Knight Digital Media Center Multimedia Training Multimedia Storytelling

By Jane Stevens

For updates and discussion on this tutorial, visit: http://multimedia.journalism.berkeley.edu/tutorials/reporting/starttofinish

Introduction

Not all stories make good multimedia stories. The best multimedia stories are multi-dimensional. They include action for video, a process that can be illustrated with a graphic (e.g., "how tornadoes form" or "how this new surgery works"), someone who can give some pithy quotes for video or audio, and/or strong emotions for still photos and audio. Most multimedia stories require that the reporter go into the field to report the story face-to-face with sources, rather than doing a story entirely by telephone.

What is a Multimedia Story?

A multimedia story is some combination of text, still photographs, video clips, audio, graphics and interactivity presented on a Web site in a nonlinear format in which the information in each medium is complementary, not redundant.

Nonlinear means that rather than reading a rigidly structured single narrative, the user chooses how to navigate through the elements of a story. Not redundant means that rather than having a text version of a story accompanied by a video clip that essentially tells the same story, different parts of a story are told using different media. The key is using the media form - video, audio, photos, text, animation - that will present a segment of a story in the most compelling and informative way.

Here are some examples:



Touching Hearts



<u>Heroes</u>



360 Degrees.org



Race in America

When news organizations take full advantage of two other important characteristics of storytelling on the Web -- context and continuity -- multimedia stories are wrapped in a story "shell" that provides background information on the story. This could include everything from databases, timelines and infoboxes to lists of related stories, links to other resources and online forums. The information in each shell gives the reader a sense of the context of a story and where it fits in with other stories on the same topic.

Each story shell, in turn, is part of a broader issue or beat shell at a news site that defines the more general context for each story - politics, foreign policy, education, crime, etc. And those issue/beat shells are wrapped in a general shell - usually a home page with its navigational menus - that defines what a journalism organization stakes out as its territory.

Here are some examples of how news organizations have wrapped stories in the different layers of shells:



Beat Shell What isn't a multimedia story?

Sites such as CNN, the Washington Post, NPR and MSNBC.com are multimedia sites. They have text. They have video clips. They have audio. They have still photographs. They have interactive graphics. But the main stories on these sites are often linear and produced in either text or video or audio to stand alone. The text is often augmented with photos, as it would be in a newspaper or magazine. The video is usually the same version that appears on television. Rarely are video, text, still photos, audio and graphics integrated into the same story. Usually, they are stand-alone stories, each produced for a different media about the same subject, that are then aggregated into multimedia packages.



Reporter-driven vs. editor- or producer-driven stories

There are two basic types of multimedia stories:

-- Those in which a reporter is in charge of putting the story together. The story is usually a daily beat story, a feature or part of an investigative series or special project. The reporter -- sometimes called a "backpack journalist" -- goes into the field and uses his digital video camera as a multimedia reporter's notebook. He gathers video clips, video from which to grab still photos, audio, and information that will go into text and graphics. The story is in his head, and he makes the basic decisions on how to assemble the pieces that make up the whole. Joe Weiss' "Touching Hearts" is a reporter-driven story.

-- Those in which the editor/producer is in charge, generally breaking news or special projects. The editor assigns individuals to produce pieces of a breaking news story, e.g. tornadoes damaging a city. She asks a photographer for photos, a reporter to go into the field to do interviews, a videographer to go into the field and film the destruction, another reporter to gather information by phone, and a graphic artist to produce maps and illustrations. The story's in her head, and she makes the basic decisions on how to assemble the pieces that make up the whole. The Minneapolis Star-Tribune's "Local Heroes" is an editor- or producer-driven story.

This course walks you through putting together a multimedia feature story on your own. But the skills you derive from doing this story can be used to assemble a team to do a breaking news multimedia story as well.

How does convergence fit into multimedia storytelling?

When you report a story for print -- using a reporter's notebook to write down information from interviews or what you see or hear -- what you gather is useful only for print. When you report a story for television -- using a video camera to shoot only interviews or events that will be visual elements in a clip -- what you gather is useful only for television.

But when you report a story for the Web -- using a video camera to shoot interviews or events, as well as using it to grab still pictures, record audio and collect information that can be used in text or graphics -- what you gather can be used to produce a multimedia story, a television story, a print story or a radio story.

In a converged newsroom, you can do a multimedia version of the story for the Web, but also produce different versions for a print publication like a newspaper, for a television newscast, for a radio program or even a pure text version for wireless applications.

Choosing a Story

Not all stories make good multimedia stories. The best multimedia stories are multi-dimensional. They include action for video, a process that can be illustrated with a graphic (e.g., "how tornadoes form" or "how this new surgery works"), someone who can give some pithy quotes for video or audio, and/or strong emotions for still photos and audio. Most multimedia stories require that the reporter go into the field to report the story face-to-face with sources, rather than doing a story entirely by telephone.

The story used in this course to illustrate how to do a multimedia piece has action, process, and a person who can give pithy quotes. It's about the "dancing" rocks of Death Valley National Park. Rocks, some as large as boulders, move across a dry lake bed in a remote section of Death Valley and leave trails, some as long as half a mile. Since the rocks were discovered in the early 1900s, people have offered many theories on how they move. This story follows a high-tech geologist as she solves the mystery. Gathering Preliminary Information

Before you venture into the field to shoot a story, gather as much information as possible to put together a rough storyboard - an outline of the story that lays out the multimedia possibilities. This means doing a preliminary interview with the source or sources for background, getting a basic idea of what to expect in the field, and looking up anything the sources have published in print or on the Web. Then collect as many available visuals -- photos, videos, maps and graphics -- as you can from your sources or from the Web to get an idea of what the story's components may be. Track down any previous stories on the topic -- print, video, radio or Web.

Here's the information available about "Dancing Rocks."

Dr. Paula Messina's Web site

A print story about the Dancing Rocks

A telephone interview with Paula Messina

View the final Dancing Rocks story & Web site

Storyboarding

Why Do a Storyboard?

A storyboard is a sketch of how to organize a story and a list of its contents.

A storyboard helps you:

- Define the parameters of a story within available resources and time
- Organize and focus a story
- Figure out what medium to use for each part of the story

How to Do a Rough Storyboard

A multimedia story is some combination of video, text, still photos, audio, graphics and interactivity presented in a nonlinear format in which the information in each medium is complementary, not redundant. So your storyboard should be put together with all those elements in mind.

The first thing to tackle is the part about the story being nonlinear.

- 1. Divide the story into its logical, nonlinear parts, such as:
 - a lead or nut paragraph, essentially addressing why this story is important
 - profiles of the main person or people in the story
 - the event or situation
 - any process or how something works
 - pros and cons
 - the history of the event or situation
 - other related issues raised by the story

Instead of thinking "first part," "second part", "third part", "fourth part", think "this part", "that part", "another part", and "yet another part". It helps to avoid linear thinking. The home page comprises a headline, nut graph, an establishing visual (can be a background or central photograph, a slide show or a video), and links to the other parts, which are usually subtopics of the overall story.

Next, divide the contents of the story among the media -- video, still photos, audio, graphics and text.

- 1. *Decide what pieces of the story work best in video.* Video is the best medium to depict action, to take a reader to a place central to the story, or to hear and see a person central to the story.
- 2. Decide what pieces of the story work best in still photos. Still photos are the best medium for emphasizing a strong emotion, for staying with an important point in a story, or to create a particular mood. They're often more dramatic and don't go by as quickly as video. Still photos used in combination with audio also highlight emotions. Panorama or 360-degree photos, especially combined with audio, also immerse a reader in the location of the story.
- 3. *Does the audio work best with video, or will it be combined with still photos?* Good audio with video is critical. Bad audio makes video seem worse than it is and detracts from the drama of still photos. Good audio makes still photos and video seem more intense and real. Avoid using audio alone.
- 4. *What part of the story works best in graphics?* Animated graphics show how things work. Graphics go where cameras can't go, into human cells or millions of miles into space. Sometimes graphics can be a story's primary medium, with print, still photos and video in supporting roles.

- 5. *Does the story need a map*? Is the map a location map, or layered with other information? GIS (geographic information systems) and satellite imaging are important tools for reporters. Interactive GIS can personalize a story in a way impossible with text by letting readers pinpoint things in their own cities or neighborhoods such as crime or meth labs or liquor stores or licensed gun dealers.
- 6. *What part of the story belongs in text?* Text can be used to describe the history of a story (sometimes in combination with photos); to describe a process (sometimes in combination with graphics), or to provide first-person accounts of an event. Often, text is what's left over when you can't convey the information with photos, video, audio or graphics.
- 7. *Make sure the information in each medium is complementary, not redundant.* A little overlap among the different media is okay. It's also useful to have some overlap among the story's nonlinear parts, as a way to invite readers to explore the other parts of the story. But try to match up each element of a story with the medium that best conveys it.
- 8. *Interactivity means giving the reader both input and control in a story*. By making the story nonlinear, you've introduced an element of interactivity, because the user can choose which elements of a story to read or view and in which order. By including <u>online forums</u> or chats, you give readers input into a story. Some news sites have included interactive games so the reader can construct his own story. One newspaper let people help plan a waterfront redevelopment project with an online game in which they placed icons on a map of the waterfront showing where they thought parks, ballfields, restaurants, shops and so on should be located. For more examples of how news Web sites are including different types of interactivity, check out J-Lab -- the Institute for Interactive Journalism.

When you're done breaking a story down into its elements - both in terms of its content and the different media you could use - you need to reassemble all that into a rough storyboard.

On a sheet of paper, sketch out what the main story page will look like and the elements it will include. What's the nut graph? What are the links to the other sections of the story? What's the menu or navigation scheme for accessing those sections? What multimedia elements do you want to include on the main page as the establishing visuals, whether video or pictures.

Then do the same for the other "inside" pages that will be the other parts, or subtopics, in your overall story. What is the main element on each page and what other information should be included there? What video, audio, pictures or graphics would best tell this part of the story?

A rough storyboard doesn't have to be high art - it's just a sketch. And it isn't written in stone - it's just a guide. You may very well change things after you go into the field to do your interviews and other reporting.

What storyboarding does is help point out the holes in your story. It helps you identify the resources (time, equipment, assistance) you'll need to complete the story, or how you have to modify the story to adjust to your resources. A good way to learn storyboarding is to take a newspaper feature story and sketch out a storyboard of all the elements in it, the multimedia possibilities if it were more than a print story and how you might break it up into a nonlinear Web presentation.

Example - Dancing Rocks Rough Storyboard

Here's a rough storyboard for the "Dancing Rocks" story.

From the preliminary interview in which <u>Dr. Paula Messina explained</u> what she does in the field, <u>her Web</u> <u>site</u>, and a <u>review of an existing story</u>, the content -- existing and anticipated -- broke down into:

Nonlinear parts -- Home page with four inside pages. The four parts are the quest (research), a bio (of

Messina), the rocks (how they move), and the site of the dancing rocks, Death Valley's Racetrack Playa (its colorful history).

Video -- Anticipate video from the field trip: Messina mapping the rock trails, assembling her gear, the trip to and from the playa.

Audio -- Anticipate audio from the field trip: Messina explaining how she works, what the gear does, and why she does what she does. Maybe what the Racetrack Playa sounds like.

Still photos -- Available from Messina's Web site, and professional photographers, if necessary. Anticipate grabbing still photos from video of wide-angle shots of the playa, rocks and trails, maybe Death Valley National Park rangers.

Graphics -- Existing aerial photo, maps and rock trails.

Text -- History of research, history of the Racetrack Playa from interviews with Messina, other researchers, and the park rangers.

This is a sketch the rough storyboard (click for larger versions):



Home page -- Background photo of Messina and sliding rock in Racetrack Playa, with headline and four links to inside pages.



The Quest -- Research history and application in text, how Messina did her research in video, and a competing theory in text and photos, if available.



Bio -- Messina background in text, why she does what she does in video, day-in-the-life-of-a-high-tech geologist in photos grabbed from video and text captions.



Rocks -- Pick up graphic from Messina's Web site and use text blocks to explain in more detail than research page how rocks move. Maybe highlight a couple of rocks to show trails -- photos, graphics from Messina's Web site.

View the Dancing Rocks site



Racetrack Playa -- History in text, map placing it in Death Valley, and photos of playa, perhaps park rangers on patrol.

Fieldwork

The Complete Equipment Guide for Backpack Journalists

Whether you're driving across town to interview a zookeeper or flying to Alaska to interview a bear tracker, the basic equipment list is the same:

- Laptop computer loaded with Photoshop, Dreamweaver, iMovie or Pinnacle Studio 8 (or Final Cut Pro or Adobe Premiere if you're doing advanced video editing), Flash and a text editor such as Word.
- Video camera and accessories (lenses, filters, microphones, headphones, batteries, cables, tripod)
- Digital video tape (more than you think you'll need tape's cheaper than missing the most important shot of the story)
- Lens cleaners (brush, tissues, solution -- clean your lens before every outing)
- Absorbent soft towel (for emergency lens cleaning)
- Duct tape (if some part of your camera breaks, as mine did in a Moscow subway station)
- Pocket knife (remember to put this in your checked luggage when traveling)
- Rubber bands (you never know)
- Extra batteries for microphones (replace these every few months)
- Camera and microphone manuals (unless you've memorized both)
- Plastic bags for camera (as emergency protection if you don't have a raincoat for your camera, or if you're moving between extremes of heat and cold and need the camera to adjust slowly)
- Plastic bags, small and zip-lock for used DV tapes
- Water bottle (for you)
- Power bars (for you -- you never know when you're going to skip a meal)
- Pens (if nothing else, to jot a quick ID on the tape you've just shot)
- Small notebook (of course, your camera is your reporter's notebook, but a small notebook is handy for writing down shots that you don't want to forget, especially if it's raining and you can't read what you've written on your hand)
- Backpack journalist vest with many pockets (you don't have to go the extreme of still photographers with their 87 pockets, but it's more efficient to have towel, batteries, DV tape, notebook, pen, knife and duct tape within easy reach)

All main equipment should fit in a camera/computer case that works for you, one that is configured as a backpack, preferably, especially if you also have to carry a satellite phone. If you're flying, never check your camera bag -- always carry it with you. You may have to check your tripod, so buy one that fits into your suitcase.

The Backpack Journalist at Work

Memorize your rough storyboard, or have a handy reference to it, before you start gathering information in the field. Always work with your storyboard in mind. Is this a part that's going into video for sure? If so, then shoot a series of sequences (see Sequences in the <u>Shooting Tips</u> tutorial). Is this a part that works better in still photos? If so, then pay more attention to framing and setting up the shot, with close-ups and extreme close-ups that will likely be used as still photos.

Consider doing interviews twice: once while the person is actually doing the action that will be depicted in video clips, and another in a quiet, controlled area to describe again the action and comment on the implications of the action. The reason is that the sound in the field may be contaminated with airplanes overhead, lawnmowers being used nearby, protestors, etc., that mask the words. You may get enough in the action shot for part of a pithy quote, and then overlay the audio from the controlled setting to explain the

action.

Be flexible -- opportunities for unanticipated video, stills and other interview materials suitable for text are likely to pop up when you least expect them. Go for them -- don't hesitate. Tape is cheap. Visuals aren't like print – if you miss the shot, you can't use the phone to fill in the gaps. The only thing you can do is describe it in text, or put a talking head on camera to describe the action, neither of which is as effective as getting the real action, either in video or stills.

If you have to file multimedia stories daily:

- Review your tape and grab still photos and potential video clips as you go. Write detailed information on your tapes, such as the tape number, date of video, main subjects, important sequences, your name and phone number (in case you lose the tape).
- Make notes on the story elements as you go through your tape -- send a nut graph and rough storyboard to your editor, if necessary. Usually, if you're filing daily, you and your editor will have designed a couple of templates to choose from that will lay out some basic schemes for including video, photos and text on a Web page.
- Edit still photos and video clips in the field (rather than deferring to judgments of the editor back home).
- Send still photos (sending video clips from the field can still be dicey, so send photos, which take less bandwidth, first).
- Write accompanying text blocks and send them in.
- Send video clips (this often takes some time to process, so it's a good opportunity to prepare for the next day).
- Send appropriate graphics if available (scientists especially often work on their own laptops and may have information to give you).

If you're not on a daily deadline:

The strategy's a bit different if you don't have to file until you're back at your desk, especially if you're working on a longer feature story.

In the field:

- Review and label your tapes every night
- Transcribe interview material that's likely to go into text blocks or captions
- Make notes on the shots and information you need to get the next day
- Review your rough storyboard and make adjustments if necessary

Back in the office:

- Review your tape, grab obvious photos and video clips for later editing
- Do a detailed storyboard
- Gather the rest of the information you need for the story (graphics? maps?)
- Start assembling the content for the pages, rough text blocks first, then the visual elements. It's likely that you'll be working with your immediate editor and graphics editor at this point, so you may be doing some back-and-forth on photos and video clips

Above all, remember this: don't panic, and take a nap whenever the situation presents itself.



Example: Dancing Rocks of Death Valley

The fieldwork for this story took five days: one day of travel and four days in the field. Three days were with Dr. Messina on Racetrack Playa; one day with park rangers Dillenges and Forner.

Camera: Canon XL-1, comes with good shotgun microphone. Purchased separate wide-angle lens -- couldn't have done the story without it.

Additional microphone -- Lectrosonic remote lavalier

Mini DV tapes -- brought 10, used 4

Computer -- Sony VAIO (eventually switched to hardier iBook, and now have Powerbook G4)

View the <u>Dancing Rocks</u> site.

Editing

Refining the Storyboard

Now's the time to make decisions about exactly what information is going into video, audio, still photos, graphics and text. For this you need to refine your rough storyboards, figuring out what's changed from your original vision of the story, and mapping out what you media have and what should appear on each page. Here are some general guidelines about using the different media:

Video -- Keep videos short -- three or four minutes, tops, and preferably around 1 or 2 minutes. Keep talking heads to a minimum -- a few seconds -- and then switch to "B-roll" (any shots other than the on-camera interview of your main subject - such as action of the subject while he or she is working or playing or whatever the individual is doing when not being interviewed by you, as well as the environment that person moves around in, whether micro -- office -- or macro -- city or country). Usually, the video screen isn't large enough and the frame rate isn't high enough on the Web to capture the nuances of emotion that make some talking-head interviews on television compelling (think "60 Minutes" and Barbara Walters' interviews). Make sure the B-roll is specific to what's being addressed in the interview. This is different from television. For example, if you're doing a story about a research discovery for television, anything that lights up or moves, whether it's directly related to the research or not, is fair game. However, for the Web, the video should act more like the content of a still photo in a newspaper -- the visual specifically illustrates an aspect of the story. And action shots with a lot of movement usually display poorly on the Web, with its low frame rate.

Audio -- It's got to be high-quality. Unless it's the long-lost and only recording of the Abominable Snowman, there's no excuse for poor audio. (An exception is really old recordings, but then those have to be scratchy and tinny, by definition.) Don't be afraid to use subtitles with the audio if necessary (see <u>Oscar's Story</u> in Joe Weiss' Touching Hearts series for an example) to get the point across and you have no other options. Subtitles also can be used to reinforce an important point. Unless it's pertinent to the story, avoid using music as a background.

Still photos -- The Web is a VISUAL medium, so be sure to include photos. Use them to replace 1,000 words, not as accessories to words. If used together, text and photos should complement each other visually, as well as in their content. Don't be afraid to use Photoshop to put text directly on your photos, either. Photos can be used two ways -- individually, to set a mood or introduce a story or section of a story; and sequentially, to tell a story via a "slide show".

Graphics -- Make them interactive and/or animated (with Flash). Used with GIS (geographic information systems), you can let readers personalize the story by selecting a geographic area (such as their neighborhood) and getting information related to it. Don't be afraid to use graphics as the centerpiece of a story or part of a story, and, in that case, make the text secondary. Most crime reporting as it exists now and much of international reporting, for example, can be presented as graphics with text blocks.

Text -- For headlines, captions, with photos in a pas de deux, for history, and for first-person descriptions. Watch out, print folks -- this is your comfort zone, the medium you fall back on when you can't think of anything else to do. If you've got a page that has a lot of text, ask a graphic designer or a photographer or a videographer for ideas for another approach. This is not to say that some stories shouldn't be text -- op-eds, many political stories, analyses, and short updates work best in text. But this is a multimedia story you're doing. Text is what's left when you've put as much information as possible into every other medium.

Here are examples from the Dancing Rocks story of how the media choices and layout change from the early rough storyboards to the more refined storyboards (as well as some notes on how things were further refined

in the <u>finished product</u>):

Rough	Page	Refined
Background photo of Messina and sliding rock in Racetrack Playa, with headline and four links to inside pages.	Home page	The concept for this page didn't change much. I decided to downplay the navigation elements because a navigation bar would have detracted from the intriguing photo. Embedding the nav elements in the trail instead also echoes the search of the scientist.
Research history and application in text, how Messina did her research in video, and a competing theory in text and photos, if available.	Research	This page changed from the rough storyboard because I wanted to add a simple interactive quiz to a page dense with scientific information. This page has the most text, and the most video. "Quest" was dropped in the final version in favor of "Puzzle", and the page was dominated by the question: What moves the rocks?
History in text, map placing it in Death Valley, and photos of playa, perhaps park rangers on patrol.	Playa	I wanted to have the user go through a linear storytelling experience within this page, by clicking on the photos and having the main photo and text change with each thumbnail

		photo selected. But this proved too daunting with the Web editing software I was using, so I ended up going with something that was organized more like the rough storyboard, with some photo/text links embedded as blocks in the large aerial photograph.
Recks on the Whee Fick up graphic from Messina's Web site and use text blocks to explain in more detail than research page how rocks move. Maybe highlight a couple of rocks to show trails photos, graphics from Messina's Web site.	Rocks on the Move	The basic concept remained the same between the rough and detailed storyboard, except that I took video that simulated a rock's movement along its trail, and decided to include it on the page. As the page came together, it seemed that it would be less cluttered if the video were linked from within the main graphic/aerial photo. And separate photos of rocks with links to their trails worked well below the text. This page also presented the opportunity to be a little more poetic than scientific in the writing et the
Messina background in text, why she does what she does in video, day-in-the-life-of-a-high-tech geologist in photos grabbed from video and text captions.	Profile	The "high-tech rockhound" was altered to "for the love of rocks," since that seemed a more accurate frame for Dr. Messina's motivation. As with the "Racetrack Playa" page, my plan in the refined storyboard to try doing a linear story here with clickable thumbnail photos proved impractical, so I decided to go with a narrated still-photo (mostly) essay in QuickTime. I also embedded in a

	Multimedia Storytelling
	large photo text with some additional biographical information.
Editing the Content	

Editing the Content

In print, you generally write the story and then find or assign photos to illustrate or augment the text. In television, you pick out the best visuals, write a script, then begin adjusting each until they work together.

In multimedia, the best approach is to put together your refined storyboard first, and then:

- grab the pieces of the video for the stills, clips and audio you've decided to include
- edit the video, photos and audio and assemble the graphics for each page
- finish by writing and editing the text (captions, text blocks, headlines and nut graph)

View the **Dancing Rocks** site.

Assembling Your Story

Why does a reporter have to assemble a story?

While a multimedia reporter will use storyboards to map out a story and then pull together all the different elements to be used, the final design of the multimedia site is likely to be taken over by a publication's Web designer. However, as outlined in the Editing section, it's important for you to decide the parts of a story, the flow of a story, and what's most important in each section of your story. For example, deciding what visuals need to be the centerpieces of the story and displayed prominently, vs. what visuals are just ancillary.

It's similar to what a print reporter does in deciding how to organize the story -- usually putting the most important parts of the story toward the top, identifying which people and places are the most important to be photographed, reviewing graphic information to see if and where it fits into the story. Just as graphic designers then take all that information and develop a layout for print, so they can improve your rough multimedia story layout to make it more pleasing to the eye and help communicate better what you're trying to convey.

After reporters complete a few multimedia stories, they can work with graphic designers to develop a selection of templates to be used for inside pages. A unique home page usually should still be created for each story, but then the layout of inside pages can be selected from several templates developed beforehand. Dropping story components into templates saves time, since the reporter can put her effort into helping design the home page and the interactive elements. And having a variety of templates to choose from will reduce the predictability in design that can bore readers.

Example: Dancing Rocks of Death Valley

I originally did the Dancing Rocks story for Discovery Channel's Web site, Discovery.com, in 1998. This was an expedition, so I filed four stories from the field. There was no fast way then to send video from the field, so the story was presented only in text and photos, much as most news organizations present stories on the Web today. After Discovery.com was redesigned in 2000, the story was removed from the site.

For this online course, I reconstructed the Dancing Rocks of Death Valley story as a new Web site. I re-interviewed Dr. Messina, updated the text, redesigned the site as a nonlinear feature story instead of a chronological expedition series, and added video clips.

This whole story as you see it today took me about two weeks to complete. In 1998, I spent four days in Death Valley National Park and two days in travel. In 2003, I redid interviews with Dr. Messina, redid the rough and refined storyboards to change them from a chronological expedition story package to a new nonlinear feature story package, edited three video clips, chose different still photographs from those I used in 1998, and rewrote the text and headlines. I used Photoshop to put most of the pages together (photos, text and headlines). Then I worked with our Web designer, Scot Hacker, for four hours to put the pages together in Dreamweaver. He then spent another 10 hours tweaking out the bugs.

Here's the final product and what went into each page:



Home page: The elements of this page -- text and still photos -- were put together in a single Photoshop file that was converted to a jpg and embedded in a Web page as an image. The hotspots on the trail that link to the inside sections were added by Scot when he put together the Web page.



Onthemove page (How Rocks Rock Out): The elements of this page -- text, aerial photo/graphic, photos of the rocks and the navigation bar -- were put together in a single Photoshop file that was similarly converted to a jpg. The links to the video and rock trails were added by Scot.



Playa page (The Eerie World of Racetrack Playa): The headline and locater map were combined with the aerial photo in Photoshop. This again was converted into a jpg file and inserted into the top left column of a Dreamweaver table. The text on the right side was put into a form using Dreamweaver that lets the user scroll the text without disturbing the placement of the photos and text elsewhere on the page. The photo of Dan Dillenges was dropped into the left column (with text wrapped around

it) and the photo of Ed Forner was placed in the right column at the bottom of the table. The links on the aerial photo (locater map, other photo/text blocks) and the image nav bar at the bottom were added when Scot built the Web page.



Profile page (For the Love of Rocks): This is another Photoshop file that was turned into a jpg and dropped onto the page as an image. The links to the video clip and the nav bar were added by Scot.



Research page: This page was also constructed in Photoshop, after a disastrous try in Dreamweaver, in which, on some browsers, text and images overlapped and appeared in unexpected places on the page. It also had an additional headline that looked okay on the storyboard and in my head, but made the page much too busy. So, that headline was yanked and replaced with a smaller subhead that became the link to the video. The entire page was constructed in Photoshop, and the pop-ups and

links were added when Scot did the Web page. Hopefully, this all has given you a good idea of how a multimedia story is put together from beginning to end. You've seen all the different elements that go into a multimedia story and the various steps and stages needed to pull everything together. I hope you also have some appreciation for the challenges and last-minute glitches that invariably arise

Now it's time for you to go out and start doing your own multimedia projects. To help you along, use the tutorials listed in the menu on the left. There you can find step-by-step instructions on how to use a video camera, video shooting techniques, and how to edit photos, video and the final Web project. Let us know if you think we need to add anything else. We'd love to hear your suggestions.

View the **Dancing Rocks** site

Print Story about the Dancing Rocks

By Robert Evans Smithsonian Magazine July 1999

Heed the words of Robert Frost one day and take a road less traveled by, one that will make all the difference. Go northwest from Furnace Creek in Death Valley, between the jagged rim of the Grapevine Mountains and the peaks and canyons of the Cottonwood Range. Turn south-southwest past the vast bowl of the exploded Ubehebe Crater, and take a rocky unpaved track for twenty-five miles until you descend into a broad desert valley. Slow down now, rest your rut-and-boulder-shaken frame. Around one last bend in the water-gouged and gulleyed road, prepare for a sight the like of which you have never imagined: the tracks of the sliding rocks of Racetrack Playa, a sight unique on Earth.

Only 2.8 miles from north to south and about 1.3 miles wide, the tan-colored Racetrack is arid, devoid of vegetation, and so flat that the north end is less than two inches higher than the south. Near that north end, the Grandstand, a small island of bare rock, looms dark against its light surroundings. Dozens of rocks, some weighing hundreds of pounds, rest on the surface of the playa. Each rock is at the end of a grooved track incised into the hardened clay of what was once an ancient lakebed, now dry except for rare flooding after heavy rain that makes it dark and slick.

Tracks may be long or short, some half-a-mile, others mere tens of yards. Engraved straight as a ruler, or curving and sinuous, adjacent trails may be parallel with each other or cross and cross again. Some veer abruptly more than ninety degrees from their original route. Here and there, groups of two or three loop back on themselves, leaving trails that remind you of the paths of dancers in some stately, elegant minuet of centuries past. And like dancers, some of the rocks must have spun as they moved, leaving wide and then narrower tracks, then wide again.

The rocks themselves may be as small as a fist, or as large and blocky as an ice-chest. They weigh anywhere from a few ounces to more than seven hundred pounds. Of the 162 recorded recently on the playa, more than ninety percent fell from a bed of rock known to geologists as the Racetrack Dolomite, which forms a steep promontory at the extreme south end of the Racetrack. From that birthplace, most of the dancers on the playa have progressed to the northeast, winding and cavorting for hundreds of yards across the flat surface.

Take a walk out onto the Racetrack and you can imagine that the sun-cracked hexagons beneath your feet are the perfect cobbles on some medieval street in Europe. As you walk, your feet crunch into curled clay cereal-flakes and break a silence that is almost absolute, save for the sound of air moving past your head as you walk. And if you venture a few yards up the slopes around the Racetrack, you can trace a trail made thousands of years ago when this valley was filled by a lake, and when the indigenous people walked its shores. In the shimmering 120-degree heat of the desert summer you may still see a lake in this valley, but only as a mirage.

Since the turn of the century, prospectors, scientists, and the merely curious have traveled here to see the moving rocks and their trails. On foot or horseback, by automobile and even by aircraft-for the flat valley floor makes a perfect runway-they come from all over the world. The visitors are mystified by what they see, and guess that the rocks rolled onto the playa, or were dropped there in a fraternity prank. No one has ever seen one in motion, and only since 1948 have scientists made serious attempts to explain what makes the rocks move.

In that year, two U. S. Geological Survey geologists suggested that erratic whirlwinds known as dust-devils

could have caused some of the rocks to trace serpentine paths on the playa. Dust-devils flit across the desert southwest during summer, when air heated by the hot surface rises, twisting skyward, and creating miniature but powerful tornadoes of dust that is picked up as the whirlwinds move. To create his own wind, one enterprising geologist flew a plane onto the playa in 1952, soaked the clay surface to make it slick and then made movies of rocks that he blew about in the propeller wash of his aircraft. He was mimicking in a small way what nature showed him on the Racetrack. That same year came a different suggestion, when George Stanley of Fresno State College in California mapped some parallel trails, and, knowing that ice did occasionally form during winters in the mountains, concluded that the rocks became frozen in ice-sheets that floated about on shallow water.

This served to stimulate two other geologists to try to settle the matter once and for all: Was it ice, or was it only the wind that moved the rocks? Robert Sharp of California Institute of Technology and Dwight Carey of the University of California at Los Angeles watched 30 of the rocks for seven years between 1968 and 1974. Coming back twice a year, they recorded the movements and mapped the paths of the 28 rocks that moved. As he and Carey worked, Sharp began a whimsical tradition. "The first time I visited Racetrack Playa, I was with a friend," Sharp said. "His wife Mary Ann was along. Later once we started monitoring the rocks, we found one with a beautiful trail and named this first one after her." He and Carey then named others after secretaries and laboratory assistants, all women. "Jean was my wife's name and Grace was named after my aunt," Sharp said, "who lived to be 103 years old and was one of my favorite people."

To test the ice-floe hypothesis, Sharp and Carey made a corral of stakes around some of the rocks, reasoning that ice frozen against the rocks would also be fast to the stakes, preventing any sliding or dancing. If there were no ice, any rock that moved would do so with the aid of wind alone. On two occasions, a lone rock sneaked out of the corral, leaving others still trapped. Another time, one rock joined a cluster of some others that were undisturbed. To Sharp and Carey, this indicated that although ice may play a part in some movements, it is not the only means by which Mary Ann and Jean and Grace danced their minuet on the Racetrack.

As often as they went there, Sharp and Carey never saw a rock move, nor were they able to say conclusively that wind and wind alone was the cause. In a rare bit of levity-and an expression of their frustration-Sharp and Carey wrote in the Geological Society of America Bulletin that "Some immutable law of nature probably prescribes that movements occur in the darkness of stormy moonless nights, so that even a resident observer would see newly made tracks only in the dawn of a new day."

By the middle seventies, when Sharp and Carey finished their study, the U. S. National Park Service was making serious attempts to protect the Racetrack, vulnerable to vandalism by scientists and tourists alike. Already in 1969, they had dug a ditch along the west side of the playa to prevent vehicles from driving on its surface, for tire tracks last years in the arid climate. Rangers regularly inspected the place, removing rocks that had been placed for curiosity, cleaning up debris that visitors left, including shell casings and ammunition clips. Some researchers left stakes hammered into the surface, brought in extraneous rocks, and painted or carved numbers and symbols on the original residents. The rangers noticed, too, that some of the sliding rocks had been stolen as souvenirs.

The latest research has produced two strong opinions, almost defined by the gender of the scientists. For John Reid, Jr., of Hampshire College in Amherst, Massachusetts, the rocks move in lockstep, rigid in a sheet of ice that floats on shallow water when the playa is occasionally flooded. As the ice is blown about by the wind, the rocks scrape parallel trails in the fine mud of the playa surface. Paula Messina, professor of geology at San José State University, sees the rocks, individually or in pairs and small groups, as being more free-spirited, responding to the wind across the wet and slick mud. The rocks seem to dance their individual paths, sometimes in delicate loops and twirls like performers in a minuet. Messina continued Robert Sharp's tradition of using female names as identifiers, keeping the ones he had used, and adding the names of people in her

own life. This delighted Sharp. "He felt like he had found his lost children. He was just thrilled."

Between 1987 and 1994, Reid took some of his students to the Racetrack to measure the force it takes to move a rock and then calculate how much wind speed is necessary to provide that force. It was hundreds of miles per hour, far greater than was realistic. But Robert Sharp is skeptical, because the finest dust on the playa-the clay particles that are the slickest when wet-is soon blown away after it dries, and probably was not there during the experiments. The wind speeds necessary are therefore much lower.

As for the trails, Reid used a geometric way of measuring how parallel they were, reasoning that the further apart parallel tracks were, the less likely it was that the wind had formed them, and the more likely that ice slabs were involved. Seven tracks made by movements in the 1980s were very similar, as were six tracks formed in 1992-3. "For the wind to move two rocks several hundred yards apart and make exactly parallel lines," Reid says, "would be the equivalent of setting a bunch of monkeys down at typewriters and have one of them produce a Shakespearean sonnet."

Messina does not agree. In 1996, she began a complete survey and analysis of every sliding rock on the Racetrack. It was a combination of the traditional geologic methods of walking and careful observation, and modern technology: satellite-based Global Positioning System (GPS) and computer-based geographic information system (GIS). With GPS she could map all the trails quickly, and to an accuracy of less than a foot, and with the computer she was able to superimpose her maps on images of the terrain, and then integrate wind data to see how the rocks and the winds interacted.

" No one had looked at the big picture," Messina explains. "I wanted to see what the playa was saying." The playa was saying some surprising things, for although there are some parallel tracks, the vast majority are not. Pamela, Amelia and Cynthia showed the spirited moves of accomplished dancers, progressing to the northeast, then rotating, turning this way and that, back to the northwest, finally parading together to the southeast. Julie and Jacki came closer and closer in their minuet, eventually turning and twisting southeast, northwest, then southeast again, making a grand loop back to the northwest, another to the northeast, with a few quick steps and turns back and forth before parading to the southeast as Pamela, Amelia and Cynthia had done. Helen was evidently a solitary dancer, looping a complete circle first counterclockwise, then clockwise, before ending her dance in a straight path to the southeast.

" Reid's plots are remarkable. They are stunning," Messina says. "But I'm not sure you can look at only those few trails and conclude that ice is necessary for all the others. The overwhelming number of trails don't show parallelism, so you can't rule out wind alone." After studying them, Paula Messina was satisfied that the dancers had not been locked together in ice. They were too free, too idiosyncratic. And she showed that the complicated patterns were traced where strong winds from two directions merged on the playa to create dust-devils, with their powerful winds in a vortex, whirling across the playa and making the rocks dance.

Modern technology could easily resolve the controversy. Install small transmitters on the rocks to monitor their movement, and install a weather station to record the rain, the wind and the freezing of the playa. If we can track animals, we can surely track rocks. But the entire Death Valley is now a national park, an International Biosphere Reserve designated by the United Nations, and carefully protected. The regulations say there can be no "perturbation of natural features" on the Racetrack because it is a wilderness area. That means that nothing can be moved, nor anything-like markings, labels, scientific equipment-added. It belongs to everyone, not only curious scientists, although some of the other visitors are curious in their own way.

Dan Dillenges is the ranger responsible for protecting Racetrack Playa. He has worked in Death Valley since 1977, full-time since 1984, and has watched the strange behavior of people visiting the sliding rocks. Apparently, the very uniqueness and isolation of the Racetrack induce a freedom of expression that is not available in the everyday lives of many visitors. He has seen them dance around naked on the ancient lakebed.

Nudity, however, is not a breach of national park rules, at least not in the naked desert. On one occasion, Dillenges heard the beating of gongs in a Tibetan religious ceremony on the Racetrack. On another, he apprehended a man who had been driving on the playa, insisting he was being chased. Shown that there was only one set of tracks on the playa, the man confessed he had not taken his medication.

The Racetrack's remoteness and smooth natural runway made it attractive for drug-dealers and their transactions. To this day, you can see the faint tracks of twin-engined aircraft on the playa, and although regular surveillance by Dillenges and his colleagues has reduced the likelihood of it being used now as a clandestine landing strip, they have to be careful. Tipped off one night that someone was taking a generator and lights up to the playa, Dillenges prepared for the worst. "It appeared to us as though they were drug-dealers," he said, but as he and another ranger sneaked closer, they were surprised to see the Grandstand illuminated by hundreds of tiny lights flicking on and off.

" The whole place lit up like a damned Christmas tree. They were all drunk, but just normal kind of folks," says Dillenges. He sobered them up by having them work all night to remove the lights and wires, and sent them on their way. Racetrack Playa is an affecting place, as Paula Messina can warrant.

" My first glimpse was one of those pivotal moments. It was so unlike anything I had ever seen before," she says. "You come around the bend in the road and you see this perfectly flat area with a mountain sticking up out of its north end. It just looks so beautiful." She was instantly captivated. "I could not believe what I was seeing," Messina says. "I had to come back and see the place again."

Both Reid and Messina plan to continue their researches, for the Racetrack draws them both. "My students and I love going out there so much that we are going back to figure out the subtler parts of the process," says Reid. And Messina hopes to show that the rocks can move in the summer storms, when no ice is possible. But if she isn't able to confirm what she believes, Messina won't mind. "I like the idea of sleuthing and trying to figure things out," she says. "But I prefer that something remain a mystery, for if you know too much, the work is no longer romantic."

Solving the mystery or not, she and Reid will separately take that road less traveled by. In the light of an ending day, they will leave the dark mass of the Grandstand fading into the long evening shadows. On the playa the rocks will sit, waiting for that combination of rain and then high wind or cold that will set them moving across the Racetrack. And out of sight of human eyes on one moonlit night, as Robert Sharp imagined, Pamela, Amelia, Cynthia, Jackie, Julie and all the others will begin the second or third movement in their elegant but mysterious minuet in the desert.

Reprinted with permission of author.

Phone Interview With Dr. Paula Messina

She's agreed to let a reporter go with her when she does another trip to Death Valley to update the movement of the sliding rocks of Racetrack Playa.

The mapping will take three days, maybe four. She's planning day trips from a motel in the national park. She leaves two hours before dawn to get to the Racetrack Playa just before dawn. She has lunch there and leaves mid- to late afternoon.

The Racetrack Playa is very remote, and there's nothing within 30 miles except a dry lakebed and rocks. Bring plenty of water and food, enough for two or three days if the car breaks down, which is possible on the very rough, unpaved road. It might take that long for a park ranger or another visitor to appear.

Once on the playa, Paula will use her maps to identify old rocks, and GPS equipment to figure out if they've moved since the last time she visited. If she comes across new rocks, she'll map their trails and take their measurements. She will identify or map every rock that she finds.

She will email contact information for other researchers who have worked on trying to solve the mystery and park rangers.

She suggests checking out her Web site for background information, photos and maps, and reading a Smithsonian article about the sliding rocks.

Related Links

A Spanish version of this site is located here: http://www.jcwarner.com/colombia/multimedia-instrucciones.html courtesy of Janine Warner and David LaFontaine.

© The Regents of the University of California