

## Geointeresting Podcast Transcript

### Episode 14: A historical look at Matthew Maury, pathfinder of the seas

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Welcome to Geointeresting, presented by the National Geospatial-Intelligence Agency. Today, we get a look at the historical significance of Matthew Fontaine Maury, a 19th century pioneer in the study of the ocean and modern navigational techniques. John Grady, a former managing editor of Navy Times and a Maury biographer, recently visited NGA's Springfield, Virginia, campus to discuss the seminal figure in the development of maritime tradecraft and his importance to NGA's mission.

NGA: Well, good morning, and thank you to coming to our event this morning. I think you will enjoy it. It's about one of the people who was fundamental to the tradecraft development that we employ here at the agency. Sometimes it's the side of our being that we don't pay nearly enough attention dwelling upon, and we should do a lot more of it. Our visitor today is Mr. John Grady, a manager and editor for the Navy Times for more than eight years and retired communications director of the Association of the United States Army, and after 17 years he has had his biography of Matthew Fontaine Maury, a leading figure in the U.S. and the Confederate Navy. We have a picture of him in both uniforms published recently by [inaudible] publishing. It's entitled "Matthew Fontaine Maury, Father of Oceanography" and was nominated for the Library of Virginia 2016 nonfiction award. Mr. Grady has contributed to many publications. He is a journalist by trade, as I mentioned before. His work has appeared in USNI.org, breaking defense, government executive, governmentexec.com, nextgov.com, among others. The most important thing is that he has taken some time off to do some history about a very interesting character, who was almost on both sides of a conflict we call the Civil War but also fundamentally made a contribution to the way we manage the ocean and our society. That is important for us given the fact that 70 percent of the Earth's surface is covered by ocean. So without further ado, let me ask Mr. Grady to come up and begin his talk. Welcome, John Grady.

JG: Thank you very much. What I wanted to do is we are going to start off by showing you this picture. Does anybody know where this picture is from? What street is that? Monument Avenue. He is the last confederate on Monument Avenue. Behind him by one block is the changed Richmond, Arthur Ash — an army officer. Maury is the only naval figure, and we start at Jefferson Davis, and then go through the pantheon of Confederate military heroes. He is the only naval figure up there. Also, with the exception of Davis, he is the only one not wearing a uniform because Maury, even though you have a picture of him with his ceremonial dress blues, rarely ever wore a uniform. He generally stayed in black flack coats so that he could more easily go in and out of the Navy Department and then go up to Capitol Hill and lobby the heck out of them for appropriations, for exploration and more importantly to him, to make the Navy the handmaiden of commerce. So when I say explorations, you have to think wailing, cotton trade, coffee [and] flour. That's what he was most interested in; developing those trade routes.

He probably was the most controversial naval figure of the 19th century. Gary mentioned that he was both a confederate and in the United States Navy. He also was one of the most divisive



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figures in American science. American science was beginning to look at itself as professional or popular riser. Maury was a popular riser.

He was born far from the sea in Spotsylvania County on January 14, 1806, in what is now the Wilderness Battlefield — actually, closer to Chancellor's Tavern. The battles were very near each other. His parents bought the land from "Light Horse Harry" [Henry] Lee. The connection between the Lee family and the Maury family stretched on from there. They not only knew each other as family members, they understood the failings and the gifts of both. [Inaudible] and they took off for the blue grass of Tennessee. Maury wanted an education and adventure. He was a middle son; there were six children that lived to adulthood. His older brother was sent into the Navy because the trustees that controlled his mother's inheritance said that they didn't think John the older brother, the oldest brother, would have any more success at farming than his father Richard. They found him a position in the Navy as acting midshipmen. He was 14 years of age.

We won't go into a great amount of his career, but the tales when he came back of being marooned on an island in the Pacific fighting with David Porter, being a prisoner of war of the British in the war of 1812, going to the Lake to stop the invasion of the British down the corridor into cotton New England and New York off after 1812, and returning into Britain — they stirred the young Maury's soul. Like another older brother, Richard, he wanted an education; an education that wasn't home-schooled. The problem that he ran into [was] his father had so little money that he sent the next oldest son, Richard, to Hartford Academy. Now making that long story short, Matthew fell out of a tree, broke an arm, bit his lip and his dad, saying that recovery is going to be a long time, said, "I will pay for your education." And he did. Maury never wanted to stay and become a cotton farmer like father; they argued throughout his teen years that he, too, wanted to go away. One of his teachers, William Hasbrouck, said, "Well, you know, you got your cousin Abraham here, and he is at the Military Academy, and that is free, and they want to have science and engineering." Maury thought about that for a while and then said maybe not.

Now how did he get into the Naval Academy today? Well, first of all, there was no Naval Academy back when Maury was a teenager. He was quite instrumental in there being a Naval Academy. You still need a congressman's recommendation to get an acting commission. Who was the congressman from that district in Tennessee? A man named Sam Husten, whom refers to as Sam Houston. Who was he? He was a veteran of the Creek Wars with Andrew Jackson. The political connections that Maury was able to use; Maury wrote his own recommendation! He wrote it to Houston [and] sent it on off to Washington. Houston looked at it and recognized the name Maury — not because of Maury's father, but because of Maury's uncle — and said, "Oh, OK." By the way, if you didn't get here in time, the Navy is going to be taking Lafayette back. It's 1825; he has had his grand tour of the United States. We have given him 300,000 acres around Pensacola. Do with it as you will; thank you for liberating us 50 years ago. To make the long story short, Maury did get that commission. He did serve on the ship that returned Lafayette, called Brandywine, because that was Lafayette's first big battle. It was originally named something else, which right now I have forgotten. They renamed it Brandywine, took him there and he had his commission. He only had four major voyages. We are going to skip all but two.

The first voyage that he made as a sailing master — this was actually his second one — and he decided he was going to write an article on navigation. It was called "Rounding Cape Horn." He

saw that there was a book there. Now, in your corridor here, you have Nathaniel Bowditch. Maury said naval midshipmen need a book like that but more understandable. So he devoted himself to creating that book when he got through with that voyage.

He then got himself married, and what happened after he got married, of course, [was] they had children. Next picture please. That's Fredericksburg today. I always put a [inaudible] in case you have never been down there; they still have a lunch encounter. It's one of the few drugstores I think in the United States that has it. Maury's family was originally from here, as I said — Central Virginia. He went to the blue grass the rest of his life. When he wanted to return for comfort, he always came back to Fredericksburg. His wife was an orphan child of a banker in Fredericksburg. In 1835 when he was no long sailing, he sat down after being married and began to write his book. He sent the book on navigation off to the guys who did the naval charts in Philadelphia. [Inaudible] people who understand how to make engravings and things like that; that is the same company. By that time his wife was pregnant with their first daughter, Elizabeth. Next slide please. This is Betty Herndon Maury at age 35, actually slightly after the Civil War. She wrote a magnificent diary that you should go look at if you want to see a Southern refugee thinking of the end of the Civil War. She looks exactly like her mother looked at that age. It's an amazing thing. You would think they could have been sisters. Maury, you would think, stayed home with the wife and child. Nope! He was off to Philadelphia because he wasn't hearing how the work was progressing. He was living on \$40 a month now with a wife and child to support, so he takes off to Philadelphia. He couldn't even afford [a] cheese and crackers diet to complete that book.

In the letter to his brother Richard — Dick — Maury daydreamed the book guaranteed his promotion to lieutenant with ten years of service. On this he was dead wrong. On April the 29th 1836, Key and Biddle applied for the copyright on "A New Theoretical and Practical Treatise of Navigation" by M.F Maury, past midshipmen, U.S Navy. It was the first scientific book written by a naval officer; I should say by a United States naval officer. Despite the secretary ordering the book to be put in all ships' libraries, which didn't mean much; there were only about 20 ships on active duty in the entire United States Navy at the time. Maury could not stand what happened to him at the handling of Dickerson.

Next slide please. Now this man should also be in your pantheon here at NGA. This is Alexander Bache who was at that point not the head of the coast survey but was in charge of the Central High School in Philadelphia. Here, you see him taking fixings. He became one of Maury's greatest, greatest rivals through the history of science. At the time of the book, however, [he] praised to the high heavens Maury's work in navigation. He was a graduate of the Military Academy. He had two brothers in the Navy. His father had been post master of Philadelphia. GTT, as they would write on houses that were abandoned in Tennessee — gone to Texas — and that's where he went. He was the only one in the Texas legislature to vote against joining the United States. He was living in Galveston. It fueled his writings, this navigation book. And then the one trip that he made, the first circumnavigation of the globe by a United States war veteran, and that was Vince. He was a midshipman at that point. You have to imagine what this boy from Tennessee, a young man at this point, saw. He had been to Brazil. He had been on the west coast of South Africa. Now, he was at the same island that his brother had been marooned on. He was in China. He was in the Philippines. He was in Malaysia. He was in Cape Town. They stopped in St. Helens to go to the grave of Napoleon and sailed back to Rio and ended up back in Norfolk. He now had the experiences of a lifetime that he poured into his most

important book and probably the most popular oceanographic book ever written: “The Physical Geography of the Sea and its Meteorology.” Now that was published in 1855.

The voyage he didn't make, which is equally important, was the South Sea's exploring expedition. That was originally called for by John Quincy Adams in his initial State of the Union address. If you go to the Museum of Natural History, on the wall today you will see part of the collection [of] Lt. Charles Wilkes, who self-promoted himself to Captain Charles Wilkes for the trip. Not just commodore because he was commanding several ships; he created his own rank of captain. This makes up the base of this collection. Standing on the other side of the wall is a big statue of Joseph Henry. We will get into Joseph. Joseph, if he knew that there were all these museums down on the [National] Mall, he probably would put a gun to his head and start tearing things down. What the Navy wanted out of all of this stuff — the scientists in the United States wanted this to be James Cook [and] George Vancouver. They wanted it to be like the French. They wanted it to be like the Russians were starting to do by hiring Barry. Bring scientists with you, and we will find all this stuff. Well, what did the Navy want? The Navy wanted charting data. They wanted astronomical sightings for navigation. They also wanted to bolster the nation's claim to specific lands; Oregon for one. When you think of Oregon, don't think of the state now; think back past Montana, and then go up into Canada and draw a straight line across about where Calgary is. That's what they considered Oregon. They also wanted to drive the British whalers out of the Sandwich Islands, Hawaii. If nothing else, poking around these waters would be America thumbing its nose at British pretensions here, there and elsewhere. When approval finally came from the White House and Congress to go and take this, the Navy fell into incredible rivalry as to who was going to command. It finally took the secretary of war, not the secretary of the navy, to determine who was going to lead this expedition. He chose Wilkes. Maury said, “I have dealt with Wilkes before. I can't go on this.”

Maury was to be the astronomer of the expedition, which was probably the plum scientific assignment afloat. Then Maury got word from his parents still living in Tennessee that they were ailing and probably needed a place to stay close to family. He went to Tennessee and arranged temporarily to send them to a sister who lived outside of Memphis, in Mississippi. As you know, that's not that far away, and they stayed there for the winter. As Maury was coming back by stage coach — there weren't railroads that went that distance — he offered his seat to a woman who got on near Cambridge, Ohio. As the stagecoach was heading to Summerset, Ohio; basically, if you go up I-77, you are following that route. The stagecoach caught on the side of the road; a rut due to construction. Maury, who had given up his seat and was riding on the top, crashed on the ground. His leg was broken in multiple places, and he also had some other arm injuries. Maury's naval career was in jeopardy. If he could not go to sea, even though he spent more time at home, get out of the Navy. There was no such thing as retirement as we understand it now. It would have to be an act of Congress in your name and what they call prayers for relief. They would either give you a lump sum or agree to pay you a pension of whatever amount. He began to write. He wanted to expose the ills of the Navy.

Now, Maury very rarely ever wrote under his own name because when you are taking shots at somebody, even if you want to get back on active duty, [it's] probably a good idea not to use your name. He wrote under the name Harry Bluff and Union Jack. Most of the time he was attacking the Navy organization, that actual structure of the Navy. They did not have a chief of naval operations. They had five commissioners; sometimes they had three, but most of the time they had five. They sort of divided up what the Navy was going to do. He didn't really sort of

control the commissioners. He would go up to Capitol Hill and get the appropriations. It was a revolving door for the secretaries; even after the reforms of Maury, who was one of the great leaders in pushing through. Maury had three secretaries of the navy in six months. When I say a revolving door, I mean revolving door. They were in and out. One of the publications that he wrote in was called the Southern Literary Messenger. Among the biggest supporters of the Southern Literary Messenger was a politician, former governor, former senator, John Tyler. Another one was this federal judge who had these peculiarly tough for Virginians views of slavery; Abel Parker Uptcher believed slavery, like John Calhoun, was a God-given good. They were regular contributors and probably also helped finance the Southern Literary Messenger. Maury began writing in there. More importantly, as Maury was recovering from these injuries, he tried to get back on active duty. The doctor who examined him [in] Fredericksburg and again in Washington said no, and his wife is writing or going to his friends and saying, "I need you to write to the Navy Department and make sure that Matthew Fontane Maury does not get back on active duty."

So William Henry Henderson wins the election and manages to give this unbelievably long inauguration address and catches pneumonia 31 days afterward; he is dead. Tyler is down in Charles City County, Virginia, with his new bride, and word gets to him: you are the president. Tyler tells Henry Clay, the leader of the Whigs — and he supposedly was elected as a Whig — "I am not backing your national bank." Clay arranges to have the entire cabinet resign with the exception of Webster, who is negotiating a treaty with the British to determine where the boundary is between Maine and the Mississippi River. Low and behold, who do they finally turn to come into the Navy who had reorganized it? Uptcher is a great navalist. You find it in the Southerners, you find it in Calhoun, you find it in King and you find it in Charles Conrad; why? They wanted to sell cotton around the world, so they became strong supporters of the Navy. Uptcher was one of the great reformers of the navy. Uptcher said, "Come on; we are going to put you in the Bureau of Hydrography. You are going to run the charts; the small charts."

A year and a half later, James Gillis, who also ought to be celebrated as a great naval scientist of this time, had successfully lobbied Congress to get the Navy put in charge of an observatory. Nobody expected the Navy to get that. Gillis was relentless in lobbying Congress to get it, and he got it by having no votes against everything else. By default, the Navy ended up running it. John Adams, who first called for the observatory, was incensed. Maury managed to calm him down. Who did Uptcher then turn to have the observatory? Another Virginian! Maury! Come on back in; we will take care of you. After the war with Mexico, the observatory was viewed as one of the service's better shore assignments. Duty there during the 1840s was an assignment sought by the Navy's brightest young officers — David Dickson Porter, Robert Minor, Hunter Davidson — you go on and on and on, and you start to find that these names keep popping up. Hard work is glorious, is what Maury wrote. He wrote to William White, who had been on Slave Coast duty off West Africa, and said, "Come to work here." What he then began to make popular in the observatory was his mottos. He would always go up to the naval officers, and it would usually be 8–10, and civilians varied from 5–12, and say [inaudible.] Now remember, he only had a couple years of real formal education. For those of you who are not Latin scholars or have no idea what I just said, it means, for whose benefit? This is what he wanted constantly from the work of the observatory. You would think the observatory would be primarily concentrated on the skies; well, the problem is that Maury never got away from his interest and the congressional funnel of money going to the ocean graphic work versus the astronomical work. So they began to fall further and further behind.

Next slide please; we are going to skip ahead. That is Wilkes. Skip ahead. That is Maury. Probably the one classic picture that we do know that this was painted at the observatory, and he must have been dolled up for this one. Next picture please. OK. We are going to leave that one there.

Maury kept building on the theory that if he delineated every track — they had already started to collect these log books, not only from the cruisers that were naval vessels on missions, but also from merchant mariners and whalers, which drove the royal navy crazy. They never trusted the whalers. But they started to get the log books coming in, and so what he wanted to do was create tracks through the sea. What was happening was they were wasting all this time trying to delineate everything, but what he wanted to eventually come up with was this: books, if I may so, impart information through the ear. These charts, as he envisioned them, through the eye and therefore, in a manner in form are much more condensed and invaluable. What he started to do was he started to look at a specific route, and that specific route was the most popular one for the Navy. Now he did it from Baltimore and Norfolk; because it was a Brazilian squadron, they needed to have the best route. If you looked at how they sailed those before they went to the coast of Africa and then let themselves be blown back. Maury found that coasters sticking to the coast of South Africa, coming across the coast of South America, hugging the coast, you could still get into Rio and save time. The average time was 55 days using the lets go by Africa route. A guy named Jackson carrying flour from Baltimore to Rio made it in 38. Guess what? Coming back because he picked up the Gulf Stream, now he is loaded with coffee, made it in 37. Needless to say, that then became the route. It was a single route that changed everything. Almost all the Navy charts started to look at that kind, and why? Because they believed that if they got this information, they could then pass it on to the American merchant mariners, and they would find their value. Congress would see the value of the Navy and maybe divert some money to them. Navy is very capital intensive.

Next slide please. That's Baltimore Harbor; actually, that's Fellow's Point after the Civil War, 1875 or something like that. The point here is these were all sailing vessels. None of the vessels that Maury wrote the original charts had steam. He needed currents, and he needed to know winds. With that discovery by Jackson, shaving off time — a man named Robert Bennett Forbes, who was an old China hand, and dozens of Atlantic Coast maritime merchants, underwriters and ship builders began to see the value of the Navy charts, and they, too, put pressure on Congress to pay for those charts. The interest Maury created in nautical science could not have come at a more propitious time. You had the amalgamation of two scientific organizations into what is now the American Association for the Advancement of Science. That then went back into other merchants. Give us more log books. Endorsements flowed in like a river.

What they wanted to do then after 1848 and the discovery of gold — oh, what were the two things? We have got gold in 1848 and ships by 1846. So we had this combination of fast ships, and you had gold. You had to get the gold from Southern Mill or the American Tiver, back around the horn and then back up to New York. What's the problem? It's still a long time. The merchants said, "We don't want to go around the horn. It's too dangerous. Not to be carrying that amount of gold. What's the best route across? Do we go across the Yucatan Peninsula? There's a story in New York Times today about the Chinese trying to build their canal across Nicaragua do we go there? Or do we go across Panama? Panama is the shortest route.

Problem there [is] it may be the shortest, but they put an awful lot of jagged mountains in there. How do you get them across? Are you going to build a canal?" Maury said "Nah." The best spot is Panama, but what we are going to do is we are going to have two ports, one on the Atlantic and one on the Pacific. I think the Atlantic still may have been part of the Pacific at that point, but anyway. We are going to have one on the east and one on the west. We are going to go as far inland as we can with the railroad, then you are going to get on a mule, and you are going to go over to the other side and get on another railroad, and then you are going to get on a ship, and we are going to cut the time to California by half. We are going to make California part of the United States.

Maury began writing with his charts things called the sailing directions. It actually has larger essays on the winds and currents, and sailing directions was the full title. This is a weather log that they wanted kept. Now why did he want the weather? Well, as we noted, the ocean water is 70 percent of the Earth's surface. The weather is so variable in different parts of the world. Anyone who has been in the Indian Ocean knows about the monsoon season. If you live in Arizona, which is very inland, there is another monsoon season. This is what he was trying to capture — to get that exact time within a week or so of when this occurs, and therefore, you can make voyages safer, you can make journey's safer, and you stand a better chance of getting the cargo through. Now we are moving toward 1840. We are moving past the war with Mexico. The United States now control 50 percent of what had been Mexico. There was also telegraph lines being laid across the eastern part of the United States. What was important about those telegraph lines? Not that you got news from Mexico. You could use those the time that it took from a signal in Washington to Baltimore or Washington to Philadelphia to determine longitude. The Navy wanted control of that. The coast survey under Bache said, "You are already poaching on our territory looking at the Gulf Stream. We want control of that."

Next slide please. This is an ad for a clipper ship, and it tells you how you can get your voyage. The charts you can find today. You can actually see the original chart — probably not the original charts; the original charts are hanging in Joe Biden's home at the naval observatory on Massachusetts Avenue. When you come into the house, to the sides are all the ocean charts. They are beautiful. They are absolutely gorgeous. If you want to see copies of those charts, go to the map room, which I think is the fifth floor in the Madison Building of the Library of Congress. They are there, and they are not small; they are huge. When he said he wanted the eye to picture it, the eyes can picture it. They are in different colors. The problem is by 1850 they had so many tracks through it I couldn't figure out where they were going. But every one of those ships carried Maury's charts. The reason being was you sent your log book in. We sent you charts. Oh, you are going to Bombay? No problem. We have a chart of the Indian Ocean. Here it comes. You send us a log back. We will send you new charts, and if we made a mistake in the charts, guess what? The next time we print them we are going to correct it. Ever since Andrew Jackson's second term, California won, and the Mexico war was a secondary prize to Oregon.

What I want to skip ahead to — go to the next slide please. This is San Francisco Harbor in early 1850. Once a ship arrived from anywhere, what did they do? The crew got off and abandoned it and headed to the gold fields. If you needed a ship, you could find it in San Francisco Harbor. Ambitious men always knew that if you could get this gold across, then you were in great shape. Keeping the crews became the problem. The way around the problem, at least from steam ships companies' point of view, was to go to Congress and say, "You know,

you got all these naval officers on half pay, and by the way, we have got all these steam ships, and doesn't your Navy need to have officers that are trained in steam? Don't you need some engineers to handle those ships? Well, you know, if you pay their salary, we will give them a job. They can work for our steam ship company on the East Coast or West Coast. In case we go to war again with Great Britain, guess what? They can come back on naval service, and we will give you the ship or give you the ship at the [inaudible]." If you look at it from the point of view of Congress, this is [a] money-saving venture. If you look at it from the steam ships company's point of view, who makes the money? We do, and the odds of us going to war with Britain are pretty slim.

One of the great steam ship captains turned out to be Maury's brother-in-law, William Louis Herndon. Those of you who have been to the Naval Academy would know there is the Herndon obelisk there. Herndon died in 1857 when he was a captain of a gold-carrying vessel; a passenger vessel called Central America. When Central America went down, he was heroically the captain that stayed. He was the last man that stayed with the ship. They were carrying so much gold that called the species run that led to the panic of 1857. However, Herndon was regarded as one of the great heroes of the entire Navy leading up to the Civil War. The obelisk was built by patriots of the Navy. Ironically, it stands across a small little green from the Maury home.

The point of having Herndon mentioned in this is that Herndon did one of the great explorations of all time, which was the Amazon. Maury was convinced that the United States needed slaves. The Amazon in Brazil would be that outlet. He believed that American slave owners could move on down to Brazil and be welcomed to develop the country and become part of the United States. What he wanted to do was this — take the pressure off slavery in the south. Now some people look at that as being not abolitionist, but a gradual abolitionist. Look at it from the other perspective. If you look at the world from Maury's perspective at this point, and you are thinking Amazon, you are looking down; Cuba is over here, Hawaii is over here, Central America is here, and we are controlling traffic through Panama, and then there is this fertile land down in the Amazon, and the Navy already knows what's over on the West Coast with Peru. Think of Manifest Destiny not just going east and west. Think of Manifest Destiny going south. You don't have the British up north. Those republics are constantly in rebellion. You have an empire that is teetering in Brazil. That fueled Maury's drive politically. What fueled their drive commercially was when gold was discovered in Australia. Maury then turned to find a way to tweak the British line's tail. How do I get gold from Australia to London? By way of New York. Let's see if we can do that. He asked for \$33,000 to print more charts of a run across the South, and that was to get the gold.

Next slide please. This is the wind and current charts reduced from about the size of that screen deeper [to] what it looks like. This was from the 1852 sailing directions, and it reflects Jackson's voyage from Baltimore to Brazil.

Next slide please. That's Central America going down in the Hurricane heroically drawn for Harper.

Next slide please. This is a license to mine gold in Australia. I was stunned. The license only went for 30 days. You better find it quickly because then you got to go back and get another one. At least in the California gold fields, when you took the license, they gave you 60 days to



find something. When it finally got into Alaska, they gave you six months, but of course, in six months you might not be able to do any digging for four because everything froze. This is a 30-day license to dig gold, and this is from one of the more prosperous fields.

Next slide please. This is where Maury's greatest benefit to a specific industry came — the whaling charts. Now where were the whales in the United States economy at that point? Cotton was the number one export. Flour was number two. Tobacco may have been number three and falling. Whale oil was needed for lamps. Other byproducts [were] needed for perfumes. Other byproducts were used for shoe polish. Other byproducts were used for the heels of men and women's boots. Whaling moved from fourth to third. How many whaling ships were there? Seven hundred in the United States in 1850. How many were there in the British whaling fleet? About 200. And where were these guys going? They were going all over the place. They were down in Antarctica. They were up in the Arctic. They were off of Japan. They were over coasting down by Angola, and they are sending back their log books. They are sending you even more detail of where they are going, and unlike the merchant mariners, they write notes. They write letters to Maury and say, "Look what we found over here." Maury is writing all of this down. It's not only going into the sailing directions; they are putting it in to new and revised charts. They are not just benefiting the whaling industry, but maritime commerce as a whole. Maury had another expression that he used all the time. He used it all the time against Joseph Henry and Alexander Bache. He said, "To whose benefit?" This would be a benefit. The other thing that Maury was getting from them was more meteorology, and because they were working on land, he was getting weather information on land, which is what he wanted to combine. So his other motto was [inaudible] another Latin phrase: "Why not?" Henry would say, "Why?" Maury would answer, "Why not?"

[What] I wanted to show you today was how the development of what your agency does from its very primitive start with those hydrography and the soundings; also with the charts themselves. We didn't go into the astronomical part of this, but I thank you very much.

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