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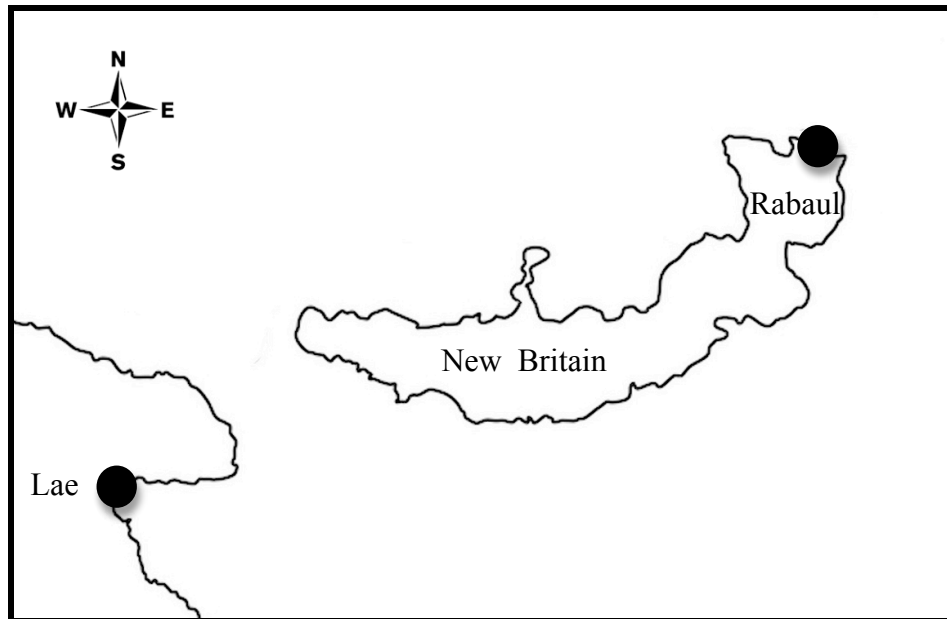
Battle Strategies in the Bismarck Sea

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In early 1943 the Japanese navy was ordered to move an invasion force from Rabaul to Lae. Radio intercepts told the Americans where the invasion fleet would originate, its destination, and the date of the invasion. However, the Americans did not know whether the fleet would move along the north coast of New Britain and then turn south to Lae, or sail along the south coast and gradually turn west to their destination.



The Americans knew that the Japanese had to commit irrevocably to either the northern route or the southern route because they did not have enough armed escort ships to send parts of the invasion force both ways.

The Japanese knew that the Americans had enough air power to scout both routes and to guard either route but not both at the same time. They also knew that if the fleet were discovered along the route not protected it would take the Americans an additional entire day to reposition their airplanes.

Both sides knew that the distances involved and the speed of the fleet made this a three-day journey, whichever route was chosen. Both sides knew that the southern route would have clear weather throughout the time of the operation, and that a storm would move in and hide the fleet in dirty weather for all of the first day the fleet sailed if they used the northern route. That heavy cloud cover would make air attack impossible during that day if the fleet were discovered. Both sides understood from past experience that the results of this kind of attack would be a linear function of engagement time.

If both commanders behave logically, which route should the Japanese take and which route should the Americans defend?

Intuitively, one might suppose the fleet should go north to minimize the time it is exposed to attack. Also intuitively, one could expect the air commander to reason similarly and move his forces to defend that route. Then the men of the fleet will wish they had taken the other route. Perhaps the Japanese commander should outsmart the American commander by taking the illogical and unexpected route. Should the American commander anticipate that cleverness and defend accordingly? So should the Japanese commander do the intuitive thing in the first place? Once begun, such back-and-forth ideas continue endlessly without suggesting any solution.

What should each commander do?

The Japanese commander's mission requires him to expose his fleet to the least possible attack time. The American commander's mission requires him to maximize attack time. The following table shows all possible command decisions and their resulting attack times. Take a minute to convince yourself that the table is complete and correct.



Consider the American strategy based on that table of results. If the fleet goes north, the air commander prefers to use the northern area. If the fleet goes south, the air commander prefers the southern area. Furthermore, defending the north leads to a total of four possible attack days, as does defending the south. So the air commander is indifferent between defending the north or south. Analyzing the table does not point out a best strategy for the Americans.

Consider the Japanese strategy based on the table. If the air forces defend the northern route, the fleet commander is indifferent between going north or south. If the air forces defend the southern route, the fleet commander prefers the northern route. Analysis of the table shows that the best Japanese strategy is to go north.

Therefore, the Americans should defend the northern route and prepare to attack the fleet along that path. The theoretically correct solution is for both sides to move north.

In 1943 those radio intercepts gave the American commander time to move his forces where he wanted them to be. He moved north. He didn't know which route the Japanese navy took until his scout planes found the fleet moving along the northern route. In the ensuing battle, all of the Japanese troop transports and half of their armed escort ships were sunk.