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USAFA Harmon Memorial Lecture #11
"The War of Ideas: The United States Navy, 1870-l890"
Elting E. Morison, 1969

Cadet Commander Martin, Cadet Roselle, and the members of the Cadet Wing: It is of course an honor for me to be asked to be one of the members of the distinguished list of Harmon lecturers. It is also an honor for me to be here in Arnold Hall. In fact, if it had not been for Gen. Arnold perhaps none of us would be here. He was thought by some to be innocent and simple. This was a deception. He was an extremely skilled negotiator and dedicated to whatever purpose he had in mind. The purpose he had in mind above all others was a separate Air Force and he contributed markedly to the attainment of that objective. Hence, you are here; hence, I am here. It shows you what one man can do even in a complex and large system like an Air Force.

I am here under certain handicaps. The previous speakers on this program were real military historians. They were old pros- I am not. I have done some work in naval history in a period now long gone, and I have spent most of my time in that period thinking about the Navy as a society rather than an armed force, trying to find out in a kind of sociological way what happens in a highly articulated, neatly organized, closed society. So I appear with some diffidence following these others who, as I say, have been old pros. I also have a feeling of diffidence or handicap in other ways. I am told, for example, that some of you think of this room as a master bedroom- that you tend to go to sleep here. Then I have a third diffidence. My subject is largely the Navy and I have been told over and over again that this is not a subject which has first claim to your interest or affections.

I have, I hope, some redeeming features The Navy that I am going to talk about is the Navy from 1870 to 1890, a period in which the Navy in fact did not look so good. You can take some superior satisfaction in that. Indeed, I do not intend to talk much about the Navy. I want to talk about another subject (and the Navy will give me an opportunity to do so) which I would call "The Care and Feeding of Ideas."

It cannot have escaped your notice that anyone who lives in this society today, whether in an armed force or outside of it, lives in an environment based in large part upon scientific understanding and engineering applications, and in order to thread our way through that complicated, densely intellectual environment, we must all master certain kinds of information and master certain ways of dealing with ideas. So I thought it would be more interesting to spend some time tonight talking about, as I say, "The Care and Feeding of Ideas," or the dangers of having too few ideas on the one hand, or on the other, the dangers of having too many.

I will start this investigation with the Navy of the period that I was billed to talk about, from 1870 to 1890. For much of the period that I will be concerned with there was little science, less technology, little invention, and fewer ideas. I think the quickest way for me to give you some sense of what that environment was like, what an armed force was like a hundred years ago, is simply to tell you a few stories or anecdotes. These will of course distort the meaning of the whole somewhat and I am aware of that, but I am anxious to give you a general feeling for what the world of the United States Navy in those years was about. We can correct some of the distortions later.

First of all I would like to talk about David Dixon Porter, one of the most celebrated naval officers who ever lived and the most effective commander in the Civil War. In the year 1886 he appeared before a committee of Congress to argue with all of the force at his disposal for keeping full sail on

warships. This was eighty years after the Claremont, Fulton's steamship, had begun her regular duty between Albany and New York. It was about forty-five years after the first merchant vessel had crossed the Atlantic under steam. Yet, the Admiral of the Navy approached the Congress of the United States to plead with all his force to retain full sail power on the naval vessels of the United States.1

A second brief anecdote deals with ship design. It occurred along about 1885 to some members of the Navy that they needed a new kind of ship, but they were puzzled by how to proceed because they had been building vessels out of wood (in a way that I will come to later) but they knew they had to try something new, and they had no one available to help them. So they told one officer to go about the shipyards of Europe and buy the plan of a useful warship for the United States Navy. He was obviously an indefatigable officer. He came up not with one plan for one ship but with four different plans for various parts of one ship, which he had culled from various shipyards. The resulting vessel was a composite of plans he had picked up from one British warship, two Italian warships, and one Chilean warship. She sailed for about five years, but she never sailed very well. This was in 1885.2

We come then to the question of energy within the military society. Target practice would be a good place to begin. There was a regulation that each ship should have a target practice every quarter-every three months. Now this was a distressing duty for many ships. It dirtied the vessel. You had to clean it up afterwards and you never had any great confidence that you were learning how to shoot anyway, because you only shot once every three months and you shot at small moving targets which you rarely hit. In fact one article in the Army-Navy Journal said, "It was a brilliant display of gunnery. All the targets were left untouched but it was a brilliant display." One resorted in this matter to remarkable methods of circumventing the regulations.

The most remarkable and ingenious circumvention was attributed to an officer who, finding that he was a little late and could not order up the target practice on time, had his men throw all the ammunition for the quarter overside and then took out the forms and filled in a fictitious set of target reports. Then, his conscience overcoming him, so as not to send in a fake report, he tore it up into small pieces, put the small pieces of the target report into a small box, put two cockroaches into the box, nailed up the box, and sent it off to the Department, the hope being that it would be felt that the cockroaches had eaten the target practice reports on the way.

We come next to another aspect of our problem. When the Navy began to build ships of its own, not having much expertise, it had some trials and experiments. It thought that one very interesting thing to do was to try to mount as many guns, to get as great a weight of metal as possible, on a small platform by doing what was called superimposing the turrets. You mounted the turrets for the eight inch guns, which were about as large as they were building in 1890, and mounted on top of them the turrets for five inch guns. This was done to get a maximum amount of gun power in a small space. They neglected to take into account two things which became very apparent in the course of the first practice. One was that the turrets were arranged to swivel or turn on the same turning circle at the same time, but the correction for the rifling and wind velocity and everything else for the five inch guns was different from the eight inch guns, so you never could train both sets of guns at the same time on the target. Also, they used the same ammunition hoist, and there was room for only one ammunition bag at a time, so only one gun could be kept going at a time; so the whole expensive contrivance, which was looked upon as a miracle of imagination, simply complicated the gunnery task enormously.3

Now I hope that, by these short little anecdotes, I have given you some feeling for the general state of the professional body of seamen at that time. There is, however, always in an armed force (you will find out soon if you have not already) the civilian side of the thing, notably the Secretary and his assistants. They are looked upon by civilians as the source of the most refreshing inputs into the military, who may get stale if they get sunk in their own juice. It is felt that civilians constantly bring in new ideas from the outside. In the middle of the period I am talking about, there was a Secretary from Indiana named Thompson. He had just been appointed. Indiana is an inland state. He went on his first

inspection tour. He went aboard a ship. He looked down a hatch and was heard to exclaim in surprise, "Why, the damn thing's hollow!"4

Now these anecdotes give some distortion, but not much, about the general intellectual level of the Navy at that time. I would like to say one or two more things in general about the state of the Navy so that when we come to talk about ideas, you will have some feeling for it. Consider ships in the era 1870 to 1890. In general they were still built more often of wood than of metal, and they still were more often powered with full sail power than with effective steam power.

Let us take the work of the seamen and the sailors on a cruise. They stood watches, they shot the sun at noon, they kept watch, quarters, and station bills up to date. Standing watches was about all there was to do. It was what seamen had done when at sea for three or four hundred years- a set of routines, arbitrary, clearly defined. They had a role to play. If you were at sea for as long as they were- frequent cruises of three to four to five months- it was necessary, having a ship's company that did not have to much to do, to have a set of rather arbitrary routines that held the whole society together and that in fact held the watch officer (who was a junior officer) or the senior officer himself together; but it was not a very imaginative or changing situation.

Consider ordnance. There were still a lot of smoothbores on the ships, of low power and little accuracy. As far as tactics were concerned, there were still people in 1890 who argued seriously that boarding and ramming were the major ways to engage in a sea fight. The great and fundamental wisdom about tactics was still Nelson's great dictum, "No officer can go very far wrong who lays his ship alongside an enemy."

In strategy the highest thought was that you existed to protect the coastline. You went out on a station if there was war and waited for the enemy to come to you. You then went close to her and at very short ranges either boarded or rammed or poured broadsides into her

In all, nobody really quite knew why there was a Navy at this period. The definition of what a Navy was supposed to do and how it was supposed to do it was not clear. There was no naval doctrine. There were no strategic ideas and there were very few tactical rules except the rules of thumb. The result was a series of wooden ships mostly under sail (I am talking about most of this period from 1870 to 1890 at least) that went on individual missions following patterns of sailing that were devised shortly after the war of 1812. The mission was the suppression of the pirates in the Mediterranean, the prevention of the slave trade from Africa to this country, or showing the flag in alien ports. But in the last third of the Nineteenth century, the pirates had disappeared from the scene, and the slave trade was over.

Naval society was run by faith and by habit. It had really no ideas at all. It never changed at all during this period and it was an exceedingly stable and pleasant life for many people. It was not, however, as though the seamen were in Eden before the serpent. In fact officers had had a taste of the fruit of the tree of knowledge. They did know much more at this time than their actions suggested. They had been through a civil war a very short time before, and in the course of that conflict they had learned that steam was infinitely superior to sail. They had learned that iron was infinitely superior to wood. They had learned that rifles were infinitely superior to smoothbores. They had learned that a blockade was infinitely superior to coast defense by isolated ships. They had, in fact, learned all the things they were turning their backs on. In the course of the Civil War two ships had been built that were twenty-five years ahead of their time. Fifty years after that, at the very turn of the century, a great naval designer said those two vessels were the greatest men-of-war that had ever been built. They had speeds that were not equalled for a quarter of a century. They had seakeeping qualities that were not equalled for thirty years. They had maneuverability and fire power. They lasted exactly two years after the Civil War, when one was made a Navy receiving ship and the other was sold into the merchant marine.5

The Navy had the instruments, it had the demonstration that all of the things it had learned in the Civil War might make a brand new and effective and exciting Navy. Yet it systematically destroyed the weapons and turned its back on the ideas. All the new-fangled stuff was turned back, and in order to assure that the Navy would not have to deal with these complicated new systems and thoughts, the men who had been at the bottom of them, who were technical men, engineers and naval constructors, were either demoted or were put into stations or into positions or into areas of the Navy where they could do no harm by having new ideas. So they returned to paradise in 1865, which was the condition of things before the Civil War, and they could maintain this posture for several very interesting reasons.

First, there was peace and it was a real peace of a kind that we do not understand now. There was no view of a war ever happening again. Second, there was no system such as what we now call the military-industrial complex. Steel had to be bought abroad. There was no effective steel company in this country right after the war. Ship designs had to be bought abroad. We did not have, once you got rid of the original engineers, anyone with enough know-how in the system. Third, there was Congress, as there always is; and congressmen were devoted to the idea of coastal defense so that they could tell their constituents that Charleston or Portsmouth or Boston would be protected by these single ships. This was a great comfort to people who lived there. Finally, there was (and I think this is one of the fundamental things) abroad in the land or in the Navy no real intellectual notion of how to use the Navy, what it was for, or how to go about doing anything except sailing in these antique patterns. So back you went to look for the pirates who were not there, to repress the slave trade that did not exist, and to show the flag.

Now it sounds as though nothing was happening. In fact, new ideas were floating about in this bloodstream, mostly among the younger officers. There was a man named Fiske who came up with a brand new range finder with a telescopic sight that he showed proudly to the captain of his vessel. The captain was a celebrated naval officer, "Fighting Bob" Evans. He took one look at it and tossed it overside on the grounds it was useless in the present situation. Then there was a man who recommended that armor plate be used, and for years he came up against the resistance of naval officers who felt that wooden ships were more effective. There was a man named Homer Poundstone who developed a new design called the all big gun battleship that fifteen years later became the major capital ship of Britain. There was a man named Sims in gunnery who devised all kinds of new ways of shooting; these, too, were sat on.

The reason for this was, as I say, that there was an interest in retaining a system which had been satisfactory to grow up in, and live in, and which did not seem to need to be changed; there was no understanding of why one should change. Finally, there was no way within the system to make all these things fit together. Someone developed a new range finder. What use was it if you were going to fight by ramming and broadside at close range? It could not necessarily lead to telescopic sights that would provide, after the range finder, a better bead on the enemy. These were isolated ideas that never fitted together because there was no general theory or system into which they could fit. I can give you an example.

Long ago in Athens a man named Hero invented a steam engine, a pretty good little model that actually worked. It was never used at all and dropped out of sight for centuries because there was no way to hook it up to anything. It could not do work with anything, it was an isolated idea; and it faded. This is very much the situation with the telescopic sight, with the range finder, with the new system of gunnery that could have been put together. There was no way for the society which had no use for ideas in general to make any use of these specific notions.

And then finally in 1890 an event happened that I think was as important as all of the other things that were helping gradually to move the Navy into a more modern place. Alfred Thayer Mahan wrote a book on the influence of sea power on history, and in the course of it he defined what use a navy could be. It could command the sea, and the way in which it could be used to command the sea was by

general fleet actions, far from the coast, with fleets in being, fighting each other in the middle of the ocean. This defined for the first time, really, very clearly for officers and for people who thought about it, whether they were politicians or citizens, what a navy in fact could do and how it could do it. Very shortly after this all of the random ideas that had been floating around in the society, ideas that had been thought of as products of rebels, of stormy petrels, of isolated men working alone, all these ideas found homes within a system- Mahan's- in which they interacted so that you could begin to build a technical system within which the Navy could operate effectively and understand why it was operating. It was not until a great, ruling, general idea came into effect that ideas in general began to work within the naval body. The Navy had been an entity- it had held itself together most effectively up to this time as a society but mostly through habit. In about 1890 the force of habit began to be supplanted by a theory.

Now both habit and theory give pattern and structure to a society, but the one, habit, provides a rigid, resistant, impenetrable scheme for going on exactly as you have, whereas the other, a theoretical structure, provides a pattern and a means for assimilating ideas that can relate to each other, that can change and move and grow. Now in all military establishments, as you well know, there is a certain amount of routine, and there is a certain amount of loyalty and devotion to routine. It is simply that in the Navy of the period I was talking about the devotion was too great and unqualified. I think any armed force can run, as any society can run, the risk of proceeding by habit and faith and devotion to certain primitive schemes until it runs out of energy and steam. As long as you are existing within a theoretical structure- a body of ideas- you have a chance to grow and survive. Now that is the first part of what I wanted to talk about- what happens to a society when it loses its interest in ideas and falls back on familiar patterns and ancient loyalties, however noble and however splendid a past it may have had.

I want now to speak about the second part. We will leave the Navy. The first part was the possibility of having too few ideas in a community. The second part is the possible danger of having too many ideas in a community. Today we are 180 degrees from where the Navy was in the previous century. The difference is as from night to day. We have a system going for us of pumping new ideas and devices into the whole society, although I am speaking at the moment just about an armed force. That system has its base in fundamental science, which is still conducted in the society mostly by universities, and in engineering applications that are still conducted mostly in industries and in places like the Bell Laboratories, and within the research and development agencies of the armed forces. You have as a result of this system of interaction between general and fundamental ideas and specific applications, a system that has markedly cut down, for one thing, the time from the moment you have an idea to its application.

Poor old Bradley Fiske, when he had the idea of a range finder, had to spend about fifteen years before he could get anybody to listen to him and had to take about five years more to make a good one. Today such is the system, it seems to me, that the lag between the first fundamental notion and the application is reduced, by the nature of the system I have mentioned, to a minimum. I could describe at great length, if you wanted me to, the nature of this process for systematically producing and developing new ideas. I can give you some feeling for the results of it very quickly.

I was in Pearl Harbor on a destroyer in January of this year, and I had not seen a destroyer in about eighteen years. The number of things on that vessel that I had never seen before, and the number of new things one had to learn to make use of those new things, had totally changed the routines of a man at sea in a destroyer within the course of eighteen years and in large part had changed the purpose or the mission of the particular vessel. We have got a thing, as I say, going that pumps in new notions so rapidly that we can in fact change large sections of our society in a very short time.

There is another thing I want to say about this system besides the way it has collapsed the time lag between the fundamental idea and the application. Remember it took literally centuries to go from the steam engine to its useful application. The normal course up to 1890 of an application of an idea after

its fundamental, first thought was probably a hundred years, and now we have reduced it to, in some cases, a term of months. That is the first thing about the system that we have devised.

The second thing is what I would call the predictive characteristic in the system as we have built it; you can make an extrapolation from what you know you can do to what you think you may need in just a few years. Fiske, after all, when he had his range finder or his telescopic sight, had no idea of the system he was working in, so he had no idea of what uses to which it could be put, what organized system he could put it into, or what prediction he could make about where he would go from there. Today, however, all science in a way is a means of predicting what you can do. We now have in the scientific and technical way a method of saying that from this stage of the game it is only about ten years or five years or three months before we can proceed to the next stage.

I have two worries about the meaning of this extremely powerful system of ideas and mechanisms that we have put into the world. The first is, as with the destroyer, if we get to the point of thoughtlessly introducing too rapidly too many changes into an armed force, the structure that existed- the structure that the men in the last part of the nineteenth century wanted to preserve and protect because their very lives depended on it might disintegrate under the load of new ideas and machines. Anybody in an armed force lives by a certain dedication to routines and loyalties and procedures inherited from the past. If you swamp those too rapidly- those old structures and routines- with a series of new findings that alter the way the men in the armed forces live, it may be too difficult for them to survive effectively in a very rapidly changing system. Indeed, they may in many ways find that things that they have done before are no longer possible to do at all, and they may have to find some new way of ordering their lives as an armed force. So it would worry me some that unless we find ways of selecting and controlling the load that we put on an armed force, whether Army, Navy, or Air Force, we may put too great a social and emotional burden on the men in it to accommodate to rapid change.

I have a second worry as it relates to armed forces, one that is more complicated and one that I hope I can be clear about. It has to do with Clausewitz's statement that "War is a continuation of policy by other means." It is in our society an accepted belief that policy controls the use of arms- that arms exist to support a policy and that that policy is determined by the civilian branch of the government and therefore in a representative form of government by the civilians themselves. What I have wondered about is that with this capacity to generate new ideas rapidly, to predict in advance the long-range technical needs of an armed force, whether, given these possibilities, we will not all of us- civilians and soldiers and politicians alike- come to concentrate much too simply on the means available to us rather than the ends to which those means are put. In other words, I worry now and then that by concentrating upon the means of applying force, we may in some subtle way distort the making of policy in any other terms. We may lose sight of alternative policies that we otherwise might take into account, that might enable us to avoid the tragedy of war at all. We may tend to lose our sense that there are policies of various grades and sizes, policies that various kinds of power- not just military force-can be used to support.

Now, thus far I have spoken only of the armed forces, but I said to you earlier that my interest in them historically has been too look at them, to try to think my way through into problems that are more obviously part of the whole society but less easy to think about because most societies are more loosely structured, less articulated than armed forces, so you cannot see the effect so clearly. I think that what I have been speaking about is the possibility of overloading the structure of an armed force with new ideas and the possibility of getting so concerned with those new ideas that you lose sight of why you are developing them and what you want to use them for. This is not a problem for the military alone. It is a problem that we must all face together.

I think that the developments in biology which have given us a much fuller sense of what makes human personality what it is, what it might be, and how it might be changed; the developments in physics, which have given us a much fuller understanding of the natural world and how we might

change it; developments in all areas of life that science can throw light on and that is most of them, have given us a complicated system for introducing new ideas and new ways of dealing with things into the whole of society so that we may very well overload the existing classical structures. Clearly we have overloaded the cities. They cannot handle their problems. Clearly in some ways we have overloaded governments of all kinds. Clearly in recent days we have overloaded the classic structure of the universities. These are all symptoms, it seems to me, of the decay of institutions that have been overloaded by new inputs mostly from science and technology

So if I worry about what happens to an Air Force as a result of new missile developments, I worry also about what happens to all of us, what happens to cities, universities, and organized governments of one kind or another, and our established habits and conventions. I think that what we all have to begin to think about much more clearly than we have is the question of what ends we want these means to serve. I think it means the development of new kinds of institutions and new kinds of criteria for judging, so that we can set restraining context organized schemes like Mahan's Theory. That will enable us to control the extraordinary energies and applications that we have power over in such a way that they will serve man and society most effectively.

I think this calls for the most urgent and concerned and dedicated cooperation among the scientists, the engineers, the social scientists, and the humanities, and any other elements in the society that have a concern for it, whether in industry or in armed forces or whatever. One of the reasons that I wanted to come tonight, and one of the reasons that I admire the Air Force, is that you seem sufficiently aware at the Academy of the importance of getting this cooperative venture going when all of us can begin to think about the development of new institutions. The invention of new kinds of conventions, and the creation of new kinds of cultures to enable us to hold in check the forces that we have let loose within a context that will serve us effectively.

To have historians join you in thinking about this and take two days doing it, and to have you join historians, is at least a beginning, I think. In the kind of joint concern that we all have got to have if we are going to keep the show on the road, whether it is the Air Force or the Navy or the United States or the world as a whole.

1. Harold and Margaret Sprout, *The Rise of American Naval Power*, 1939 Princeton. p.195.
2. Frank M. Bennett, *The Steam Navy of the United States*, 1896, Pittsburgh. pp.789ff.
3. Elting E. Morison, *Admiral Sims and the Modern American Navy*, 1942, Boston pp. 87ff.
4. Sprout, *op. cit.*, Chapter Eleven gives an excellent summary of the period under review here.
5. Bennett, *op. cit.*, Chapter Twenty-Nine gives the fullest account of these ships.

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