Art at War: Dazzle Camouflage
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Dazzle Painting?

In addition to the usual books, the Fleet Library at RISD (Rhode Island School of Design) has many interesting specialized collections: artists' books; picture, slide and video collections; special collections of nineteenth- and early twentieth-century design portfolios and research materials in the decorative arts; and archives relating to individuals associated with the school. To this latter category belongs one of the Fleet Library's most intriguing and unique collections, located in the Special Collections department: a set of drawings of colorful ship camouflage, or "dazzle" plans. Because the collection is not listed in the catalog and is stored in unlabelled folders, it is relatively unknown, even among library staff. This article hopes to rectify that obscurity.

History of Camouflage

Surprisingly, research reveals that the use of the word "camouflage" is relatively recent. The Oxford English Dictionary defines camouflage as:

The disguising of any objects used in war, such as camps, guns, ships, by means of paint, smoke-screens, shrubbery, etc., in such a way as to conceal it from the enemy; also, the disguise used in this way.¹

The OED's earliest example of the word's use is attributed to an article in the Daily Mail in 1917. Furthermore, the word "dazzle" was also coined that same year:

The painting of large patches of colour (sic) on warships, etc., as camouflage in time of war. Also Comb. in dazzle-paint, -painted, -painting, -pattern.²

While it is easy to find information about camouflage in general, what were these specific types of ship plans or designs like? Grove Art Online provides a good general overview.³ Camouflage was first adopted by the French, when the service de camouflage was established in 1915. The British joined suit in 1916 with the British Camouflage Services and the Americans with the American Camouflage Corps in 1917. Many European and American artists, such as Jacques Villon, Henri Bouchard, Charles Dufresne, Barry Faulkner, and Grant Wood, were used as camoufleurs. At first, camoufleurs mostly camouflaged equipment: they made observation posts look like tree trunks, painted miles of canvas to look like roads, and created inflatable tanks. Ship camouflage, or the above-mentioned dazzle, was developed later in the war. Dazzle is a form of ship camouflage in which bright stripes and swirls of color are painted on ships in such a way as to confuse the enemy about the ship's course.

But where did camouflage originate? Abbott Thayer, an artist interested in nature, published Concealing Coloration in the Animal Kingdom in 1909. Thayer defined two types of camouflage, blend and dazzle (also called disruptive patterning, or zebraage, or razzle dazzle).⁴ Blending occurs when an object blends in with its background, and dazzle happens when an object is visually broken up by color and shape.⁵ In 1914, Sir John Graham Kerr hypothesized that a disruptive camouflage would work
on ships, but the hypothesis was not tested or implemented. During the war, P. Tudor Hart and four artists, Sydney and Richard Carlne, Hugh de Poix and James Wood, considered the idea of using dazzle to camouflage ships, but the idea again was abandoned. It took an artist, a cold morning ride, and persistence to implement a dazzle scheme for ships.

**British Dazzle**

From March to December 1917, German U-Boats (Unterseeboot or under-the-sea-boat) sank 925 British ships. Norman Wilkinson, an artist and British naval officer, tells of his “eureka” moment:

*On my way back from Devonport in the early morning, in an extremely cold carriage, I suddenly got the idea that since it was impossible to paint a ship so that she could not be seen by a submarine, the extreme opposite was the answer—in other words, to paint her, not for low visibility, but in such a way as to break up her form and thus confuse a submarine officer as to the course on which she was heading.*

Wilkinson explains his dazzle theory further: the reason why a ship cannot be made invisible is therefore the reason why dazzle works. The ship is broken up by "masses of strongly contrasted colour" thus making it difficult for a U-Boat to discern a ship's course. A U-Boat must accurately gauge a ship's course in order to execute a successful attack. In nature, many animals blend into their habitat and are safe from predators. Land camouflage exploits this effect. However, it does not work for ships because they are moving and there are "two elements, sea and sky, subject to constant changes of colour and light" as well as the horizon in the background. The motion of the sea, as well as weather conditions, cause the horizon, sea, and sky to change continuously. Wilkinson also points out that the coloration that allows animals to blend into their background and makes them invisible on land would only work if a ship's paint was in perfect condition, not dirty or worn. And how could the ship's smoke be concealed? But these issues are of little concern with dazzle painting, because dazzle does not conceal—rather it distorts the size, speed, and course of the ship.

Wilkinson expressed his ideas in several letters to the Royal Navy, and some time later, he was told he could dazzle a ship. If the results were favorable, his dazzle scheme might be implemented. The results were favorable, but the Royal Navy had no space for his project. Undaunted, Wilkinson found space for a Dazzle Department—at the Royal Academy of Art in London.

**How a Ship Was Painted**

The work began with a small-scale ship model made of wood. It was then painted by one of the team of women who were hired for the task, and then viewed through a submarine periscope against different color skies. Next, a plan maker took the model and created profile plans on 1/16th scale. Finally, an Outport Officer at a port used the plans to have the ship painted accordingly. Edward Wadsworth, a Vorticist painter, was also an Outport Officer, and supervised the painting of over 2,000 ships within one year. Wadsworth's job inspired numerous paintings and woodcuts such as *Dazzle Ships in Drydock at Liverpool*. Quite a few similarities may be found when comparing dazzle with Vorticism, "the English variant of Cubism and Italian Futurism." Many believe that Vorticism and dazzle must have influenced each other. Wilkinson's instructions for creating the plans to paint a ship have survived:

*Divide the vessel amidships; paint the fore end white, and the after end, say, No.2 blue. On the port side – fore end No.2 blue, and after end white.*

This is a broad principle, but is subject to certain modifications. For instance, a colour should never be allowed to stop at an important constructional point, such as the stern or centre of stern; consequently, either the white on starboard or the blue on port side should be carried round the bow until checked by part of the dark pattern, and the same time at the stern.

The Dazzle Section found that the best paint colors were black, white, blue, and green, and the best lines were sloping lines, curves, and stripes. Many patterns were used; towards the end of the war striped designs were settled upon as being the best. They broke up a ship's form very well and were easy to apply. As the war progressed, foreman painters became well trained and had a great deal of experience to bring to the task.

**American Dazzle**

Although some German submarines were painted in dazzle, and the French, Italian, and Japanese all adopted a form of dazzle, it was the Americans who applied it more extensively. In 1918, Wilkinson worked with the American Navy to come up with dazzle plans for 1,000 American ships. These plans were used on Navy, as well as merchant and passenger ships. The American approach to camouflage and dazzle was decidedly more scientific than that of the British. There were three groups involved: the artists, the scientists, and the Shipping Board, via the Emergency Fleet Corporation.

Everett Warner was in charge of the artists at the Washington camouflage office. His team consisted of Frederic Waugh (marine painter), Gordon Stevenson (portrait painter), and John Gregory (sculptor). They applied patterns to models and prepared plans, which were then submitted to the Camouflage Research Center, a part of the Eastman Kodak Research Laboratories in Rochester, NY, which was created to provide qualitative assessment and objective analysis of dazzle applied to ships. A physicist at the Center, Loyd Anile Jones, invented the “Jones Visibility Meter” which scientifically tested the effectiveness of dazzle plans. At the Research Center, only one artist was involved in the dazzle project.

The Emergency Fleet Corporation was created by the Shipping Board during the war to handle the painting of American merchant ships as a priority. The Research Center gave the Shipping Board design plans and recommended colors while the district camoufleur supervised the dazzle painting of the ships. Many artists and architects were recruited as district camoufleurs. Artists such as Louis Bouche and Thomas Hart Benton made sketches of the ships being painted as a form of quality control.

During World War I many ship camouflage methods were tried. The main ones were low visibility concealment, course deception, dazzle, and combinations of those three. The following artists were involved in creating the various schemes:

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William Andrew Mackay—Mackay Low Visibility System
George de Forest Brush—Brush Counter-Shading System
Maximilian Toch—Toch Disruptive/Low Visibility System
Lewis Herzog—Herzog Low Visibility/Disruptive Systems
Everett Langley Warner—Warner Disruptive Dazzle System

Eventually, the Research Center recommended one scheme for the Shipping Board that was very similar to the dazzle scheme of the British. Used from 1917 to 1918, it was called “United States Navy Dazzle Painting.” The design, heavily influenced by William Andrew Mackay, consisted of irregular patterns of strongly contrasting colors, including blue-grey, blue, white, black, grey, grey-white, green, grey-green, grey-pink, blue grey, and blue. In just under two years, the Research Center approved 495 designs, of which 302 were applied to merchant ships while the rest were applied to navy ships. As of March 1918, a total of approximately 1,250 ships were camouflaged. Implementation of dazzle by merchant ships may have been stimulated by the fact that the War Risk Board charged more to insure ships that were not camouflaged in some way.

Reactions to Dazzle

What was the public’s reaction to dazzle and dazzle-painted ships? A few pertinent quotes speak for themselves, such as this one, which described a fleet of dazzled ships as “a flock of sea-going Easter eggs.”

Or this one, by British composer of musicals and humorous songs, G. Frederic Norton:

Captain Schmidt at the periscope
You need not fall and faint
For it's not the vision of drug or dope,
But only the dazzle-paint.
And you're done, you're done, my pretty Hun.
You're done in the big blue eye,
By painter-men with a sense of fun,
And their work has just gone by.
Cheero!
A convoy safely by.

When Picasso saw dazzled cannons in Paris, he commented “It is we who have created that.” Charles DeKay, in “Ships That Fade Away” also saw the link between contemporary art and dazzle:

“That this kind of Cubist painting on a colossal scale should have proved useful in the world war is only one more example of the fact that you can never tell!”

And shortly after the war, journalist Hugh Hurst wrote:

It was necessary frequently for vessels to have their dazzle designs altered ... Ships so treated would creep back in to port with a particularly odd-looking coat of many colours, the wear and tear of a winter journey across the Atlantic having played havoc with the fresh paint of her new design, causing the old one to appear in patches. Observers spoke of ships developing ‘dazzle leprosy’ after only a couple of months at sea.

Did It Work?

In 1918, an official “Committee for Dazzle Painting” was formed by the British Government to study whether dazzle painting was effective:

After careful study of all the evidence, no clear arguments, in our opinion, can be made in favour of this type of camouflage. At the same time, however, the statistics do not indicate that it has had any negative effects, and keeping in mind the undeniable improvement of self-confidence and morale among the men and officers of the Merchant Marine due to this camouflage—a factor of inestimable importance as well as the low added costs per ships we consider it advisable to continue with the dazzle system.

It was found that a number of dazzle ships were hit by U-Boats but most made it to port safely because the ships were not hit in a vital area. It was felt that this supported the effectiveness of dazzle as the U-Boat commander, even up close to a ship, was unsure of the ship’s actual course. However, the HMS
Pata was sunk by a U-Boat in 1918, in spite of its dazzle scheme consisting of black, white, green, red, and fuchsia.\(^\text{47}\)

Much like the British, the Americans found that dazzle did boost morale.\(^\text{48}\) Of the 1,250 ships that were dazzled as of March 1918, only eighteen were lost. During the same period, seventy-eight uncamouflaged ships were lost. Of the eighteen dazzled ships, four were sunk in accidents, and three were destroyed by mines; therefore less than one percent of U.S. dazzled ships were sunk.\(^\text{49}\)

In 1920, the United States Navy established a camouflage training school led by William Andrew Mackay. The school carried out camouflage experiments and created the *Handbook on Ship Camouflage*, published in 1937. The *Handbook* contained an evaluation of dazzle and directions for how to apply various camouflage patterns to ships.\(^\text{50}\) But by World War II, disruptive patterns were not used widely because of new measures\(^\text{51}\) and changes due to air warfare and radar.\(^\text{52}\)

### The RISD Collection

During World War I, Maurice L. Freedman was a District Camoufleur in the 4th District of the US Shipping Board. In 1918 and 1919 he attended RISD to study decorative design as well as freehand drawing and painting. According to the Library Annual Report of 1919, he donated to the RISD Library "charts and directions for camouflaging ships and samples of colors used."\(^\text{53}\) Today the collection consists of nearly four hundred discontinued plans for the short-lived dazzle ships. The collection also includes twenty black-and-white photographs of World War I dazzled merchant ships. Unfortunately, the whereabouts of the "samples of colors used" is unknown.

### Description

The collection contains about four hundred drawings, each one foot by three feet with some color. For each design there are two plans: one for the starboard side of the ship and one for the port side. On the upper left-hand corner of each plan is noted: "Form No. 1, Navy Department, Bureau of C & R [Construction & Repair], Washington, DC." The upper right-hand corner contains information about the type number, design letter, port or starboard, scale, length, and colors with the note "...Colors of plan are for the purposes of measurement only...actual colors as per color chart." Sometimes the number of tons and a ship’s name or type is also listed in the upper right-hand corner. In the bottom right-hand corner, the print number is listed as well as "approved by" and a signature by "Naval Construction USN."

Many of the RISD prints have initials in this corner. The drawings show bow, bridge, midship superstructure, stern, break of fo’c’sle, and break of poop. Colors are labeled; for example, "2BG" refers to the color chart in the upper right-hand corner, "no 2 blue gray." Many of the prints are stamped: "From the Office of M. L. Freedman, District Camoufleur, 4th District, U.S. Shipping Board, Emergency Fleet Corporation, Heard Building Jacksonville, FLA (sic)." Discontinued dates of various times in 1918 are stamped on some prints.

The collection also includes a copy of a letter describing the filing and recording system of the camouflage section, along with the subjects under which the correspondence was filed.\(^\text{54}\) A sample camouflage record is also part of the collection. Something like a timecard, it has spaces for the following information: color and amount of paint, amount left on board, and amount returned; name of ship; date; paint furnished by; notes; and spaces for the signatures of the contractor, foreman, and assistant foreman, along with spaces for painters and riggers to work Sunday through Saturday.

Included in the collection is a copy of the constitution of the American Society of Marine Camoufleurs. This society was based in District 2, New York, but it included non-resident members. Annual dues were one dollar and members met monthly. Members were "Any man who shall be appointed to the position of Camoufleur in the U. S. Shipping Board."

All except one of the twenty black-and-white photographs are mounted on cloth. The names of the ships are usually written on the back; for example:
SS Everglades #32
Oscar Daniels Shipyard
Tampa Fla (sic)
Launched July 29 1918
First ship launched in the U.S. already camouflaged

Many photographs have typed statements certifying that they were completed correctly to plan:

I certify that this photo was taken at the yard of J. M.
Murdock Jacksonville, Fla (sic) on 9/2/18 and is correctly (sic) described on its face.

H L Kendle, Resident Inspector
SS Harish Hull #375
Launched Sept 2, 1918 (Labor Day).

Class Use

One to two RISD classes a year use the collection for various class assignments. The Digital Nature Class comes every year to be inspired for its camouflage project, for which students are required to select an object from nature and create a camouflage shell. The purpose of this class is to “find a way to infuse digital imagery with the organic fluidity found in nature.”

Access to the Collection

RISD’s dazzle painting collection is located in Special Collections at the Fleet Library at RISD, 15 Westminster St., Providence, RI. Requests for on-site use of these materials are made in the Archives + Special Collections Reading Room on the 2nd floor. Individual research consultations and group presentations are available by calling 401-709-5923 or 401-709-5927 for an appointment.

Future Projects

Future projects planned for this collection include an inventory, digitization, preservation, and creation of a Web site about the collection, including its history, list of resources, and links to other similar collections.

At present, staff is being trained in proper handling and scanning of the collection to develop a scanning workflow. Work has begun on a metadata structure for cataloging, a scanning schedule, and running test scans.

The goal for 2007 is to begin to scan and inventory the collection. While handling the work, a review of each drawing’s physical condition and the collection’s overall storage needs will be addressed. Acquiring a grant for preservation and housing is also being explored. Ideas for accessing the digital surrogates include a Web-based exhibition or a collection (personal or other) hosted in ARTstor.

Further research is required on this topic to find out more about the collection, the circumstances of its donation, and in particular, about the RISD alumnus who was the donor. It is hoped that a visit to the National Archives and the Navy Historical Center Library in Washington will be fruitful. A visit to the Imperial War Museum in London might also yield more detail about the origins and history of the dazzling “dazzle” ships.

Other Collections and Resources

Imperial War Museum, London, UK
http://www.iwm.org.uk/ HMS Belfast is part of the museum and is painted in a disruptive pattern scheme. The museum has a collection of Admiralty Dazzle designs and photographs.

Camouflage exhibit – March 23 – November 18, 2007

Naval Historical Center Library, Washington, DC
http://www.history.navy.mil/ The library has a collection of American dazzle designs and photographs.

Roy R. Behrens Web site
http://www.bobolinkbooks.com/Camoupedia/DazzleCamouflage.html Roy teaches graphic design and design history at the University of Northern Iowa. He has written a great number of books and articles on camouflage and in particular dazzle painting. His Web site has many images of dazzle painted ships.

U.S. National Archives and Records Administration, College Park, MD

Acknowledgments

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Notes

6. Hartcup, Camouflage, 40.
7. Ibid., 41.
11. Ibid., 2.
13. Ibid., 83.
15. Ibid., 2.
16. Behrens, “Camouflage.”
18. Scottish Arts Council, [Camouflage], unpaged 10.
19. Ibid., 11.
20. Ibid., 8.
21. Scottish Arts Council, [Camouflage], unpaged 12.
22. Behrens, “Camouflage.”
24. Behrens, False Colors: Art, Design, and Modern Camouflage, 94.
25. Ibid., 95.
27. Ibid., 223.
29. Ibid., 75.
30 Behrens, False Colors: Art, Design, and Modern Camouflage, 95.
32. Ibid., 37.
33. Ibid., 43.
34. Ibid., 38.
35. Ibid., 44.
37. Williams, Naval Camouflage, 1914-1945, 52.
38. Williams, Liners in Battledress, 78.
41. Roy R. Behrens, “Art, Culture and Camouflage,” Tate etc. 4 (Summer, 2005): 54.
42. Patience, “The Art of War,” 120.
43. Behrens, False Colors: Art, Design, and Modern Camouflage, 85.
46. Scottish Arts Council, [Camouflage], unpaged 12.
47. Patience, “The Art of War,” 120.
49. Williams, Liners in Battledress, 78.
50. Williams, Naval Camouflage, 1914-1945, 12.
51. Ibid., 14.
52. Ibid., 15.
54. A description of the Plan Filing System: System Blueprint cabinets—size 4’6” long x 1’2” wide x 3’6” deep, containing ten envelopes each, in which eight different designs of one type of ship can be placed, are used in this office for the filing of all the plans received from the Home Office. Upon receipt of a set of plans from the Home Office, they are immediately checked up and acknowledged after which three port and three starboards of each plan are selected and placed in their respective envelopes in the “Plan” cabinet. The cabinets in question are so constructed that when opened, the front is raised and forms a drawing table which is most convenient for the use of the Camoufleurs, thus eliminating separate drawing tables for the studio.

Additional Sources Consulted


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