfare (e.g., Fry 2006:89–91; Malinowski 1941; Turney-High 1949).

In recent years, several archaeologists and anthropologists have expressed skepticism toward this position (Keeley 1996; LeBlanc 1999; Otterbein 2004:34–38): many small-scale societies conducted ambush and raid with deadly intent, and their war mortality rates could vastly exceed those of nation-states (Keeley 1996:88–94, 195–197; Roscoe 2009:82). This is less clearly the case, however, with regard to the open battles that some of these societies fought. Many observers commented on how “sporting” or “game like” these confrontations appeared, which led analysts frequently to conclude that the participants were exercising some kind of restraint, observing a set of cultural rules, or both (e.g., Carman 1999:42; Gat 1999). Thanks partly to the film *Dead Birds*, the set-piece battles of the Dugum Dani in New Guinea have become a case in point, “a classic example of ‘ritual combat’ in the anthropology of war” (Arkush and Stanish 2005:10; see also Jones 1980:109–111; Smith 2007:12–13). Dani battles were not without their dangers, but the overwhelming impression was of a “sportive” event (Heider 1970:111, 129:29), “more like a medieval tourney than like what we usually mean by war” (Heider 1970:118). The Dugum Dani themselves were dubbed “peaceful warriors” (Heider 1997).

The conduct of Dugum Dani battle was certainly highly stylized, theatrical, even playful. The crucial—and unresolved—question, though, is whether, as scholars like Jeffrey Blick (1988:663) and Schuyler Jones (1980:110) contend, these confrontations really were “ritualized” in the sense that the fighting was restrained by some form of institutionalized rules. And if they were not, if combatants really were trying to kill one another, why did they go about it in such a seemingly playful and ritualized manner? In this article, I argue that the apparent restraint of Dani battle was the product not of cultural restrictions but, rather, of the particular terrain on which it was fought, a circumstance virtually invisible in *Dead Birds* and only incidentally apparent in the ethnographic record. The Dugum Dani certainly intended to kill their enemies, but they confronted them across a no-man’s-land of swamp and water that was hazardous to any large military force attempting to cross it. By default, therefore, armies met on one of two narrow strips of land that lay above the swamp. The tight confines of these corridors, however, prevented either side from fully deploying and resulted in the gamelike or “ritualized” character of their battle. The case highlights the critical importance for an anthropology of war to consider not only the motives that galvanize fighting behavior but also military practicalities that constrain or enable their realization.

THE DANI OF THE MID-BALIEM

Although the two principal ethnographers of the Dugum Dani of the Grand Valley of the Middle Baliem (see Figure 1) differ markedly on specifics, they concur in describing a community similar to many in the central highland valleys of New Guinea (Broekhuijse 1967; Heider 1970). Subsistence

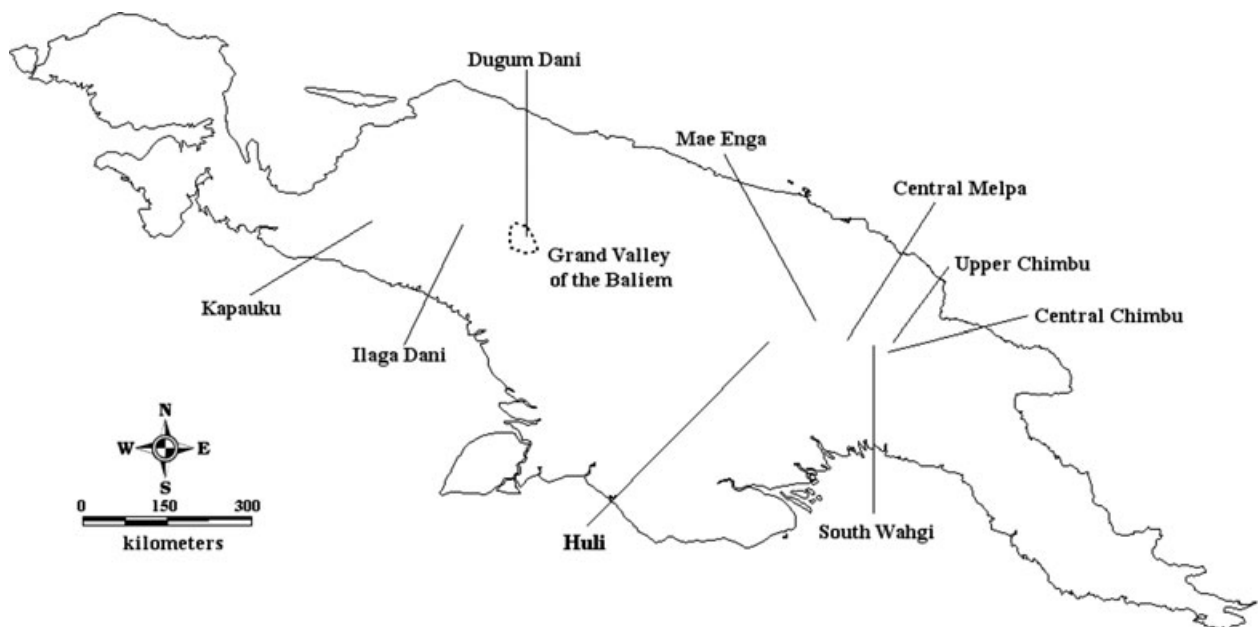


FIGURE 1. New Guinea: societies mentioned in the text.

was based on sweet-potato cultivation and pig rearing, technological capacity was limited, all communication was oral, and all travel was on foot. Political leaders resembled the Big Men found elsewhere in the highlands—"skill in manipulating the economic system" was "of great importance"—but no man became a leader who had not also "proven himself in war: on the front lines, facing the spears and arrows of the enemy; or on the flanks where the dirty war is fought around bushes; or in raids" (Heider

1970:129). Social organization was small scale. The Dugum neighborhood—an *ap logalek* or group of "lineages" divided into intermarrying moieties and named "Wilihiman" for the pair of "lineages" at its core—numbered only about 320 people in 1961. And along with at least one other like unit, the Walalua, it was part of a "confederation" (*agot logalek*) called the Wilihiman-Walalua, totaling some 1,000 people (see Figure 2; Broekhuijse 1967:21–31, 60–63; Heider 1970:23–98).

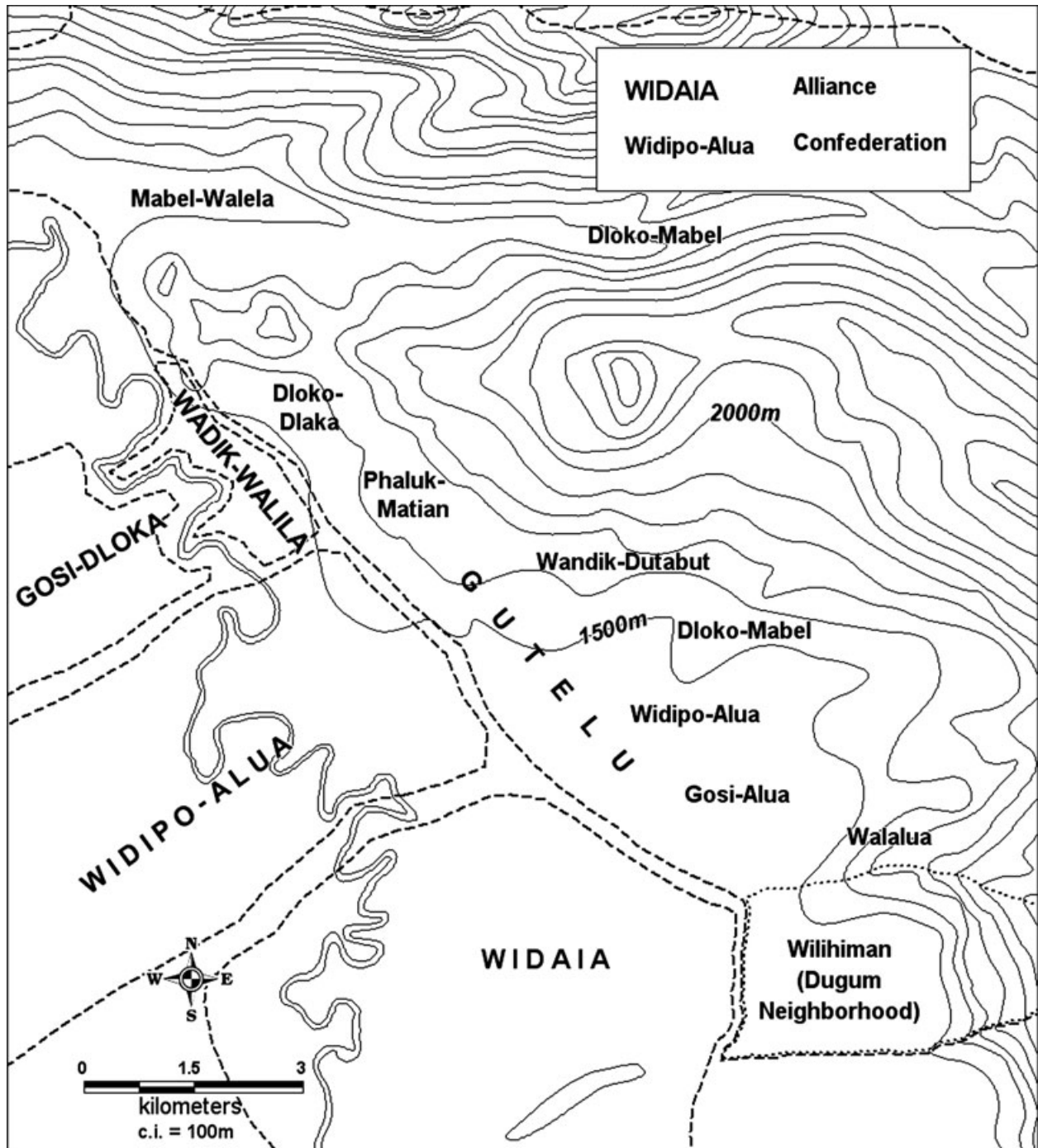


FIGURE 2. The Gutelu Alliance of the Grand Valley of the Baliem. NB: Names following Heider. Sources: Base map (Army Map Service [AMS] 1967a, 1967b); contours (AMS 1967a, 1967b); alliance and confederation locations in 1961 (Broekhuijse 1967:50, 219; Heider 1970:301; n.b. names following Heider).

There is abundant evidence that the macrosociological organization of New Guinea communities—the units variously described as “longhouses,” “clans,” “villages,” “confederations,” and the like—was dedicated to defense (Roscoe 2009:80–87). In the event of attack or encroachment by an enemy, members of these groups acted collectively to try to reduce the damage that their foes could wreak while increasing the mortal costs they would suffer in the process. Typically, in the event of an attack, every capable adult male rushed to defend those in jeopardy, while every available woman snatched up children and valuables and sought safety. Dani “confederations” such as the Wilihiman-Walalua constituted a case in point. Characterized by “cooperation in war” (Broekhuijse 1967:60), their male members had a “duty to participate in the warring of their own *ap logolek* and therefore usually also in that of the [confederation]” (Broekhuijse 1967:62). Dissension and conflict being antithetical to defensive unity, moreover, fighting within the confederation was uncommon; when it did occur, it took the form of a “brawl” (Heider 1970:104) rather than deadly fighting, which would cause the group to split apart.

Throughout New Guinea, defensive groups also sought to forge relations of peace with other, similar groups nearby (Roscoe 2009:87–88). Where defensive groups aimed to defend members against attack, however, these “alliances” aimed only to suppress the threat of attack between those who, being in close proximity, otherwise would pose a severe existential threat. Thus, among the Dani, the Wilihiman-Walalua were part of a “war alliance” (*lapuchoro*) called the Gutelu (or Kurelu) alliance, numbering around 5,000 people (Broekhuijse 1967:60–63; Heider 1970:77–78).¹

Within an alliance, confederations were largely at peace with one another. Alliances in New Guinea, however, were always less stable than the defensive structures that forged them because the latter were too far apart geographically to render each other effective defensive aid in the event of an attack (Roscoe 1996:652, 658–660). Among the Dani, for example, fighting sometimes broke out between neighboring confederations and occasionally resulted in deaths. Usually, this was considered less serious than “war” but about every ten years or so it exploded into “secular warfare,” a massive dawn raid that split an alliance apart, transforming erstwhile allies into deadly enemies (Heider 1970:105, 118–122, 131–132).

Alliances were the largest military units in the Grand Valley, and each was potential enemy to the others. Wars broke out between alliances, but the fighting itself occurred between their component confederations, battle taking place on long-established battlegrounds on their frontiers (Broekhuijse 1967:62–63; Heider 1970:78–80, 86). The principal enemy of the Wilihiman-Walalua, for instance, was the Siep-Elortak confederation of the Widaia alliance, whom they fought at two battlegrounds known as the Dogolik and the Watabaka.² Individuals or groups from other confederations frequently aided their allies in

the fighting at these battlegrounds, but these two confederations initiated the hostilities and contributed the core of its warriors (Broekhuijse 1967:60–62, 64–66, 220; Heider 1970:80). Fighting itself was a close-range affair, its scale defined by the reach of the bow and arrow, about 80 meters. Short-throwing spears and long lances were used as supplementary weapons, and cassowary-bone daggers were occasionally used in hand-to-hand combat. Neither shields nor cuirasses were used in defense (Broekhuijse 1967:221–223; Heider 1970:280–286).

EUROPEAN CONTACT IN THE MID-BALIEM

European contacts with the Grand Valley were few and brief until April 1954, when the Christian and Missionary Alliance (CAMA) established an airstrip and base at Hetigima, about 20 kilometers south of the Dugum neighborhood. Two years later, the Dutch administration established an “exploration post” at Wamena, about ten kilometers and some two to five hours’ walk to their south. The first “Controller,” Frits Veldkamp, was charged with constructing the post and its airstrip but instructed not to interfere with local affairs (Broekhuijse 1961:2, 1967:13–16; Heider 1970:13–14, 302–303; Veldkamp 1996:82–83, 86–89; personal communication with author, May 1998). The task of “pacifying” the valley thus fell to his replacement, 26-year-old Rolph Gonsalves, who arrived in January 1958.

Gonsalves was charged with “pacifying” the entire valley—some 60,000 people—but he was furnished with wholly inadequate personnel and resources. Precisely what happened under his tenure is unclear, but the nicknames he attracted—“God himself” and “Gun Salvoes”—hint at what ensued. A subsequent criminal inquiry received “abundant materials” on many reported cases of abuse but chose to focus on a handful of the better substantiated incidents, finding that the increasingly “eccentric” Gonsalves or the officers under his command had shot several local people dead, administered “corporal punishment” to others, and burned a number of settlements to the ground (Gonsalves 1960:1–3; Gonsalves and Verhoog 1999:62–124; von Meyenfeldt 1960:1–2).

When the Peabody Expedition (hereafter, “the Expedition”) arrived in April 1961 to begin the research on which most of our knowledge of Dani warfare is based, Gonsalves had recently departed, and according to Karl Heider the Dugum were as yet “not under the influence of government or missionaries” (1967:54). Strictly speaking this was true, although for some time CAMA missionaries had been living at Tulem, a mission station in the territory of their enemies, the Widaia, where an uneasy peace had been established. When the Expedition arrived, the missionaries had withdrawn to the Wamena area, but one of them was still visiting Tulem on a fortnightly basis, finding to his chagrin that local youths were once again fighting the Wilihiman-Walalua (Broekhuijse 1961:3, map; Rose and Rose 1960:2–4).

As for the Dugum Dani, they may not have been under European influence, but they were hardly untouched by its

presence. Gonsalves had visited the Gutelu alliance on at least two occasions, and in the first encounter one Dugum warrior had been shot dead and another wounded. By July 1959, the administration had helped broker an uneasy truce between the Gutelu and Widaia, but toward the end of the year fighting again erupted (Gonsalves 1960:4; Heider 1970:106; Rose and Rose 1960:5). Whether the war depicted in *Dead Birds* was a continuation of this fighting is unclear, but it had been underway for some time when the Expedition arrived, and it continued until early September of 1961, when a police post was established in the Dugum area and administration-led negotiations eventually concluded a peace (Broekhuijse 1967:232; Heider 1970:106–107).

How might these events have affected the fighting depicted in *Dead Birds*? A rumor has long circulated that the Expedition provoked the wars it filmed. Heider (1970:16) was diplomatic in explaining the origins of this charge and in rejecting it. Jan Broekhuijse, the former Dutch administrative officer assigned to the Expedition, was more forthcoming as well as more bitter in denying it. He attributed it to a “rumor machine” driven by Catholic missionaries at Jibika and especially to the CAMA missionaries at Tulem, who were distressed that the Expedition had refused to help them expand their influence to the Wilihiman. Their complaints to the authorities in Wamena had fallen on receptive ears because Carel Schneider, the officer in charge, was already “very upset” at the Expedition’s presence, fearing that it would implicitly sanction local warfare and cause it to erupt again across the valley (Broekhuijse 1961, 1996:141–144). In the end, inquiries by the Dutch administration found no grounds for the complaint (Broekhuijse 1967:143–145; Heider 1970:16).

But might the expansion of the colonial state have intensified the frequency and ferocity of fighting among the Wilihiman-Walalua, at least temporarily (Ferguson and Whitehead 1992)? Alternatively, might the Expedition’s presence have induced them to temper their violence, an important point in appraising the theatricality of their battles? Both Broekhuijse (1967:217) and Heider (1970:122) considered war to have been a long-standing and ongoing feature of Grand Valley life. On the basis of genealogical evidence, Heider (1970:128–129, 230–232) calculated that it had accounted for around 16 percent of all deaths over the two generations prior to the Expedition’s arrival. Perhaps our best source on whether the fighting was out of character, however, is Broekhuijse. He had lived in the valley since December 1959, he had “worked for four months with a pacified group” in the south, and he had no obvious motive for misrepresenting the record (Broekhuijse 1961:2, 1996:131–133, 140–141). It was he, in fact, who advised the Expedition to choose Dugum as its base, precisely because it was one of the few areas within logistical distance of Wamena “where real Dani life could still be recorded” and where “normal warfare according to the old pattern” was still going on (Broekhuijse 1961:2; 1996:133).

“CALLING BATTLE” AMONG THE DUGUM DANI

The apparent constraint under which the Dani conducted battle was evident at every stage of their confrontations. Battle could begin only by joint agreement. Once a war leader had decided to “call battle,” a band of his men would approach the enemy frontier and shout the challenge across no-man’s-land. If the enemy preferred to garden that day or was otherwise preoccupied, the call would be rejected and no battle would occur. Customarily, however, the challenge was accepted, a battlefield was agreed on, the two sides set about rallying their allies, and when all had mustered they convened on the battlefield and the fighting commenced (Broekhuijse 1967:232–261; Gardner and Heider 1968:136–138; Heider 1970:107). “As with so many other points of procedure during a battle, *it is understood that fighting will not start until both sides are ready*” (Gardner and Heider 1968:138, emphasis added).

The idea that battle might be scheduled like a soccer match, each side allowing the other to prepare for the confrontation ahead of time, is frequently taken as a signature of “ritualized” warfare (e.g., Divale 1973:xxi; Gat 1999:572; Keegan 1993:99; Naroll 1966:17). For Blick (1988:662–663), it is specific evidence that Dani battles were “constrained.” The practice stands in stark contrast, it is supposed, to the Western way of war where the aim is to maximize the kill, and battles begin with surprise attacks (as at Pearl Harbor), invasions (as in WWI and WWII), or with one side advancing on and closing with the other (as at Agincourt).

FIGHTING THE BATTLE

The conduct of Dani battle only enhanced this impression of a sporting or “ritualized” confrontation. Fighting would proceed in fits and spurts, with numerous breaks for rest, resupply, and even recreation (Gardner and Heider 1968:139, 141). “Often during the noonday heat both sides simply withdraw and sit in groups, smoking, talking, and resting for a while before resuming hostilities” (Heider 1970:111). During these intervals, warriors frequently amused themselves with high-spirited abuse of one another. “Once, late in the afternoon, fighting ceased altogether and both sides sat on comfortable rocks hurling insults at one another, picking out certain of the enemy by name. A choice remark would be greeted by both sides with roars of laughter” (Heider 1970:111; see also Broekhuijse 1967:238, 262–264; Heider 1962:28; 1970:191). “Such tirades . . . are almost as great a pleasure as the clash of arms, and they offer the opponents both release and vast amusement” (Gardner and Heider 1968:141).

Breaks and banter seem the epitome of a playful, ritualized form of battle (Arkush and Stanish 2005:10; Gat 1999:572), and even when warriors came to arms they hardly seemed in earnest. Only a small proportion of the 200 to 400 warriors present would actively be fighting: “rarely . . . more than a few dozen on each side” (Heider 1962:28; see also Broekhuijse 1967:60,250). The fighting

itself, moreover, was “a highly stylized, almost social event conducted according to protocol and governed by conventions amounting almost to rules and regulations” (Gardner and Heider 1968:141). Initial skirmishes resembled a “stylized ballet,” “almost entirely ritual, like that of Japanese wrestlers, who confront each other with characteristic squats and bows before the sudden furious struggle begins” (Gardner and Heider 1968:138). As battle heated up, clashes became more serious. Even so, the front line remained “relatively stationary” (Heider 1962:28) with warriors moving forward to release or retrieve arrows and spears before dropping back, the action resembling “an unchoreographed but still graceful cavorting of men dodging the haphazard flight of spears and arrows” (Gardner and Heider 1968:138).

Tellingly, the kind of large-scale maneuvers that elsewhere in New Guinea could turn a battle—a shock assault on the enemy front or an attempt to turn the enemy flank—were all but absent. In his detailed accounts of the nine battles observed in 1961, Broekhuijse (1967:232–278) reports not a single instance in which a coordinated flanking maneuver was attempted on the battleground itself. Some attempts were made to filter warriors surreptitiously into the sparse cover off the edge of the field and then lure the enemy forward into an ambush on its flank. But both sides were thoroughly familiar with these stratagems, and the trap was “almost always” detected before it could be sprung (Gardner and Heider 1968:138–139; see also Broekhuijse 1967:241, 256).

Occasionally, under cover of a hail of projectiles, spearmen and archers did mount a massed charge on an enemy front, but these efforts were infrequent, success was “rare,” and they were launched more in the hope of gaining a strategic hill on the battlefield than of overrunning and killing the enemy (Broekhuijse 1967:234, 237, 262; Gardner and Heider 1968:148; Heider 1962:28, 1970:110). By default, most attempts to close on the enemy were individual affairs, a single warrior rushing forward to launch an arrow or spear before quickly dropping back to the safety of his front line (Broekhuijse 1967:238, 250; Heider 1962:28). “Except for one or two tense moments, no one was ever in real danger of being overrun by an advancing enemy line” (Heider 1970:111).

Adding further to this gamelike atmosphere were events that seem incredible from the standpoint of “modern” warfare. A shower of rain was usually sufficient to “stop play”; indeed, allies living at a distance from the battleground would take into account the possibility of rain before deciding whether it was worth turning up (Broekhuijse 1967:234, 249; Gardner and Heider 1968:137; Heider 1970:107; see also Gat 1999:572). At the height of battle, moreover, people were often to be seen working in their gardens a few hundred meters away, occasionally looking up at a particularly loud cry from the field (Heider 1970:111,114). Elizabeth Arkush and Charles Stanish (2005:10) draw attention to another incident in which “a large cuckoo dove flew back and forth over the lines. All fighting stopped as the warriors,

boisterously laughing, threw sticks and stones at the bird” (Heider 1970:111, 312).

Dani battle, in sum, was a “casual,” even playful, affair (Heider 1970:111). “There can be no question that Dani men find the battles great fun. The exuberance, the joking, the ornaments, and even the risks and the daring are all indications of this sportive element” (Heider 1970:129; see also Broekhuijse 1967:238). “Except in the rare circumstance of an effective charge,” Heider observed, “the atmosphere is free of tension and jokes and insults fly back and forth between the opposed forces” (1962:28; see also Heider 1970:111).

THE OUTCOME OF BATTLE

If one feature more than any other has been cited as evidence that small-scale battles are conducted with restraint, it is their low mortality (Arkush and Stanish 2005:10; Blich 1988:663; Gat 1999:572). Dugum Dani battle was no exception (Heider 1962:28, 1970:99,111). An analysis of Broekhuijse’s (1967:60, 232–267) figures for the wounds sustained in the nine battles of 1961 by the Wilihiman’s 75 “able-bodied warriors” indicate that a Dugum warrior ran about a six percent chance of injury in any one encounter, with about one to four percent of the wounded actually likely to die. With each side typically fielding between 100 and 400 warriors, this amounts to no more than about 0.4 deaths per battle (Broekhuijse 1967:60,250; Heider 1962:29). By comparison, the ambushes that Dani warriors launched when they were not doing battle were more than twice as efficient: seven 1961 raids, each involving between 30 and 40 warriors, resulted in “about six men killed on the spot”—that is, about 0.9 victims per raid (Heider 1962:29; see also Broekhuijse 1967:232–267).

A major reason why battle was “inefficient in killing” (Heider 1970:112) was the Dani practice of allowing a defeated enemy to withdraw from the battlefield unscathed, another characteristic commonly associated with “ritualized” battle (e.g., Divale 1973:xxi; Gat 1999:566, 572; Naroll 1966:17). Warriors forced to flee become highly vulnerable: with their backs turned to the enemy, they can neither see to dodge his weapons nor readily return his fire. Yet, in victory, Dani warriors failed to capitalize on the advantage. Commonly, they chased their defeated enemies off the battleground but instead of pursuing them into their settlements and cutting them down, they simply withdrew to their end of the field, allowing the vanquished to regroup, return, and reengage (e.g., Broekhuijse 1967:245, 256–257). Within “living memory,” the Dugum Dani had suffered neither massacre nor any large-scale destruction of their property following a loss on the battlefield (Heider 1970:131), nor apparently had they ever inflicted such a fate on the Widaia.

THE TOPOGRAPHY OF BATTLE

To account for the curiously restrained nature of the battles he had observed in 1961, Heider proposed that they

were part of a “ritual” phase in Dani warfare that deployed battle and small-scale raiding as “a human means to effect ghostly revenge” (1970:132). This ritual phase of war was occasionally interrupted by a short-lived “secular phase,” which involved the massive surprise attacks mentioned earlier. These were launched not for spiritual reasons but for economic motives or as retaliation for perceived wrongs, and they typically resulted in scores of deaths, the displacement of whoever survived, and the destruction or appropriation of their property and territory (Heider 1970:102, 105, 118–122, 130–132).

In dubbing the principal form of Dani fighting “ritual war,” Heider was apparently referring to its religious motivation rather than to any “ritualized” restraint that warriors exercised in confronting their enemies. Nonetheless, in proposing that ritual war could “be seen as an extension of ceremonialism” (Heider 1970:130) and in speculating, with Gardner (Gardner and Heider 1968:139), that the Dani deliberately reduced the lethal potential of their weaponry, he encouraged a conclusion that it was also a restrained form of combat (e.g., Blick 1988:663; Gabriel 1990:25).

There is nothing in reports of Dani sentiments, though, to suggest that their intentions were benign. Following one confrontation in April of 1961, for example, the Wilihiman lamented that it “had not been harmful” (Broekhuijse 1967:236); following another, they expressed satisfaction that it had been hard fought and that several enemies had been dangerously wounded (Broekhuijse 1967:239). Furthermore, the small-scale raids that were a part of “ritual warfare” were clearly launched with murderous intent. Responding to an old woman who was lambasting him for a raid that had turned out disastrously, one Wilihiman warrior blurted out: “Those people are our enemies. Why should we not kill them, they aren’t humans” (Broekhuijse 1967:259). In late August of 1961, when Wilihiman-Walalua fortunes were at their nadir, Broekhuijse (1967:265) observed that the “urge to kill an enemy” had grown to a “form of collective obsession.”

If we accept these sentiments at face value, however, we are confronted with two further problems. First, if the intent of Wilihiman-Widaia battle was to kill, why did warriors go about it in so counterproductive and inefficient a manner? Why arrange their battles ahead of time, allowing their enemy ample time to prepare? Why eschew large-scale tactical maneuvers like flanking and shock assault that could effect an enemy’s collapse? Why allow enemies to regroup after a setback on the field rather than following on to cut them down and destroy their settlements? Second, if the intent was to kill, why would the Wilihiman and the Widaia content themselves with battles and small-scale raids? The massive, surprise attacks that characterized “secular” warfare were far more efficient a means of killing, and yet neither side appears ever to have launched such an attack against the other.

In Heider’s telling, this seemingly contradictory behavior was the consequence of the different cultural calculi that

governed ritual and secular war. What this overlooks, however, are the consequences of terrain and military scale on the deployment of armed force. The Dugum landscape was characterized by two features with profound military implications. First, although the territory around and to the rear of the Dugum settlements was under dense or scattered forest, savannah, or thick scrub, the land facing toward the Widaia was largely devoid of cover, its vegetation consisting mainly of grass, reeds, and scattered scrub (Heider 1970:34–35, 82, 108).³ The military consequence was that neither the Wilihiman-Walalua nor the Widaia could, during daylight, easily approach the other in large numbers without being seen.

The second critical feature was the nature of the terrain between the two enemy confederations. In its middle reaches, the floor of the Grand Valley is a broad, flat expanse of land, much of which actually lies below the level of the Baliem River. Although the no-man’s-land between the Wilihiman-Walalua and the Widaia, for instance, is six kilometers away from the Baliem, altitudinal data displayed on Google Earth imagery shows it to be one to two meters below the level of the river. As a result, it is muddy, waterlogged ground that, in 1961, consisted “mainly of swamps with vegetation of low bushes, short reeds, and water plants. The depth [of the swamp] varies from about half a meter to about a meter. After large rainfalls, the water level can even be half a meter higher” (Broekhuijse 1967:218, 259; see also Matthiessen 1962:9). The Dugum also used dikes to create pools of water along the western flank of the Dogolik, providing harbors for bird life that, in the clamor of their flight, would betray the approach of an enemy raiding party (Gardner and Heider 1968:141; Matthiessen 1962:9–10). Then there were the substantial areas of garden out toward the frontier, about 20 to 40 percent of which comprised a “labyrinth” of deep ditches two or more meters wide, filled with mud and water (Heider 1970:34–37, 42).

According to Broekhuijse, the Dani preferred “not to fight in the swamp as they get cold there, and their bare feet are likely to be wounded by the sharp edges of the water plants” (1967:218). As military theorists have observed for centuries, however, open waterlogged terrain is treacherous ground for any large-scale force attempting to maneuver across it, and a death trap against an enemy positioned on firmer land (e.g., Sun Tzu 1983:bk. 9; Vegetius 1993:bk. 3). Warriors find themselves hindered by the mire sucking at their legs, and because they must attend to the ground at their feet, they find it harder to dodge enemy fire, maintain their line, and conduct an organized maneuver.

On the frontier between the Wilihiman-Walalua and Widaia, in fact, the only dry land where a large body of warriors could advance without placing themselves at exceptional risk were the Dogolik and the Watabaga, two “narrow” ribbons of land rising above the swamps and gardens (see Figure 3). The Dogolik was a “long open grassy strip,” about three kilometers long and between two to four meters high, “running through a swamp” (Heider 1997:102; see also

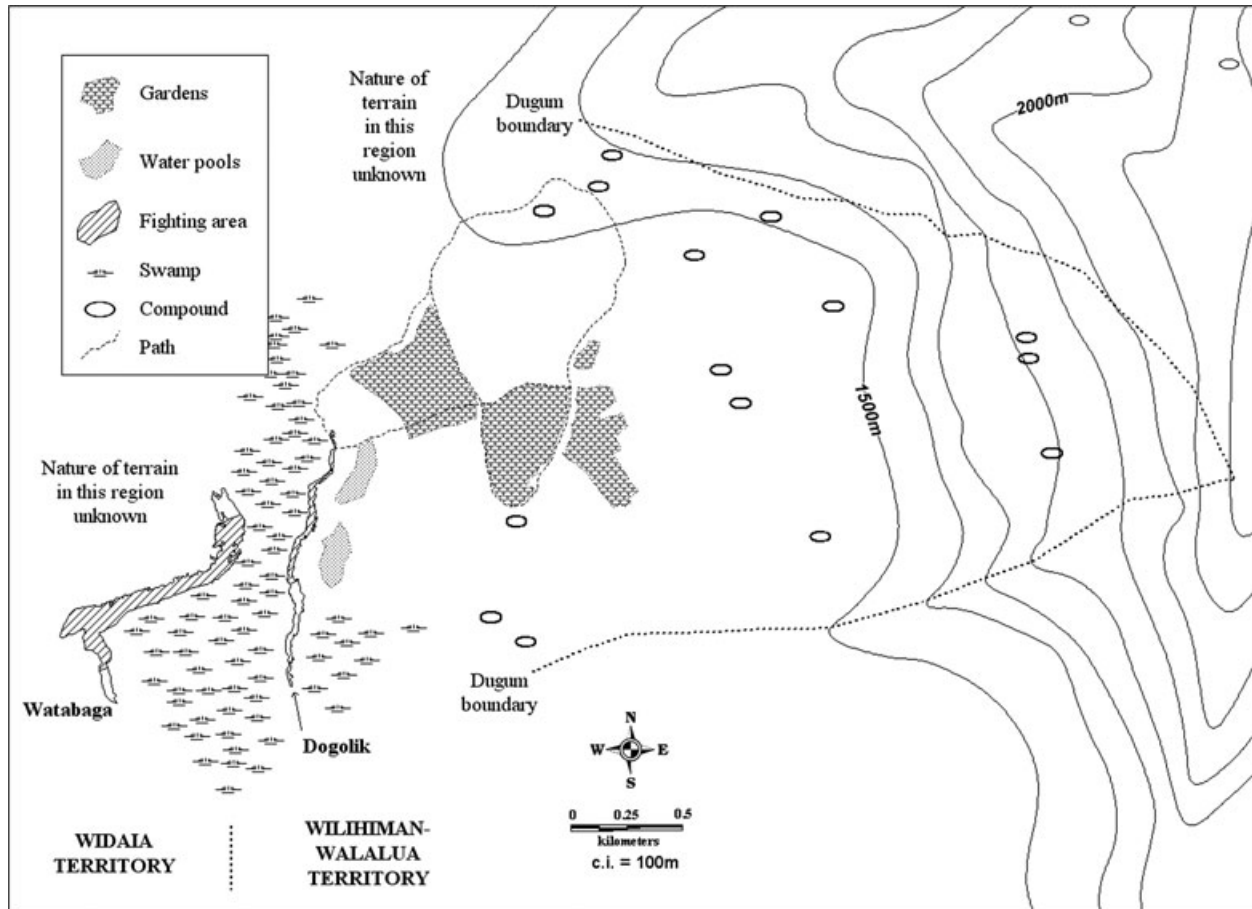


FIGURE 3. *The Wilihiman-Walalua and Widaia Frontier.* NB: Precise locations of water pools unknown; garden boundaries approximate. Sources: Base map (AMS 1967a, 1967b; satellite imagery courtesy of TerraServer); contours (AMS 1967a, 1967b); location of swamps, gardens, and settlements in 1961 (Broekhuijse 1967:50, 219; Heider 1970:115, 301; Matthiessen 1962:9–10); extent of interbattlefield swamp (satellite imagery courtesy of TerraServer).

Broekhuijse 1967:218; Heider 1970:33,110; Matthiessen 1962:9). Broekhuijse (1967:237) and Heider (1970:110) put its width at 30 to 50 meters. My own measurements from high-resolution satellite photographs (courtesy TerraServer) indicate that, on the section where battles were staged (Broekhuijse 1967:219), it averaged about 25 meters, varying between 12 meters and 38 meters. The other battleground, the Watabaga, was “a rocky L-shaped ridge . . . about 1.5 kilometers long,” with an uneven topography rising between 10 and 30 meters above the swamp (Broekhuijse 1967:218; Heider 1970:110). Measurement from satellite imagery reveals that the sections on which battles occurred averaged 100 meters in width, ranging from 46 meters to about 140 meters.

MASSED INVASIONS AND SMALL-SCALE RAIDS

These two features of the frontier—open ground and two ribbons of elevated land threading across a swamp-and-water barrier—provide an alternative interpretation for both the “ritualization” of Dani battle and the areal patterning of “ritual” and “secular” warfare. To begin with, they explain why neither the Wilihiman-Walalua nor the Widaia mounted

large-scale, “secular” raids against each other: they were ineffectual if not suicidal. Consider an attempt to launch such an invasion under cover of night. The difficulty was not in the advance: a large force could easily cross the Dogolik or Watabaga in the dark and infiltrate the enemy’s settlements. The problem lay in the retreat. If the frontier were favorable military terrain—if, for instance, it had been a firm, grassy plain—retreat would be relatively unproblematic: once their assault was over, attackers could either coordinate an organized retreat or simply split up and dash for home. In the mid-Baliem, however, the only avenue of retreat was toward the northern ends of the Dogolik and Watabaga, and the only means of getting there were a couple of narrow paths winding through one to two kilometers of garden and swamp (see Figure 3).

The attackers’ peril was the ease with which even a small group of defenders could block these chokepoints, preventing their escape and exposing them to destruction in detail as other defenders and allies rallied to their rear. Their main options, therefore, were to strike and withdraw before defenders could rally and block their line of retreat or to deploy part of their force ahead of time to protect it. The

former option, however, would produce minimal military profit for considerable exposure to risk, while the latter would severely deplete the numbers they could throw into the attack itself given how extended was the line of retreat that required protection. Whichever option attackers chose, moreover, they could never be sure that their plans had not leaked to the enemy and that, as the sun rose, they would not find themselves surrounded by defenders, with no path back to safety. It is no surprise, therefore, that in the mid-Baliem attacks were never launched under cover of night (Heider 1970:117).⁴

If an invasion under cover of night was a formula for folly, a massed “secular type” of raid by day was an exercise in futility. Given the minimal cover on the frontier, the advance would be spotted literally a mile off from the watchtowers that lined the outer edges of the gardens, providing the defenders with ample time to assemble their defenses. Should defenders happen to be caught off guard, moreover, they could still dispatch small pickets to the Dogolik or Watabaga where, rather like Horatio at the bridge, they could delay the advance until reinforcements arrived. Indeed, in a battle in June of 1961, a “far outnumbered” Wilihiman-Walalua force did precisely this, barring the Dogolik at its narrowest point and preventing the Widaia from bringing their full numerical advantage to bear (Heider 1970:311).

Given the mid-Baliem terrain, in sum, only a small number of raiders could ever hope to approach enemy territory unseen, and they could not afford to penetrate deeply. To the extent raiding occurred at all between the Wilihiman-Walalua and the Widaia, in fact, it was solely the small-scale, daylight attacks that Heider considered part of ritual warfare. Some 12 to 30 warriors, never more than 50 (Broekhuijse 1967:227; Heider 1970:111; Matthiessen 1962:152), would spend hours worming their way up toward the perimeter of enemy territory under cover of scattered scrub or a tendril of gallery forest in the hope of finding a garden party or careless youths out close to the frontier (Broekhuijse 1967:232–267; Heider 1970:310–313).

“RITUALIZED” WAR: THE ONSET AND CONCLUSION OF BATTLE

The same characteristics that made mass invasion across the frontier between the Wilihim-Walalua and Widaia a hazardous if not futile exercise also accounted for the curious “chivalry” with which battles began and ended. Midvalley battles began by prearrangement not from any sense of good sportsmanship but because the alternative was too dangerous. If one side was disinclined to fight, the other could not force the issue without invading, and invasion as we have seen was an invidious option. As a result, battle could occur only if both sides wanted to engage, which in turn required their prior agreement on when they would engage and where. Absent such an accord, one side could turn up to do battle, but there was no guarantee the other would be there. The two sides chose the Dogolik and Watabaga as battlefields because these were the only places on the

frontier that were firm enough to sustain large-scale engagements and did not place one side or the other at a military disadvantage (Broekhuijse 1967:218).

The disinclination to pursue a defeated enemy off the field to cut him down was another product of frontier terrain: it was easy enough for a demoralized side to withdraw but exceedingly dangerous for victors to chase after them. Broekhuijse identified one problem: victors were reluctant to pursue a fleeing foe because “fighting in the swamp and also in the old gardens always becomes very difficult to survey and appraise, and the danger of an ambush is no fantasy” (Broekhuijse 1967:245). To make pursuit yet more difficult, the Dani laid log bridges beneath the water of the swamps, which as Heider (1997:108) notes conferred “a tremendous advantage” on the “home team” if it was forced to flee for home. Knowing the location of these hidden bridges, those fleeing could escape through the swamp with little difficulty. Unfamiliar with the territory, however, their pursuers would soon flounder, leaving themselves easy prey to those they had been trying to pursue. The ultimate problem, though, was that, in pursuing a defeated force, the victors would be exposed to the same risks that they would run had they invaded. Their fleeing prey might regroup, dispatch a small force to block their retreat across the Dogolik or Watabaga, and then mount a counterattack as they floundered in the swamp or tried to retreat along the paths. Indeed, a pursuing force could never be sure that the enemy’s flight was not simply a ruse with precisely this goal in mind. In fine, it was no chivalry that led victors to allow a defeated force to depart the field unmolested; rather, it was the mortal hazards of trying to pursue them once they were gone.

“RITUALIZED” WAR: THE CONDUCT OF BATTLE

The difficulty of pursuing a fleeing enemy across the swampy terrain of the Mid-Baliem provides an alternative explanation for why small parties could often be seen working in their gardens, unperturbed by a battle raging nearby. It might appear that they owed their immunity to some code of restraint, but in reality, so long as they remained beyond arrow range, they were not endangered in the first place. Given the waterlogged nature of the intervening terrain and the bows of a hundred or more enemies at his back, it would be a foolhardy warrior indeed who left the battlefield to attack them at closer range. Little wonder that garden parties felt safe at their labors.

If many of the “ritualized” features of Dani battle derived from the military implications of the waterlogged terrain on the frontier, the rest can be traced to the tight confines of the two battlefields on which they preferred to fight. To begin with, the confines of both the Dogolik and the Watabaga physically limited the number of warriors who could engage in active fighting at any one time. If we assume that a warrior needs at least three meters of space in which to stand, dodge enemy projectiles, and deploy his own weaponry, then no more than 13 warriors could have occupied a Dogolik front

line at any one time and only about 50 on the Watabaga. To judge from published images of Dani battle and the fighting sequences in *Dead Birds*, in fact, warriors usually stood farther apart than this—two to three meters from their nearest neighbor (perhaps to limit the enemy's target density)—which would allow only six to eight warriors on a Dogolik front line and about 25 to 30 on the Watabaga. In practice, there were “seldom more than a dozen men on the actual front” (Heider 1970:110), with a body of fighting men behind them up to “twenty or thirty meters deep.”

The confines of the Dogolik and Watabaga also explain why warriors rarely attempted group maneuvers in their battles. Flanking maneuvers were all but impossible because the two armies could fill a field to its edges; these edges were protected by swamps and declivities; and neither side could therefore hope to extend its own line around the other's. An organized shock assault—a massed charge to try and break the enemy front—was just as futile. Precisely because the front was so narrow, enemy lines were several ranks deep (Heider 1970:110). Rather than breaking the enemy line, therefore, a shock assault would simply be enveloped by it and annihilated.

In fine, the size of Wilihiman-Walalua and Widaia armies, the confines of their battlegrounds, and the waterlogged terrain that surrounded them resulted in battles that were essentially stalemated from the start. Warriors could maneuver as individuals, but group maneuvers, the kind that can turn a battle, were too difficult or too dangerous to be worth attempting. In any case, if one side did somehow manage to turn the battle to its favor, the other could immediately nullify its advantage by simply withdrawing from the field. Under these circumstances, battle cannot but be a relatively static, predictable, and risk-free affair, one in which warriors can afford to show off before their peers with “stylized” or “balletic” maneuvers—a kind of Kabuki of the killing fields.

The ability to withdraw from the field with impunity also conferred on each side the unilateral capacity to halt fighting whenever they chose. Should one side want to break for rain, rest, or resupply, the other had little choice but to agree or find itself alone on the field. If one force broke off to shoot at a cuckoo dove, the other gained nothing by trying to spoil their fun. Nor is it surprising that warriors speaking the same language and positioned within shouting distance of one another should substitute insults for projectiles during these intervals. If midvalley warriors found their encounters “fun,” in other words, it was because the size of their forces and the constraints of their fields rendered battle only marginally more dangerous than a sports match.

“RITUALIZED” BATTLE AND THE THREAT OF SECULAR WARFARE

In the mid-Baliem, it was the theater of battle—the terrain on which warriors fought—that produced the “theater” in their battle. If military conduct took a “ritualized” form, it was not because warriors were exercising restraint toward

one another. Their intentions were lethal, but the ground across which they were obliged to fight made it too difficult and dangerous to pursue more aggressive forms of action. But if open battles were so inefficient as a means of killing, why did the Dani even bother with them? The answer appears to lie at both an individual and social level.

As defensive organizations, confederations had a direct interest in promoting military qualities in their warriors. In consequence, bravery and military skill were esteemed and, as noted, prerequisites for leadership. Open battle thus provided Dani men with a public theater in which to establish their individual credentials: it might be difficult to kill the enemy, but a warrior could still display his courage and ability under fire. Confederations, moreover, also had an interest in displaying their fighting strength as a collectivity on the field because, by so doing, they could deter attacks from other confederations (Roscoe 2009:95). The principal threat was not from their enemies across the Baliem Valley, whose military capacity was blunted by the intervening, waterlogged terrain. Rather, as Paul Shankman (1991:309–310) has shrewdly pointed out, a confederation had to worry more about a massive, “secular” attack by “allied” confederations, which lay on its own side of the valley. A “secular” invasion might be too ineffective and dangerous to be launched across the valley, but it was a much more viable option along the sides, where the terrain was firm not waterlogged, the forest provided ample cover to mount a large-scale attack, and there were few chokepoints to endanger retreat.

The three cases of secular invasion that we know of in the Gutelu region, for example, were all launched down the valley sides. Around 1950, the Dutabut sib of the Gutelu alliance was decimated and displaced from its territory by other Gutelu confederations to its north. In September of 1962, the Itlai-Phisake, located in rough, elevated terrain southeast of the Dugum, were likewise devastated. And in 1966, the northern confederations of the Gutelu alliance attacked their erstwhile allies to the south, killing over 100 people and sacking their settlements (Heider 1970:80, 102, 118–122, 130–132).

“Secular” invasions were infrequent, but they constituted a major threat to life in the mid-Baliem. The principal defense was deterrence, a confederation's reputation for superior fighting strength, and the open battles that characterized the “ritual phase” of war were the public venues that put this strength to the test. As elsewhere in New Guinea, they demonstrated in an unfakable and ongoing manner the number, skill, and military commitment and coordination of the fighters that a confederation could muster in its defense (Roscoe 2009:90–94). In Shankman's (1991:309–310) words: “Should a group fail to make a credible showing of warriors during the ritual phase of war, it may seem vulnerable to its nominal allies or enemies and become the target for an all-out secular attack” (see also Otterbein 2004:202). The theatrical battles that Dani communities in the mid-Baliem fought across the waterlogged terrain of the valley floor, in sum, were the principal vehicles for deterring the

far greater threat that hovered along the valley slopes on their flanks.

BATTLE IN THE NEW GUINEA HIGHLANDS

It is unfortunate that open battle among the Dugum Dani has become so iconic of warfare in highland New Guinea because, in reality, it was highly atypical. Like the mid-Baliem, other highland valleys had broad, open floors; unlike the mid-Baliem, however, their terrain was firm, not soft and water logged. This is a crucial detail because firm, flat ground allows warriors to range freely over the terrain, creating a form of battle that was typically more dynamic and dangerous than confrontations in the Grand Valley.

To begin with, the onset of battle elsewhere in the highlands did not depend on the prior agreement of both parties. Instead of being prearranged, battles typically began with one side invading or otherwise forcing a confrontation on the other (e.g., Bergmann 1971a:189; Meggitt 1977:85–90; Pospisil 1994:117; Vicedom and Tischner n.d.:298). Instead of a “static,” stalemated form of fighting, battle was highly fluid, with each side charging or trying to outflank the other. Upper Chimbu battles “were not at all static. The area of fighting would change as the combatants surged first in one direction then in another” (Criper 1967:135). A Central Melpa battle “surges to and fro on the same place. All is alive, running, evading, covering up, attacking, pursuing, to the accompanying shouting of the battlecry (Vicedom and Tischner n.d.:298–299). Mae Enga battle was “fluid and highly mobile” (Meggitt 1977:97, see also pp. 88–90, 96–97). Huli battles involved “fighters maneuvering, making flank attacks, advancing and retreating as circumstances dictate” (TRI 1952–53:27; see also Glasse 1959:285). Until he observed a South Wahgi confrontation in the 1980s, Michael O’Hanlon had not appreciated “quite how fluid a battle front can be” (2000:57).

In contrast to battle in the mid-Baliem, moreover, the consequences of defeat could be catastrophic: with multiple lines of retreat, unconstrained by swamp or narrow paths, victors could afford to pursue losers into their settlements in an attempt to cut them and their kin down, destroy their gardens and houses, and force the survivors to flee (e.g., Bergmann 1971a:187, 193–194, 1971b:75–76; Criper 1967:173; Glasse 1959:285; Larson 1987:245, 428; Meggitt 1977:89–90; Pospisil 1994:118–119; Vicedom and Tischner n.d.:197, 302–314). Estimates of mortality are sparse and difficult to interpret, but the ratio of deaths to injuries indicates that these were considerably more dangerous battles than those fought in the mid-Baliem. Whereas only about 2 Dugum Dani warriors died for every 100 wounded, 4.9 perished among the Mae Enga, 7.6 among the Kapauku (prior to “pacification,” around 1950), and 9.3 among the Ilaga Dani (Broekhuijse 1967:232–267; Larson 1987:293–295; Meggitt 1977:102; Pospisil 1994:121).

There was just one other place in highland New Guinea where open battle did sometimes resemble the “ritualized” form of Dani battle.⁵ Among the Mae Enga, most battles

were fought between clans: some 80 to 100 warriors took the field on either side and, as noted above, the fighting was typically fluid and dangerous. About once every decade or so, however, battle broke out between phratries rather than clans, and these interphratry confrontations were more “formalized” than the battles between Mae Enga clans (Meggitt 1974:197, fn. 52). Like Dani battles, they were prearranged. They opened with “balletic episodes” that involved “stylized displays of aggression” and individual duels between enemy champions (Meggitt 1977:18, 21). Hand-to-hand combat was “largely avoided” (Meggitt 1977:20), most casualties resulting from long-range arrow fire. And although occasional attempts were made to turn the enemy’s flank, no instance was remembered in which one side had suffered “disproportionate losses” in these battles or had been forced to flee by the other (Meggitt 1977:20–21).

Meggitt construed these interphratry battles as “formalized,” “rule-bound” affairs. But there is an alternative interpretation. In the vicinity of Meggitt’s field site (Sopas), battlefields were far wider than those of the mid-Baliem: grassy areas of undissected terrain suitable for open battle ranged up to three-quarters of a kilometer across (NMB 1982). But the armies that assembled for interphratry battle were also far larger than those of the mid-Baliem, on the order of 500–1,000 men on each side (Meggitt 1977:17). Allowing two to three meters between adjacent warriors, therefore, a phratry army would fill the largest Mae field with scores of warriors to spare. Under these conditions, the capacity for tactical group maneuvers is severely limited; battle, to use Meggitt’s terms, becomes “a prolonged stalemate” (1977:19), and fighting takes on a “ritualized” form regardless of whether or not the participants are observing “rules” of restraint. As among the Dugum Dani, in other words, the fighting was shaped by the limitations of the field, and the appearance that it was “formalized” or “ritualized” was perhaps deceptive.

CONCLUSION

To support the idea that “Stone Age” cultures deliberately limit the carnage of battle, military historians have sometimes referred to a “tribe in New Guinea, experts with the bow and arrow, [who] remove the stabilizing feathers from the arrows during war, thus making it almost impossible to hit anything” (Gabriel 1990:25; also Blick 1988:663). The identity of this tribe has proved something of a mystery (Gabriel 1990:133; Otterbein 2004:34–38), but in all probability it was the Dugum Dani—Gardner and Heider (1968:139) having speculated that the reason why they left their arrows unfletched was to reduce the chances of injuring the enemy (also Heider 1970:117–118). This proposition can be quickly rejected. No mainland New Guinea society ever fletched its war arrows because there was no need. With a light reed stem and heavy hardwood head, the center of gravity of a war arrow was forward of its center of pressure, conferring a natural aerodynamic stability over its typical range (Cotterell and Kamminga 1990:170–172).

It is perhaps surprising that military historians, not just anthropologists, should make this kind of mistake, but it is symptomatic of an analytical approach that locates the generation of military behavior in cultural perceptions and “rules,” with little or no regard to the implications of military scale and terrain. In the mid-Baliem, I have argued, these implications are crucial for understanding why battle was theatrical in its performance and comparatively innocuous in its outcome. Battle was prearranged because large-scale, surprise attacks were impractical across the waterlogged ground of the central valley; to contend at all, therefore, forces had to agree ahead of time when and where they would fight. The conduct of battle took a static, stylized, and “playful” form because it was largely stalemated by the confines of the field in proportion to the size of the contending forces. A defeated side escaped massacre, destruction, and displacement not because its foes were magnanimous in victory but because pursuit was too risky across swampy terrain.

To many archaeologists, the idea that terrain shapes military behavior will seem uncontroversial. Some cultural anthropologists, however, will suspect a lurking environmental determinism in the argument. In its strong form, environmental determinism assumes that all human behavior is determined by an inherent nature common to all humans, that this nature responds solely to environmental stimuli, and that these stimuli are transparent to human perception. If by “human nature” we mean some kind of genetically determined character, this position is difficult to defend even within its own terms: mutation, meiosis, and fertilization ensure that humans have different genotypes and so, in principal, will respond differently to the environment.

But a weaker form of environmental determinism is also untenable. To begin with, the environment is not transparent to perception but culturally mediated by it (Cosgrove 1998; Lefebvre 1991). In the case of military action, terrain is not an objective condition to which warriors are compelled to respond but is constituted by cultural meanings that affect how they operate on it (Carman 1999:45–50). In launching the battle of Nablus, for instance, the Israeli Defense Force (IDF), drawing inspiration partly from the writings of Clifford Geertz and Gregory Bateson, adopted a tactical innovation subsequently referred to as “walking through walls” (Weizman 2006). In 2002, Nablus was a fortified city: its entry points were barricaded; streets, alleys, and intersections were mined and covered by Palestinian firepower; and the doors to its buildings were booby trapped. The IDF responded by subverting prevailing cultural conceptions of urban terrain: it blasted holes through party walls, ceilings, floors, and elevator shafts to create hundred-meter-long “overground tunnels” through which it could securely move around the city. In strictly military terms, the strategy was a success; in anthropological terms, it illustrates how cultural conceptions of an urban landscape can quite literally be as solid as a concrete wall until semantic creativity (along with some high explosives) undermines them.

Second, humans are not automatons but knowledgeable and capable agents who pursue interests that, like their perceptions, are culturally mediated. Some of these interests plausibly derive from key dispositions that are part of our genetic heritage: to labor the obvious, a disposition toward survival no doubt galvanizes human interests in procuring food and water and defending themselves from attack. But these are dispositions not determinisms, and agents can act to subvert them. I have suggested elsewhere, for example, that humans have an innate aversion to killing conspecifics (Roscoe 2007). As creatures with a highly developed intelligence, however, we are also capable of recognizing interests that can be advanced through killing, and we appear to have developed a range of cultural and psychological “technologies” that allow us to short-circuit this disposition in order to do so.

But if environmental determinism is indefensible, a cultural or symbolic determinism that insists behavior is solely the product of meaning is no better. In pursuing interests, humans act in the world. Unless we adopt a militant antirealism, therefore, it follows that, to realize their interests, humans must take some account of the physical and social properties of that world. In Anthony Giddens’s (1984:5–14) terms, agents continuously monitor the flow of their activities as well as the social and physical contexts in which they move, and they routinely maintain a “theoretical understanding” of these grounds to their activities.

Where human interests and activities invoke or respond to an existential threat, as is the case with war, we may expect these “theoretical understandings” to be acutely attuned to the physical and social properties of the world. In walking through walls, for instance, the IDF exposed (and undermined) cultural perceptions of the material environment. But it beggars credulity to suppose that Palestinians (and others), whose interests these actions thwarted, would not rapidly update their cultural understandings of the urban landscape and use the results to contemplate how they might frustrate future IDF actions.

To apply this to the Dani: battles may be “intensely rule directed” (Carman 1999:42), but it does not follow that these rules are necessarily, say, moral rules dictating restraint in killing enemies or ritual rules about where battle can and cannot be done. They may also be, and in part surely are, a military ethnoscience, a set of technical rules of combat derived from experience of the most effective way, given local technological and organizational capacities, to operate militarily on the home terrain. Thus, for instance, if the Dani wanted to kill their enemies (as their sentiments indicate), and if their interests lay in reducing the chances of perishing in the process (evident, *inter alia*, in their attempts to dodge incoming enemy projectiles), then as knowledgeable and capable agents it is improbable that they would try to advance across waterlogged terrain against an enemy ensconced on firmer ground. Similarly, within the narrow confines of the strips of frontier land on which large forces could contend, we should not expect them to launch a shock assault against

a packed enemy line that could simply encircle and swallow it. And so on.

If anthropology and archaeology are fully to understand warfare in small-scale societies, in fine, then we need to recognize that scale and terrain, in addition to cultural values and perceptions, mediate and shape the deployment of armed might. And before we conclude that some kind of “military horizon” differentiates “restrained” fighting in small-scale societies from “genocidal” warfare at the state level, we might consider more closely whether the differences we have detected are not artifacts of the implications of terrain and military scale for the conduct of war.

Paul Roscoe *Department of Anthropology, University of Maine, Orono, ME 04469; Paul.Roscoe@umit.maine.edu*

NOTES

Acknowledgments. I am deeply grateful to Tom Boellstorff, Ulrike Claas, Bradley Coons, Terry Hays, Peter Hennigs, Anton Ploeg, and five anonymous *AA* reviewers for their comments on, or assistance with, previous drafts of this article. I am also grateful for Claas’s enormous help in translating documents from the Dutch and to the American Philosophical Association and the NSF for financial support of data collection.

1. Broekhuijse and Heider differ markedly in naming and spelling Dani social units. Because Heider’s ethnography is the better known to English-speaking anthropology, his nomenclature is adopted here.
2. When warring with the Siokossi alliance to their south, the Wilihiman-Walalua fought on a third battlefield, the Jalabaga (Broekhuijse 1967:66).
3. Measurements from high-resolution satellite imagery show that, in 2008, some 40 percent of Wilihiman territory was under dense or scattered forest, most of it on the Dugum hillside and the mountain wall behind. Of the land lying toward the Widaia, however, more than 90 percent was open country. Widaia territory was yet more open (Haberle et al. 1991:32), but lacking information about Widaia boundaries, quantification is impossible.
Here and elsewhere, spatial measurements were made from high-resolution (1.5 m) satellite imagery (courtesy of TerraServer), imported and georegistered in MapInfo software. Dugum terrain can be viewed in Google Earth, centered around 138.956934° East, 4.013502° South.
4. We have little information on the terrain west of the Watabaga. Because a Wilihiman-Walalua invasion into Widaia territory could only return via the Watabaga or Dogolik, however, it would face a similar invidious predicament in protecting its line of retreat.
5. About 100 miles west of the Dugum Dani, the Ilaga Dani are also said to have practiced “formalized, ritual fighting” (Larson 1987:146, 246), even though the floor of their valley was firm and minimally dissected. Space constraints prevent me from analyzing the Ilaga case in detail. Suffice it to say, the actual

conduct of their battles was very similar to that in other highland valleys. Three of the four characteristics that Larson identifies as “ritual” fighting—ritual appeals for ancestral assistance; the involvement of the entire warrior force of a local region; and near-continuous fighting until an approximate parity of kills was reached on either side, followed by peace ceremonies (Larson 1987:245)—characterized many battles in other parts of the highlands.

The fourth criterion, “supervised fighting” to prevent stealth attacks on the enemy’s flanks or rear, was clearly neither defining nor even critical because by no means were all “ritual” battles supervised. Those doing the “supervising,” moreover, were not the combatants but “neutral” parties (Larson 1987:257, see also 251, 270). In the one case Larson describes, the “supervisor” was a preeminent leader who was in the process of consolidating his influence over the two alliances that had come to blows (1987:142, 374–376, 381, 428) and who therefore had a vested interest in preempting an escalation that might result in half of his political base being put to flight.

Finally, the evidence provides no support for the idea that Ilaga combatants were trying to avoid killing one another. As elsewhere in the highlands, battles end in rout and massacre rather than peace. Furthermore, their wars left an average of 12 people dead on each side and “hundreds” more “wounded in their houses” (Larson 1987:167, 261, 263). As noted immediately above, in fact, the ratio of deaths to woundings suggests that Ilaga battle was the most dangerous fighting that we know of in the central highlands.

REFERENCES CITED

- Arkush, Elizabeth, and Charles Stanish
2005 Interpreting Conflict in the Ancient Andes: Implications for the Archaeology of Warfare. *Current Anthropology* 46(1):3–17.
- Army Map Service (AMS)
1967a Meervlakte Oost, 1:250,000 Map Series: Sheet SA 54–14. Washington, DC: Army Map Service, Corp of Engineers, U.S. Army.
1967b J. P. Coen Gerbergte, 1:250,000 Map Series: Sheet SB 54–2. Washington, DC: Army Map Service, Corp of Engineers, U.S. Army.
- Bergmann, W.
1971a *The Kamanuku: The Culture of the Chimbu Tribes*, vol. 1: General Remarks. Harrisville, Queensland, Australia: H. F. W. Bergmann.
1971b *The Kamanuku: The Culture of the Chimbu Tribes*, vol. 4: Religious Conceptions and Social Culture. Harrisville, Queensland, Australia: H. F. W. Bergmann.
- Blick, Jeffrey P.
1988 Genocidal Warfare in Tribal Societies as a Result of European-Induced Culture Conflict. *Man* (n.s.) 23(4):654–670.
- Broekhuijse, J. Th.
1961 [Letter to Th.H. Bot, 6/12/1961, Wiligiman.] File 4354. The Hague: Instituut voor Nederlandse Geschiedenis.

- 1967 De Wiligiman-Dani: Een cultureel-anthropologische studie over religie en oorlogvoering in de Baliem-vallei [The Wiligiman Dani: A cultural anthropological study of religion in warfare in the Baliem Valley]. Tilburg: H. Gianotten.
- 1996 De Harvard-Peabody-expeditie in de Baliemvallei [The Harvard-Peabody expedition in the Baliem Valley]. *In* Besturen in Nederlands-Nieuw-Guinea 1945–1962: Ontwikkelingswerk in een periode van politieke onrust [Administration in Netherlands New Guinea 1945–1962: Development work in a period of political unrest]. Pim Schoorl, ed. Pp. 128–148. Leiden: KITLV.
- Carman, John
1999 Beyond the Western Way of War: Ancient Battlefields in Comparative Perspective. *In* Ancient Warfare: Archaeological Perspectives. John Carman and Anthony Harding, eds. Pp. 39–55. Trowbridge, Wiltshire, UK: Sutton.
- Cosgrove, Dennis E.
1998 Social Formation and Symbolic Landscape. Madison: University of Wisconsin Press.
- Cotterell, Brian, and Johan Kammaing
1990 Mechanics of Pre-Industrial Technology. Cambridge: Cambridge University Press.
- Criper, Clive
1967 The Politics of Exchange: A Study of Ceremonial Exchange amongst the Chimbu. Ph.D. dissertation, Australian National University, Canberra.
- Divale, William Tulio
1973 Warfare in Primitive Societies. Santa Barbara, CA: ABC-Clío.
- Ferguson, R. Brian, and Neil L. Whitehead
1992 The Violent Edge of Empire. *In* War in the Tribal Zone: Expanding States and Indigenous Warfare. R. Brian Ferguson and Neil L. Whitehead, eds. Pp. 1–30. Santa Fe, NM: School of American Research.
- Fry, Douglas P.
2006 The Human Potential for Peace: An Anthropological Challenge to Assumptions about War and Violence. New York: Oxford University Press.
- Gabriel, Richard A.
1990 The Culture of War: Invention and Early Development. New York: Greenwood.
- Gardner, Robert, and Karl G. Heider
1968 Gardens of War: Life and Death in the New Guinea Stone Age. New York: Random House.
- Gat, Azar
1999 The Pattern of Fighting in Simple, Small-Scale, Prestate Societies. *Journal of Anthropological Research* 55(4):563–583.
- Giddens, Anthony
1984 The Constitution of Society. Berkeley: University of California Press.
- Glasse, Robert M.
1959 Revenge and Redress among the Huli: A Preliminary Account. *Mankind* 5:273–289.
- Gonsalves, R. A.
1960 Proces-verbaal, Mr Rodolph Aloysius Gonsalves [Verbal deposition, Mr Rodolph Aloysius Gonsalves]. File 4652. The Hague: Instituut voor Nederlandse Geschiedenis.
- Gonsalves, R. A., and G. J. Verhoog
1999 Mr. Gonsalves Memoires [Mr. Gonsalves's memoirs]. Amsterdam: Arbeiderspers.
- Haberle, S. G., G. S. Hope, and Y. DeFretes
1991 Environmental Change in the Baliem Valley, Montane Irian Jaya, Republic of Indonesia. *Journal of Biogeography* 18(1):25–40.
- Heider, Karl G.
1962 Fighting. *Working Papers in Dani Ethnology* 1:28–31.
1967 Archaeological Assumptions and Ethnographical Facts: A Cautionary Tale from New Guinea. *Southwestern Journal of Anthropology* 23:52–64.
1970 The Dugum Dani: A Papuan Culture in the Highland of West New Guinea. New York: Wenner-Gren.
1997 Grand Valley Dani: Peaceful Warriors. Third edition. Fort Worth, TX: Harcourt Brace.
- Jones, Schuyler
1980 Institutions of Violence. *In* Not Work Alone: A Cross-Cultural View of Activities Superfluous to Survival. Jeremy Cherfas and Roger Lewin, eds. Pp. 98–111. Beverly Hills, CA: Sage.
- Keegan, John
1993 A History of Warfare. London: Hutchinson.
- Keeley, Lawrence H.
1996 War before Civilization: The Myth of the Peaceful Savage. New York: Oxford University Press.
- Larson, Gordon F.
1987 The Structure and Demography of the Cycle of Warfare among the Ilaga Dani of Irian Jaya. Ph.D. dissertation, Department of Anthropology, Ann Arbor: University of Michigan.
- LeBlanc, Steven A.
1999 Prehistoric Warfare in the American Southwest. Salt Lake City: University of Utah Press.
- Lefebvre, Henri
1991 The Production of Space. Oxford: Blackwell.
- Malinowski, Bronislaw
1941 An Anthropological Analysis of War. *American Journal of Sociology* 46(4):521–550.
- Matthiessen, Peter
1962 Under the Mountain Wall: A Chronicle of Two Seasons in the Stone-Age. New York: Viking.
- Meggitt, Mervyn
1974 "Pigs Are Our Hearts!" The Te Exchange Cycle among the Mae Enga of New Guinea. *Oceania* 44:165–203.
1977 Blood Is Their Argument: Warfare among the Mae Enga Tribesmen of the New Guinea Highlands. Palo Alto, CA: Mayfield.
- Naroll, Raoul
1966 Does Military Deterrence Deter? *Trans-Action* 3(2):14–20.
- NMB [National Mapping Bureau]
1982 Wabag. Papua New Guinea Topographic Map Series—1:100,000. No. 7687. Port Moresby, PNG: National Mapping Bureau.

- O'Hanlon, Michael
2000 A View from Afar: Memories of New Guinea Highland Warfare. *In Anthropologists in a Wider World: Essays on Field Research*. Paul Dresch, Wendy James, and David Parkin, eds. Pp. 45–67. New York: Berghahn.
- Otterbein, Keith F.
2004 *How War Began*. College Station: Texas A&M University Press.
- Pospisil, Leopold
1994 "I Am Very Sorry I Cannot Kill You Any More": War and Peace among the Kapauka. *In Studying War: Anthropological Perspectives*, vol. 2: War and Society. S. P. Reyna and R. E. Downs, eds. Pp. 113–126. Langhorne, PA: Gordon and Breach.
- Roscoe, Paul
1996 War and Society in Sepik New Guinea. *Journal of the Royal Anthropological Institute (N.S.)* 2:645–666.
2007 Intelligence, Coalitional Killing, and the Antecedents of War. *American Anthropologist* 109(3):485–495.
2009 Social Signaling and the Organization of Small-Scale Society: The Case of Contact-Era New Guinea. *Journal of Archaeological Method and Theory* 16(2):69–116.
- Rose, Darlene, and Jerry Rose
1960 Circular to Friends, 3/23/1960, Tulem. File 4659. The Hague: Instituut voor Nederlandse Geschiedenis.
- Shankman, Paul
1991 Culture Contact, Cultural Ecology, and Dani Warfare. *Man (n.s.)* 26(2):299–321.
- Smith, David Livingstone
2007 *The Most Dangerous Animal: Human Nature and the Origins of War*. New York: St Martin's.
- Sun Tzu
1983 *The Art of War*. James Clavell, ed. New York: Delacorte.
- TRI [Tari Patrol Report]
1952–53 Tari Patrol Report No.1, 1952/53. Port Moresby, PNG: National Archives.
- Turney-High, Harry Holbert
1949 *Primitive Warfare*. Columbia: University of South Carolina Press.
- Vegetius, Flavius
1993[390] *Vegetius: Epitome of Military Science*. N. P. Milner, trans. Liverpool: Liverpool University Press.
- Veldkamp, Frits
1996 De bestuurlijke dilemma's bij de openlegging van de Baliem [The administrative problems in the opening of the Baliem]. *In Besturen in Nederlands-Nieuw-Guinea 1945–1962: Ontwikkelingswerk in een Periode van politieke Onrust [Administration in Netherlands, New Guinea, 1945–1962: Development work in a period of political unrest]*. Pim Schoorl, ed. Pp.73–116. Leiden: KITLV.
- Vicedom, Georg F., and Herbert Tischner
N.d. *The Mbowamb*, vol. 2: I. Social Organisation; II. Religion and Cosmology. F. E. Rheinstein and E. Klestadt, trans. Canberra: Menzies Library, Australian National University.
- von Meyenfeldt, G. W.
1960 Attorney-General's Statement, December 5, 1960. File 4652. The Hague: Instituut voor Nederlandse Geschiedenis.
- Weizman, Eyal
2006 *Lethal Theory*. Critical Theory Institute, University of California, Irvine. http://roundtable.kein.org/files/roundtable/Weizman_lethaltheory.pdf, accessed March 1, 2010.

FOR FURTHER READING

(These selections were made by the American Anthropologist editorial interns as examples of research related in some way to this article. They do not necessarily reflect the views of the author.)

- Allen, Lori
2008 Getting by the Occupation: How Violence Became Normal during the Second Palestinian Intifada. *Cultural Anthropology* 23(3):453–487.
- Bishop, John
2005 *Dead Birds Migrating*: DVD Reinvigorates Classic Ethnographic Film. *American Anthropologist* 107(3):475–484.
- Bragge, Lawrence, Ulrike Claas, and Paul Roscoe
2006 On the Edge of Empire: Military Brokers in the Sepik "Tribal Zone." *American Ethnologist* 33(1):100–113.