HISTORY, MODERN ANALYSIS, AND FUTURE WAR

The key factors in success in war are not always easy to see. Courage, skill, and determination in battle are always central, but often not sufficient. Good technology is also essential, but it is clear that high-tech does not always confer a winning advantage. The need for adequate logistical support and other elements of combat services support is obvious, of course, but where does the line fall between adequate and superfluous? What role does the ability of the commander play, and do commanders really need such large staffs?

Systematic and scientific analyses of current operations can do a great deal to answer these questions. While operations analysis has been utilized since World War II, improved techniques and technology have increased its power a great deal over the past few years. Yet there are many important issues which cannot be effectively analyzed. Major limitations include the relative lack of information on what the enemy is doing and the fact that we must be prepared for conflicts that could be quite different from the one (if any) that we are currently fighting.

Examination of history is one way to help overcome these limitations, but traditional historical studies are limited in weighing the real importance of all the various factors of victory – too much is left to the judgment of the historian.

Many of the techniques and technologies of modern operational analysis, however, can be applied to historical cases in order to yield more precise information that can be better used to guide policy decisions.

A case for analysis: The Pacific War

The war with Japan, the Pacific portion of World War II, is a useful case for analysis in some important respects:

- Although Australian and New Zealand forces played very key tactical roles, all of the direction in the Pacific at the operational level on the Allied side was in American hands. (Here, of course, we are drawing a distinction between the Pacific itself and the other theaters involved in the war against Japan, notably Burma and China.)
- The U.S. kept fairly thorough and reliable records of its efforts in this conflict, and analyzed the data within the limits of the techniques and technologies of the 1940s. Most of this still exists, although it can be quite difficult to find and to put in usable form for modern analysis.
- Japan's unconditional surrender opened its surviving records to scrutiny completely and the U.S. made comprehensive efforts to collect and analyze this information at war's end. The picture has since been filled in further by Japanese historical research.
- Most security concerns have now lapsed, and most of the relevant data can now be accessed.

Another important consideration is that this was by far our biggest and most intense conflict with an Asian power, and if we are faced with large and intense conflicts in the future it is likely that our opponents will be emerging Asian powers, as Japan then was.

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The first half of the war, up through the latter part of 1943, is particularly interesting and significant for analysis. Japan's leaders of course understood that it had no means to defeat the U.S. in the sense of compelling it to surrender. But they thought they could hold off American attacks for at least two years, and thus discourage the U.S. sufficiently to gain a peace settlement favorable for Japan. The initial six months went even better than the Japanese had imagined, but then America struck back far more swiftly and strongly than they had anticipated. Even before the invasion of Tarawa in December 1943 launched the Central Pacific drive, the Allied forces under American direction had gained commanding material advantages in the Pacific.

Two years of war

The familiar broad outlines of the early Pacific War are recapped in Figure 1 and Figure 2. The Japanese army and navy general staffs, working in coordination, had drawn up an elaborate, multi-phase plan for the initial offensive that is depicted in Figure 1. Following the neutralization of the most dangerous of Allied force concentrations by the raid on Pearl Harbor, Japanese forces isolated each of the concentration areas in the Asian region and then defeated each in turn. The British and Commonwealth forces defending Singapore were judged the most crucial, strategically, and so were attacked first. The turn of the U.S. forces in the Philippines came just a few weeks later. Even before these campaigns had closed, the seizure of the Netherlands East Indies (today's Indonesia) began. Meanwhile, the victors of Malaya had re-deployed to attack the British colony of Burma, swiftly taking most of it. Finally, the northern part of New Guinea and the island chains north and east of it were taken to guard the newly-conquered territory.

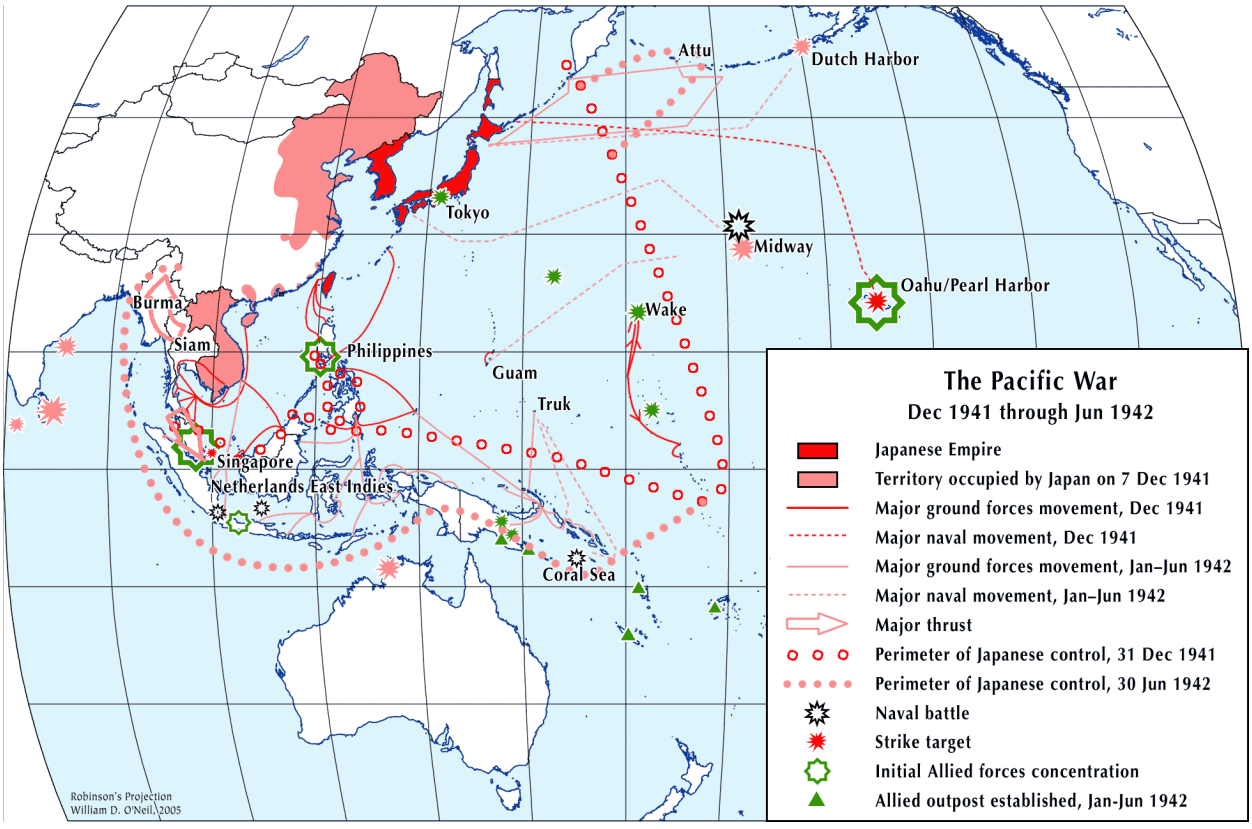

Figure 1. The Pacific War, Dec 1941 through Jun 1942.

By early May 1942, just six months after Pearl Harbor, Japan had gained every operational objective it had set, at a cost less than had been feared. There had been two setbacks – failed initial assaults on U.S. troops in the rugged Bataan Peninsula near Manila and on the U.S. atoll of Wake – but neither brought any real operational consequences because the Allies lacked the strength to exploit their temporary and limited defensive successes. Allied naval and air forces had been consistently out-matched and had accomplished little to support or protect the beleaguered ground forces. Even where the ground forces could hold out – as they did for some time in Bataan and might have in Singapore – lack of critical logistic sustainment doomed them.

By Feb 1942, American aircraft carrier task forces began conducting raids on Japanese-held islands in the Central Pacific. No great damage was done but it was a little unsettling to the Japanese naval high command, which had not reckoned on the Americans rebounding so swiftly. By 10 Mar, American carriers were conducting raids in New Guinea. Then on 18 Apr, army bombers launched from a carrier raided Tokyo and other cities. The damage was slight but the raids alarmed and embarrassed the high command by making clear that Japan's military successes had by no means secured it against attack. This led to the fateful decision to extend the defensive perimeter still further to the southeast and east, with assaults on the Allied strongpoints of Port Moresby in southeastern New Guinea and Midway Atoll, with both seen as preludes to still further extension. Both ended in carrier air battles whose results, unfavorable for Japan, aborted the planned assaults. Moreover, Japan lost twice as many large aircraft carriers in the two battles as did the U.S., largely negating the advantage in carrier strength with which it had entered the war.

Notwithstanding the reverses in the carrier battles of the Coral Sea and Midway, the Japanese leaders in July 1942 could look at maps like Figure 1 with some satisfaction and assurance. All the bases of western power in Asia had been eliminated. The conquest of Burma established a highly defensible boundary in the west while cutting off the last route for western support for Chiang Kai-shek's forces in China, seen by the Japanese Army as the key to ending Chinese resistance to Japanese domination of the country. In capturing the East Indies, Japan had gained ample petroleum resources, assuring its independence of the west and ability to hold out over the course of a long war, if need be. The extent of Japanese control in the Pacific, if not as great as had been hoped in planning the further eastward and south-eastward thrusts, exceeded what had initially been planned and was certainly impressive and formidable.

Most of all, the often-scorned Japanese military forces had shown themselves to be a match and more for those of the west. Even the carrier air forces had shown superiority to those of the U.S. in many ways – the defeats at the Coral Sea and Midway could be and were largely ascribed to bad fortune. If Japan could hold the line there seemed every reason to hope that the western powers, distracted and weakened by the war with Germany in Europe, would soon weary of fruitless struggle in Asia and Pacific and make terms.

Nor were the Japanese particularly alarmed at the attacks launched by the Allies in August 1942 – an invasion of Guadalcanal, near the end of the Solomon Islands chain, and overland thrusts in the rugged and densely overgrown southeastern tail of New Guinea. They had come earlier than anticipated and proved difficult – ultimately too difficult – to overcome, but they were not in great strength and the same environmental factors that so impeded Japanese efforts to strike back at them equally constrained the successes the Allies could achieve.

The Allied attacks continued, in gradually growing strength, through 1943 and into 1944. Those through the end of 1943 are shown as green arrows in New Guinea and the Solomon

Islands in Figure 2. They represent an Allied campaign aimed at an ultimate assault on Rabaul, the port on the northern end of the island of New Britain that Japan had turned into a key base. It had initially been hoped to re-take Rabaul fairly quickly, but the difficulties of the region's environment combined with the tenacity of Japanese resistance to make progress very slow and costly.

In October 1942, British Imperial forces launched a thrust into the Arakan coastal region of Burma, but this was successfully repulsed by the Japanese defenders. In March of the following year an American division was landed on the remote Aleutian island of Attu, captured by the Japanese as part of their Midway operation in June 1942. It took them two months and 1,800 casualties to finally prevail over the 2,500 isolated Japanese defenders.

With the U.S. fleet reinforced by arrival of the first new-construction carriers in the latter part of 1943, the long-planned Central Pacific campaign opened in December with assaults on the atolls of Makin and Tarawa, in the Gilberts. Makin, lightly defended, fell fairly easily, but the struggle for Betio, the principal island of Tarawa, was desperate, costly, and finely balanced.

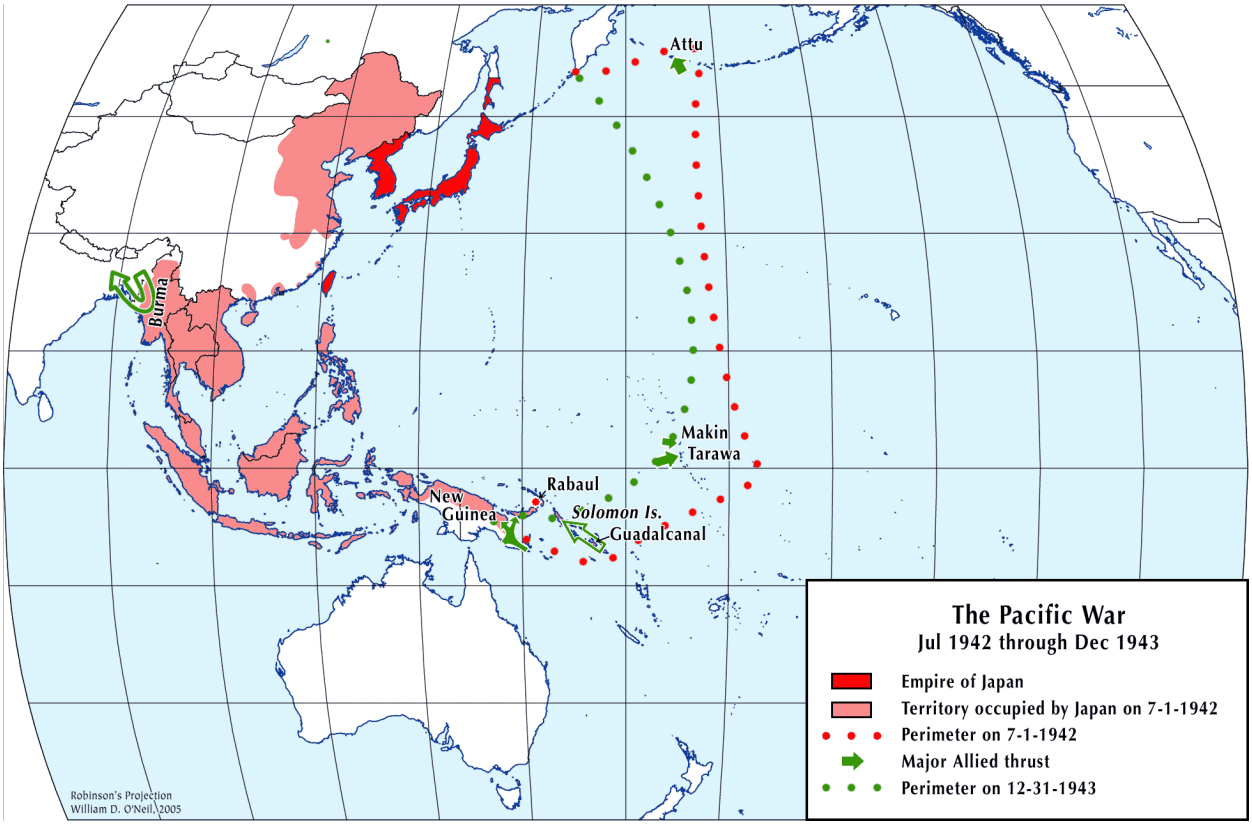

Figure 2. The Pacific War, Jul 1942 through Dec 1943.

Reasons why

The contrast between the first 7 months of the Pacific War and the next 18 – between what is shown in Figure 1 and Figure 2 – is stark. In the war's first phase the Japanese waged a campaign of maneuver on a vast scale and with striking success, suffering little loss in the process. The key elements that made this possible included

- Japanese ground forces held tactical dominance over their opponents, the fruit of superior doctrine and exceptionally rigorous training and indoctrination. This made it possible for them to attack numerically superior Allied forces and win, so that the whole campaign could be mounted with minimal forces and minimal sealift.
- Japanese naval forces outnumbered and outfought their opponents (up until Coral Sea and Midway), permitting them to isolate the theaters from reinforcement and support.
- The Allied forces were weak in air defenses and the numerically and tactically superior Japanese air forces were able to achieve effective air dominance.

After the Battle of Midway, early in June 1942, neither side had the means to establish naval superiority, except in favorable local situations. Thus neither could conduct large-scale maneuver in this ocean war. Moreover, in the Pacific, Australian and U.S. forces had largely closed the gap in capabilities in ground and air tactical warfare. Thus until American naval strength began to grow dramatically late in 1943, the war was one of hard slugging rather than grand maneuver.

Behind the appearances

To some people this period seems to be one of marking time, a war of mutual attrition pending the arrival of enough naval force to truly take the offensive. Others point to increasing Allied dominance in the air, seen as the fruit of a flood of new aircraft and newly-trained pilots from the U.S., leading to progressive erosion of the Japanese position. It is difficult to determine the reality from ordinary historical accounts.

Applying modern operational analysis techniques and technology, however, yields insights which change the picture substantially.

It is particularly revealing to analyze the material resources – personnel and physical matériel – delivered to the Pacific and actually available and operating over time. The Allies had greater potential manpower resources than did the Japanese, and Japanese production of war matériel was quickly outstripped by the United States (which provided the preponderance of matériel for the Pacific). On the other hand, the Allies had more competing priorities than the Japanese. Moreover, the distance between America and the main theaters of action (6,000 miles and more) imposed its own constraints.

With essentially no transoceanic airlift, everything sent to the fighting theaters in the southern regions had to go by sea. This was nearly as true for Japan as for the United States, but the distance was more than twice as great for the U.S. The great distance, the slow speed of ships in those days, and the difficulties of loading and offloading meant that on average ships could complete only three round-trip voyages from U.S. West Coast ports and back in a year.

Shipbuilding was arguably the most important U.S. contribution to Allied war efforts in the early years of World War II – certainly none of the other contributions would have meant much without it. Nevertheless, the demands of a worldwide war combined with the depredations of the U-boats in the Atlantic to keep shipping in critically short supply at least through the middle of 1943. The Pacific had to take its place in line. During the first six months of the war, when there was an urgent need to stabilize the situation, more than one-third of U.S. shipping was devoted to supporting Pacific forces, but then the proportion shrank to about one-quarter (albeit of a growing total).

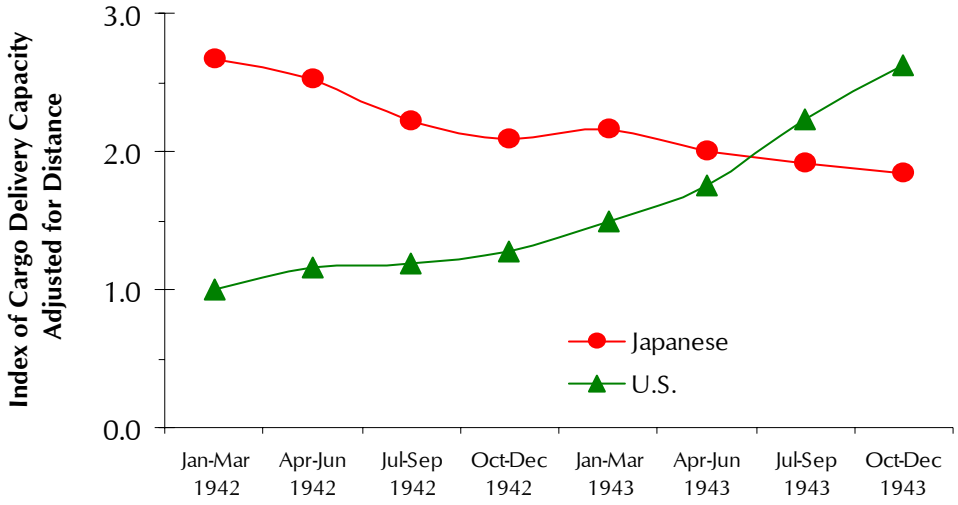

Figure 3. Relative capacity to deliver cargo to the Pacific theaters of war.

With fewer ships but fewer demands and constraints as well as shorter distances, the Japanese were able to provide substantially greater cargo carrying capacity than the U.S. throughout 1942 and well into 1943. More than 40% of all Japanese shipping was devoted to the Pacific conflict during the initial expansion phase. Thereafter some ships were returned to the civilian economy in order to permit it to get by, but the proportion of Japanese shipping supporting the Pacific War remained well in excess of 35%.

The net result, with allowance for the loss of productivity due to distance, is shown in Figure 3. Not until the second half of 1943, after new ships had built up America's capabilities and sinkings had eroded Japan's, did the advantage in shipping reverse. For 1942, U.S. cargo capacity to the Pacific averaged only half of Japan's while for 1943 as a whole the two were equal.

From this it is clear that the idea that the United States might somehow have flooded the Pacific theaters with men and equipment in 1943 is unfounded – there simply was no way to get them there in any event. This is consistent with the data we have regarding force strength in the region. Japanese troop-strength data are incomplete and somewhat inconsistent but it is clear that in terms of numbers of troops deployed to the Pacific fighting theaters they were at least equal with the Americans.

The nature of the war in the Pacific made air forces especially important. While the air forces of Britain, Australia, New Zealand, the Netherlands East Indies, and Mexico all fought the Japanese, U.S. planes carried 89% of bomb tonnage, accounted for 96% of assessed kills of Japanese aircraft, and suffered 83% of combat losses. After mid 1942, most Japanese air action was against U.S. forces and Australian forces under U.S. top-level command.

While Allied forces almost always had to face the Japanese without air cover up to May 1942, they very rarely suffered under such handicaps after that. From early 1943, Allied forces on the ground rarely faced any Japanese air attack at all. By the latter part of 1943, even Allied bombing raids against Japanese bases often encountered no fighter opposition.

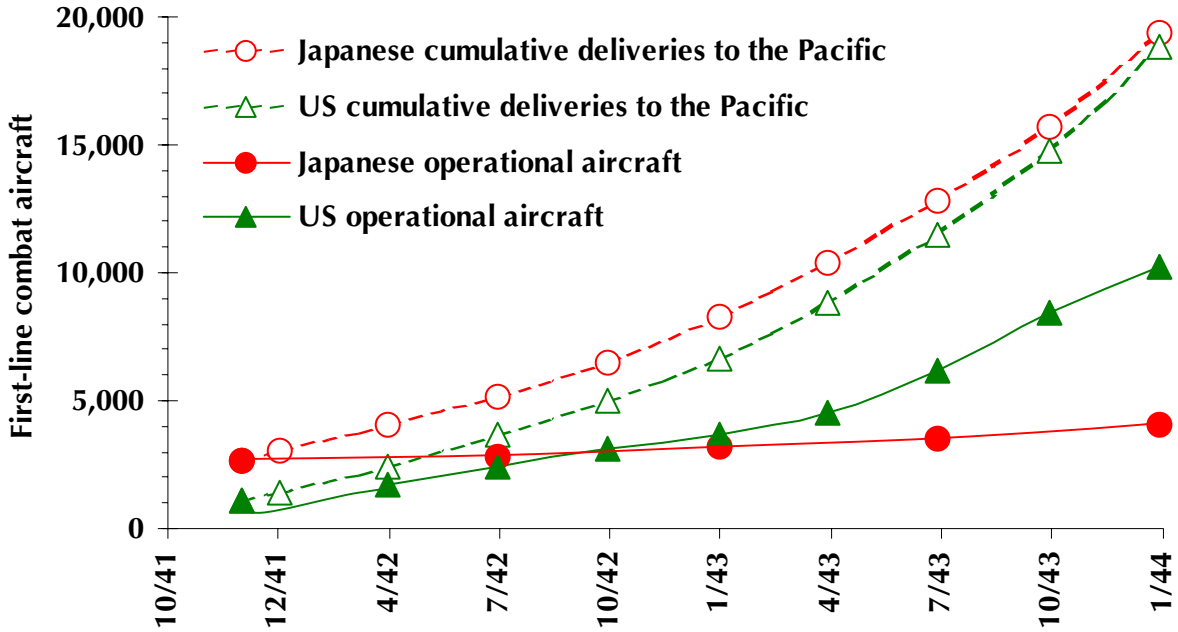

Figure 4. First-line combat aircraft delivered and operational in Pacific theaters, U.S. and Japanese.

This gathering Allied domination in the air is usually explained in terms of much larger production of planes and pilots by the U.S. and American introduction of qualitatively superior aircraft, but the facts do not clearly support either view. In Figure 4, the data for operational combat aircraft (shown by the solid symbols and lines) show that U.S. forces were numerically stronger than the Japanese by the start of 1943, and pulled steadily ahead throughout that year. But the figures for aircraft deliveries (open symbols and broken lines) show that this did not result from massive inputs; the U.S. did deliver aircraft somewhat faster than Japan did, but it took until 1944 to reverse the advantage in deliveries the Japanese had built up prior to Pearl Harbor.

The U.S. advantage lay not in delivering more aircraft but in keeping them operational longer, on average. The advent of more advanced fighters, such as the Lockheed P-38, Vought F4U, and Grumman F6F, no doubt helped, but was not the primary cause. First, we note that the trend was firmly established before these aircraft began to reach the Pacific in quantity. It must also be borne in mind that losses in air-to-air combat were but one source of loss, and by no means the predominant one. Finally, what data there are do not support the idea that the new fighters had greatly better loss exchange ratios than their predecessors – their key advantages lay in having the range, speed, and altitude to get into the fight in the first place.

It may be wondered why no one has noted these trends before. The answer is that the data presented in this section, including Figure 3 and Figure 4, are the product of extensive recent research and analysis. Such data have never before been available and cast a very different light on the events of the past. In so doing, they provide the basis, for the first time, an objective and fact-based analysis of the real roots of American victory over Japan.

Military cultures, education, and performance

Military officers of both nations strove to build distinctive service cultures to serve military needs and viewed their civilian cultures with some disdain in this respect. Yet the service cultures ultimately were closely tied to their national cultures.

In Japan, these factors operated to put the direction of the armed services – and ultimately the nation – in the hands of highly elite general staffs composed of men selected, trained and groomed from an early age, separately from the general run of military officers (who were themselves an elite within Japanese society). The culture of both the Army and Navy General Staffs placed intense emphasis on warrior spirit. This had been developed deliberately as a counter to western superiority in industrial production. (While it incorporated revived and re-interpreted elements of pre-modern Japanese warrior tradition, the popular notion that it is simply a straightforward survival of samurai tradition is ill-founded.)

Where the Japanese officer identified himself as a supremely loyal and self-sacrificing warrior, sternly committed to a holy calling, his American counterpart's identity was that of the pragmatic professional. His route to high command lay first through excelling within his branch, arm, or specialty of service and then going on to learn how to integrate and manage the combined efforts of all branches, and the cooperative (but not joint) efforts of both army and navy.

In both nations the services lay stress on higher professional military education (PME), but it meant different things. The Japanese officer strove ardently to gain entry to the war college of his service at an early age – as young as 25 in the Japanese Army, and rarely as old as 35 – for in doing so he set himself on what was virtually the exclusive track to high rank. The education he received there stressed elite indoctrination and higher tactics rather than combined-arms warfare and the operational level of war as in the U.S. system, which a large proportion of successful mid-career officers attended as men in their mid 30s and 40s.

For the pragmatic American professional no detail of war was too mean to be worthy of its proper place, from field sanitation to shipping protection. If he saw no need to devote his own efforts to the quotidian details of stock level management or cryptological security, he did not hesitate to ensure that appropriate specialists were employed and that their activities were given their appropriate weight in operational plans.

"Unwarriorlike" efforts, by contrast, were disdained by the Japanese general staff elites. The essence of war lay in direct offensive action; all else was unworthy dross, barely to be tolerated at best.

For the Japanese, war was tactics writ large, the enemy was to be defeated by direct action, and losses were to be stoically borne as unavoidable in war. For the Americans, war was a symphony of instruments, great and small, to injure the enemy and guard themselves. The payoffs of the two approaches can be seen in Figure 3, Figure 4, and countless figures yet to be compiled and plotted. The Americans accepted heavy losses when necessary but they husbanded their strength wherever possible while they made the enemy bleed at every pore. It was to take another 20 months to defeat Japan and America's technology and manufacturing capacity would speed and ease the process. But before these had come into play on any large scale, American military professionals had already shown that they and their citizen troops could meet and overcome the highly trained and motivated Japanese when fighting at even odds. Their ability to do so owed more to a culture of military professionalism, consciously shaped and fostered through professional military education, than to technology per se.

Conclusion

This brief paper has focused on efforts to understand clearly and accurately what happened long ago in some obscure corners of the Pacific. Any historical interest aside, this is important for today and tomorrow.

- While assessments and predictions of military capabilities and needs do not always start with history, they always ultimately are traceable to impressions and lessons drawn from history. Thus getting history wrong is dangerous. Getting World War II history wrong is arguably particularly dangerous because it remains the premier example of the most dangerous kind of war, a massive conflict with states powerful enough to do us real damage.
- We need not worry about having fewer military resources than our enemies. But just as in the Pacific War, distance and geography may limit our ability to apply our superiority. Analysis of the Pacific War can suggest means to achieve dominance without material superiority.
- The Pacific War can light the way toward responses to asymmetric warfare. The deliberately asymmetric approaches of the Japanese brought them some real successes, and threw some Allied commanders for a loss early on. But the Allied successes (and lapses) in responding rapidly offer many important lessons.

Beyond the value of better and more precise historical analysis this work points to areas in which such analytical approaches can aid us in the present.

- A great deal could have been learned at the time about Japanese capabilities and likely plans through clearsighted analysis of their military culture. Analysis of readily-available information regarding Japanese professional military education would have been particularly illuminating. The obvious lesson is that more effort should be devoted to comparable analyses of present-day potential foes and friends as well.
- In terms of their form, Figure 3 and Figure 4 are notably similar to the outputs from computerized campaign analyses. These and comparable quantitative historical analyses offer an opportunity to compare campaign analysis models with reality and thus better understand the weaknesses and limitations of these critical models.

To learn more

This paper largely summarizes work done by the Center for Naval Analyses under the sponsorship and guidance of Mr. Andrew W. Marshall, DoD's Director of Net Assessment. To lean more about this work and about possible extensions and applications, please contact the author:

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