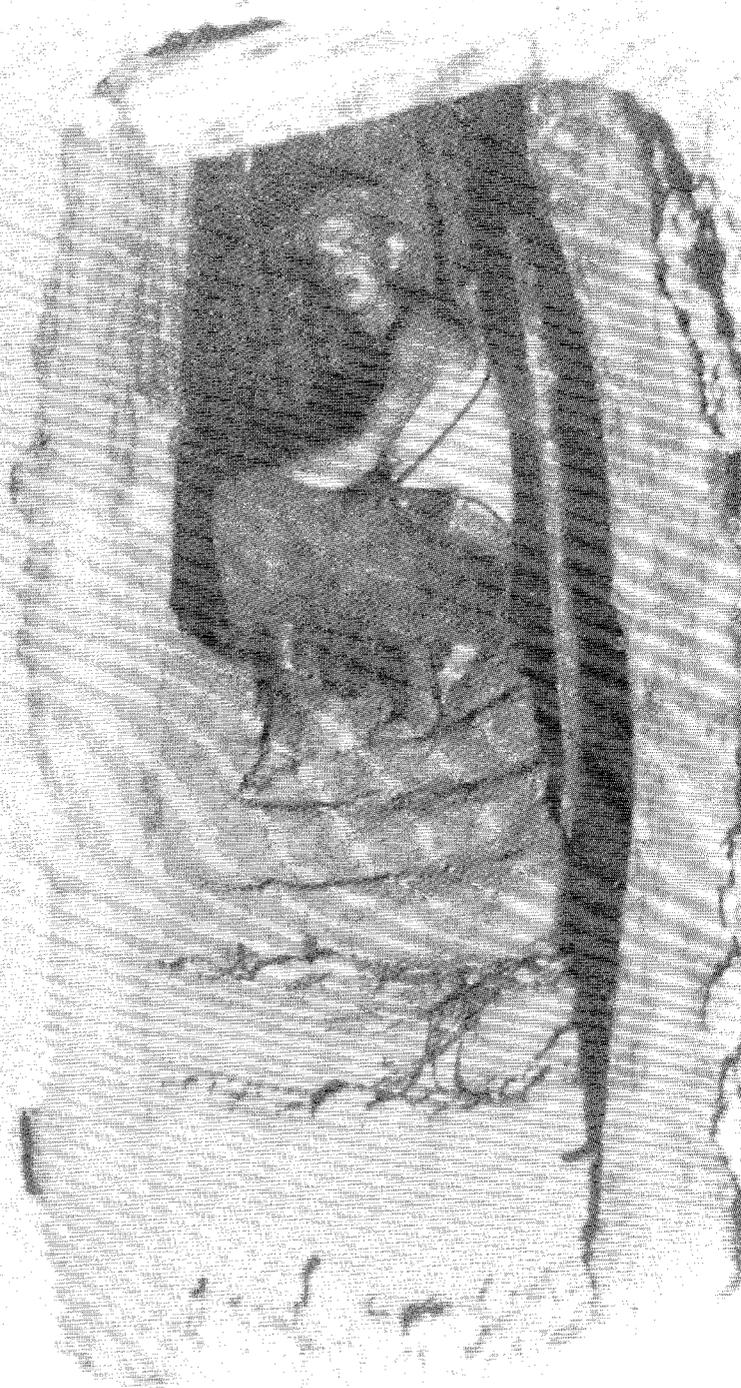
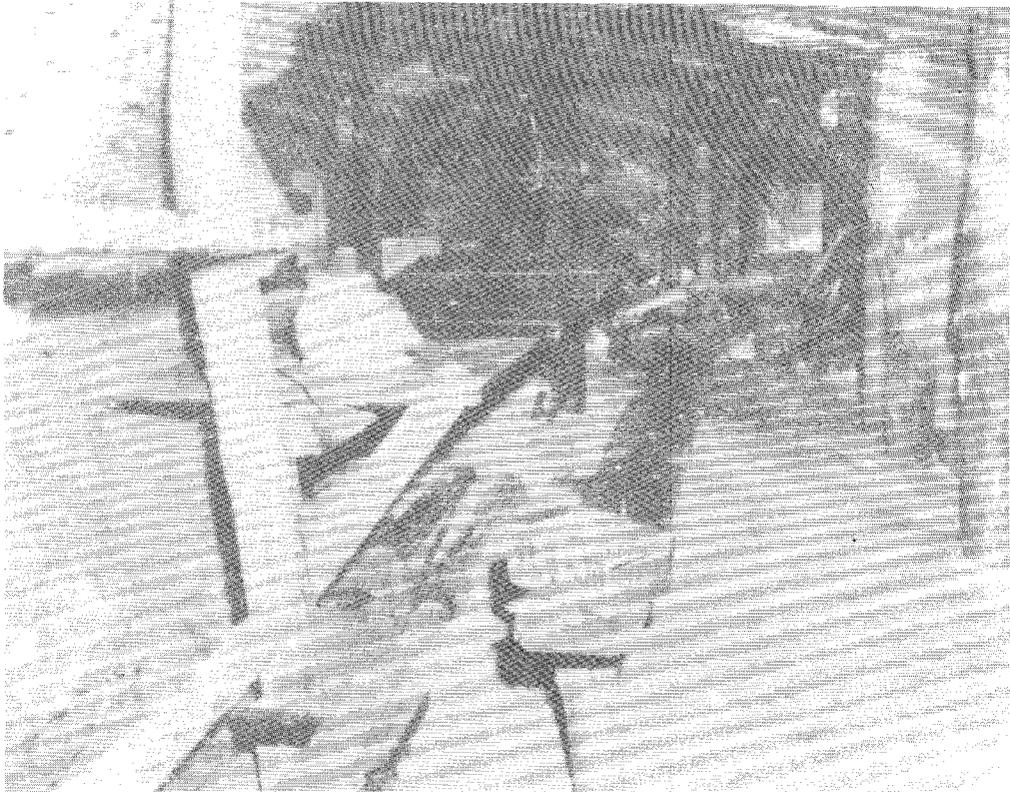




Stone shaft of a pillbox cave

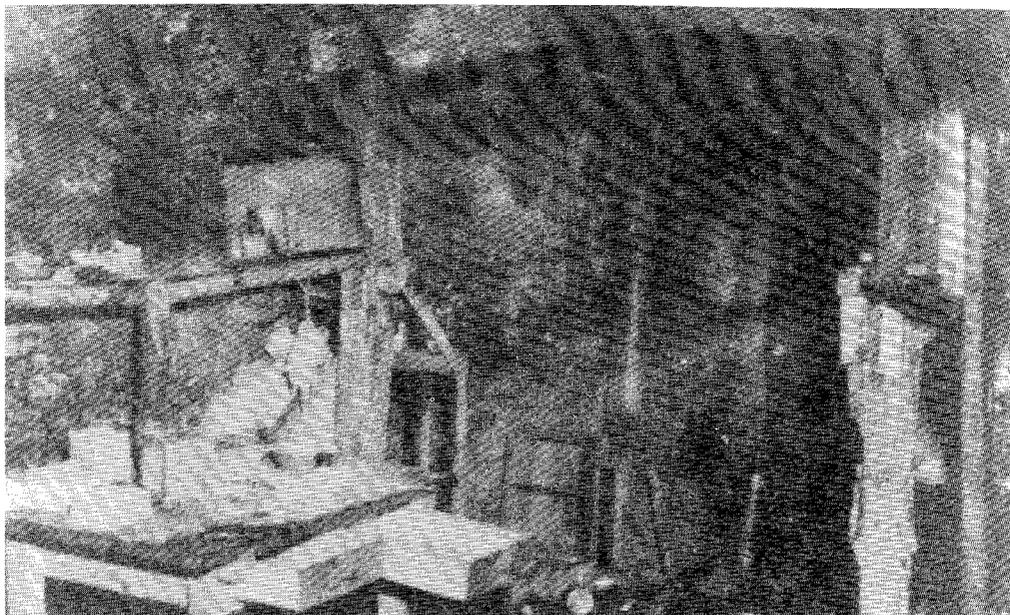


Wooden beams supported earthen shafts



U.S. Marine Corps

Underground mess hall on Oroku Peninsula



U.S. Marine Corps

Commander's office in a pillbox cave complex



Caves were linked by communications trenches



Communications trench with bamboo arches for overhead camouflage

Japanese barrel and camouflaged with sod. The firing room was widened to perhaps five and a half feet, then tapered to the fire port. The port itself might be as small as eight inches wide, with earth splayed outward from that opening to a width of three feet. This made it easy to fire out and hard to fire in. Just inside the port was a dais, a foot or so above the floor, on which was placed a machine gun or other fire weapon.<sup>11</sup> All the construction in such a position consisted of shaped earth, with hand-cut logs to shore up the walls and the external splaying. The few men who manned the position usually lived inside in a slightly widened chamber or side shaft.<sup>12</sup>

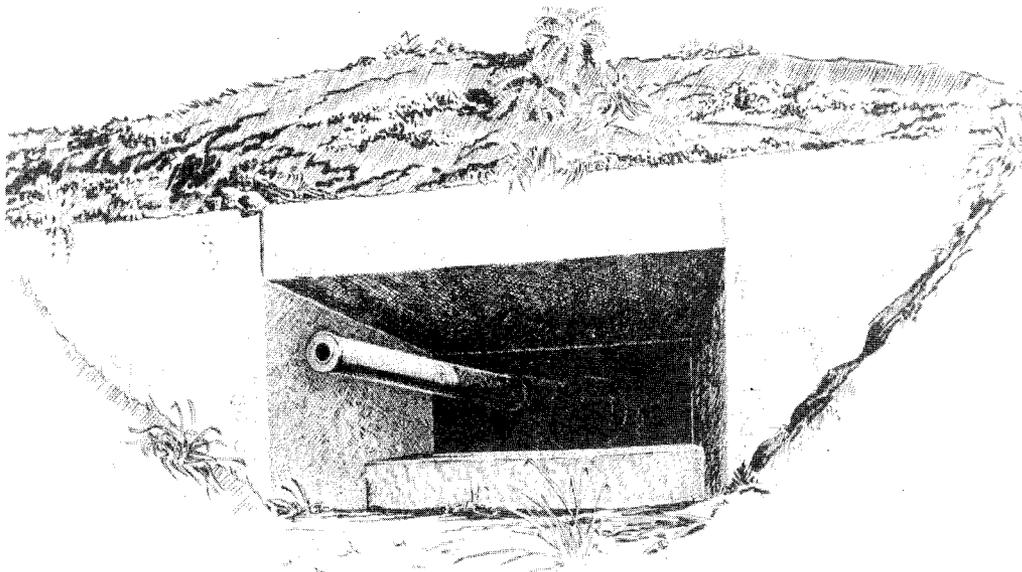
Since responsibility for building the caves lay with the battalions, communications between caves, like the fire nets between them, were well integrated at battalion level and below, but not above. Nearby caves were sometimes linked by tunnel. Caves farther apart were linked by communications trenches so soldiers could go between them unseen. The larger caves had multiple entrances, and entrances in general, like the fire ports, were small and artfully concealed.<sup>13</sup>

American observers felt that, "in some of the larger hill masses," extensive tunnels provided "underground mobility" to the Japanese that allowed them to "convert an apparent defensive operation into an offensive one by moving [their] troops through tunnels into different . . . pillboxes."<sup>14</sup> Some of the through-the-hill cave systems did allow the Japanese free movement all around a terrain feature without being seen.

Even so, the IJA 32d Army Staff was impressed with the extent to which being fixed in the caves limited 32d Army's mobility. Because the building of communications trenches had not been coordinated above battalion level, it was not impossible for large forces to maneuver out of sight. Even if they did manage to move, there was often no room for them in the already inhabited caves where they arrived. When preparing for attack, the problem could be overcome by painstakingly moving forces at night. But when responding to U.S. attacks, which always came in the day, large forces could not be moved from one network of underground positions to another. Concentrating forces to resist an attack or mount a counterattack was impossible.<sup>15</sup>

This meant that Japanese soldiers in an attacked position had to defend to the death, because their comrades could not come forward to aid them, nor for that matter, could they retreat in the open without being exposed to massive American fire.<sup>16</sup> The cave forts, although they protected the IJA force, sharply reduced its mobility, and agility was out of the question. This problem could have been partially overcome if the Japanese had paid more attention to building communications trenches between the scores of small cave systems.

American officers reported that the Japanese used the caves to maneuver behind the U.S. lines.<sup>17</sup> But it is more likely that the Japanese were trapped in their caves behind the Americans as a consequence of the Americans' forward movement. The cave positions prevented out-of-sight rearward mobility. Because the Japanese could not safely retreat, some ended up behind the American lines, though neither they nor the Americans wished for them to be there.



Fire port of a 150-mm naval gun position

While the whole Japanese infantry was installed in pillbox caves, so was its artillery—large guns and small. Although the size of the cave varied according to the size of the gun, the configuration and function of the artillery caves were essentially the same as those of the infantry machine-gun caves. One of the two 150-mm naval guns overlooking Nakagusuku (Buckner) Bay, for example, was set in a concrete-walled room twenty-five feet by fifteen feet, with a reinforced concrete fire port eight feet wide. The gun crew lived in a long shaft behind the firing room. In short the big-gun forts, like the machine-gun forts, were just fire slots with tunnel shelters behind them (see figure 7).<sup>18</sup>

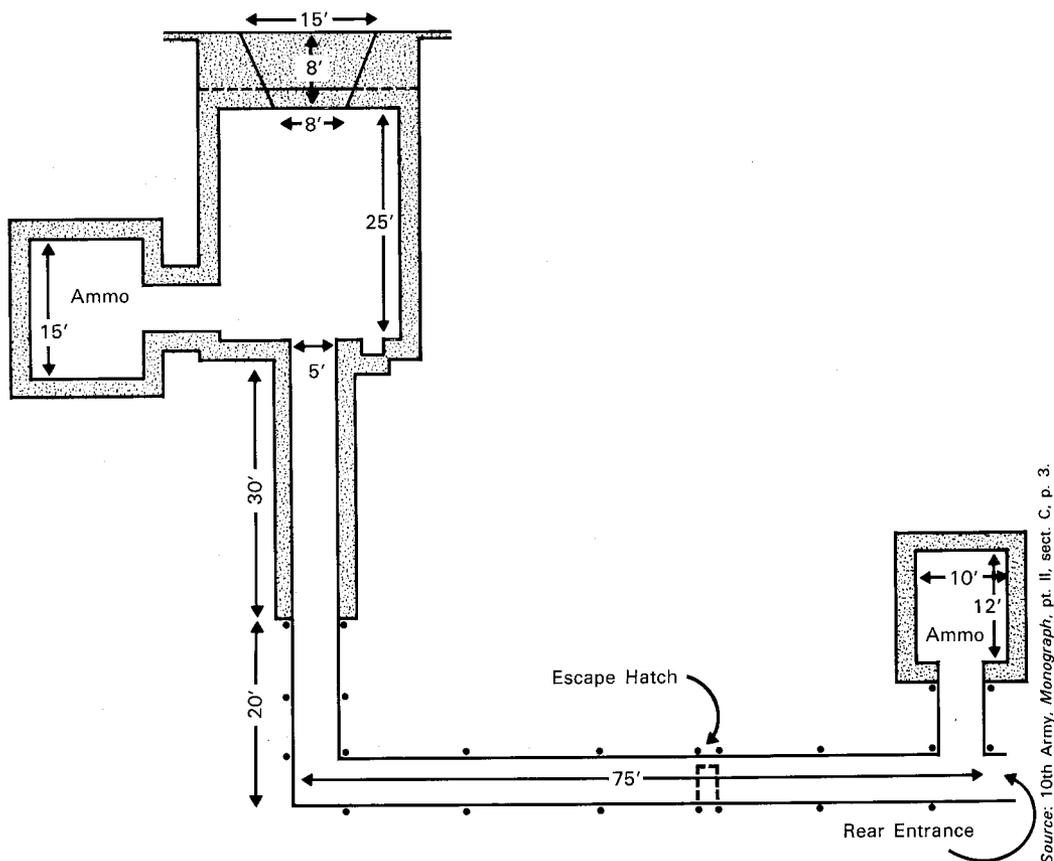


Figure 7. An IJN 150-mm naval gun position

Searchlights and naval range finders were set next to a line-of-sight opening with a barracks tunnel behind, just as the guns were. In other words, the “window-on-the-world” approach was adopted for all line-of-sight related functions. A semicircular variation was provided for mortars. Typically, a ten-foot semicircular room was set four and a half feet into the ground with a fan-shaped, hardened, camouflaged roof at ground level and an underground shaft running behind. Fire slots were created at

intervals along the 180 degrees around the edge of the roof by removing some of the ground (see figure 8).<sup>19</sup>



Rear wall of the fire room of a 150-mm naval gun position

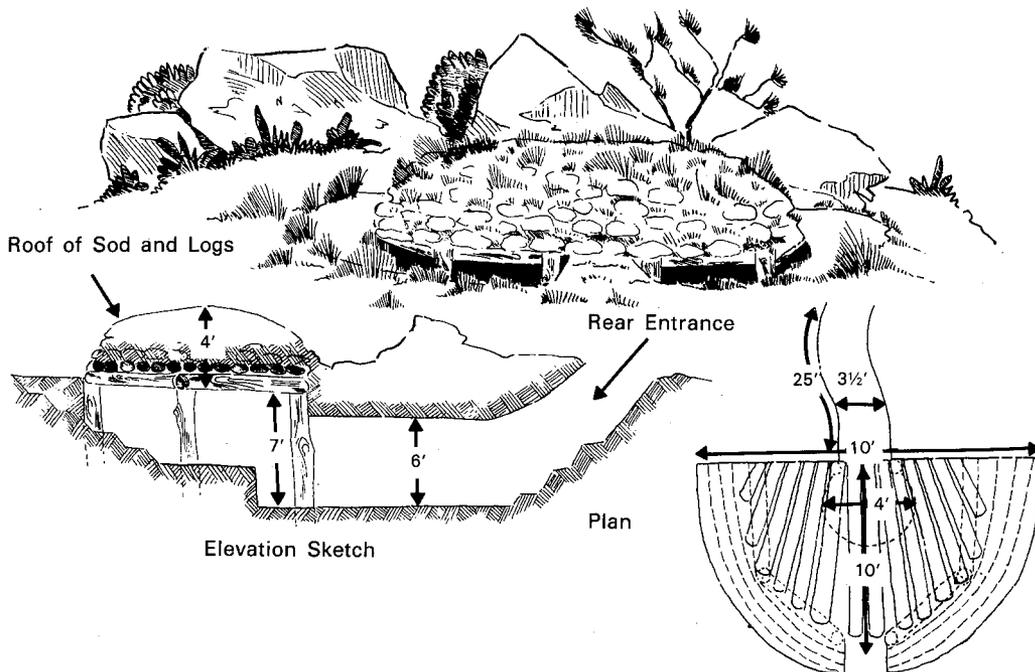


Figure 8. An IJA mortar position

Source: 10th Army, *Monograph*, pt. II, sect. B, p. 9.



Mortar position fire port

### *Cave Warfare: Some Comparisons*

There were several factors that made the cave positions on Okinawa different from the trench systems of World War I. On Okinawa both sides knew well in advance where the battle would be. Both knew also that, although one side would have overwhelming firepower and air supremacy, the other side would have exclusive control of the ground for a year before combat. American air supremacy meant that every Japanese position had to be hardened and concealed, because air observation would bring devastating bombardment on any visible target. The Japanese' long foreknowledge of the inevitable attack, coupled with their unlimited labor power, meant that the Japanese could respond to this problem with an elaborate solution: moving everything underground. The Americans, similarly, were hindered by having no access to the ground.

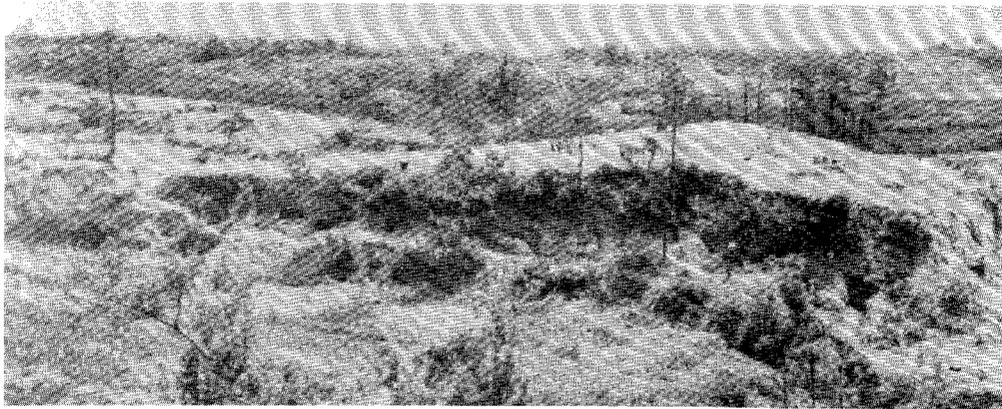
The IJA, relying on its only advantage—prior access—managed largely to neutralize the American triple threat of air, naval, and field artillery bombardment through eleven weeks of combat. Even so, since the caves were built without the Japanese knowing exactly where the Americans would land, they were not concentrated where the front would be, not well fire-integrated above battalion level, and not well connected for movement. The World War I trench systems avoided all these defects because of the doubtful advantage their builders had of constructing them in the presence of the enemy.

In many respects, the whole Okinawan struggle resembled a World War I offensive in terms of the conditions the respective sides faced. Even so, the IJA cave systems had a personality different from the Western Front trench systems. The World War I trench systems did not put men continuously underground, nor were the major artillery pieces, rear headquarters, and rear-area supply personnel underground. It was the American air presence that forced the radical movement of these combat support elements underground, because the American planes carried a weapon deadlier than guns or bombs: perfect knowledge of Japanese activities. Any observed activity would be blasted off the face of the earth by remote fire.

There was another notable difference. Because of the undulating terrain, IJA units were able to build their forts into the hillsides while still giving a view on the world that was above ground level, and that seemed to and did dominate terrain. This, plus the fact that the caves were almost completely safe from bombardment, seems to have spared IJA soldiers some of the dismay that World War I soldiers experienced living day in and day out in the trenches. The Japanese soldiers did not suffer as much as the World War I soldiers from the "underground neuroses" described by Eric Leed. That the Americans never themselves went underground to engage in World War I-style mining and countermining (in effect underground maneuver combat) also may have saved the IJA soldier some mental stress.<sup>20</sup>

### *Okinawa Terrain*

The IJA 32d Army chose to build its main defensive positions across the Okinawa isthmus near a line running from Uchitomari on the west coast to Tsuwa on the east (see map 3 in chapter 1). The rugged terrain in this area, which extended southward to the Naha-Yonabaru line, was superbly fitted to the methods the IJA had adopted of using hilltop pillbox caves and reverse-slope fields of fire that would force the Americans to engage as small infantry teams. The terrain here was rolling and hilly and "broken by terraces, steep natural escarpments, and ravines." It was



When U.S. forces fought their way over a ridge, they often found themselves in a tangle of irregular ground such as that shown here, honeycombed with reverse slope fire ports

characterized by “lack of pattern, steep slopes, and narrow valleys” and was “filled with twisting ridges and spotted with irregular knolls.” Because the terrain was hilly and irregular, it provided innumerable short fields of fire but no long fields of fire. This was ideal for the Japanese whose defense relied on “large numbers of short-range weapons.” The tangled, broken ground forced the Americans to fight a thousand small battles hand to hand instead of one large battle at a distance where their preponderant firepower would have given them the advantage.<sup>21</sup>

### *Cave War Tactics*

The IJA 32d Army on Okinawa succeeded in doing what Robert E. Lee vowed, but failed, to do at Gettysburg: maneuver offensively but fight defensively. The 32d Army placed itself where it knew the U.S. Army must come, Okinawa, and it shrewdly chose terrain (1) that was strategically crucial for the Americans to capture for control of Nakagusuku Bay and Naha harbor, yet which also (2) was extremely favorable for the defender. (MacArthur had done the same on Bataan.) Having identified such terrain, the 32d Army thoroughly prepared it. Creating the cave environment was itself the 32d Army’s greatest operational success.

The Japanese built the caves with fields of fire on reverse slopes and on important roadways and integrated the cave fire nets, though not as well as they might have.<sup>22</sup> Until U.S. ground forces reached the hidden defense line across the southern isthmus, the 32d Army stayed in its caves and did not respond to any air or sea reconnaissance efforts. The U.S. Tenth Army therefore did not know where on Okinawa the IJA 32d Army was. Scout planes could identify no IJA targets for the bombardment prior to landing. Even after landing, the U.S. Tenth Army moved about the island for eight days before it ran up against IJA 32d Army’s main line of resistance at Kakazu and Minami-Uebaru.

Both the Japanese and the Americans had to accommodate themselves tactically to the existence of the caves. At first, the Americans did not know the pillbox caves even existed and had no doctrine for dealing with them. This was a severe disadvantage, but one for which the Americans on the line soon found a solution. The Americans at the outset of the offensive advanced en masse and were mowed down in crowds by cave-hidden machine guns when they reached the reverse slopes.<sup>23</sup> American officers on the scene quickly developed a method for avoiding these unhappy effects, however. They would bombard the Japanese positions they faced, forcing the IJA off the surface. They would then infiltrate men in small numbers through narrow gaps in the Japanese fixed cave fire line (“dead spaces”). The fact that the cave positions were separated and their fire nets not perfectly integrated became a serious Japanese liability here because the Americans took advantage of the small openings in the fire line to envelop the cave positions.<sup>24</sup>

Learning these countermethods took time and probably explains the heavy losses suffered by each American line division in its first two weeks

of combat. Casualties for each American division's first two weeks of anti-cave fighting exceeded losses of subsequent weeks by 40 percent or more (see table 1). The only partial exception to this pattern was the 7th Infantry Division, which fought along the less densely defended eastern shoreline and which had already acquired prudent instincts for this type of ground action on Leyte.<sup>25</sup>

The Japanese countertactic to American ground infiltration was to leave more men on the surface during bombardment and to put still more men back on the surface instantly when the bombardment stopped. These troops would attack the few Americans who had seeped through the holes in the line and try, often successfully, to drive them back. The result was fierce small-arms fights between small units of men in isolated valleys not readily visible to either main force. These fights could be fairly equal because the Americans had only the light arms they could carry and could not use artillery because at close quarters they risked destroying their own precarious positions. Whenever the Americans could, however, they had tanks with them, which the Japanese did not. Losses in these all-important small-arms fights were high. The Americans often had to infiltrate men forward several times before they could gain a foothold that was proof against the aggressive Japanese counterattacks.<sup>26</sup>

The Japanese countermethods in some respects resembled the defensive tactics that evolved on the Western Front in World War I. Rather than attacking, the Japanese limited their efforts to counterattacking and struck only against those advanced enemy elements precariously established on the wrong side of the defense line. While the American attackers were still few and not dug in, a small IJA unit had to rush them boldly with small arms and quickly drive them out of their isolated strongpoint before they consolidated. They had to do what storm troops were invented to do in World War I. Japanese artillery also focused on the Americans' exposed positions before they could dig in.<sup>27</sup>

The fierce Japanese counterattacks were notoriously effective, and indeed it was here that the IJA's orthodox doctrine emphasizing bold and hasty attack served 32d Army well. The quick death-defying attacks by a platoon or a company, armed only with bolt-action rifles and knee mortars, was something IJA training had prepared 32d Army for well, even though that same training was inappropriate for all the rest of the Okinawa experience.

### *Tanks Versus Caves*

Use of unaccompanied infantry against the cave positions was not very successful, and if this had been the Americans' only resource, their progress could have been stymied.<sup>28</sup> Indeed there could have been a stalemate on Okinawa despite the Americans' firepower, in which both sides dug in and neither side could move. What made it possible for the Americans to advance expeditiously against the IJA's ingenious caves was the tank. The tank did not make it easy to move through the densely entrenched fire-

TABLE 1

Average Weekly Battle Casualties of American Combat Divisions on Okinawa for First Two Weeks of Full Engagement and for All Subsequent Weeks of Full Engagement

<u>Unit</u>	<u>First Two Weeks' Average Weekly Battle Casualties (A)</u>	<u>Subsequent Weeks' Average Weekly Battle Casualties (B)</u>	<u>Ratio of A to B</u>
7th Infantry Division	695 <sup>a</sup>	558 <sup>b</sup>	1:24
27th Infantry Division	1,298 <sup>c</sup>	— <sup>d</sup>	—
77th Infantry Division	905 <sup>e</sup>	631 <sup>f</sup>	1:43
96th Infantry Division	1,074 <sup>g</sup>	575 <sup>h</sup>	1:87
1st Marine Division	1,595 <sup>i</sup>	679 <sup>j</sup>	2:35
6th Marine Division	1,220 <sup>k</sup>	880 <sup>l</sup>	1:39

<sup>a</sup>Figures for 9—21 April.

<sup>b</sup>Figures for 22 April—23 June, but excluding figures for 6—26 May because the weekly numbers were affected by 7th Infantry Division's withdrawal from the line for rest on 10—22 May.

<sup>c</sup>Figures for 15—28 April.

<sup>d</sup>After suffering exceptionally high casualties in the late April offensives, the 27th Infantry Division was permanently withdrawn from the line on 1 May for mop-up and garrison duty in the north.

<sup>e</sup>Figures for 29 April—12 May.

<sup>f</sup>Figures for 13 May—2 June.

<sup>g</sup>Figures for 9—21 April.

<sup>h</sup>Figures for 22 April—23 June, but excluding figures for 29 April—12 May because the weekly numbers were affected by the 96th Infantry Division's withdrawal from the line for rest on 30 April—10 May.

<sup>i</sup>Figures for 29 April—12 May.

<sup>j</sup>Figures for 13 May—23 June.

<sup>k</sup>Figures for 6—19 May.

<sup>l</sup>Figures for 20 May—23 June.

Source: U.S. Army, 10th Army, G-1 Section, "G-1 Periodic Reports," Numbers 1 to 14 (Okinawa, 1 April 1945—7 July 1945).