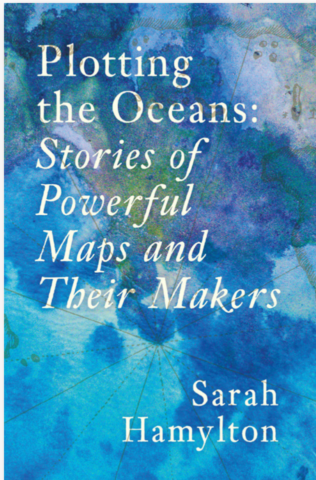

PLOTTING THE OCEANS: STORIES OF POWERFUL MAPS AND THEIR MAKERS

By Sarah Hamylton

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Review by: Arden Benner, Trimble Maps

"Maps are mediators between our innermost ideas and the outer physical world. Just as a good diary helps us to make sense of our everyday lives, maps have helped us to make sense of the world and its landscapes for thousands of years" (11). This is how Sarah Hamylton, author of *Plotting the Oceans*: *Stories of Powerful Maps and Their Makers* opens her "Introduction" (subtitled "How maps shape the world"), setting the tone for the rest of the book, in which historical insight is used to contextualize modern cartographic innovation. She then proceeds to carry us along on a journey covering hundreds of years, introducing us to the cartographic works of Charles Darwin, Hubert Wilkins, Marie Tharp, David Stoddart, and Terry Hughes—and to the mapmaking methodologies they each employed—that established them as the geographic legends we know (or read about in textbooks) today.

Although *Plotting the Oceans* is ostensibly about the stories of these five ocean-focused cartographers, I would propose that Sarah Hamylton should herself be counted as a sixth. Our author is introduced in the "Preface"—subtitled "Mapping coral reefs in Fiji"—as a technologically savvy and experienced mapmaker in her own right, and it is her knowledge of the past juxtaposed against her modern expertise that constitutes the through-line of all five stories. Hamylton's clear and comprehensive understanding of maritime cartography allows her to alert her readers—especially those of us with significantly less ocean mapping experience—to the progress that was made in the field by each of her five subjects, and how changing technology affected and facilitated that work; as well as how that progress is continuing on today. Toward the end of her "Introduction," she recounts a conversation with a "semi-retired" professor about the author's plan to use a drone to remap an area that was last surveyed over five decades prior. It reads like the set up for a joke, and cleverly introduces the book's themes of technological progress. The professor tells Sarah: "When we mapped that mangrove forest in 1974, it took two of us three days walking around it with a 50-meter tape measure," to which Hamylton laughingly replies, "This should take us about 15 minutes altogether" (27).

Each of the five chapters of *Plotting the Oceans* follows one of our key mapmakers in their marine cartography pursuits. The chapters have attention-grabbing names like "David Stoddart's battle to save Aldabra Atoll" and "Hubert Wilkins' flight to discover the true nature of the Antarctic Peninsula." In chapter three, "Marie Tharp's intuition for ocean depths," (Figure 1) we follow the bathymetric artist in the lead up to the discovery of the Mid-Atlantic Ridge that Alfred Wegener had proposed in 1912. Noted by Tharp in her analysis of transatlantic sonar profiles, the feature was incorporated in the sea floor maps she had begun producing in 1957, in cooperation with Bruce Heezen. "But her maps were not enough to convince the . . . community of ocean geoscientists. It would take a famous man with a giant underwater camera [Jacques Cousteau, in 1959] for the existence of the Mid-Atlantic Ridge, as it would come to be known, to

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gain acceptance" (112). Decades later, in the late 1970s, Tharp led the composition of the famous "World Ocean Floor" panorama—using her own interpolation skills in a "feat of educated guesswork" that "has withstood the test of time" so well that it is still being used today as part of Google Earth's submarine data layer. Hamylton muses that she has "often wondered whether people are aware that only a small fragment of this seafloor is actually real data. Indeed, only around 5 per cent of the seafloor has been fully mapped" (128).

Each chapter is an amalgam of historical accounts with Hamylton's own commentary. Readers are guided to reflect on not only how mapmaking has changed over the last two hundred plus years, but also to contemplate what it means that we are now, more often than not, mapping places where we have never set foot. In Sarah's words: "Arranged in chronological sequence, these stories offer a collective picture not only of how maps inform our understanding of nature, but also about how changing spatial technology is transforming the ways in which they do so" (41). Her stories trace a path through that evolution—from Charles Darwin receiving data points via letter, through Marie Tharp interpolating the mysteries of the sea floor from echo-sounding traces, all the way to Terry Hughes's work documenting coral bleaching by wielding a digital SLR camera from a chartered airborne helicopter in collaboration with underwater scuba teams collecting other data—showing how, as our technology improves, so do the maps we make.

Throughout her book, Hamylton examines the extraordinary evolution that cartography has gone—and continues to go—through, both technologically and otherwise, and celebrates the blessings of this progress without belittling the efforts of her predecessors. In fact, her admiration for the mapmakers whose stories she recounts is palpable, but she also sees herself, and all of today's cartographers, as standing on the shoulders of these giants while deploying new tools they could never have imagined. She contemplates the popularity of drones and the prevalence of artificial intelligence, as well as the whole digital mapping revolution, writing that the "digital approach has made mapping easier, faster and unrecognizable from the work of past eras" (25). On the other hand, however, she also worries that, as our technological capabilities allow us to get away with interacting less with the places we're recording, our maps could be suffering: we are no longer obliged—or sometimes, even, able—to spend "three

Marie Tharp leaning on one of her panorama maps.
(Photo by Steve Sagala, courtesy of Marie Tharp Maps LLC.)

Figure 1. Page 102

days walking around it with a 50-meter tape measure" (27). Our author, who has "mapped hundreds of islands, beaches, coral reefs, atolls and peninsulas," has "found that inhabiting these landscapes is a critical step in knowing them" (41). She offers the analogy that "a map is to the land what a portrait is to the sitter," that is to say, the artist's interpretation (29). In the end, *Plotting the Oceans* constantly perambulates between these themes of "progressive evolution" and "intimacy versus isolation."

Hers isn't an argument against modern mapmaking—Hamylton is herself an accomplished and well-established modern cartographer—but it is, instead, a reminder that as physically distant from the location, or topic, as we may be, the maps we create have a real and lasting impact. From the beginning of our training, we're taught how easy it is to unintentionally skew a map—usually in reference to color schemes or projections. Now that our primary sources for creating our visuals are often satellite data, we are no longer getting the on-the-ground references that were once essential to terrestrial mapmaking. We are left,

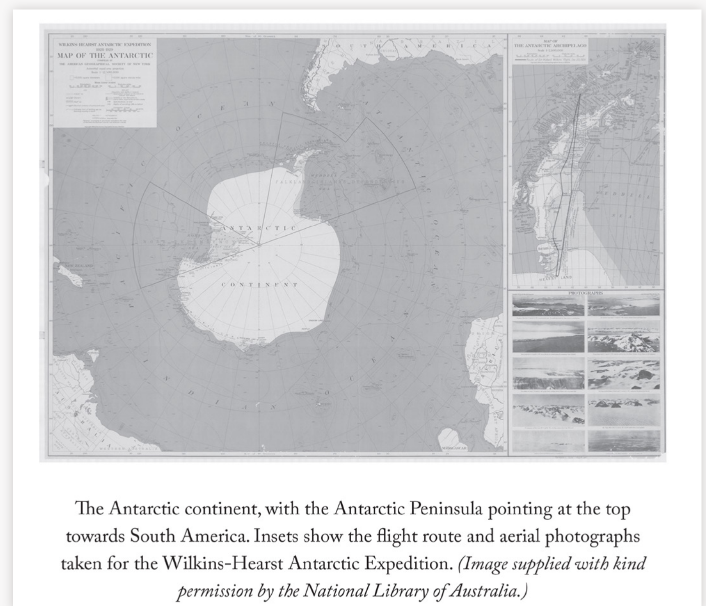
therefore, to wonder what information is being lost or malformed as we create our maps from the comfort of our desks, often thousands of miles away from our reference points. There is some comfort, however, in the reminder of the confidence with which Marie Tharp was able to characterize the seafloor (a place she had, obviously, never set foot)—characterizations that have proved reasonably accurate and reliable over time.

Something this book does incredibly well is found, once again, in the "Introduction," encapsulated in a single sentence: "Neither science nor mapping happens within a vacuum" (33). Every story the author tells, and every opinion she expresses, is grounded in unique and entirely different times, places, and contexts: both social and technological. The different societies have had different customs, cartographies have had different norms and conventions, and the different mapmakers have had vastly different tools at their disposal. Hamylton supplies the background information necessary to place these stories in the reader's preexisting understanding of the world. In 1835, when his chapter opens, Darwin was only twenty-six years old. Recollections of the creatures he had seen in the Galapagos were just beginning to prompt suspicions about the stability of species, but in the meantime he was seeing a lot of coral reefs—prompting questions about how they could have formed. Hubert Wilkins's first trip to Antarctica was in 1920, over thirty years before twelve nations came together to establish the Scientific Committee on Antarctic Research during the International Geophysical Year of 1957–1958 (79). It was the 1960s by the time David Stoddart's work to preserve the Aldabra Atoll—a remote outpost of Seychelles in the western Indian Ocean—from becoming a military base was put to the test. This context allows the reader to understand the gravity of the cartographers' tasks, and the momentous undertaking that was required to create these depictions of the natural world. Similarly, Hamylton's own modern day expertise and personal anecdotes show the effort and thought that still goes into mapmaking today, leavening and building upon the lasting legacy of those who came before. "As with photographers, cartographers also choose what story to tell with images; their motivations are products of their time" (97). Diverse as the personalities, situations, aims, capabilities, and motivations of five cartographers showcased were, each chapter highlights a hard-fought cartographic victory, often years in the making. Today's tools provide speed and precision beyond the included mapmakers' dreams, and yet we still quite rightly look to them for inspiration—what they accomplished shaped how the world exists today. Darwin laid the foundation of coral reef mapping, Wilkins was the first to map new land from the sky (Figures 2 and 3), and today, Aldabra Atoll is a UNESCO World Heritage Site (147).

Sarah Hamylton demonstrates her deep experience and expert knowledge of marine cartography in every chapter of this book. Her own cartographic work complements and extends the work of her predecessors—those whose

Hubert Wilkins (left) and Ben Eielson (right) preparing to fly in the Arctic, April 1928. *(Image supplied with kind permission by Bob Mayer.)*

Figure 2. Page 82



The Antarctic continent, with the Antarctic Peninsula pointing at the top towards South America. Insets show the flight route and aerial photographs taken for the Wilkins-Hearst Antarctic Expedition. *(Image supplied with kind permission by the National Library of Australia.)*

Figure 3. Page 84

stories she included, and others—who laid the groundwork for the research she carries on today. The scope of *Plotting the Oceans* is confined to work done in and around the oceans, only mentioning terrestrial works in passing, and similarly, availability of the book itself (at least physical copies) seems to be confined to Australia at present, as I was unable to find any available in the United States. A digital copy, however, can be just as enjoyable, and offers the same ability to admire its maps and graphics—examples of works by the included cartographers and photographs of them in their element; working in the field (or from a plane) or at massive drafting tables. Although in black and white, the images provide a look at the carefully drawn lines and shading done decades, if not hundreds of years, before the creation of GIS.

I found *Plotting the Oceans*: *Stories of Powerful Maps and Their Makers* an entertaining read. I enjoyed the funny anecdotes as much as the technical histories. This book was simultaneously a welcome introduction to cartographers I had never heard of, and deeper look into ones I had. Every story built off the last, and I was fascinated by the dramatic changes in technology, data, and map crafting practice that have evolved over the years. Most of all, I was compelled by the idea of a widening gap existing between cartographers and their subjects. In a time where we are more connected than we have ever been before, this gap is an interesting side effect I hope to hear more about. As Hamylton writes: "A new digital information empire is rewriting the boundaries and rules of imperialism. No longer are mapmakers sailing the oceans to expand empires. Information flows previously governed by global economic and cultural exchanges are now controlled by developers of spatial technologies" (197). I can only imagine what a hypothetical future chapter of *Plotting the Oceans* would look like, set, say, thirty years from now. There is no telling how far we can progress and how advanced our maps might become, but by looking back at those who came before us, we can have the determination to leave the field improved from how we inherited it.

Sarah Hamylton's reflections on the evolution of cartographic tools and the widening gap between mapmakers and their subjects offers something to every reader. I would recommend this book—not only to those interested in the world's oceans, but to anyone interested in cartography. *Plotting the Oceans* gives insight and inspiration about what it means to be a cartographer today and how we can learn from those who came before us.