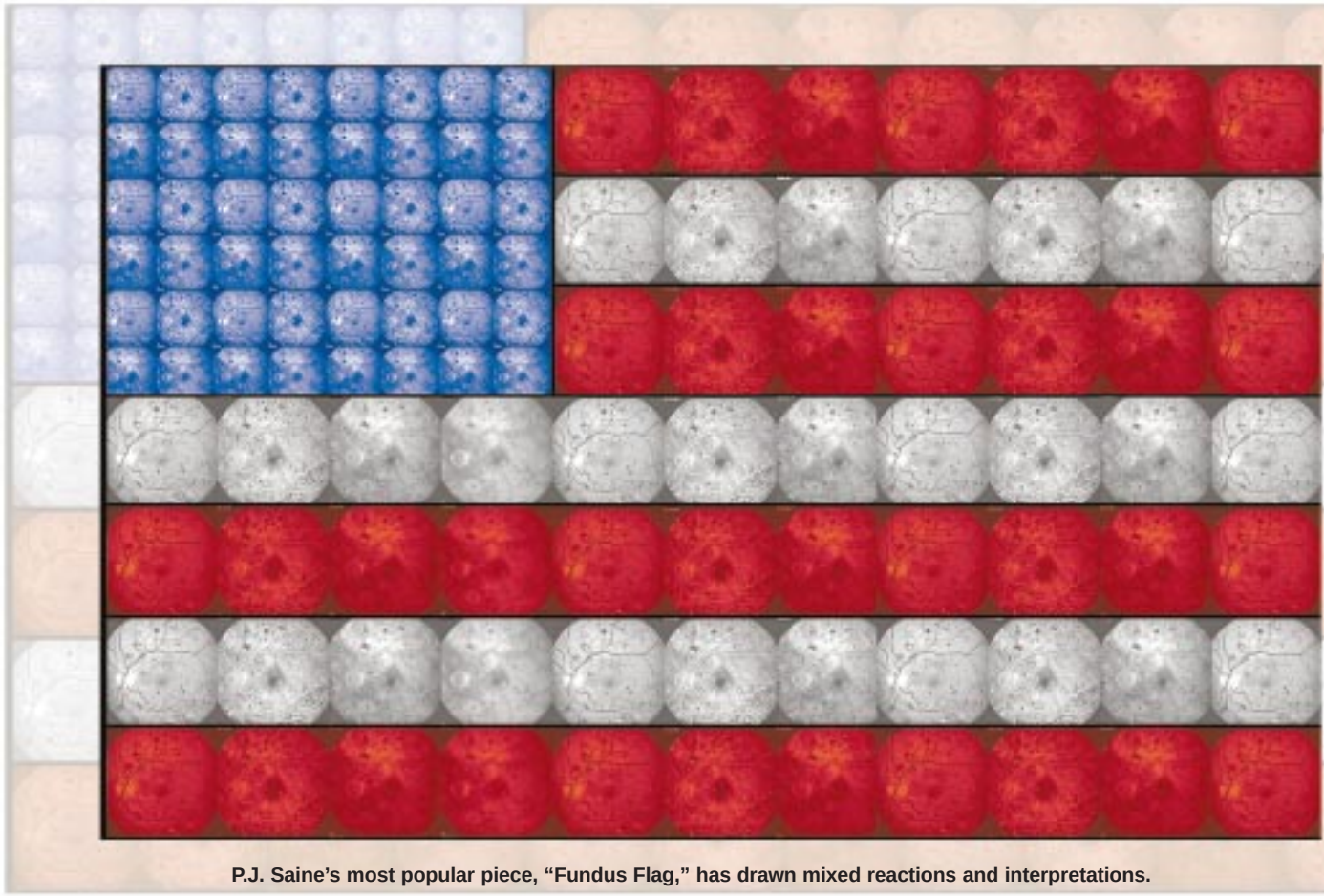
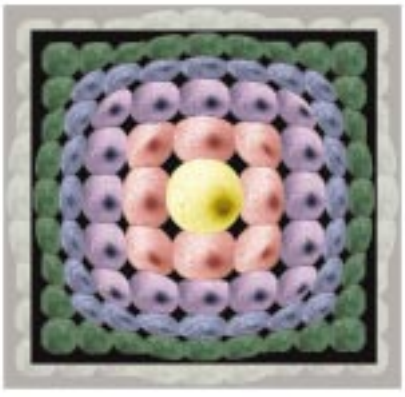


P.J. Saine's most popular piece, "Fundus Flag," has drawn mixed reactions and interpretations.

Limpid Pools

By Joan T. Sherwood

An Ophthalmic Photographer Makes Art from Inside the Windows of the Soul



"Rainbow Retina" contains natural order and progression: of color, of shape, and of fluorescein dye as it ambles through the retinal blood vessels.

It seems a Herculean task—even oxymoronic—to create something beautiful from the most detailed view of a diseased eye, yet it's here that artist and ophthalmic photographer P.J. Saine finds creative expression.

Twenty years ago, Saine was a photography teacher with a bachelor's degree in biology whose wife had just gotten pregnant with their first child. "I needed a real job," says Saine. "[My wife] answered an ad in the paper, and 20 years later I wrote a book about it." (*Ophthalmic Photography: Retinal Photography, Angiography, and Electronic Imaging*, 1997, with M.E. Tyler)

Saine spoke to *PEI* on a rainy morning in New Hampshire, where he is the manager of ophthalmic photography at Dartmouth-Hitchcock Medical Center in the town of Lebanon. Even early on a Monday morning, he is happy to discuss how the fruits of his profession evolved into the subject of his art.

"The biggest users of retinal photography are retina specialists," says Saine. By conducting a test called fluorescein angiography, during which a dye is injected into the blood vessels and then the eye is photographed, physicians can use the resulting image to analyze the eye's condition for treatment or laser surgery. The test is used to diagnose a multitude of diseases, but most commonly diabetic retinopathy and macular degeneration. "[The image] gives a road map to the physician to refer to during laser treatment," says Saine.

Saine captures retinal images with a Canon 60UVI Fundus Camera, a combination of a low-power microscope and an attached camera (*fundus* refers to the retina, from the Latin, meaning ground or bottom). "It's a specialized camera with a mirror and optical system. Light enters the eye in a doughnut, then the imaging light exits through the middle of that doughnut. It's quite specialized." The resulting photo details only the central 6-8mm of the retina, called the macula, where reading vision is located.

The image captured by the fundus camera at 1,024x1,024 ppi is quite the drab, black and white, medical image you might expect, but beauty lies beneath.

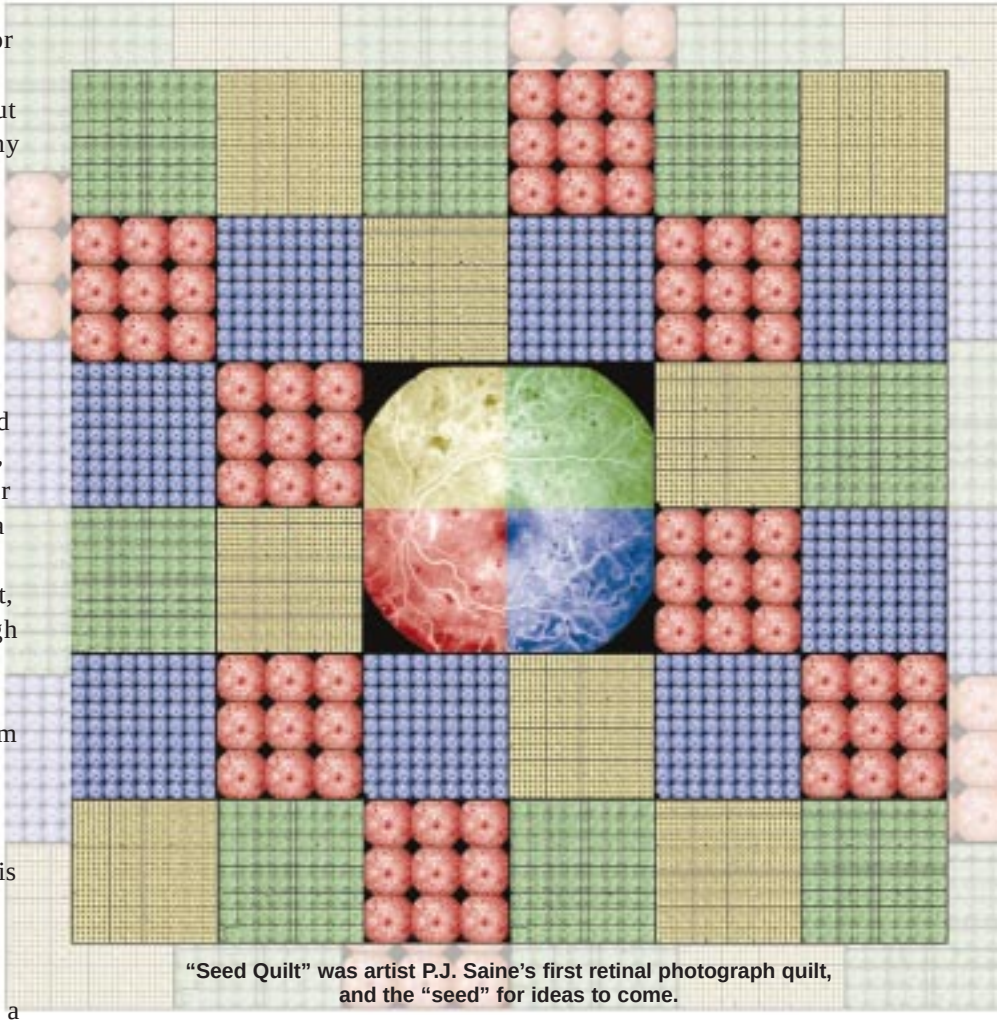
"I see as many as 10 patients in a day," says Saine, "so there are a lot of photographs." Each fluorescein dye test comprises about 30 pictures that are taken in stereo and over time, from when the dye is just entering the vessels until about 10 minutes after the injection. "So I've got all these photographs, and certain photographs are just more interesting than others, especially after 20 years. Either the disease entity is a little different, or the composition is a little different, or it's got a certain clarity."

Saine takes the raw images, which are formatted on a Windows platform, burns individual shots to CD-R or floppy, and transfers them to the Macintosh G3 in his own office.

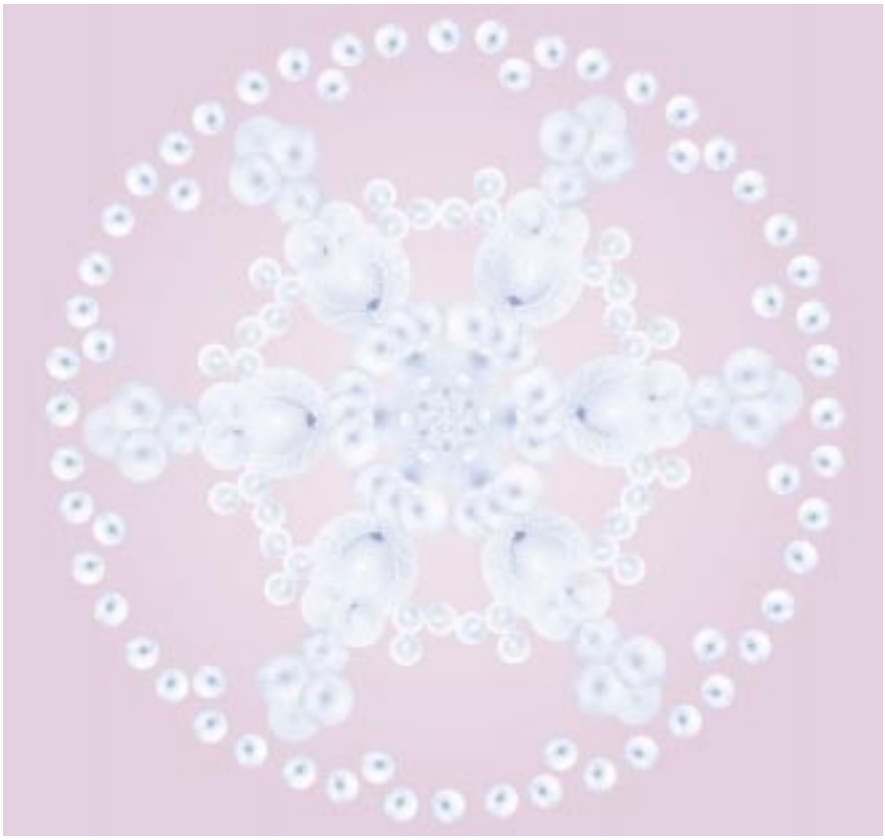
On Wednesdays, or sometimes on weekends when the kids are busy doing their own thing, Saine stays late at work to develop his digital art.

"I usually have in mind ahead of time what I want to do in terms of the design," he says. "That's often sketched out on the back on an envelope or on some scratch paper because I had this thought in the middle of the day.

"I use Photoshop to import the images, usually keeping them at full 1MB resolution… I usually work the design first to create the overall shape and concept, and then do the



"Seed Quilt" was artist P.J. Saine's first retinal photograph quilt, and the "seed" for ideas to come.



"Fundus Flake" was inspired by Vermont photographer Wilson A. Bentley, who spent his life photographing snow flakes. Saine feels a kinship in Bentley's appreciation for detail.

coloration," using Photoshop's Image>Adjust Hue/Saturation. "I learned early on, if you're careful about layers and keeping specific things in layers, then you can work much more efficiently when you color them."

In his Dartmouth-Hitchcock office, where one wall is consumed by books on ophthalmology and ophthalmic photography, and software boxes stacked on top of a file cabinet reach the ceiling, Saine can concentrate fully on his art, even in environs he describes as "messy and tangled."

"Actually, I'm focused *inside*. The surroundings usually kind of disappear and it's just between me and the computer screen." He will keep working until the piece is finished, or until it at least reaches a stage of completion.

"[Stopping] mid-piece is okay if it's fully shaped or fully colored, but there's got to be some sort of defined stopping point," says Saine. "And every once in awhile I'll just work until I get it and end up coming home at 2:00 or 3:00 a.m. The next day is kind of a zoo, but I know that I finished it. Somehow there's a process when I'm working—I've got to get whatever it is out of me, and as long as I get enough out, then things work."

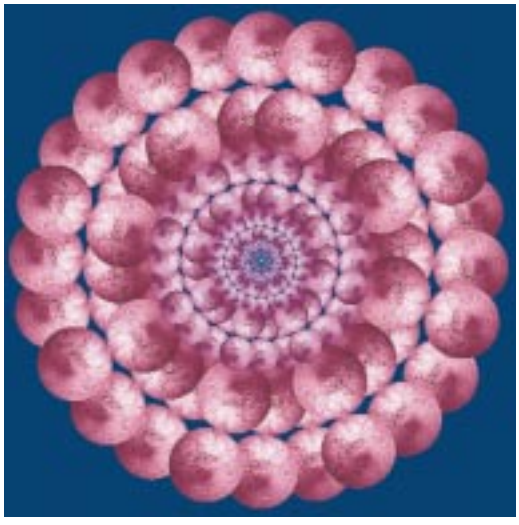
Saine, who has shown his film photography in museums and in numerous exhibitions, is no stranger to creative composition, but his digital art began quite by accident.

"When we do a fluorescein angiography test, after we photograph the patient, we make a four-up—a simple set of four pictures, which tells the quick story. The physicians look at the images directly on the screen, but we make this print so there's something in the charts to remind them what the major steps looked like," Saine explained.

"So I was creating this, and instead of creating one four-up, I ended up creating a four-up of four-up, so that I had 16 images. I looked at that and said, 'Gee whiz, that's a quilt.' And then the idea of putting them together in Photoshop came to me the next day. I tried to create an image of four-ups, and 16-ups, and multiple images created on the IBM computer, putting them together to create a quilt. I called it 'Seed Quilt' because it was the first idea—it was the seed for all the rest of them.

"When I put ['Seed Quilt'] together, it was interesting in black-and-white, but I knew that it wouldn't be successful without some color. For some reason, I had in my head the kind of light, almost pastel-y but not quite, colors of the old seed packets from the '40s and '50s. So I figured out how to create those colors in Photoshop and then transfer them onto [the images]."

With his first piece complete,



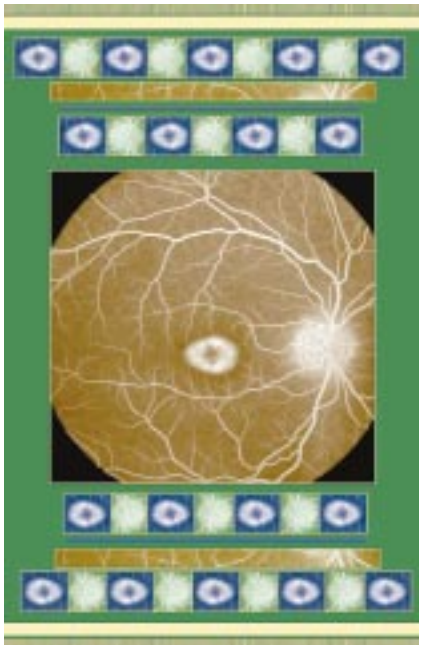
"Cranberry Mandala"

Saine started looking for other ways to employ his retinal photographs in a design.

"Probably the second piece I completed was 'Fundus Flag,' which actually is one of the most popular ones. I said, 'OK, I made a quilt with this, what else can I do?' As I was thinking, I realized, 'A flag is a quilt. I can create a flag out of this.'

"When I tried to create an American flag the correct way—with all the correct stars and all the correct stripes—it just didn't look right. So I worked back and forth with it until it had a nice balance and reminded people of a flag. But isn't exactly a flag."

His not-quite-a-flag work has drawn an array of responses. "People look at your work and have all sorts of different reactions to it. A physician who knows what [diabetic retinopathy] does with the eye said that she looked at this flag and all she could think of was the necrosis, and the dying of the different retinal cells, and the American flag, and so it represents the death of certain things in America. She got real heavy about it, but it's supposed to be fun. It's interesting how different people can interpret your work."



Reminiscent of a magic carpet, "Cone Quilt" was created from the retinal images of a young man with a particular type of cone dystrophy.

Saine sees his style as centered in the duality of his images—scientific yet artistic, simple yet complex, revealing the beauty in something diseased. While he has refined his technique, he says, "What gets harder is coming up with fresh ideas each time."

One of Saine's more recent works is "Fundus Flake," which reflects a winter feel to this transplanted Midwesterner, who moved to New Hampshire three years ago.

"I happened to come across a Vermont photographer, Wilson A.

Bentley, who photographed snowflakes." The photographer's appreciation of the minute in his 1931 book, *Snow Crystals*, inspired Saine.

"This is pages and pages of snowflakes, and no two are alike. I had seen his work and thought, 'Oh, well, a snowflake and a Fundus, they're each small items that we don't see in our regular everyday world that a photographer has brought to our attention. And

"Fundus Flower"

wouldn't it be interesting if I made the Fundus into a snowflake?' The winter up here in New Hampshire doesn't hurt the cause. You get used to the coldness of the colors and the coldness of the sky in the morning, and that has a certain beauty to it."

For Saine, IRIS giclée prints are the best form of output for his work. He has the digital image files printed on heavy watercolor stock at Color Works in Portland, Maine, where they are output on an IRIS 3074G inkjet printer with excellent results.

"The IRIS print is the only type of print that captures the tonality and the quality and the fine art look that I'm attempting here…There is one hanging at the AVA Gallery in Lebanon right now that is 32x32 inches. The nice thing about keeping the final file sizes large is that there's detail down to the smallest blood vessel. If you looked at these as an ophthalmologist, you could still tell exactly what was happening in the eye."

A slew of specialized cameras serves Saine in his professional work. He uses a Nikon F3 with a 120mm medical Nikkor lens for external eye photography, a

Zeiss Stereo Photo Slit Lamp for anterior segment photography, and a Keeler Konan Endothelial Cell Camera to photograph corneal endothelial cells.

He uses Contax SLRs for 35mm photography—an AX, the RTSII, and a 167MT. He has also been experimenting with the new Voigtlander Bessa-L with a 15mm Heliar lens and is impressed with the results so far.

Though Saine has only been in the digital game for half a decade or so, he seems convinced that the technology makes crucial contributions to the medical field.

"A few years ago, digital imaging was 'all the controversy' in professional photography. A similar controversy over digital imaging continues to rage in scientific imaging circles. Can we document what we need to see? Is the quality there? How will our time-honored working methods need to change?

"I've come to realize that while digital results may not be identical to film images, digital is as useful at conveying the appropriate information and has certain other advantages." Saine says these include instant feedback, ease of post processing and manipulation, and environmentally neutral processing.

"I can't say that I save any time with digital (my old darkroom time has morphed into computer time), but I can say that it seems as if I am more productive and have found additional creative avenues to explore."

As for the future of digital art, Saine says, "What I'd like to see more of is *not* digital used as merely a replacement for film—'How can I make my digital images look more like film images?'—or digital images that scream, 'I am digital,' but rather, effective images made with the tools at hand. Make me want to look at the image—not ask you how you made it.

"Each decade or movement has its signature, which, at times, is dictated by the tools in use, like the California Large Format Landscape tradition, the Carbro Color Prints of the '40s, and the Small Camera Street photography of the '60s. Will the '90s and '00s be remembered as the Decades of Digital Experimentation? And snickered at in the same way this generation regards the 'funky design' of the '70s? I'm hoping to see more digital image makers create work that doesn't get thrown away with yesterday's newspapers." ◀

You can reach P.J.Saine at *patrick.j.saine@hitchcock.org*. Learn more about ophthalmic photography from the Ophthalmic Photographers' Society at *webeye.ophth.uiowa.edu/ops/*.