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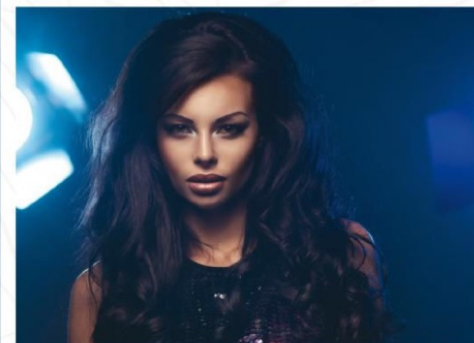


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POPULAR PHOTOGRAPHY (ISSN 1542-0337) (USPS 504-890) is published bimonthly (6 times a year) by Bonnier Corporation, 2 Park Ave., New York, NY 10016. March/April 2017, Volume 81, Issue 2. Copyright ©2017 by Bonnier Corp. All rights reserved. Reprinting in whole or in part is forbidden except by permission of Bonnier Corp. Periodicals postage paid at New York, NY and additional mailing offices. **POSTMASTER:** Send address changes to **Popular Photography**, P.O. Box 6364, Harlan, IA 51593 or email to **PPHcustserv@cdsfulfillment.com**. If the postal service alerts us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within one year. Publications Mail Agreement No. 40052054. Return undeliverable Canadian addresses to: IMEX, P.O. Box 25542, London, ON N6C 6B2. **SUBSCRIPTION SERVICES:** Visit **www.PopPhoto.com/cs** to manage your account.

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EDITOR'S LETTER



PETER HURLEY

In Praise of Craft

The word has fallen out of favor. Craft. It sounds dusty and old-fashioned—corny, even. As for the practice itself, in a world that measures the

importance of an image by shares and likes, where pictures are created to be consumed and then forgotten, why bother?

Yet, craft is something this magazine celebrates and encourages in every issue. We look for photographers whose work exemplifies it. We ply them with questions to reveal their techniques. And we explain the tools you might need in your own photographic practice.

You can see the results throughout this issue, though you may think some of the photographers we profile a little mad in their pursuit of craft. Take Ingo Arndt, who traveled the globe capturing exquisite photographs of something most people take for granted: grass ("The Grass Menagerie," page 42). Or Teresa Engle Schirmer, who toils with toxic chemicals and elaborate handmade masks to render famous photographers' images in flawless black-and-white prints ("40 Years in the Dark," page 62). Or David Arky, who marshals a team of stylists, model makers, and technicians to create deceptively simple visual metaphors for very complex ideas ("High Concepts," page 68).

What better way to recognize your achievements in craft than by showcasing the winners of our 23rd Annual Readers' Photo Contest ("A Winning Year," page 50). Our biggest, most important competition of the year conferred \$250 on each of the six category winners and \$1,000 on the winner of the Grand Prize. This year, by the way, it turns out that only one of our prize winners is a professional photographer. The rest are all avid enthusiasts, ranging in age from their 20s to their 80s, who work hard to make wonderful pictures.

That's because craft still matters. A great photograph tells a story, sells an idea, delivers information, elicits emotion, conveys beauty—sometimes all of these at once—more effectively than any pedestrian shot can. Without craft, a picture's message might be lost. But master your tools and you can create photographs that chime with meaning and sing with delight. Yeah, that's corny. But it's still worth the effort.

Miriam Leuchter



NEWSSTAND Satoshi got the deep focus in his photo of the Olympus OM-D E-M1 Mark II and Apple iPhone 7 Plus by stacking images shot at various planes of focus. Cover story, page 60.

SUBSCRIBER Christopher MacDonald spotted this fox on a walk in the park. Good thing he had a real camera and long lens! See more winners, page 50.

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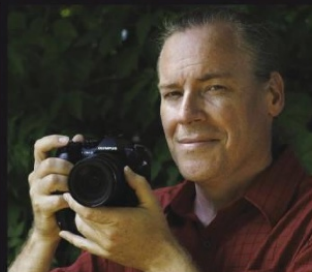
PETER BAUMGARTEN HAS BEEN an acclaimed pro and educator for over 30 years and a proud Olympus Trailblazer since 2014. Here's an inspiring first person account of how his Olympus OM-D E-M1 Mark II lets him create images at an entirely new level.

"While photographing this beautiful Harris Hawk at the Wye Marsh in Midland, Ontario I was blown away by the incredibly fast, precise AF of my new Olympus OM-D E-M1 Mark II as I tracked the bird in flight," recalls Baumgarten. "At 15 fps using the mechanical shutter, and a blazingly fast 60 fps using the silent electronic shutter, this camera can easily handle any extreme action scenario. As the hawk came to rest I moved for a portrait, choosing the M. Zuiko 40-150mm f/2.8 PRO lens to capture an exquisitely sharp, detailed image that would elevate this majestic creature. Being able to move quickly and confidently from one challenging

shooting situation to the next is the hallmark of this remarkable camera."

"As an outdoor photographer I really appreciate the light, compact form factor and weather-sealed construction of this latest top-of-the-line Olympus OM-D because I know it can handle anything Mother Nature throws at it. With 121 cross type AF sensors that use both phase and contrast detection, I am now consistently capturing great wildlife shots that I simply couldn't get before. In short, the astonishing performance of the OM-D E-M1 Mark II has exceeded my highest expectations"

There are of course even more awesome capabilities built into the amazing Olympus OM-D E-M1 Mark II, from its top-performing, in-body 5-Axis Sensor-Shift Image Stabilization to UHD video capture, to built-in Wi-Fi and dual card slots. You could say that it sets a new professional standard—and you'd be right!



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¹ Sequential shooting speed as of September 2016, when using Silent Sequential Shooting H Mode S-AF.
² With M.Zuiko Digital ED 12-100mm f4.0 IS PRO lens, as of September 2016.

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Head Space

Sunshine State native Clarissa Bonet was in for a shock when she moved to Chicago to get her MFA in Photography. Her customary tropical surroundings were replaced with cold concrete, steel, and glass. This photograph, titled "Mixed Use," is from her ongoing series *City Space*, a project that was born out of Bonet's sentiments about her new home. Feeling at once attracted to and overwhelmed by the towering built environment of downtown Chicago, she began using her own experiences of the city as templates for elaborately staged images. Bonet casts models, chooses their wardrobes, and meticulously plans each photo, scouting locations in the city and taking note of the best time of day to shoot. "My favorite thing about this image," Bonet relates, "is the disorienting effect that is created by the façade of the building in combination with the vantage point of my camera. It's reminiscent of the urban environment—strong, disorienting, and beautiful."

NEXT

THE HOTTEST NEW STUFF AND THE TECH TRENDS BEHIND IT

JUST OUT TOP TOOLS

Cine Shooter PANASONIC LUMIX GH5

The latest Micro Four Thirds ILC should be equally attractive to video and still shooters. Its weather-sealed body contains a stabilized sensor that pumps out 20.3MP stills at 9 frames per second with the benefit of continuous autofocus. It shoots 4K at 60p and FullHD (1080p) video at 180 fps. Still shooters get improved focus tracking, with 225 AF points. **\$2,000, body only, street; panasonic.com**

Fast Glass MEYER OPTIK NOCTURNUS 50MM F/0.95 II

Just like glass that made Meyer's name in the early 20th century, this super-fast prime is handmade in Germany—and priced to match. Fully manual and clad in an all-metal housing, its 10-element, 7-group optics focus to 1.6 feet, and its uncommonly large f/0.95 aperture lets light pour in. For now, it's strictly Sony E-mount. **\$3,000, direct; meyer-optik-goerlitz.com**

What's Up, Dock? OWC DRIVE DOCK

Stuck in a cycle of buying pricey drives for your data-hungry still and video shooting? Scoop up one of these docks that accept bare 2.5-inch and full-size hard drives—they're cheaper to replace than fully enclosed alternatives. With two bays, you can easily back up data to a second drive. One USB 3 and two Thunderbolt ports promise data transfer rates up to 477 MB/s (write) to speed your archiving. **\$242, street; macsales.com**

MAJOR UPDATE



IMAGE EDITOR



Retooled Tablets WACOM INTUOS PRO

The premier name in graphics tablets updates its industry-standard Intuos line in medium and large sizes. Happily, both tablets now include Bluetooth; their predecessors required adapters. They ship with a reworked stylus with improved pressure sensitivity and allow for swappable "texture sheets" (not included) for dialing in your ideal surface friction. **\$350 (medium) or \$500 (large), street; wacom.com**



Pro-level 17-inch printer P.16

Five cool new lenses P.18

Exhibits and books to check out P.20

Through a Filter Darkly SYRP SUPER DARK VARIABLE ND FILTER

For that long-exposure landscape, consider this variable neutral-density filter that can absorb 5–10 stops of light. This inky Japanese glass filter will allow you to use slower shutter speeds in bright daylight while still maintaining maximum depth of field. Available in 67mm (small) and 82mm (large) sizes, each ship with step-up rings to fit a wider array of glass. A leather case is included to keep them all safe. **\$170 (small) or \$210 (large), street; syrp.co.nz**



Pint-Sized Power CANON POWERSHOT G9 X MARK II

Not ready to cede shooting to your smartphone but still want something small? Canon's latest high-end compact has a 20.2MP 1-inch sensor and Digic 7 processor, touted as providing improved autofocus tracking. To make sharing your shots easier, the camera also offers Bluetooth and Wi-Fi connectivity. High-speed shooting tops out at 8.2 fps, for both JPEG and Raw files. **\$530, street; usa.canon.com**



STILLS ONLY

Modern Classic LEICA M10

Slimmed down to match the depth of Leica's film cameras, the M10 lets shooters switch bodies seamlessly. The viewfinder is about 30 percent larger than the one on the M9. A new full-frame CMOS sensor boasts 24MP and sensitivity up to ISO 50,000. Bursts of 5 frames per second allow upwards of 100 JPEGs or 30 DNGs before the buffer fills. With a magnesium-alloy chassis and top and bottom plates milled from solid brass, the M10 maintains the weighty, solid feel Leica shooters love. **\$6,595, street; us.leica-camera.com**



SLIM STYLE

Luxe Light

PROFOTO PRO-10 This powerful unit outputs a staggering 2400 W/s at durations as fast as 1/80,000 sec. Not only will it let you freeze studio action in new ways, but it also recycles nearly instantaneously, providing a mind-boggling 50 flashes per second. Fully integrated with Profoto's wireless TTL triggers, it's also compatible with more than 11 different heads, so you might not have to go out and buy more equipment to use it with. That's a good thing given the Pro-10's extremely pro-level price. **\$13,970, street; profoto.com**

Lower Your Profile MINDSHIFT GEAR SIDEPATH

For short trips or shooting *sub rosa*, this sleek, versatile bag doesn't announce that you're a photographer. Its lightweight nylon design holds a configurable padded equipment cube for ILC bodies and small DSLRs along with shorter zooms or primes. With both a tripod-mounting system and a routing portal for hydration pouches (not included), it is equally at home on the mountain and on the streets. Available in black and red. **\$100, street; mindshiftgear.com**

F.Y.I.

DXO announced an early 2017 release for a free update to its app for using multiple cameras to shoot to Facebook Live. It's slated to allow users to preview footage and select between feeds from up to three different cameras all recording in real time.

AT THE CES show in Las Vegas in January, Kodak announced the revival of production of its Ektachrome color-reversal still- and motion-picture film stocks. Without making any promises, it claimed to be looking into bringing back its beloved Kodachrome too.

FUJIFILM announced the release of a gunmetal gray version of its X-Pro2 mirrorless rangefinder-style camera, our 2016 Camera of the Year, as well as the roll-out of a silvery edition of its popular X-T2 model.

THE LOWDOWN

LensRentals.com, which rents more than just lenses, is a popular source for all kinds of high-end photo equipment. It reported that its most popular item in 2016 was the Canon EOS 5D Mark IV. Sony's Alpha a6300 and Nikon's D500 snagged second and third place for the most-rented still cameras.



SWEET 17

Large-format power for the home studio

IT'S BEEN six years since Epson wowed photographers with its Stylus Pro 4900 professional inkjet printer. Now a successor has finally arrived. The new SureColor P5000 (\$1,795, street), like its predecessor, accepts 17-inch roll media or cut-sheet paper up to 17x22 inches—and uniquely among Epsoms in this price range, it can accept sheet media both front-in and front-out. Its fairly compact size lets it fit in a home office or small studio, putting lab-quality prints within reach of those who lack the space or budget for larger printers.

But the P5000 is more than just an incremental update. Shifting to Epson's SureColor family, it brings with the new name a new inkset: The latest UltraChrome HDX set comprises 10 colors, including four blacks—photo, matte, light and light light—along with orange and green

STANDOUT SPECS

MAXIMUM SHEET SIZE: Standard cut sheets, 17x22 in.; roll paper, 17x1200 in.

INKSET: 10 pigment-based inks; 200ml cartridges

DIMENSIONS: 34x30.2x15.9 in (closed); 114.6 lbs

PRICE: \$1,795, street; replacement inks, \$87

INFO: epson.com

pigments, as well as regular and light versions of its cyan and vivid magenta. This is the first time that the full range of pigments will be available for a printer of this size, having previously been relegated to 24- and 44-inch models.

Epson claims that the photo and matte black formulas provide a 150-percent boost to black densities from the older UltraChrome HDR pigments and wider contrast ratios overall. To cut down on bronzing—when darker prints are viewed at an angle and reflected light gives the image a brownish metallic look—Epson reformulated its cyan and magenta inks, enhancing their absorption by inkjet media.

Like the P5000's larger SureColor cousins, the new printer also has Epson's PrecisionCore TFP print head, the piece of hardware that's

responsible for actually laying down the ink. This small (and very expensive to replace) component incorporates a 1-micron crystal film that flexes when an electric current is applied to it, acting as a pump. While Stylus Pro models rely on similar technology, this new print head, similar to the larger versions in the SureColor line, includes 10 channels and 360 nozzles with an ink-repellent coating. These advancements, Epson told us, help reduce nozzle clogs and allow for printless nozzle checks, which should save you time and ink.

While these features may not sound flashy, if they live up to Epson's claims, they stand to noticeably improve print quality. We look forward to giving a review unit a full test when they are available.

—Adam Ryder

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GLASS APPEAL

EXPECTING A handsome tax refund? It may be time to consider picking up some of the latest glass for your kit—especially if you've gotten a new camera recently. These lenses sport high-tech optics, with low and anomalous partial dispersion elements to enhance image rendition, and some even boast hot-ticket features such as de-clickable apertures for video. In step with recent trends, most of those listed here are wide-angle or short telephoto primes. —Adam Ryder

1 Canon EF-M 18-150mm f/3.5-6.3 IS STM \$500

This new lightweight zoom for Canon's line of mirrorless ILCs—it was designed specifically for the M5—comes in two colors for style-conscious shooters. **HOT:** Its image stabilization, touted as delivering an extra 4 stops of handheld shooting, works in tandem with the M5 body to boost steadiness when used without a tripod. **NOT:** With a low price and long maximum focal length comes a narrow f/6.3 maximum aperture when racked out—not great for shooting in low light.

2 Rokinon 20mm f/1.8 ED AS UMC \$600

True to form, Rokinon's most recent release, which ships in Canon EF, Nikon F, and Pentax mounts, offers bang for the buck by sticking only to manual focus. **HOT:** The optical makeup of the lens includes two aspherical and three low-dispersion optics to constrain spherical distortion and work against color fringing. Plus, the 7.9-inch minimum focusing distance lets you get up close. **NOT:** Shooters who rely on autofocus may struggle to adapt to a manual optic.

3 Tokina Firin 20mm f/2.0 FE MF \$800

This latest wide-angle for Sony full-frame E-mount ILCs has some surprises up its sleeve: Nearly half of the elements are specialized optics designed to cut back chromatic aberration and image distortion. **HOT:** Although it focuses manually, electronic contacts on the mount communicate aperture and focus distance info to the camera body, so metadata won't be lacking. **NOT:** Close focus tops out at nearly a foot, not outstanding for this focal length.

4 Sigma 85mm f/1.4 DG HSM | A \$1,200

The newest member of the brand's prestigious Art line, available in mounts for Canon EF, Nikon F, and Sigma SA, promises to deliver on its good name, incorporating three types of specially formulated elements to help render sharp images. **HOT:** It's compatible with Sigma's USB dock, allowing you to update and tweak the lens's firmware. **NOT:** The glass required for such a wide aperture at this focal length means that it's also quite heavy—almost 2.5 pounds!

5 Leica Summilux-SL 50mm f/1.4 ASPH \$5,295

For use with Leica's SL body, this optic is one of only three lenses currently on the market for the system—and the only prime. **HOT:** It's compatible with Leica's less-expensive APS-C-format T-series, and its weather sealing and (almost assuredly) outstanding optics would make it a fine 75mm-equivalent for that system. **NOT:** At a price far exceeding that of most camera bodies, it may be out of reach for most shooters.

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SPRING SHOWS



WATER'S EDGE

CALEB CHARLAND, INVERSIONS *Gallery Kayafas, Boston*
APRIL 14–MAY 20 These prints may remind you at first of Hiroshi Sugimoto's seascapes, but they demonstrate an entirely different approach to capturing the nature of water and light. Maine-native Charland photographs the surface of a pond in his home state and prints his negatives on half a sheet of darkroom paper. After developing the bottom of the image, Charland folds the photo paper in half and exposes it to light, creating a negative image on the top; the result is clever illusion that blends craft and concept.

Coming Soon

CONTEXT *Filter Space, Chicago*

MARCH 3–APRIL 22 A group show exhibiting works from more than a dozen artists, this is the result of the Chicago photography nonprofit Filter Space's yearly spring call for submissions. Photographs are selected for exhibition by rotating curators—this year Natasha Egan, who has curated shows from Houston to Dubai, presides.

BOOKS

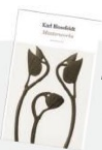
LOOKING BACKWARD: A PHOTOGRAPHIC PORTRAIT OF THE WORLD AT THE BEGINNING OF THE TWENTIETH CENTURY, MICHAEL LESY (W.W. Norton, \$50)

A selection of nearly 250 stereoscopic photographs that show how the West perceived its world a century ago.



BERND NAUT SMILDE: BURIED REMNANTS (Damiani, \$50)

The first monograph of the work of Dutch artist Smilde, who stages photographs by creating artificial clouds in opulent interiors.



KARL BLOSSFELDT: MASTERWORKS, ANN WILDE AND JÜRGEN WILDE (D.A.P., \$55)

Spare, poetic photos of flora from a self-taught pioneer in the technique, still lovely almost 100 years on.

WALEAD BESHTY: INDUSTRIAL PORTRAITS (JRP|Ringier, \$30)

In the first of two books, Beshty photographs the artists, assistants, and go-betweens in his sphere, documenting them in an almost anthropological fashion.



THE PHOTOGRAPHY SHOW *Pier 94, New York*

MARCH 30–APRIL 2 Now in its 37th year, the Association of International Photography Art Dealers (AIPAD) hosts its expansive showcase of galleries and publishers from the U.S. and around the world. You'll see both museum-quality work and sometimes even affordable prints from contemporary artists and historical masters of the medium, all within a vast exhibition hall on the Hudson River.

Last Chance

HARLEM HEROES: PHOTOGRAPHS BY CARL VAN VECHTEN *Smithsonian American Art Museum, Washington, D.C.,*

THROUGH APRIL 2 Legends of the Harlem Renaissance, from Ella Fitzgerald to Langston Hughes, take center stage in this series of portraits, variously casual and contrived, from the federal collection. The works themselves are handmade gravure prints from Van Vechten's original negatives.

RESISTANCE, PROTEST, RESILIENCE

Minneapolis Institute of Art

THROUGH APRIL 16 Some 60 photographs from the museum's collections highlight crucial moments of social unrest, from the Iranian Revolution to the Civil Rights Movement, seen through the lens of some of the 20th century's greatest documentarians, including Gordon Parks, Danny Lyon, and Stan Douglas.

DETROIT AFTER DARK: PHOTOGRAPHS FROM THE DIA COLLECTION *Detroit Institute of Arts*

THROUGH APRIL 23 The Motor City's Art Deco dereliction and glaring fluorescent street lights are on display in this exhibit of gritty nighttime scenes from the museum's collection. Images of Detroit's storied rock scene share the walls with portraits of the city's hip-hop artists, metal workers, and graffiti artists.

BREAKING NEWS: TURNING THE LENS ON MASS MEDIA

The Getty Center, Los Angeles

THROUGH APRIL 30 The lens-based arts and news media share more than just technical production methods, as this exhibition reveals. Sarah Charlesworth and other Pictures Generation affiliates are joined by contemporary counterparts such as Omer Fast, whose incisive re-cuts of CNN broadcasts exemplify the potential of news as a creative resource.

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CONVERSATION, INSPIRATION, CONTESTS, AND YOUR QUESTIONS ANSWERED

A tree grows
in Washing-
ton P.26

Letters to
the editors
P.27



MY PROJECT

WHAT'S IN A NAME?

A distinctly American family album

IT ALL STARTED on Facebook.

In 2011, photographer Amanda Hankerson, then based in Minnesota, received a message from a stranger inquiring if they might be related. In New York, Diane Hankerson was

looking into her family's lineage. Amanda Hankerson is white and Diane Hankerson is African-American. Their conversation would spark an art project that tells a genuinely American story going back more than two centuries.

"I felt an immediate connection to her," the photographer says of

meeting the New Yorker. They shared family stories and curiosity about their origins, and Amanda made a portrait of Diane. Both women could trace their family histories to 18th-century Barnwell, South Carolina. Further research showed the surname Hankerson connects



Amanda Hankerson
Now living in L.A., she runs her own advertising photography studio, Hunt + Capture, with longtime collaborator Lacey Criswell.



MEET THE HANKERSONS

Clockwise from far left: Matt, Roseville, MN; Dianne, Boynton Beach, FL; Elizabeth, Birchwood, WI; family photos, St. Paul, MN; Zabian, North Miami, FL; Brett, Wells, MN; palm tree, Tampa, FL; Anissa, Ft. Lauderdale, FL.

a relatively small number of individuals to a shared history of slaveholders and enslaved people spanning 260 years.

Finding out that her ancestors owned slaves surprised her. She learned there are fewer than 3,000 Hankersons in the U.S., and less than 10 percent of them identify as white. "Growing up in a white community like I did, there wasn't a discussion about race. This project,

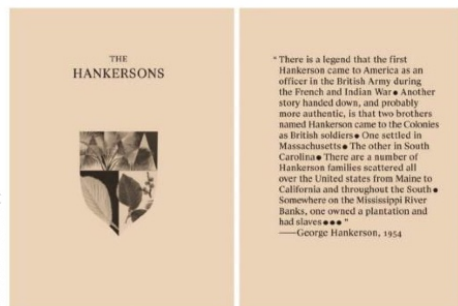
in a way, has given an entryway into the conversation," at least for her own white family, she says.

Amanda decided to meet as many Hankersons as she could—to hear their stories and create a family album of their portraits. After reaching out to others with her name on Facebook, and getting two grants from the Jerome Foundation and the Minnesota State Arts Board, she was on the road.

Armed with a Phase One 645DF medium-format DSLR with a P45 digital back and two lenses (45mm f/3.5 LS and 80mm f/2.8 LS Schneider-Kreuznach), Amanda drove through Florida, Georgia, and South Carolina, visiting Hankersons and making their portraits along the way. She photographed two portraits of each person at home—one close up and one from farther away that showed the context—

AMANDA HANKERSON (9)

SHARE MY PROJECT THE HANKERSONS



WE ARE FAMILY
More far-flung Hankersons from Florida and Minnesota, paired across the lines of race, time, or location. Plus, a design for a book cover for the project.

along with pictures of personal possessions and objects from their environments. She took her time, photographing one person or location a day, "to allow them enough time to learn about the project and build a rapport. That really ended up being an important part of the project," she says.

"Most of the people who wanted to participate had a strong desire to

connect," she adds. "The longing for family is universal." To her delight, she experienced "a huge welcome" into other Hankersons' homes and was truly treated like family.

She arranged the images into diptychs that combine images of (or things owned by) two different people. By pairing disparate portrait subjects or a portrait with, for instance, an old family photo,

map, or object, the work suggests connections—both visual and historical. "Records of African slaves and early European immigrants are often sparse, incomplete, lost or never existed," she says. "I suspect that there is far more missing from the Hankerson legacy than there is to be found—this Hankerson story is really an American story."

—Vanessa Mallory Kotz

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PINE SENSE

Seeing the trees for the forest

ALTHOUGH HE wasn't a photographer, the writer and naturalist Henry David Thoreau had sage advice for today's shooters: "It's not what you look at that matters, it's what you see." Glen Van Slooten seems to have channeled the *Walden* author on a Mentor Series trek to Mount Rainier National Park in Washington State, where he captured this bonsai-like coniferous sapling.

While not as spartan as Thoreau's accommodations on Walden Pond, Van Slooten's lodgings at the park's Paradise Inn did lack internet service and cell phone reception, which he credits for the quality time he and the other participants

LITTLE WRIT LARGE With his 70–200mm f/2.8 lens zoomed to 200mm, Van Slooten isolated this pine sapling with an f/2.8 aperture at 1/3200 sec and ISO 2000.



GLEN VAN SLOOTEN (SAPLING); LOUIS FLENTES (HEADSHOT)

shared with each other and with mentors Wolfgang Kaehler and Tamara Lackey.

Van Slooten was walking along a trail behind his lodge while chatting with some fellow trekkers when the tiny tree caught his eye. Recalling a prompt by Kaehler to consider smaller elements of the natural landscape when shooting, he quickly snapped three images of the little pine.

"I did not fully appreciate the shot until I got home," he says. "I loved the lighting and the fact it was located a perfect distance from the trail that allowed me to shoot it at 200mm and f/2.8, which filled the frame. I purposely shot wide open to get a shallow depth of field so the tree would dominate the focus from the surrounding plants. I like the way this worked to make the tree stand out from the background."

Playing with scale, Van Slooten captured an image that described his surroundings without relying on the vista of the mountain. "I love the colorful, out-of-focus plants, which provide a sense of the fall environment we experienced," he says. Though he was shooting alongside other photographers, he notes, "some people just see things that others miss."

—Adam Ryder

Glen Van Slooten

A professional chemist from West Palm Beach, Florida, Van Slooten began shooting in the 1970s but became more serious about 10 years ago when he purchased his first digital camera.



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TINTYPE TRICK?

The picture on page 70 in the January/February 2017 ("Tin Works"), "John Wayne's Special Spot," is reversed left to right. I took the same picture in 2003 and have a record of the landscape. Is this the result of tintype photography?

Greg Brammer
Cincinnati, OH

I ENJOYED your article "Tin Works" but noticed something odd about the images created by Lisa Elmaleh. Then it struck me, especially with the image on the top of page 74. The image of the band shows a rare, amazing, and practically unheard-of collection of all left-handed musicians!

Curiosity got the better of me and so I went to the band's website and the mystery was solved. Is there some reason the images on both page 74 and page 75 are reversed? And by the way, the band's name is "Hogstop String Band," not Hogstop. Just thought you might want to know.

Jeff Adrian
Minnetonka, MN

...IT LOOKS to look to me like the pictures got flipped in the reproduction! Tintypes use no negative, so this couldn't be a case of the negative's having been printed emulsion-side up. What happened?

William Fagal
Berrien Springs, MI

EDITOR'S NOTE: So many of you noticed this mirror effect in the tintype photographs we published that we went to an expert to explain it. Says Geoffrey Berliner, executive director of the Penumbra Foundation and the Center for Alternative Photography, "The reason the images are reversed is because they are

direct positives, not positives made from a negative, which would reverse the image when a negative is printed to a positive. In a sense, a tintype is really a negative that has been processed to be a positive. This is why right-handed people appear to be left-handed."

I ENJOYED my glimpse of Tyler Haughey's look back at the New Jersey resorts in the December issue (My Project, "Ghosts in Winter"). However, I must totally disagree with the author's opinion that "his images remind us that nostalgia is something to be visited for a short amount of time and then left behind." In my opinion, his images remind us that we should preserve as much of our history as we can.

Earl F. English
Rochester Hills, MI

POPULAR PHOTOGRAPHY

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HOW

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Light an interior P.40

SCREEN GEMS

Diffuse a picture by shooting through mesh

JORDAN TIBERIO, a Brooklyn-based fine art and commercial shooter, uses photography to explore the concept of the

THE GEAR

• **CAMERA** Tiberio used a **Canon EOS 5D Mark II** for this series, but any camera that lets you focus manually will work. This is how she locked onto the screen without having to deal with an ever-hunting autofocus system. Live View mode also helped, since enlarging the finder image in her camera's LCD monitor made it easy for her to confirm focus.

• **LENSES** Tiberio shot with **Canon's EF 24-70mm f/4L and 50mm f/1.4** lenses. But other lenses will work, depending on the size of your window screen: The larger it is, the wider your focal length can be. You do need a lens that focuses close, because if the screen is too far away, its texture and individual cells won't read.

• **OTHER GEAR** Tiberio shoots with her camera on a tripod. And if you don't have an assistant to hold the screen in place, bring a clamp to attach the screen to a light stand.

past: the pull of memory and the aesthetic potential in times gone by. She produced the pictures you see here for her series *The Girl Next Door*, which grew out of this passion. "I try to create moments that are familiar or reminiscent of something universal that can speak to anyone, not just to me," she says.

To visually suggest a separation between present and past, she placed a window screen between the camera and subject—a technique she took from a favorite Irving Penn photo, "Summer Sleep, New York." Using the screen as a temporal diffuser, Penn gave his portrait a faintly nostalgic, but also voyeuristic, quality.

If you want to attempt something similar, Tiberio suggests buying a framed window screen from a home improvement store. She used a 21x10-inch screen, which she said was easy to handle but often too small. Its compactness limited the amount of background detail that she could capture before the screen's frame nosed into her shot. You might consider a screen built for a larger window if you want to capture a wider scene.

She likes to photograph people and floral subjects behind the screen, especially with brightly lit and colorful backgrounds. Try to avoid low light, she advises, because the individual cells within the screen won't read well and will cause the image to lose its mosaic quality. Although shooting outdoors at or around noon on bright, sunny days is something photographers usually avoid, for this technique it can actually work to your advantage.

Tiberio started spraying water onto her screens after observing rain's effect on windows. By adding water to her screens, she blocks our

view of the subject and background in a seemingly random way that underscores her metaphor: "I love how [the water] breaks up the monotony of the texture created by the repeating pixel-esque screen cells," she says. "The dashes of water that obstruct bits of my scenes represent the fragments of our memories lost to time."

To try the same idea, you don't have to wait for rain, of course; Tiberio carries a water bottle along with her into the field.

The photographer also uses wardrobe and styling to invoke a dreamlike past. "I like to use vintage clothing in my shoots, and many of the pieces come from my own wardrobe or from my models'." I often shop for myself with my photography in mind," she says.

Tiberio selects her color palette with an eye toward memento, and often experiments with color adjustments in postprocessing. One thing she bears in mind is the color rendition of the Polaroid prints she enjoyed viewing as a child.

Another technique for suggesting the past: "Most of the images of the model in *The Girl Next Door* don't show her face, because I wanted the series to have a universal quality," Tiberio says. "I didn't want the viewer to focus on the model's features, her expressions, and who she might be. She could be anyone. The pixelating effect of the screen also breaks up the model's face into vague and unknowable pieces."

—Peter Kolonia

Step 1

Scout for locations.

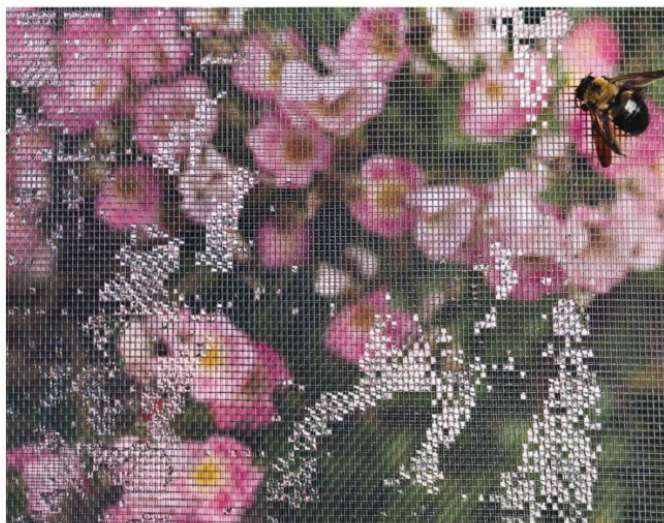
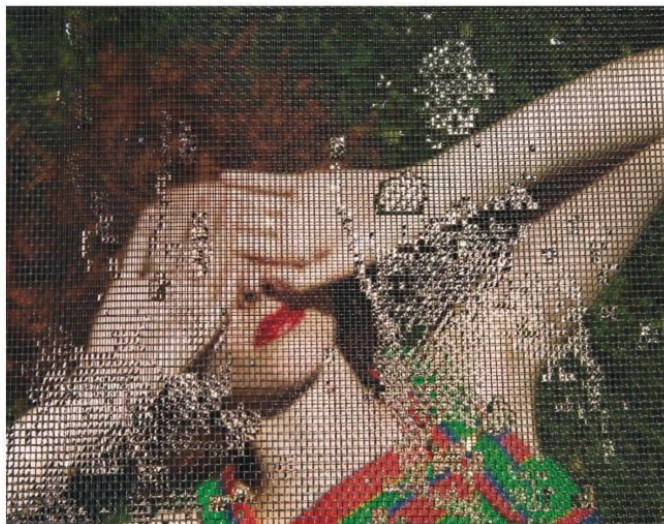
Tiberio recommends backgrounds with strong color and lines. "It might sound crazy, but pull your lens out of focus and study the scene in front of you through your



JORDAN TIBERIO

Texte

HOW YOU CAN DO IT SHOOT THROUGH A SCREEN



camera's viewfinder. Look for bright blurs of color and graphic lines. Architectural elements can help here. Definitely choose backgrounds that are geometric in nature. You want buildings or foliage that can be abstracted [by the screen],

but still be recognizable," the photographer says.

Step 2

Compose the scene.

Working with your camera on a

MANUAL FOCUS AND EXPOSURE
Tiberio set her ISO to 100 and shot the top photo at f/10 and 1/80 sec and the others at f/5.6 and 1/125 sec.

tripod, determine what you want to include in the scene. This will dictate the focal length of your lens and how close the screen should be to the camera. With an assistant holding the screen, Tiberio manually focused on its surface, selecting an aperture that threw her distant subject adequately out of focus—blurred, but not too blurred. Placing the screen in shadow and away from strong ambient light will allow its texture to read better.

Step 3

Tweak screen texture by adding water.

"Experiment with the patterns you create when adding water to the screen. I always hit the screen or flick it with my finger after I douse it to create water patterns that I customize for each scene," Tiberio says. Obviously, you don't want the water to completely blot out your subject.

Step 4

Add props.

To add dimensionality to a scene, consider attaching objects to the screen. Flowers, leaves, shadows, or the bumble bee in the photo at left can link or comment on the relationship between foreground and background while adding narrative interest and dimension.

Final Step

Tweak with software.

"Finesse in post by sharpening and creating a vintage feel. I apply an unsharp mask in Adobe Photoshop to all of these images. It makes the texture of the screen pop more cleanly," Tiberio says. For the vintage feel, it all comes down to color temperature and saturation. She adds a cross-processed curve layer to many of her images and adjusts opacity for just the right effect.

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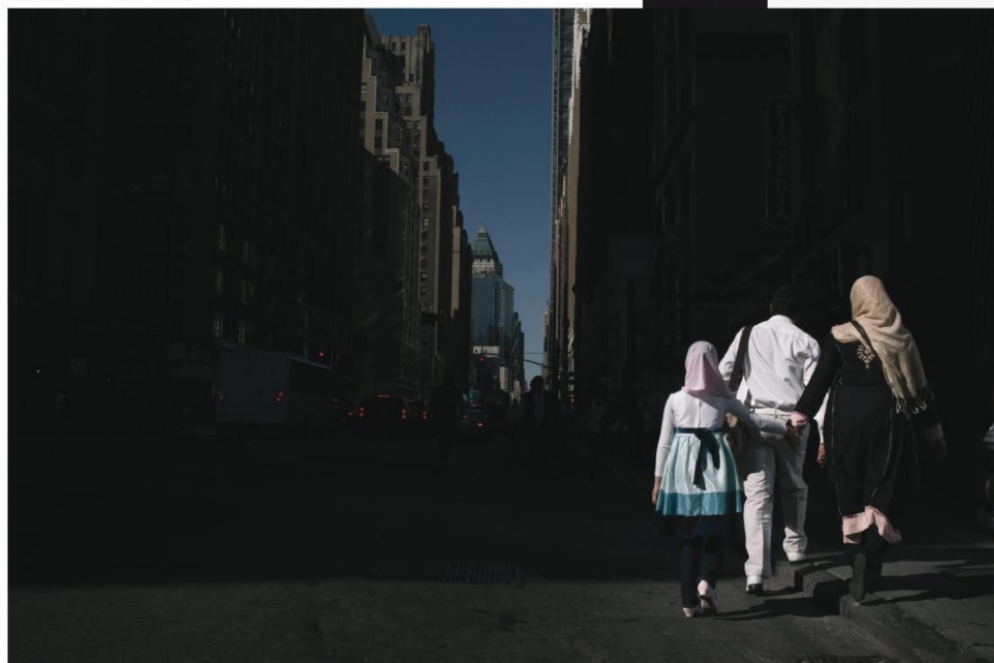


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FLEETING GRACE

Choose your decisive moment

"EDITING STARTS the minute you pick up the camera," says preeminent New York street photographer Joseph Michael Lopez. "Do the work on the street and do the work with rigor, sensitivity, and dignity, and that will lead you in the right direction."

Lopez, who made the image above as part of a commission from the Museum of the City of New York, knows about doing the work. He has been honing his craft for almost 20 years and is adept at spotting the important moments and plucking the best shot out of an array of outtakes.

A glimpse at Lopez's handful of pictures of this scene demonstrates

A NEW YORK MILLISECOND
"Midtown,"
2016, from
Joseph Michael
Lopez's Museum
of the City
of New York
exhibition, *New
York At Its Core*.
Leica M-P240
with 35mm f/1.4
Summilux-M
ASPH lens;
exposure
1/1000 sec at
f/16, ISO 800.

just how imperative choosing the right frame is to creating visual poetry. His first step was to find his location and previsualize his composition. With a frame in mind, Lopez paced, crossing and recrossing the street until he saw subjects who held potential. When he spotted this group, he began to move with them, capturing a succession of images as they passed through the composition he had envisioned.

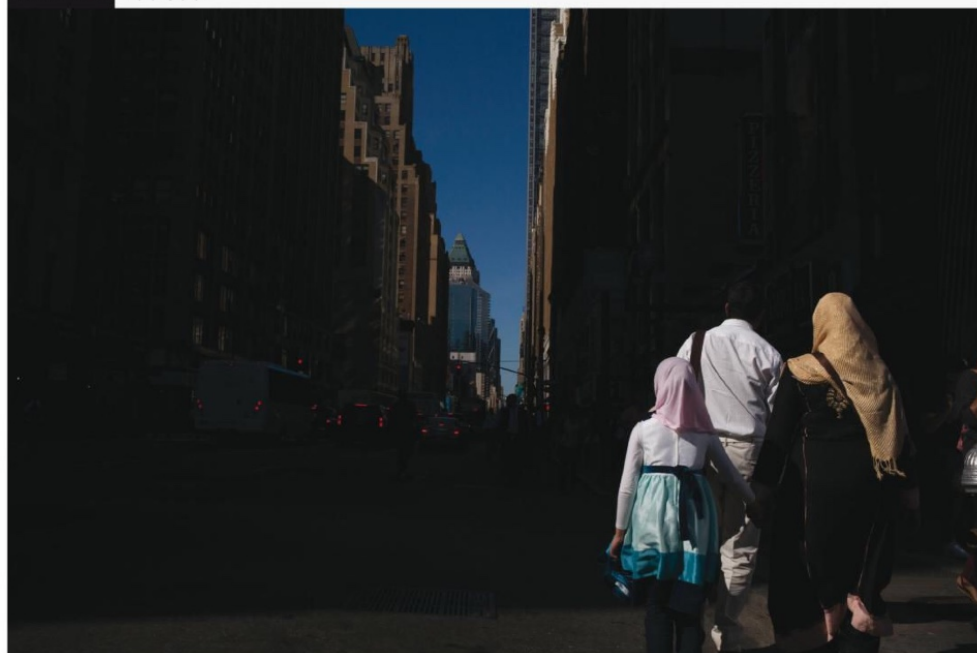
Because Lopez does little in post, the process of selecting his image is the second most influential decision he makes (after shooting, of course). Back at his studio, he uses blackout cloth to eliminate any light that would distract him from the images on his 23-inch calibrated display.

Using Adobe Bridge, he rates his favorites. He opens the best and zooms to 100% to check focus. He pays close attention to the edges, looking for balance and an optimal foreground/background relationship.

In picking the absolute best moments, Lopez faces a decision that is both subjective and philosophical: "Do you know who you are? Do you know what you want to say?" he asks. With time, Lopez notes, the answers to those questions will become clearer.

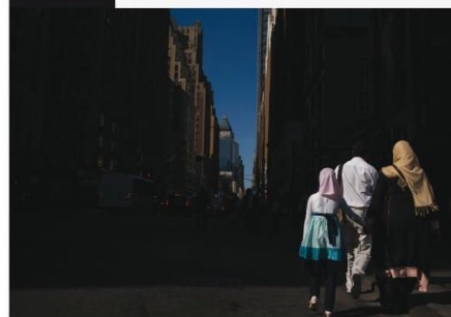
At the beginning, though, he recommends enlisting a friend with a great eye to look at your selects. Keep working and eventually, he says, your best shots will jump right out at you. —Debbie Grossman

OUTTAKE 1 TOO SOON



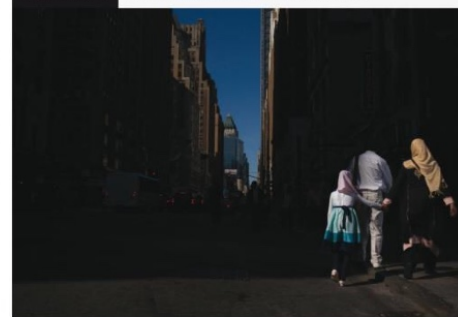
Lopez had the street's canyon, with its stripe of blue sky, in the frame, but the band of light across the foreground is too narrow here. The heads of the girl and the woman are in sync and have good body language, but the fact that they are holding hands gets lost in the shadows. Worse, their feet are cut off—something Lopez avoids.

OUTTAKE 2 PRETTY CLOSE



In a great street photograph, all the body language needs to be just right. The man's foot in this image is well placed, but the girl's foot is still cut off. The composition is nearly there, but he caught the pedestrians just a moment too soon.

OUTTAKE 3 THE MOMENT HAS PASSED



Lopez notes that what makes the final image sing is its "in-between-ness"—the way the group is partly in the street and partly on the sidewalk. That's happening here, too, but it doesn't play as exquisitely as it does in his final selection, where the hands of woman and child stand out clearly against the figure of the man.



HOT SPOT

Take a new approach to a geothermal mecca

"ICELAND IS unbelievably breathtaking, with very dramatic landscapes speckled with

sheep and horses," says travel photographer Jessica Sample, who shot this luminous scene of the iconic Blue Lagoon geothermal spa in Grindavík on the Reykjanes Peninsula in southwestern Iceland.

STEAMY SCENE
Jessica Sample shot the Blue Lagoon using a Canon EOS 5D Mark II with a 24–70mm f/2.8 Canon EF lens set to 70mm; exposure, 1/320 sec at f/5, ISO 160. "You can't take a bad photo in Iceland," she says.

"What makes it a photographer's dream is that, while there are as many tourists coming in every year as there are residents, it remains the least densely populated country in all of Europe—meaning there are no tourists walking into your shots," she says. "You can find yourself alone under a breathtaking waterfall or in a field of moss-covered lava. You feel like you're

the first person discovering each new landscape."

Based in Los Angeles, Sample travels the globe on assignment. She took this photo during her first trip to Iceland, in August 2016, and she is already dying to return. "Blue Lagoon is considered the Disneyland of hot springs there. Not all the other hot springs have that cool-looking blue water," she

says. "The color comes from the silica and the way it reflects in the light. The pool itself is around 100 degrees Fahrenheit, but the air temperature was probably around 50 to 60 degrees Fahrenheit."

She took this photograph early in the morning, which she says is a good time to beat the crowds. In this case, it made logistical sense as well. "Everyone stops at the Blue Lagoon, either on their way to the airport or from the airport. We had taken a redeye flight to Iceland, so it was our first stop at 8 a.m. right when they open," the photographer says. "It was nice because it didn't get very crowded until around 10-ish, and by then we were ready to go."

To get the picture's immersive perspective, Sample walked out on a platform, like a boardwalk, that is used to reach different areas of the lagoon. "You have to keep to certain spots, so this was shot all the way zoomed in, hence the compression of all the people onto one plane," Sample says. The angle of view isn't too telephoto, though—she captured a well balanced, and somewhat surreal, scene by shooting at 70mm on a full-frame DSLR.

"What I love about this shot is that it reminds me of people waiting for the bus or train—all lined up—but in water," she says.

Sample explains that her aim was to take some photos of the Blue Lagoon that would be different from the images we've already seen. "I only shot two frames like this, which I snuck in while taking pics of my husband in a white silica mask," she says. "I was shooting in a swimsuit and robe, and it happened so fast that I didn't realize I had even gotten this shot until I downloaded the images later."

—Jeff Wignall

MORE PHOTO OPPS

ICELAND IS A PHOTO ADVENTURER'S DREAM. HERE ARE FIVE PLACES AROUND THE COUNTRY TO CAPTURE.

HARPA (AUSTURBAKKI 2, 101 REYKJAVÍK)

Reykjavik's spectacular concert hall/conference center is one of the country's most impressive architectural works. "The glass panes mirror the basalt columns found naturally across Iceland," says Sample. "The building is stunning from the inside, especially at the end of the day with the sun setting." Look up at the ceiling for wild geometric patterns. Behind-the-scenes guided tours (in English) are every 45 minutes and cameras encouraged. en.harpa.is

LANDMANNALAUGAR

Lonely Planet says this area is filled with "mind-blowing multicolored mountains, soothing hot springs, rambling lava flows, and clear blue lakes." No surprise it's one of Sample's faves. Part of the Fjallabak Nature Reserve in the Icelandic Highlands region, the mysterious landscape is accessible only by 4WD or Super Jeeps (lots of tour companies will take you there). Sample advises bringing rain gear, as the weather is highly unpredictable. Primarily a mid-June to autumn destination, the area is also popular for guided Northern Lights tours in winter.

REYNISFJARA BEACH

Near the village of Vík, a little over two hours southeast of Reykjavik on Iceland's south coast, black sand (actually polished black basalt pebbles) frames dramatic cliffs of basalt columns where puffins and other seabirds live. Tall rock shapes known as Reynisdrangar, which legend says are trolls turned to stone, rise up from the sea and make a nice focal point for beach shots. Sample's advice: "Get there before or after the tour buses come." Waves and sea mist can be wild, so protect your gear; you may need to run, too.

SKAFTAFELL ICE CAVE

For a wintery wander, nothing beats hiking on a glacier and photographing a massive, luminous, blue ice cave. The Skaftafell cave in the Vatnajökull glacier region is considered among the best on the planet, and Trek Iceland offers guided tours. (Their exact location and timing depend on weather and cave conditions and access.) Tours last about four hours; glacier gear and safety instructions are included. trek.is/en/our-tours/glacier-hikes/skaftafell-ice-cave

THÓRSMÖRK NATURE RESERVE

A lofty mountain ridge line surrounding a wide glacial river valley that Sample says offers unequaled views of "unbelievably green and dramatic landscapes with lots of waterfalls and rivers," this is one of Iceland's favorite hiking areas (including the popular Fimmvörðuháls and Laugavegur trails). You can also view the nearby glaciers Eyjafjallajökull, Mýrdalsjökull, and Tindfjallajökull. She recommends a light tripod for hiking and a neutral-density filter to make the cascades look painterly with long exposures. Getting there is too rugged for rental cars—join a tour. icelandrovers.is



DEEP BLACK AND WHITE

The secret to b&w conversions? Layers.

HAROLD DAVIS wrote the book on digital black-and-white. Literally. His new volume, *The Photographer's Black & White Handbook* (The Monacelli Press, 2017), is a roadmap to creating intricate and beautiful b&w images.

Davis often begins his monochrome process with bracketed exposures. Back at his studio, he combines those exposures to make a few different high-dynamic-range images. Some of these he makes using HDR software and some he creates manually via layers and

masks in Adobe Photoshop. From there, he adds b&w conversion layers made with various filters and plug-ins. He masks those in order to display only the most useful and beautiful tones of each layer.

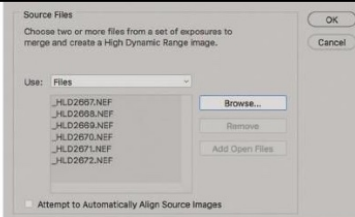
Sound complicated? It can be, especially as you add more layers. To get you started, Davis cooked up a simple version of his method beginning with the HDR software in Photoshop, then layering on b&w conversions via Photoshop and Google's free Nik Silver Efex Pro plug-in. Once you master this technique, you can start to get fancier.

—Debbie Grossman



Step 1

Open Bridge and locate your bracketed sequence. **A spread of +/-1 EV (adjusted by shutter speed) works well in most cases.** Note that this workflow can be modified to work with Lightroom rather than Bridge.



Step 2

Go to Tools > Photoshop > Merge to HDR Pro to open the files in Photoshop's built-in HDR tool. If you shot on a tripod and the subject was still, uncheck the box that attempts to align the source images.

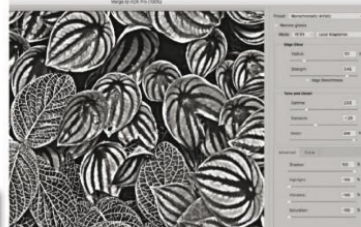


Step 3

Once inside the HDR tool, begin with the Default preset, then adjust it to your liking. Davis reduced highlights, brought up the shadows, and increased exposure overall to reveal more detail in the leaves. Once you are satisfied, click OK to open in Photoshop.

Step 4

Now head back to Bridge and grab that same group of bracketed images. Open them in the HDR merge tool. **This time, create a black-and-white version of the HDR.** Davis used the Monochromatic Artistic preset. Open it in Photoshop, too, and set it aside for later use.



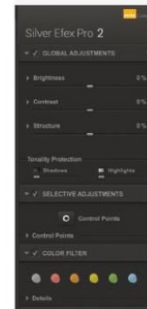
Step 5

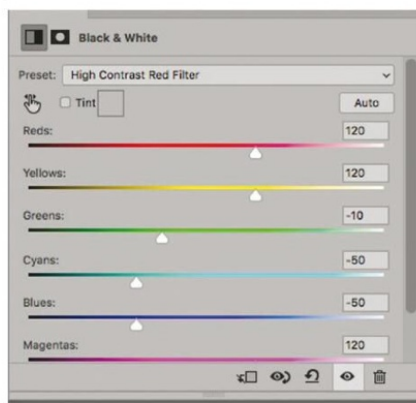
In Photoshop, find your first HDR merge—the one that's in color. Save it. **Double-click the background layer and rename it "default HDR with modifications."**



Step 6

You're now ready to create the first b&w conversion layer in your stack. **Go to Filter > Nik Collection > Silver Efex Pro 2.** Davis stuck with the Neutral preset. This will serve as your basic b&w conversion, so a flat image with maximum detail often works best. You'll add contrast with subsequent layers. Click OK to apply; your conversion will be added to your file in its own new layer in Photoshop.





Step 7

The image is off to a good start, but the leaves in the lower left should be more contrasty. This time, we'll use Photoshop's built-in b&w tool. Duplicate your color HDR layer and drag it up to the top of the stack. **Now go to Image > Adjustments > Black & White.** The High Contrast Red Filter brings out the contrast in those lower leaves. Click OK to apply, then rename the layer High Contrast Red Adjustment.



Step 8

Now mask off what you don't need from this latest layer. Alt/Option + click on the mask icon in the Layers Panel to add a black mask. Set the foreground color to white by typing D on your keyboard, then X. **Grab the brush tool, set both opacity and flow to 50 percent, and paint with white on the areas where you want to reveal contrast.**



Step 9

Remember the monochrome HDR you merged in Step 4? **Open it and, holding down the Shift key so it lands in the center, drag it on top of the High Contrast Red layer.** Name the layer Mono HDR and dial its opacity down to 20 percent—this helps to delineate the black lines in the leaves.

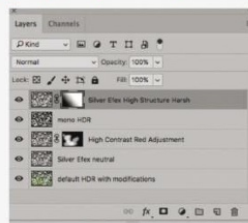
Step 10

The top right portion of the image could use more contrast and structure. **Click on the background layer and run Silver Efex again.** Go through the presets to see which does the best job—this time the High Structure Harsh preset is most useful. Apply it, then drag your new Silver Efex layer up to the top of your stack.

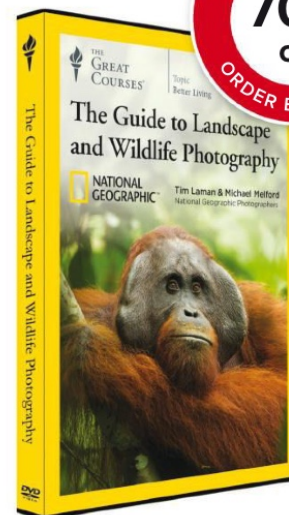


Final Step

Last, add a mask to hide the lower left portion of the High Structure Harsh layer. Type G for the gradient tool and D to set black as the foreground color and white as the background. **Make sure the mask is selected, then drag diagonally from the lower left to the upper right of your image to apply the gradient.** Save and archive the file as a PSD to preserve its layers. Next, choose Layer > Flatten Image to create a single-layer file to be your master image. Save that one to be a starting point for output to print or web.



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3. What's in My Bag?
4. Four Kinds of Light in Landscapes
5. Landscape Color Variation and Combinations
6. Nighttime and Daytime Skyscapes
7. Above- and Below-Surface Waterscapes
8. Landscape Photography Site Research
9. Drive-By Photography: Travel Photos
10. Computer Editing: Review and Cataloging
11. Computer Editing: Development
12. Five Ideas for Successful Landscape Photos

Wildlife

13. Wildlife Photography
14. Photographing Winter Wildlife
15. Photographing Island Wildlife
16. Nighttime Wildlife Photography
17. Documenting Biodiversity
18. Photographing Life in the Sea
19. Camera Traps for Elusive Wildlife
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LIGHT REPAST

Bump up an interior's appeal

GEORGE BARBERIS, a pro based in Portland, Oregon, has clients on both coasts who hire him for jewelry, food, commercial still lifes, and other subjects such as Manhattan restaurant Lupulo, shown here. It

presented several knotty lighting challenges that the photographer was able to knock out within a three-hour window between lunch and dinner shifts. "I was working with one assistant in a small space with very little time, so we needed to be as mobile and unobtrusive as possible," says Barberis. "It was tough having to

MODERN TOUCH Shot with a tripod-mounted Canon EOS 5D Mark III and 35mm f/1.4L II lens, this image is a composite of exposures, each taken at slightly different shutter speeds.

work around a busy New York City restaurant's schedule."

The eatery was divided into two spaces. Its long street-side section featured a massive wall of floor-to-ceiling windows that lent the space a glint and gave meals a colorful and appetizing appeal, especially during the afternoon. But that's not the space you see here. This rear portion of the restaurant was far darker.

One of Barberis's lighting challenges was to power and

position his strobes in a way that carried the front room's bright, open lighting deeper into the restaurant's interior. Of course, the resulting light had to look natural—of a piece with Lupulo's window-lit front section, which he'd also photographed during this shoot—and not call attention to itself.

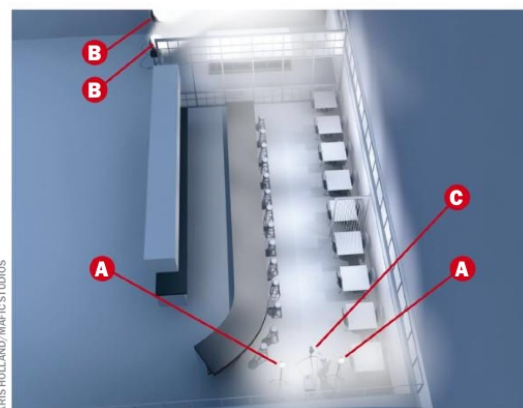
Making his job a little easier were the restaurant's many glass surfaces and white wall and ceiling surfaces. All gave him *de facto*

TOOL TIPS

1 PROFOTO ACUTE 2-D4 FLASH HEAD The head includes a nifty zooming reflector that lets photographers focus the light's output where it's needed. \$1,134, street

2 POCKETWIZARD PLUS III FLASH TRIGGER This transceiver automatically switches between receiving and transmitting modes. \$135, street

3 PROFOTO ACUTE 2400 GENERATOR These packs "have enough power for most location shoots, without being cumbersome," says Barberis. "They also offer consistent color temperatures and a large selection of great modifiers." \$3,078, street



To enhance the airy openness of this modern mid-Manhattan eatery, photographer George Barberis flanked the space with two Profoto Acute 2400 power packs, each juicing two heads (A) for four lights total, all of them bounced off nearby white or glass surfaces and not aimed directly into their respective spaces. He modified the lights in the kitchen with Profoto medium sized softboxes (B) for a broader ambient light that replicated window light, and those in the dining room with 7-inch Profoto reflectors for a more contrasting light that cleanly brought out detail in the restaurant's tables and wall tiles. The photographer fired all four from the camera position (C) using PocketWizard Plus III wireless flash triggers. One of his greatest lighting challenges was maintaining the distinct look of each space. "I made sure to show some difference in the color temperatures. For example, I wanted to show how the kitchen used fluorescent lighting. This helps add a sense of place, because in real life color temps aren't all the same," Barberis says.



reflectors off which he could bounce the output of four strobe heads. (See the sidebar for specifics on where he placed these and why.) The result was a diffused daylight-balanced light that filled the room to the corners, appearing natural and bright.

As is the norm with commercial photography, Barberis relied heavily on digital tools for fixing and improving on lighting problems. Digital compositing was probably the most important. "I composited the kitchen [shots] so that I was ultimately able to blend the available [fluorescent] light in the kitchen with that of the dining room," he says.

This blending gave a truer feel for the restaurant's overall lighting. It also let him drag shutter speeds for the kitchen layers, which gave motion to the cooks and captured

the fluorescent hue back there.

Barberis also faced a number of hurdles that weren't related to the lighting. Because the restaurant's tight configuration dictated a relatively wide-angle lens (35mm on a full-frame DSLR) and his subject had many parallel and perpendicular lines, he kept the camera as level as possible to avoid converging lines. "Even though some of these corrections can be made in post now, I've always found the results from getting it right in-camera are superior."

And as long as he had to do all that compositing, why not clean up the scene in postproduction? "Among other tidying up, I removed all of the bar mixing tools that were by the tap. I found them distracting and thought they took away from the bar itself," Barberis says.

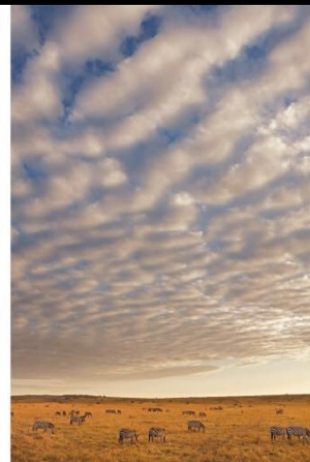
—Peter Kolonia

The Grass Menagerie

Renowned wildlife photographer Ingo Arndt journeyed to the world's greatest grasslands. He shares how he's documented everything from bison herds to tiny flowers.

*Text by
Jennifer Chen;
photos by
Ingo Arndt*

MAASAI MARA,
KENYA
Grazing tops
photographed
from a car
window using a
Canon EOS-1Ds
Mark III and
24-70mm f/2.8L
Canon EF lens.
Exposure:
1/125 sec at
f/11, ISO 400.



CLOCKWISE FROM TOP LEFT, MAASAI MARA, KENYA:

ACACIA TREE, SUNRISE
Tripod-mounted Canon EOS-1Ds Mark III and 24-70mm f/2.8L Canon EF lens with polarizing filter. Exposure: 1/125 sec at f/11, ISO 250.

BURCHELL'S ZEBRA
Photographed from a car with camera resting on a beanbag using a Canon EOS-1Ds Mark III and 24-70mm f/2.8L Canon EF lens with polarizer. Exposure: 1/125 sec at f/11, ISO 400.

OSTRICH CHASE
Taken from a car using a Canon EOS-1Ds Mark III and 500mm f/4L Canon EF lens. Exposure: 1/500 sec at f/4.0, ISO 200.

PRIDE OF LIONS
Canon EOS-1Ds Mark III and 500mm f/4L Canon EF lens. Exposure: 1/350 sec at f/5.6, ISO 400.



Ingo Arndt, a world renowned wildlife photographer, has spent most of his career depicting animals and their homes. In 2014, he decided to focus on something specific that animals need to survive—grass.

"I was always fascinated by grass, especially when you look at grass flowers, because they are so different than what you'd expect," says Arndt. The image of the topis on the opening spread, taken in the Maasai Mara Nature Reserve in Tanzania, is symbolic of Arndt's project. "This photograph shows you how natural grasslands should look with herds of animals grazing," says Arndt.

Another reason for his determination: The world's grasslands are endangered. "In the U.S., you only have four percent of the wild grasslands of the Great Plains left. The only beautiful and wild grassland areas are private land," says Arndt.

Arndt researched the exact locales he wanted to explore, and chose seven grasslands to photograph for *GEO Germany* magazine. Those would later become the basis for his art book, *GrasArt* (Kneesebeck, 2016). Over the course of two years, Arndt zipped across the globe to examine various types of grasslands such as the Everglades in Florida; the savannahs of Kenya and Tanzania; reed landscapes in Romania's Danube Delta; and the Shunan bamboo forest, the largest in China.

To ensure that he gets the shots he wants, Arndt goes out with a picture in his head. Then he waits. His steadfast patience and vast experience has earned him timeless images such as a meadow of spider webs in morning dew (page 47) and a rattlesnake hissing along a mountain range (page 48).

His book editor sums up his work best: "He endures for days and weeks outside until he gets the best image he can think of. That makes his imag-

ery and projects special. The result is always fascinating," says Susanne Caesar, an editor at Kneesebeck Publishers in Germany.

Arndt shared with us how he is able to capture wildlife and nature with beauty, grace, and a dash of humor, and gives his best tips for those who want to try it too.

Gaining Access

Covering such expansive landscapes requires more than just fantastic gear; to get the best access to your subjects, begin by getting help from the locals. In Tanzania's Serengeti, Arndt hired an experienced driver to take him around the land.

"In Serengeti National Park, you have to shoot out of a car because you're not allowed to step out onto the land. You need a driver who knows what a photographer likes and needs. This is very important because the animals react when you come close to them with a car," says Arndt.

If you plan to go, he recommends renting a Land Cruiser, especially in the Maasai Mara area in Kenya, because you need four-wheel drive to navigate muddy areas. The Land Cruisers are long, and you can ask if all the seats can be taken out except the last row, so that you have a lot of space inside the car. "You can open the windows, set up your tripod, and shoot in all directions," says Arndt.

For aerial nature shots, like the one of the Everglades in Florida on page 47, Arndt travels by helicopter; he suggests finding one that allows you to keep the door open at all times. You'll get the best photographs when your view is unobstructed, but this also means securing your equipment beforehand to make sure nothing falls out.

From all of his travels, Arndt plans ahead based on where he is going. While in the Maasai Mara and Serengeti regions of Africa, he stayed in a lodge for overnights or during slow times when the lions were sleeping.



Grass Roots

A macro look at how Ingo Arndt photographs the tiny blades of grass that make up nature's grasslands.

To document each grass flower and detail, Arndt traveled with a foldable white light box. He bought the pop-up photography tent that's normally used for tabletop studios because it filters outdoor light well. He found that no matter what time of day or how strong the light was outdoors, the light inside the white box was very soft and devoid of shadows. "You can be out on a very bright day and with this setup, you just need a little higher ISO and you can photograph without flash," says Arndt.

But photographing tiny plant life comes with big challenges. First, finding the right blades of grass

that are flowering can take time. "I had days that I only looked for grass species I wanted to photograph," says Arndt.

Next, there's wind to reckon with, an element that is out of a photographer's control. "In open grassland, it's always windy. I had to wait for a quiet day, look for a place without wind, or use my car for wind protection."

Picking the right time to travel to the grasslands was an adventure in itself. "When I traveled to South Dakota in September, normally you should find a good number of flowering grass species, but when I arrived, it was a very dry and hot year. Everything was already dry and yellow. Or in Africa, you never know exactly when it's going to rain and when the grass is in the right stage," says Arndt.

In the Sichuan province in China, a good guide will help you secure permits for access to panda breeding centers, if you choose to photograph them. "You need a permit to go inside this special breeding center that's normally closed to the public." The public breeding centers, Arndt shares, are often clogged with tourists and people gawking at the pandas. "You will never get a good picture there because everyone is panda crazy in China."

Other times, he hits the road with a little camping van, as when he went to Lake Neusiedl in Austria to photograph the great reed-warbler. Setting up a big camping tent in the middle of the Mongolian Dornod Mongol steppe, a temperate grassland region in Mongolia, afforded Arndt access to a completely undisturbed area to shoot an amazing thunderstorm with several bolts of lighting. "The tent was in the middle of nowhere, about three days from the next village. My wife, my guide, and a driver watched as I opened the tent, stood there with my tripod, and took one exposure after the next," says Arndt.

Animal Instincts

Arndt's history of photographing wildlife has taught him a great deal about how to interact with birds and beasts. His best piece of advice is to always focus on the animal's eye. "If the eye is not sharp, then the rest of the animal is not going to look good," recommends Arndt. Another pointer: Be aware of how an animal is displaying its annoyance. For example, when a bison sticks out its tail, it's a sign that it's angry and doesn't want you come any closer.

"Over the years, you get a feeling for the animals," Arndt says. "You can use that knowledge for new animals you encounter because similar species will act in similar manners."

When photographing birds, he sometimes will photograph them roadside from the window of his

CLOCKWISE FROM TOP, EVERGLADES NATIONAL PARK, FLORIDA:

GRASSLAND, WETLAND, MANGROVE, AND CYPRESS
Photographed from a helicopter using a Canon EOS-1DX and 24-70mm f/2.8L Canon EF lens with polarizer. Exposure: 1/500 sec at f/4.5, ISO 800.

GREAT BLUE HERONS
Photographed with tripod-mounted Canon EOS 1DX and 600mm f/4L Canon EF lens and 2X III extender. Exposure: 1/1000 sec at f/16, ISO 1000.

SPIDER WEBS AND DEW
Photographed from a car roof with tripod-mounted Canon EOS-1Ds Mark III and 100-400mm f/4.5-5.6L Canon EF lens. Exposure: 1/250 sec at f/22, ISO 320.

BLUE-WINGED TEAL IN FLIGHT
Photographed from a helicopter using Canon EOS 1DX and 100-400mm f/4.5-5.6L Canon EF lens with polarizing filter. Exposure: 1/750 sec at f/5.6, ISO 800.





CLOCKWISE FROM TOP:

SOUTH DAKOTA PRAIRIE

A prairie rattlesnake shows a threat display. Photographed with tripod-mounted Canon EOS-1DX and 600mm f/4L Canon EF lens and 1.4X III extender. Exposure: 1/1000 sec at f/5.6, ISO 500.

PAMPA, CHILE

A mountain Lion hides in grass. Photographed using tripod-mounted Canon EOS-1DX and 600mm f/4L Canon EF lens and 2x III extender. Exposure: 1/250 sec at f/8, ISO 1600.

EASTERN MONGOLIA

Sawflies on dry grass. Canon EOS-1DX and 100mm f/2.8 Macro Canon EF lens. Exposure: 1/350 sec at f/10, ISO 800.

TORRES DEL PAINE NATIONAL PARK, PATAGONIA, CHILE

Pampa grassland and mountain range at sunrise. Photographed remotely using a tripod-mounted Canon EOS-5DS R and 24-70mm f/2.8L Canon lens with polarizing and neutral-density filters. Exposure: 1/2 sec at f/16, ISO 160.



camper. "You have to be careful, drive very slowly, and open the window very slowly—even if you have a long lens," says Arndt.

The one thing that Arndt stresses that you must have when aiming to photograph animals in their natural habitats is patience. He'll wait for the right moment and then fire a bunch of shots. For the pride of lions on [page 44](#), Arndt waited for about two hours until the group was looking in the same direction. "With lions, during the day, they do nothing and the light isn't good. In the mornings and the evenings are when they're the most active."

Before he embarks on any animal adventure, Arndt will do online research and read books, but he emphasizes that the best way to learn about the behaviors of animals is to go out into the wild. "It's important to know where you can find the animals, how they behave, and to know your equipment, but it's always better to go out and watch what happens in real life," says Arndt.

What to Bring

Arndt always packs light, robust, and very strong Gitzo tripods—essential for the kind of work he does. Depending on what he's shooting, he might bring more than one. During a recent trip to Ecuador where he photographed hummingbirds on assignment, he lugged 10 tripods.


The only time Arndt doesn't bring a tripod? When he's in a helicopter. Instead, he packs his Canon EOS-1DX outfitted with a 100-400mm f/4.5-5.6L IS II lens and a SDS R with a 24-70mm f/2.8L II lens. "That way you have a big variety of things you can photograph. You don't want to change lenses while in an open-door helicopter. It's better to bring two cameras and two lenses, and secure them around your neck with neck straps," says Arndt.

For the flowering grasses (see

sidebar on the previous spread), Arndt got close using a 100mm f/2.8L IS Macro lens and a 65mm f/2.8 MP-E 1-5X Macro lens. He set up his studio-on-the-go with a white light box and a plastic box with sand in it to stick the grass inside and arrange the flowers, as he wanted. He prefers to shoot these macro shots with a tripod-mounted camera, no matter if he's using a short or long focal length, because "the tripod allows you to work more precisely."

For animal shots such as the lion pride and the running ostriches ([page 44](#)), Arndt shoots with a Canon EOS-1Ds Mark III and 500mm f/4L lens. For more up-close images like the great blue herons in the Everglades ([page 47](#)), he used a tripod, a Canon EOS-1DX, a 600mm f/4L lens, and 2X III extender. For wider landscapes such as the mountains in Torres del Paine National Park (bottom left), he used a polarizer, neutral-density filter, remote control, and tripod with a Canon EOS-5DS R and 24-70mm f/2.8L zoom.

Typically, Arndt likes photographing animals with his 100-400mm f/4.5-5.6L IS II lens, a 16-35mm f/4L, and a 600 f/4L IS II with 1.4X and 2X teleconverter.

While you might not set out to document the world's best grasslands on your next photo expedition, Arndt's images and dedication to his craft and his subject can serve as the inspiration for an idea that's waiting to be explored. Do your research, head to where the wild things are, and enjoy each moment among nature's wonders. 

Ingo Arndt has published more than 15 books on subjects ranging from monkeys and marmots to the architecture built by animals (which we showcased in our April 2014 issue). See more of his work on his website, ingoarndt.com.

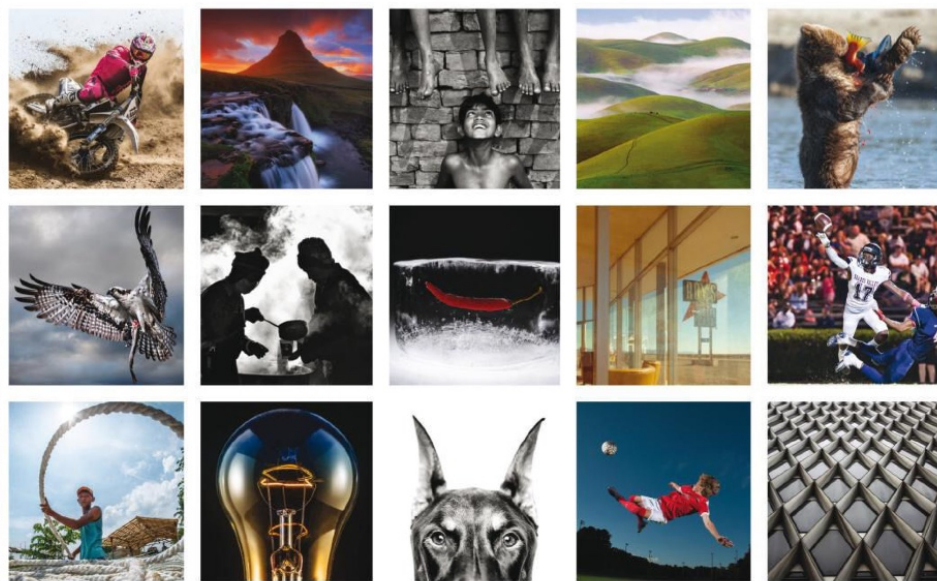
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Exploring the woods of Canada with a snow-dusted fox, watching the stars from under a cave on the Northern California coast, cheering front row at an action-packed Arizona rodeo, or unearthing the inner workings of a family heirloom, this year's prize winners captured mementos of lives well lived—and well photographed. Read on to find out the creative ways our readers used their cameras to skillfully depict their worlds.

By Sara Cravatts



Landscapes

Janne Kahila, 26, data analyst, Espoo, Finland

When Janne Kahila first saw a photograph of the Vøringsfossen waterfall in Eidfjord, Norway, he knew he had to go see it for himself. "The valley and the waterfalls from both sides made the scene look almost prehistoric, which really gripped my attention," Kahila remembers. Visiting an hour before sunset on a September evening, the photographer composed using the flowing stream as a leading line for the viewer's eye. Both overall and graduated neutral-density filters let him set a long exposure. "I was fascinated by the way the light diffused through the fog in the valley and reflected from the stream," he says. Kahila crafted his panoramic final frame by merging in Adobe Photoshop three separate vertical images captured with the same camera settings, after editing each individually in Photoshop Lightroom.

TECH INFO: Canon EOS 6D with 16–35mm f/2.8 Canon EF USM lens with 8-stop graduated neutral-density and 6-stop neutral-density filters, mounted on a Velbon GEO E630 tripod. Exposure, 2 sec at f/9, ISO 200; edited in Photoshop CS6 and Lightroom 5.



Objects & Still Life

Rodney Furgason, 72, retired, Topeka, Kansas

In his basement workshop, Rodney Furgason went back in time by exploring the inner workings of his grandfather's pocket watch. "I was attracted to the old-school technology and precision of the gear works in the watch," he explains. "It's the opposite of all the digital tech we are exposed to now." The photographer shot with his DSLR, with a macro lens and a ring light mounted on a Kirk focusing rail in order to capture the beautiful details hidden within the timepiece. "I like the almost abstract design of the shapes and repeating patterns of the gears as well as the tones and colors," he says. Furgason shot five separate photos of the gears with slightly different focal points, creating a final composite image that's sharp all the way through by stacking the group together in Helicon Focus software.

TECH INFO: Kirk FR-2 focusing rail-mounted Nikon D800 with 90mm f/2.8 Tamron SP Di VC Macro USD 1:1 lens and GiSTEQ Flashmate Model F-60N ring light; 1/6 sec at f/11, ISO 100. Edited in Helicon Focus 6.7 and Apple Aperture 3.6.



Action & Sports

Arthur Schwartz,
74, retired, Tucson, Arizona

Arthur Schwartz was taking in the excitement at a rodeo in Sonoita, Arizona, as the bull rider struggled to stay on the massive animal's back. "Having shot rodeos for several years, I knew approximately where the action would be," says Schwartz. "It's simply a matter of getting into position, setting up, and hoping for something good." Up to the challenge of mastering perfect timing, the photographer knew that the rider would attempt to stay on the bull for around eight seconds, and in his experience bulls generally turn to the right after leaving the gate. "Only one out of eight riders stay on for the full time, so you have to be ready to start shooting right when the gates open," he says.

TECH INFO: Canon EOS 5D Mark II with 70-200mm f/2.8L Canon EF lens racked out to 200mm; 1/800 sec at f/10, ISO 500. Edited in Photoshop CS6.



Animals

Christopher MacDonald,
40, law enforcement officer, Brantford, Ontario, Canada

During an afternoon walk in early spring through Algonquin Provincial Park in Ontario, Canada, Christopher MacDonald spotted a fox perched on a snowbank. Having already set up with his tripod-mounted camera to shoot a pine marten hurrying up a tree, the photographer was able to instantaneously transition to photographing the fox once it appeared in his line of sight. "I love foxes as subjects, especially in the winter when their coats are full and colorful," he says. "When I looked at the scene I knew I wanted a portrait that showed both the fox and the snow accumulation on its head. With the dark background and falling snow, a tighter shot seemed appropriate to me." MacDonald worked to make his furry portrait subject stand out against the darkened forest background by using Photoshop to adjust levels, use selective sharpening, remove sensor spots, and reduce noise in the background. "I wanted the forest to blend away in the snow and just give the tinge of the pine colors," he says. **TECH INFO:** Tripod- and gimbal-mounted Canon EOS-1D Mark IV with 100-400mm f/4.5-5.6L Canon EF IS lens at 300mm; 1/400 sec at f/5.6, ISO 1000. Edited in Photoshop CC.



Cities & Architecture

Raymond J. Klein, 84, retired, Vancouver, Washington

On a trip to Portland, Oregon, with his local camera club, Raymond Klein found himself standing at a tram station looking northeast over the Marquam Bridge. To the right of his view stood beautiful Mt. Hood, and Klein could not resist attempting to include the natural sight in his shot. Though impossible to compose in a single frame, assembling the cityscape and natural surroundings became feasible through a composite image. Klein captured images of the mountain, the clouds, and the bridge separately, moving his camera and swapping lenses as the beautiful sunlight hit each element of the scene. He took several exposures of these three subjects, allowing him to pick the best when creating the composite in postproduction. "I brought each image onto the screen and turned each into an individual layer; once I had completed [the process]...I felt I had achieved an image worth preserving," he told us.

TECH INFO: Tripod-mounted Canon EOS Rebel T5i with both 18–55mm f/3.5–5.6mm Canon EF IS and 75–300mm f/4–5.6 Canon EF IS lenses. Mountain: 75–300mm lens at 200mm, 1/50 sec at f/7.1 ISO 100. Clouds: 18–55mm lens at 18mm, 1/50 sec at f/4, ISO 100. Bridge: 75–300mm lens at 110mm, 4 sec, f/22, ISO 100. Edited in Photoshop Elements 12.



People

Keith Napolitano, 36, military officer/pilot, Natick, Massachusetts

Some memories are just asking to be recorded, and for Keith Napolitano, his son's first haircut was one of them. "One of my primary motivations to learn photography was to be able to document my family as perfectly as possible," he says. So Napolitano had camera in tow when he accompanied his son to the barber for the first time. Taking advantage of the natural sunlight bouncing off a wall of floor-to-ceiling mirrors, the photographer framed his son's face mid-haircut. "I chose to zoom in tight to focus on his amusing expressions while still capturing enough of the surrounding detail to tell a compelling story," he says. Napolitano made basic adjustments in Lightroom, then moved to Photoshop, where he converted to black-and-white and used the burn tool to minimize the chaotic background.

TECH INFO: Canon EOS 6D with 24–70mm f/2.8 Canon EF II USM lens; 1/160 sec at f/5.6, ISO 800. Edited in Photoshop CC, Lightroom 6, and Google Nik Silver Efex Pro plug-in.



Grand Prize Winner

Aaron Feinberg, 34, photographer and gallery owner, Kilauea, Kauai, Hawaii

During one of his frequent work-related visits to the Northern California coast, Aaron Feinberg noticed that he had once marked a location in Google Maps and the Photographer's Ephemeris, two apps he uses to keep track of shooting locations. "Driving there I had forgotten what had made me mark the spot, but, upon arriving, I had an idea," he recounts. While the scenery was breathtaking, Feinberg wanted to do justice to the architectural form of the cave. "The sweeping walls of the cave draw the viewers into the frame, and the light and sky do the rest," he says. To make his image match more closely what he saw, he made two exposures—one of the starry sky and one of the cave and surroundings—and composited them in post. "This twilight image was taken as a way to get enough depth of field using a lower ISO before the light dropped too much, and the sky image was taken with star-shooting settings." **TECH INFO: Nikon D800 with 14-24mm f/2.8 Nikon AF-S FX Nikkor lens at 14mm. Sky: 30 sec at f/3.5, ISO 3200. Cave: 4 sec at f/6.3, ISO 800. Edited in Lightroom 5 and Nik Color Efex Pro 4.**

Do You Still Need a 'Real' Camera?

Consider these facts before you decide whether your smartphone is enough

Text by Miriam Leuchter; photos by Satoshi

1 Smartphones have good cameras.

They keep improving, not just in image quality but in capabilities. The best smartphones released in the past year—Android's Pixel, Apple's iPhone 7 Plus, and Samsung's Galaxy S7—take sharp pictures, focus quickly, and even let you shoot bursts as fast as 10 frames per second. Newer features such as dual camera units for creating the appearance of shallow focus, 4K video resolution, and built-in image stabilization systems help the look of both still photos and video.

EXOTIC HYBRIDS
One way to get better image quality is to add a little camera that works only with a phone. For instance, the DxO One pops into an iPhone's Lightning port; the Hasselblad True Zoom snaps onto a Moto Z and gives you 10X optical zoom and real Xenon flash.

2 Real cameras do cooler tricks.

It's tough to justify buying a point-and-shoot when your phone can do a comparable job in everyday use. Camera makers are fighting this trend by adding bigger sensors and special features to their compacts. You can also find specialty cameras that do things your phone can't do, such as fly (hello, drones) or take 360-degree spherical images.

3 You already use your phone daily.

Smartphone cameras rule when it comes to size, convenience, simplicity, and easy, instant posting to social media. They're great for snapshots and sneaky pictures. They're extremely handy for making notes and recording the stuff you encounter every day. Just about every committed photographer we know, serious enthusiasts and professionals alike, shoot with a smartphone some of the time. And you'll have that option whenever you reach into your pocket or purse.

4 Special occasions need special gear.

The pictures that pay the bills, get printed big and framed for the wall, or are tough to get just right—these still require a dedicated camera. Committed photographers want to set their pictures apart from the hordes of smartphone-wielding snapshotters. Can you make distinctive photos with a phone? Absolutely! But cameras give you far more options.

5 A camera's bigger sensor means more resolution.

The physical size of a sensor makes a difference. For instance, while they may have the same number of light-gathering photodiodes in their pixel wells, a 12MP Four Thirds sensor will have much larger pixels than a 12MP smartphone sensor. The larger the pixels, the sharper and cleaner the images. And Four Thirds sensors are physically smaller than the APS-C-sized chips used in entry-level DSLRs and some ILCs, let alone the full-frame (35mm) and medium-format sensors used in top-level cameras. So, these not only have larger pixels, but more of them. No wonder some studio pros insist on medium-format digital camera backs with up to 100MP for their most important work—as Satoshi did for the photos here.

6 Body size affects image quality, too.

Heat plays a role in photography by creating digital noise in images. A phone's body tends to build up more heat than a larger camera body does, and this degrades image quality, especially in low light when the electronic sensor must work harder to gather data. Smartphones and cameras alike apply a certain amount of noise reduction in processing JPEG images, but, while this will help the

overall appearance of the picture, it will also rob it of resolution—and phones often add a lot more noise reduction than you would need to with a good camera.

7 Smartphone cams need lots of light.

Noise isn't the only issue. You also need to consider the overall sensitivity of the sensor. Remember those little pixels versus the big ones? Their size makes a big difference in a sensor's ability to take in light. Most cameras will give you usable images in much darker conditions than phones can handle.

8 For true shallow focus, you need a sizable sensor.

The physical size of the sensor affects a picture's potential depth of field—how much of the frame is in focus. The smaller the sensor, the harder it is to isolate a subject by keeping it sharp while objects in front and in back of it blur out. Photographers use this technique judiciously—often you'd rather have more of what's in the frame in focus than to let it go blurry—but it's a look that's prized in portraits. New smartphones, such as the iPhone 7 Plus and the Pixel, create this effect by manipulating the image, but it's not as convincing or attractive as with a large sensor and the right lens.

9 A camera gives you optical options.

Smartphones mostly sport wide-angle fixed lenses, though a few have added a second telephoto module; very few (such as the Asus ZenFone Zoom) have true optical zooms. But even most compact cameras provide a telephoto zoom and some reach as far as 60X. DSLRs and ILCs give you dozens of options for high-quality glass, not just telephoto zooms and primes but specialty lenses such as tilt-

shifts and fisheyes. (Yes, you can get add-ons for smartphones, but these don't offer nearly the control of a camera lens.)

10 Real flash makes a big difference.

The built-in lamp on smartphones lacks the intensely brief duration of a strobe. You can't hold it at an angle to your subject or bounce its light, the way you can with a hot-shoe flash for a camera. Real flash lets you stop motion for a briefer instant than your camera's shutter is open. This also lets you produce cool effects, such as leaving the shutter open for a longer exposure to let some motion in the scene appear blurred while using the flash to freeze the subject. Camera flashes can sync up with each other, too, letting you set up several lights to fire at the same time.

11 Focusing a smartphone is a challenge.

Good smartphones do a decent job of figuring out what part of your picture should be in focus. But good cameras and lenses give you sophisticated autofocus tracking capabilities for when your subject is moving, and will let you pinpoint the exact spot you want sharpest when you focus manually.

12 Changing exposure is even harder.

Smartphone cameras let in as much light as possible as quickly as possible. This helps them avoid noise by using lower ISOs and shorter exposure times. But you might want to set the camera for a longer exposure to let your subject's motion go streaky. Or

TIME-LAPSE TOSSUP
Want to create a time-lapse video from a string of still images taken at regular intervals? Many new cameras have time-lapse built in, and apps let your phone do it, too. But keep in mind that using your phone for this could keep it tied up for hours—or days.

BETTER TOGETHER
Now that most cameras have built-in Wi-Fi (and sometimes NFC), you can not only share images right from the camera but use your phone as a remote control, changing settings and firing the shutter from 50 feet away or more.

you may want to preserve the mystery of darkness or render the bright white of a snowy day. A camera can easily change the exposure by widening and narrowing the lens aperture or reducing and increasing the time the shutter is open. With a smartphone, if you can do this at all, you'll need to step through an app. For very long exposures, forget your phone entirely.

13 It comes down to control.

The more you care about photography, the more you want to control the process of making a picture, from how you frame the shot, to how much detail you capture, to what you can do with the image after you shoot. All those buttons and dials on a camera can seem intimidating at first. But once you learn your way around, you realize that they make it easier to get the photo that you imagined. Having a viewfinder lets you immerse yourself in the scene; you can use your fingers to control the lens and the exposure without taking your eye off your subject. You stay in the zone and start to think like a photographer. And that, in turn, will let you take better pictures no matter what tool you use.





ESTATE OF TED CRONER

40 Years IN THE Dark

Secrets of one of the last masters of
black-and-white printing

By Hal Stucker

THERESA ENGLE Schirmer is fond of pointing out that most of her clients are dead. What she doesn't

always mention is that most of her clients are famous. Very famous. Like major-figure-in-the-history-of-photography famous. Engle Schirmer is one of the world's few remaining master black-and-white photographic printers. Her client list includes such titans as Robert Capa, Garry Winogrand, and Bruce Davidson (who is still very much alive), to name a few.

Miles Barth, founding curator of the permanent collection at the International Center of Photography, considers Engle Schirmer one of a small, elite group of experts in black-and-white printing, part, he says, "of a dying breed." The two

worked together on a project for ICP, where Engle Schirmer also taught for a number of years, printing portfolios of vintage images by Dorothy Norman that were offered for sale to collectors to raise money for the center.

"She's one of the main people still doing it," he says, noting that printing a photographer's negatives posthumously carries with it a raft of difficulties. "In most cases, photographers didn't keep records of the materials they were using. So it can be like trying to bake a cake that you've [only] tasted in a restaurant. You're just guessing at how they got to those flavors."

Though Engle Schirmer is also a photographer in her own right, she confesses that, from the beginning, the darkroom was where she'd always felt she belonged. She grew up in Freeport, Illinois, where her father, an accomplished amateur

"TAXI, NEW YORK NIGHT"

Engle Schirmer says photographer Ted Croner was at first reluctant to let anyone print his pictures, but after the two met face-to-face over bourbon, he gave her 10 negatives to print. This one, circa 1948, was among them.



EARLY WORK

For the undated Garry Winogrand photo above, printed post-humously from an original negative, Engle Schirmer mixed developer at 1:7 to add contrast, and exposed most of the image using a 3.0 filter on Ilford Multigrade paper. She then used a 0.5 filter while burning in the sky, and did selective bleaching on some buildings.

DARKROOM MAGIC

Engle Schirmer says this original Winogrand negative (right), also printed post-humously, was scratched and underexposed. She used a cold head enlarger to hide scratches and print developer mixed at super strength to increase the contrast.



1960S BURN & DODGE

For this posthumously printed Garry Winogrand image (near left), Engle Schirmer burned in John F. Kennedy's face, but then dodged most of the others.

photographer, taught her how to shoot, develop, and print film. "It was a very casual thing," she recalls. "He was just like, 'Do you want me to show you how to print?' And I immediately said, 'Yeah!'"

After college she apprenticed for a year with Lucien Clergue; she lived with the well-known French photographer and his family in their house in Arles. She spent the next three years working for PPS Galleries (now PPS Imaging), a busy professional lab in Hamburg, Germany. "I was working alongside women who'd been trained to print in technical school, so they were very fast, and their printing was spot on," she says, likening the PPS experience to graduate school.

PPS also exposed her to working with archival material as the Museum für Kunst und Gewerbe (Hamburg's Museum of Decorative Arts) would send over dozens of 8x10 glass-plate negatives from their collection. While grateful for the experience, she notes that printing the plates "was slow, tedious, and time-consuming—and you had to be extremely careful with them."

Today, Engle Schirmer's darkroom includes two vintage Omega D2 enlargers. For years the go-to for most professional labs, the D2 was the original enlarger for many of the negatives that she is tasked to print now. On one enlarger she has installed a regular condenser head with a standard enlarging light source; the other sports an Arista cold-head source. She uses the former to print contemporary negatives, the latter for older nitrate and glass-plate negatives as well as for contemporary negatives that have been heavily scratched.

The cold head, she explains, uses a fluorescent lamp instead of the traditional tungsten bulb. "It doesn't generate as much heat and, because of the diffusion, it knocks out a lot of scratches and imperfections. If you have good lenses, the loss in sharpness is minimal and you're not

going to have to spend three hours retouching one print."

The Arista's cold-head source came in handy when Engle Schirmer got the job of printing a collection of Garry Winogrand's posthumous negatives for his 2013 retrospective at the San Francisco Museum of Modern Art. Well over 2,000 rolls of undeveloped film had been found in the photographer's studio after his death in 1984, and she printed pictures from that group as well as some of Winogrand's vintage work.

Before beginning the job, Engle Schirmer visited the Center for Creative Photography in Tucson, home to Winogrand's archives. She wanted to study his visual style and understand how he expressed it in his printing. "From corner to corner and edge to edge of the frame, he pays attention to every single detail," she says. "Each person, each little thing is extremely important. A gesture, a glance, a posture, the gait of someone walking, all are essential to that image."

Leo Rubinfien, who curated the SF MoMA show, describes Winogrand's negatives as "difficult," saying the photographer's shots were often underexposed or lacked contrast. "This makes sense for some of the older negatives," he says, "as the photographic paper Winogrand would have used early on would have had more contrast." But using contemporary materials makes it a difficult job.

The task required all the skill and technique that Engle Schirmer had gained in her 40 years of experience. One negative, an early street photograph with three faces prominently featured (bottom left), was both underexposed and badly scratched, so Engle Schirmer printed it using the cold head and split filtration, a technique employing two or three different filters on the Ilford Multigrade paper she prefers. "The lower- to medium-grade filters allow you to put in all the detail you want, then you take a higher-contrast filter and give it an additional exposure to

ESTATE OF GARRY WINOGRAND/CENTER FOR CREATIVE PHOTOGRAPHY/FRANKEL GALLERY, SAN FRANCISCO (3)





make the highlights pop," she says.

Finally, Engle Schirmer bleached back selected areas of the print, a technique she employs frequently and which she used on many of the Winograd images. The "bleach" is actually potassium ferricyanide, a potentially toxic chemical that must be handled with extreme care. "But it's fun," she says. "I think of it as a way to paint with light, to bring more light in and enhance parts of the image."

After the print had been fixed, the bleach process could begin. Engle Schirmer explains how it works: "I use two ounces of fresh tray fixer and two ounces of water, then I sprinkle in the potassium ferricyanide. It should look about like tea—if it comes out looking like Tang, you've gone too far." Then, wearing surgical gloves, she dips a cotton swab into the reducer and saturates a cotton ball with more tray fixer. "I use the Q-tip to

bleach back the areas I want to reduce, and the cotton ball with the fixer is like an eraser—it stops the action of the bleach."

Engle Schirmer's printing assignments for the venerable Magnum photographer Bruce Davidson have included images from the series *Brooklyn Gang* and *East 100th Street*. Though she made the *East 100th Street* prints on Agfa Multigrade paper, Davidson says the finished work closely followed the tonality of the Portriga Rapid paper they were originally produced on.

"Her printing really opened up shadow detail, which made the photographs and the prints stronger," Davidson says. He recalls that when Engle Schirmer started the assignment, she was already so well versed in his printing style that he didn't need to send her a guide print. "She already knew what the photograph was about," he says.

There are also times when a

FROM EAST 100TH ST., 1966
This Bruce Davidson photograph was originally printed on Portriga Rapid paper, which was discontinued in the late 1990s. To get a similar look, Engle Schirmer used Agfa MG Classic and "a touch" of selenium toner.

photograph's subject will directly influence printing mechanics. Ted Croner's "Taxi, New York Night" (which graced the cover of Bob Dylan's 2006 album *Modern Times*) was shot, as many of his famous images of the city at night are, with the camera aperture wide open. The result is distinctly blurry images with heavy lens flare. "It's the most wonderful picture," Engle Schirmer says. "This 1940s taxi is screaming past you, and it captures all the light and energy of New York City at night."

Her first attempts at a print, though, came up short. "I had the enlarging lens stopped down and it took all the movement and momentum away from the taxi and the flared lights," she says. "I went to Ted and said, 'I'm doing something wrong here.' And he said, 'I shot it with the camera wide open and I did the print with the enlarger wide open too.'"

It was an *a-ha* moment for Engle Schirmer. When she went back and made the print with the aperture opened all the way, "The lights flare out and you lose the depth of field and suddenly that taxi is just whizzing right by you, and it turns into the image that Ted actually saw and first printed," she says.

"She printed it just the way Ted would have printed it," says Howard Greenberg, owner of Howard Greenberg Gallery, which represents Croner's estate. Engle Schirmer also printed some early glass negatives of Hungarian-born photographer Martin Munkacsí for Greenberg. "Teresa was very sensitive to Munkacsí's style—his prints had a soft, flatter palette, and she did a very good job of matching those tonalities. I think that's her greatest attribute: how well she can intuit a photographer's style."

For Engle Schirmer, that's exactly the point. "My goal [is not]... to re-invent the photographer's wheel, but to print the picture as if the person who shot the image is the one making the print. I'm the silent partner in that process." ☐



Case Study

Printing a Robert Capa

Before printing a negative, Teresa Engle Schirmer examines it under a loupe. Each negative is unique, and she tailors her methods to print each one, so it's important to get a rough idea of the contrast range and check for any damage. Robert Capa's negatives, she says, often present special problems, since exposures can be "all over the place." The famed war photographer shot under extremely difficult conditions—often with bullets whizzing directly at his head—and estimated exposures. Engle Schirmer ensures Capa's images still sing more than 60 years after the photographer's death in Vietnam.



A PRINT AND ITS MASK

Engle Schirmer used the mask (above) to print Robert Capa's 1950 photo (top) of a child at the Sha'ar Ha'alya transit camp for new immigrants to Israel. The print was used in the ICP exhibition and book *Children of War, Children of Peace*.

This particular image required extensive darkroom work. "The image is taken from down low," she says, "and it's bright, midday sun, so the sky is overexposed and the bottom is underexposed. If you print for the sky, then the bottom part of the image turns out dark and muddy and the little girl looks like she's standing on sausages instead of legs." Engle Schirmer decided to use a mask.

First she cut the mask, laying a piece of white cardboard under the enlarger, tracing the area she wanted

to block out, then cutting it out with an X-Acto knife. She made the first exposure using a 2.5 grade filter, holding back the child's face and legs. This exposure was relatively short, as Capa's negative was thin in the middle and lower parts of the image. She then exposed using a .05 filtration to bring in the sky, holding the mask over the lower part of the picture a few inches above the printing easel. This provided a more diffused edge and blended the two segments more effectively. She then re-exposed the sky using a 3.5 filter to bring in the highlights and boost the contrast in the clouds.

Engle Schirmer finished the image by bleaching back the girl's face and upper area under her head scarf.

Cornell Capa, Robert's brother and the executor of his estate, was "very, very excited with the results," Engle Schirmer recalls, "and that meant so much to me."



High Concepts

How David Arky makes single images that speak volumes

Text by Peter Kolonia;
photos by David Arky

Sure, some pictures are worth a thousand words. But David Arky's may be worth 10 times that. He takes complex magazine stories and creates single images that telegraph their meaning in a glimpse. For his advertising clients, he works similar magic, communicating a brand or product identity in a split second.

We met him in his bright mid-Manhattan studio and asked how he got started shooting concepts. "I don't actually say that I'm a conceptual photographer," he countered. "People don't know what that means. Instead, I say that I'm a photo illustrator, with a subspecialty in x-ray photography." His editorial clients include *Men's Health*, *Backpacker*, *Outdoor Life* (published by our parent, Bonnier Corp.), and dozens of others. (We explored his x-ray work in our May 2014 issue.)

Photo illustration often takes the form of still-life photography, and Arky focuses almost exclusively on objects, rather than people, shot on

or in front of a studio sweep. Most of his subjects are custom-made models small enough that he can easily capture them on a relatively small tabletop.

The journey that ultimately led Arky to photo illustration started in the late 1960s when, after high school, he left his hometown of Metuchen, New Jersey, to study photo engineering at the Rochester Institute of Technology. "I thought I wanted to work in something science-related, but after a year, I found myself drawn more to professional photography," he says. From there he went west to study photography at Art Center College of Design in Pasadena and work as a photo assistant. Arky made his way back to New York in 1974 and started getting advertising and editorial work for *Esquire*, *National Lampoon*, and marketing firms such as Edelman. It took another couple of decades for him to discover photo illustration.

In 2005 *Men's Health* hired him to shoot a story about how the body processes sugar. "The photo editor was at a loss as to how to illustrate it," Arky recalls. After some back and forth, the photographer got to read the story, and "a light bulb lit up in my head," he says. He made a quick pencil sketch of a light switch made of sugar cubes; the photo editor

KING OF HEARTS
Arky created this for "Hardwired for Love," an article in *Smithsonian* magazine about human attraction. Like almost all the photos here, it was made with a GX Fuji 680 II medium-format camera, Phase One P65+ digital back, and a 100mm f/4 Fujinon lens; it was exposed for 1/125 sec at f/16, ISO 100.



Once Arky sketches out a concept or two, he brings it to the client. "The drawings are an integral part of the process. A verbal description isn't enough," he says. "Pencil sketches serve as starting points for discussion, and they can prevent misunderstandings down the road. They can also ensure confidence that both parties are on the same page." He says he's not particularly talented with the pencil, but his sketches are detailed and accurate.

Executing a powerful image on tight turnarounds (usually about a week) is a matter of teamwork. Arky assembles a crew that includes a model builder or a stylist, plus retouchers and other

CROSS FIRE
Arky devised this image to illustrate a story for the military insurance company USAA's monthly magazine. The story offered information to help transitioning service members adjust to civilian health insurance and healthcare options.





CAT PAUSE

For an article appearing in a World Wildlife Fund publication about how the harvesting of pine nuts was damaging the habitats of Siberian tigers, Arky and his model maker produced an image of a disappearing tiger constructed of raw and toasted pine nuts.

postproduction help.

"There are all kinds of stylists," Arky says. "A generic prop stylist will go out and find, say, 20 specific pairs of running shoes or whatever objects you need for the assignment. Others specialize in food. Soft-good specialists are practiced at steaming, pressing, and draping cloth. They know, for example, how to shape the inside of a handbag to get perfect folds in the leather outside." As the number of conceptual photographers has grown, the number of prop stylists and model builders has grown, too. They number about 15 among Arky's contacts, but he typically relies on the same three or four.

For other projects, his retoucher supplies the most crucial contribution, compositing a final picture from dozens of component images, for example. Still other times, the model

maker does the heavy lifting, creating an object quickly on a budget.

For his part, Arky says, "it often falls on me to come up with the visual means to convey a story's editorial angle or devise highly specialized lighting that brings out certain qualities in the subject. My subjects are exclusively objects or materials, and often it's the lighting that focuses viewers' attention on the mood, dimension, or message I'm trying to communicate."

In the heart image that opens this article, for example, Arky wanted the model to pop three-dimensionally. Of course, the defocused and vignetted background helps add depth to the picture. But notice, too, how Arky produced a shadow on the right side of the heart (using dark cards, a type of light modifier), emphasizing the model's curves. He's also given the individual wires bright and dark sides, underscoring their tubular shapes. Arky and his model maker also included the plugs, which gave the subject a sense of animation.

The key to success in this busi-

HEALTHY SNACKS FOR THE WIN

On assignment for communications firm Edelman, Arky produced about 25 images such as this one, all with healthy food in the shape of a football. They promote the nutritional program Play 60, a partnership of the NFL and the American Dairy Association.

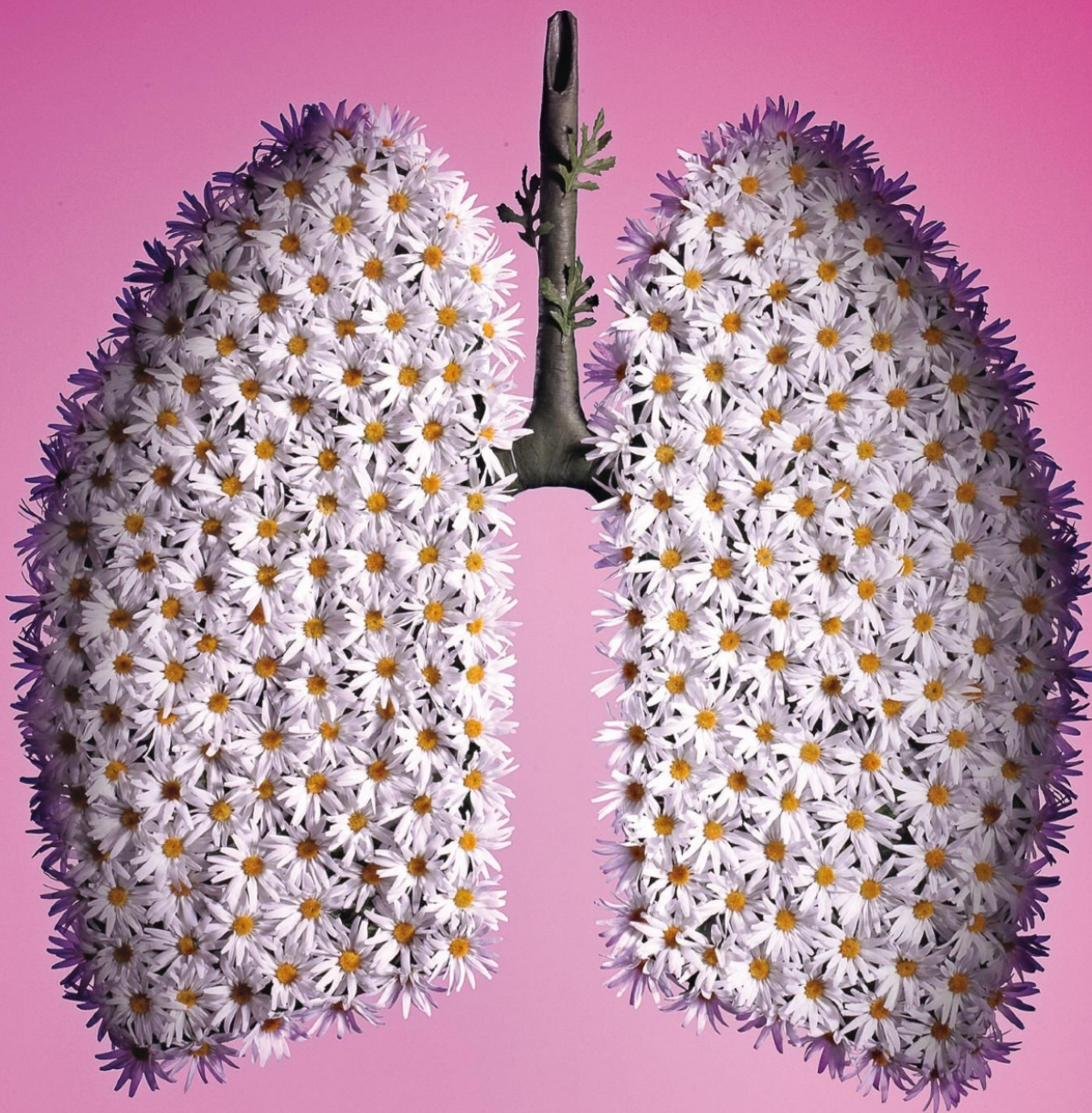
DIY MOBILE

For the UK edition of *Wired*, Arky illustrated a story about the MIT Media Lab in Cambridge, Mass. Shown here is a deconstructed DIY cell phone that MIT students made from inexpensive and readily available parts.

NO REGRETS?

For the *Boston Globe Magazine*, Arky created this cellphone collage for a story titled "#Regret" about people who send angry tweets or email they regret later.





FRESH AIR
For a *Fitness* magazine story about surviving a lung cancer diagnosis, Arky commissioned and photographed this Kellie Murphy sculpture of lungs made of plastic daisies.

BRAIN POWER
Arky created this for the same "Hardwired for Love" article for which he made the heart on the opening spread, but the brain didn't appear in the story.



ness, says Arky, is obsessing about those sorts of details. "The smaller the detail, the better. It's a necessity," he advises. "Often it's this attention to detail that sells an idea. I'd advise anyone getting into photo illustration to take the extra time and care to refine the composition and the pictorial effects. And then refine them some more."

The tiger model made of pine nuts here is a good example. Arky had to figure out the tiger's pose, the various shades of browning in the pine nuts required for its coat, and the degree to which the tiger would fade out.

"I needed a very contrasty light that would cause each individual pine nut to stand out," Arky says. Without that, the pine nuts wouldn't have registered as individual objects and the whole wouldn't have appeared mosaiclike. "I find that the more we refine the details, the more quickly the viewer will understand the message," he says.

Arky finds inspiration and ideas like everyone else: online. Until recently he looked to contemporary images. "For your readers, it's a good way to start. Online, you can find examples of various ways

to capture something specific. A strawberry, for example," Arky says. Lately, however, he's been looking to classic etchings, engravings, and line drawings.

These give him important clues as to how to render an object three-dimensionally and to give interesting and engaging twists to its presentation and visual characteristics. For instance: Challenge your own imagination and skill set with a quick search for "photographs of English idioms": "sitting duck," "flash in the pan," "barking up the wrong tree," and the like. (Behance has a clever set called "idioms-in-pictures.") Once you see how other photographers have done it, try your hand at creating your own.

Inspired to go further in photo illustration? Arky says it doesn't take expensive equipment or advanced model-making skills to succeed. "Don't be daunted by thinking you don't have the right tools or the latest gear. They don't matter. I've seen incredibly smart, funny, even powerful photo illustrations made with iPhones," Arky says. "Give yourself a little credit and plow ahead. If you're clever, and aware of your strengths and limitations, you can make a go of this."



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TIPS & TECHNIQUES

From the Pros

1 Keep Your Camera Equipment Clean

A blower brush and lens-cleaning cloth can go a long way in maintaining your cameras and lenses. Blowing dust from the camera's sensor and mirror, or gently wiping the front element of your lens ensures your images will be clear and free of any spots. Hours of editing photos on your computer will be saved simply from keeping the equipment clean.

2 Always Have Business Cards Handy

Whether you're on a professional shoot, or taking pictures for personal enjoyment, you may be approached by a person, or persons, requesting your services. Having business cards on hand, or a promo card featuring an example of your work, is always a good idea. Remember to have updated contact and website information so potential clients will always have your information readily available for any future events.

3 Motivation Is The Key

Even the most creative minds get stuck once in a while. To get out of that rut and keep yourself motivated, taking a trip to the local gallery and looking at other people's work can help guide you into the direction you might want to go as a photographer. Books and magazines can prove to be great references, as well.

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LAB

Olympus OM-D E-M1 II
P.82
**Sigma 12–24mm f/4
DG HSM A** P.85

AUTHORITATIVE TESTS AND REVIEWS

DSLR TEST



NEW BOSS

Sony's flagship A-mount DSLR is better than ever

IF YOU THOUGHT that Sony abandoned its DSLRs in favor of its Alpha 7 series of ILCs, the recently released a99 II proves this notion wrong. Sure, the a99 II shares the same full-frame 42.4MP backside-illuminated sensor as the a7R II, but the new DSLR has

Sony's fancy new LSI chip tucked into the signal path between the sensor and Sony's Bionz X processor to help deal with the data.

The autofocus system has been substantially upgraded to a 79-point dedicated phase-detection system and 399 embedded phase-detect points on the sensor, from the original a99's 19 dedicated

TAKE CONTROL
The Sony a99 II's rugged body is jam-packed with customizable buttons and dials to set to your liking.

points and 102 embedded points. Plus, while the AF system in the a99 was rated effective only down to -1 EV, the a99 II's system is rated to work down to a dark -4 EV. This new AF system can track moving subjects at the a99 II's burst rate of 12 frames per second (with full metering). That's double the speed of its predecessor. Meanwhile the top sensitivity has grown to ISO 102,400 from the a99's ISO 25,600. Those aren't the only improve-

ments on this \$3,198 (street, body only) DSLR. First, we wanted to see how the a99 II fared in the Popular Photography Test Lab and shooting out in the real world.

In the Test Lab

With its 42.4MP BSI full-frame 35mm sensor and the latest processor and algorithms that Sony has to offer, the a99 II aced our lab tests. In overall image quality, the camera easily earned an Excellent rating from its lowest sensitivity of ISO 50 through ISO 1600. That's the same overall rating that the original a99 achieved in our test, though that earlier camera did so with significantly less resolving power. It's a testament to the merits of BSI sensors, and the a99 II's noise reduction algorithms for JPEGs, that the new camera pumps out JPEG images with noise low enough to match what the old one did with Raw files. Once the camera is supported by Adobe Camera Raw we will process those and provide those test results (see sidebar).

In our color accuracy test the a99 II's JPEGs eked out an Excellent rating with an average Delta E of 7.9, the same result we saw in its predecessor's Raw files.

The a99 II's ability to keep noise down contributes greatly to the camera's Excellent overall result. In our noise tests, it earned top honors at its lowest two sensitivity settings, garnering a Very Low rating from ISO 200 through ISO 800, and earning a Low at ISO 1600. Stepping up to ISO 3200 saw noise rise to Moderate, and at ISO 6400 and above the a99 II's JPEGs landed in Unacceptable territory. To compare, the a99 with its 24.3MP non-BSI sensor got a Moderately Low rating at ISO 3200 when we tested its Raw files; though we wouldn't be surprised if the a99 II's test results end up besting the JPEGs once we generate them.

For another point of comparison,



SONY ALPHA A99 II

KEY SPECS

SENSOR: 42.4MP BSI CMOS (full-frame)

SENSITIVITY: ISO 50–102,400

BURST RATE: 12 fps

AUTOFOCUS: TTL hybrid with 79 points on AF sensor and 399 on imaging sensor

PRICE: \$3,198, street, body only

INFO: sony.net

A NOTE ABOUT TESTING

Historically, our lab tests have assessed TIFFs converted from Raw files using the conversion software that each camera manufacturer provides in the box. However, from now on we will standardize our tests using Adobe Camera Raw to convert all Raw files to TIFFs. As we did in our January/February 2017 issue with the Nikon D3400, from now on we will report test results using JPEG images in the magazine; we will post results for Raw files converted to TIFFs on PopPhoto.com after Adobe adds support for each camera. This way, our tests of the Raw files will have more continuity, and now every camera test will have JPEG results, which we didn't always include in the past.

TEST RESULTS



SPECIFICATIONS

IMAGING: 42.4MP, effective, Exmor R backside-illuminated CMOS sensor captures images at 7952x5304 pixels with 14 bits/color in Raw mode

STORAGE: Dual SD, SDHC, and SDXC slots store JPEG, ARW Raw, and Raw + JPEG files; UHS-I/UHS-II compatible; slot one also accepts Memory Stick PRO Duo/Pro-HG Duo/Micro

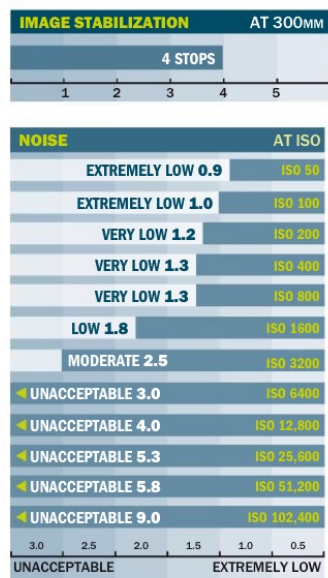
BURST RATE: Full-sized JPEGs (Fine mode), up to 63 shots at 12 fps; Raw uncompressed, up to 25 shots at 12 fps; Raw compressed, up to 54 shots at 12 fps; Raw (uncompressed) + JPEG, up to 24 shots at 12 fps

AF SYSTEM: TTL hybrid phase detection with 79-point (15 cross-type) dedicated AF sensor plus 399 points embedded on the imaging sensor; single-shot and continuous AF with focus tracking and face detection

SHUTTER SPEEDS: Mechanical: 1/8000 to 30 sec, plus B (1/3-EV increments); X-sync speed: 1/250 sec; 300,000-cycle rating

METERING: TTL metering with 1200-zone

the Raw files we tested from Sony's a7R II yielded our top rating of Extremely Low from ISO 50 through ISO 200, but got a Moderately Low



evaluative, centerweighted, and spot (size of spot unspecified); range, -2 to 17 EV (at ISO 100)

ISO RANGE: 100-25,600 in 1/3-EV increments, expandable to 50-102,400

FINDER: 0.5-inch, 2,359,296-dot OLED with 100% accuracy; 0.78X magnification; 5-step brightness and color temperature controls

VIDEO: Records at up to 3840x2160 30 fps in XAVC S (100Mbps); 1920x1080 120 fps (100Mbps); built-in stereo microphone; stereo microphone input; clean HDMI output for external recording

FLASH: No built-in flash; Multi-Interface shoe accepts accessory flashes

LCD: Articulating 3-in. TFT with 1,228,800-dot resolution; 5-step brightness adjustment

OUTPUT: Micro Hi-Speed USB 2.0, micro HDMI

BATTERY: Rechargeable NP-FM500H Li-ion, CIPA rating 390 shots with EVF

SIZE/WEIGHT: 5.6x4.1x3.0 in., 1.9 lbs with a card and battery

PRICE: \$3,198, street, body only

INFO: sony.net

rating at ISO 1600 and ISO 3200 before reaching Unacceptable at ISO 6400 and above. That camera's smaller size poses more of a challenge when

dealing with heat issues.

Essentially matching the a7R II's result of 4000 lines, the a99 II earned an Excellent rating in resolution by capturing 3950 lines per picture height at ISO 50. At ISO 800 the a99 II held most of its resolving power to capture 3800 lines. Increasing to ISO 6400 saw res drop to 3480 lines, while at ISO 25,600 it turned in 3340. At ISO 51,200 it still managed to capture 3000 lines, and at the top sensitivity, ISO 102,400, it resolved 2550 lines.

In our image stabilization test, the a99 II, which shifts the sensor to compensate for the photographer's motion, provided our testers with an average of 4 stops of shutter-speed leeway when shooting handheld. So if you would normally limit yourself to 1/320 sec when using a 300mm lens, you might be able to get away with 1/20 sec and still get reasonably sharp pictures if your subject is still.

In the Field

The new body remains very similar to the original a99, with a comfortable grip, magnesium-alloy chassis, weather sealing, and a very nice OLED electronic viewfinder. A pair of SD card slots offers flexibility: You can configure JPEGs to go to one card while Raw shots go to the other, designate one card for stills and the other for video, enable use of the second slot as extra space after the first card fills—or just mirror everything in case one card fails. Slot One can also accommodate Memory Stick PRO Duo cards.

The a99 II is littered with dedicated buttons and control dials. Eleven of the buttons can be customized to adjust a very wide array of functions. A dial on the front of the camera can be assigned based on whether you're capturing video or stills, and it has a lever to choose click-stops or smooth operation; it's a convenient way to adjust audio recording levels when shooting video (smooth) or you can use it as a dedicated ISO dial (clicked).

We're somewhat surprised that the

two command wheels to adjust shutter speed and aperture don't function as buttons too. But we weren't left wanting for ways to control the a99 II.

The 3-inch LCD rotates 270 degrees and can be positioned above the finder hump and facing forward for selfies.

The extensive menus are fairly easy to navigate—they're well organized and clearly labeled. For the most frequently changed settings there's still the Function menu that supplies a dashboard-style look at the current state of your camera.

As is usually the case for models with an EVF, the a99 II is probably best enjoyed with a spare battery or two charged up and ready to go in your camera bag. Battery life has dropped slightly from the original a99, and you'll do better using the LCD rather than the EVF to frame your shots. The two models use the same batteries, by the way: the NP-FM500H (\$49, street).

As we said up top, the a99 II got a big boost in autofocus. The traditional phase-detect system has 79 selectable AF points, 15 of which are cross-type, with the center being sensitive to f/2.8. That system is supplemented by, and works in tandem with, a 399-point phase-detect system embedded in the image sensor. Because the embedded points are all vertical-line sensors, and the non-cross points in the traditional phase system are horizontal-line sensors, when they work together, they effectively function as cross sensors.

The distribution of the traditional phase points is typical for a higher-end DSLR, with the dedicated cross-type points in the center column. The embedded points cover a large portion of the frame, so in tracking the a99 II has a bit of an advantage over cameras without such a system. We found the AF pleasingly fast and as accurate as you'll find in any DSLR in this price range (and there aren't many). Of course, you can expect it to slow and possibly hunt a bit in lower light, but it impressed us with its ability to lock on a subject even in very dim conditions.

What's Hot
Huge resolution, rugged body, 4 stops of IS

What's Not
Battery life could be longer

Who It's For
Sony shooters looking for the best DSLR the company makes

The AF system offers lots of choices for expanding and grouping focus points as well as for adjusting sensitivity and speed. Focus peaking and a focus magnifier are also on hand should you decide go manual. Or try the Direct Manual Focus (DMF) mode to fine-tune focus after the camera locks.

Burst shooters can choose four different continuous shooting speeds. The fastest is 12 fps in the Hi+ mode, and with lenses with a maximum aperture of f/3.5 or larger, it gives you full use of the Hybrid AF system for all the shots in your burst. If the maximum aperture is f/4 through f/8, which may happen when using zoom lenses, especially with a teleconverter attached, only the embedded AF points will be active. If your maximum aperture is f/9 or smaller, focus will be locked after the first frame.

The self-timer can be set to continuous mode, in which you get three or five images in rapid succession to create a bracket. You can also bracket bursts of up to nine images with lots of EV variation, or set three-shot brackets for white balance or the amount of Dynamic Range Optimizer applied.

The a99 II has a lot of options when it comes to making video, too. Capture tops out at 3840x2160 4K at 30 fps, though 24 fps is available as a selection. The camera records 4K using a 5176x2924-pixel area of the sensor equivalent to the Super 35mm format, so you should expect a crop (similar to an APS-C crop) compared to other video recording.

By oversampling the number of pixels by about 1.8 times, Sony hopes to create video with "realistic depth and dimension." The footage we shot looked as great as we've seen from a DSLR at this level. With tons of detail and well-saturated, accurate-looking colors, we'd expect most shooters to be pleased with the image quality. To get the most out of it, you should use a UHS Speed Class U3 SD card.

Full HD 1920x1080 capture allows up to 120 fps to enable 5X slow motion if you output at 24 fps or 4X if you output at 30 fps. Conversely, you can drop the capture frame rate down to 1 fps to allow for up to 60X fast motion, similar to what you'd get from a time-lapse movie.

There are plenty of nifty video settings for videographers to geek out with, including zebra stripes to highlight overexposed areas, audio level controls, wind noise reduction for the internal stereo microphone, and display markers to aid framing. Picture profiles let you adjust black level, gamma, saturation, color phase, color depth, and detail. Beside the built-in stereo mic, there's a stereo mic input and a headphone jack. Sony's Multi-Interface shoe on the top of the finder hump will let you mount accessories such as a powered mic or video light.

The Bottom Line

The a99 II demonstrates Sony's commitment to DSLRs. With serious upgrades to resolution, video, burst capture, autofocus, and more, this flagship is at the forefront of current technology. The camera is also a lot of fun to use and, when configured well, it does a wonderful job of enabling creativity rather than standing in your way.

With a large and continually growing number of lenses available, you can find pretty much any option through Sony, third-party lenses, or legacy glass. And other accessories, such as Sony's XLR-K2M adapter kit for pro audio mics, let you upgrade the a99 II's capabilities even further.

If you're a current Sony A-mount shooter looking for the best camera body available for your glass, the a99 II is a no-brainer. If you're already in deep with another system, the choice is always harder. But this extremely capable DSLR for still photographers and videographers alike certainly merits consideration.

—Philip Ryan

TOUGH LOVE

Olympus's new flagship delivers even in rough conditions

VERY OFTEN it's the big sensors with massive pixel counts that get all the attention. But with the OM-D E-M1 Mark II, Olympus has taken a different path. With a 20.4MP Four Thirds sensor, the company's new flagship mirrorless interchangeable-

SYNC UP Prominently placed on the front, a PC Sync terminal lets you trigger studio strobes.

lens compact produces images with enough resolution to satisfy almost any need, and it boasts a hybrid 121-point autofocus system that can maintain continuous tracking AF even while capturing bursts as fast as 18 frames per second.

Plus, its five-axis sensor-shift image stabilization system syncs up with optically stabilized lenses—that means more steady power for very long handheld exposures.

No wonder we were intrigued when we learned about this \$1,999 (street, body only) ILC at Photokina last September. After running it through the rigors of the Popular Photography Test Lab and taking it out in the field for extensive real-world tests, we remain impressed.

In the Test Lab

Testing JPEGs, the OM-D E-M1 Mark II earned an Excellent rating in overall image quality from its lowest sensitivity of ISO 64 through ISO 800. That's one stop higher than the original E-M1. Its chief rival, Panasonic's Lumix DMC-GX8, which uses a 20.3MP Four Thirds sensor, also kept its Excellent rating up to ISO 800 when we tested it in 2015.

For a 20MP camera, the E-M1 Mark II did well in our resolution test. At ISO 64 it captured 2740 lines per picture height, beating the GX8's 2660 lines at its lowest sensitivity of ISO 100. As sensitivity increased, the E-M1 Mark II retained more of its resolving power compared with the GX8 until their shared top sensitivity of ISO 25,600. At that setting the E-M1 Mark II captured 1675 lines, while the GX8 nabbed 1925. (We'll see if this improves once we test the Raw files from the Olympus; the GX8 results are from Raw files converted to TIFFs using the custom version of Silkipix that comes with the Panasonic. See the sidebar on [page 79](#) for more info.)

Impressively, the E-M1 Mark II stayed above 2500 lines (our cutoff for an Excellent rating) through ISO 3200, where it took in 2510 lines. At ISO 6400 it dropped to 2390 and then dipped at ISO 12,800 to 2200 lines.



5.3 in.



PHILIP RYAN/LCD IMAGE

Like its predecessor, the E-M1 Mark II includes a High Res mode that lets you boost the resolving power by using the sensor-based image stabilization system to shift the sensor in between shots as it automatically captures eight frames in 1 second. You can choose between 50- and 25-megapixel modes. We used the 50MP mode, which outputs 8160x6120-pixel files (yes, we know that is technically 49.94MP). At ISO 64, the 50MP mode captured 3820 lines.

In our color accuracy test, the Olympus E-M1 Mark II earned an Excellent rating, coming in just below the cutoff for top honors with an average Delta E of 7.9, the same as the Panasonic GX8.

Despite its smallish Four Thirds sensor and fairly compact body, the E-M1 Mark II controlled noise well. At ISO 64 it earned our best rating of Extremely Low and it maintained a Low or better rating up to ISO 800. At ISO 6400 it reached Unacceptable, but noise didn't rise to anywhere near the highest level of noise we've seen even at ISO 25,600.

For our image stabilization test, we paired the E-M1 Mark II with Olympus's M.Zuiko ED 300mm f/4 IS Pro lens to test the five-axis Sync IS that pairs optical and sensor-shift stabilization. Our testers got an average shutter speed advantage of 5 stops. Quite a show-stopper.

In the Field

With a DSLR-style design, the E-M1 Mark II has a prominent grip that gives you plenty to hold on to and

houses the battery and two memory card slots to allow mirroring, automatically hand off files to the second card, or write different file types to each. The 2.36-million dot LCD electronic viewfinder provides a great image.

The 3-inch, 1,037,000-dot touchscreen flips to the left and angles up and down. Its AF Targeting Pad option is handy for placing your AF point while composing through the finder. In a stroke of minor genius, the leftmost side of the screen's touch control is inactive in this mode so your nose won't trigger it; the rest of the screen functions the way a track-pad does on a computer.

While the camera does not have a built-in pop-up flash, it does come with Olympus's cute FL-LM3 hot-shoe unit. With a guide number of 42.3 (feet, ISO 200), this flash packs a decent punch and tilts up and swivels to bounce flash or trigger optical slaves on studio strobes.

Control buttons are amply customizable, and you can save configurations with three custom shooting modes—useful if you switch frequently between very different styles of photography or hand your camera to others to photograph you.

A magnesium-alloy chassis supports the body's rugged build quality, and a bevy of weather seals helps it withstand the elements. It's rated to function in temperatures down to 14 degrees Fahrenheit, and if you pair the camera with one of Olympus's weather-

KEY SPECS

SENSOR: 20.4MP Live MOS (Four Thirds)

SENSITIVITY: ISO 64–25,600

BURST RATE: 15 fps

AUTOFOCUS: Hybrid phase/contrast detect

PRICE: \$1,999, street, body only

INFO: getolympus.com

What's Hot
Pro Capture mode allows 60 fps bursts with electronic shutter

What's Not
Sensitivity tops out at ISO 25,600

Who It's For
Shooters looking for the most powerful Olympus camera body

sealed lenses, you can carry it in the rain for hours without having to use a plastic cover for the rig.

Like most ILCs these days, the E-M1 Mark II uses a hybrid autofocus system that combines contrast and phase detection. Its AF, which we found to be extremely fast and accurate, is built on 121 selectable, cross-type phase-detect AF points embedded in the imaging sensor. To boost AF, Olympus worked with more advanced algorithms and sped up the readout of sensor data (how fast data is sent to the processors—in this case, dual quad-core TruePic VIII). Combined, this lets the E-M1 Mark II solidly track subjects moving through the frame. We followed birds in flight and other difficult subjects with a notable success rate.

A new Pro Capture mode buffers the previous 14 frames at up to 60 fps when you press the shutter button halfway and then saves those and subsequent frames after you finish the full press. It's a great way to capture unpredictably intermittent events, such as an erupting geyser or a fleeting facial expression.

The camera has a custom timer that can function as an intervalometer, capturing up to 10 frames with 0.5, 1, 2, or 3 seconds between shots, with or without refocusing. The drive mode menu also gives you access to set bracketing and the multi-shot HDR mode.

Finally, the E-M1 Mark II offers the High Res Shot mode. While this 50MP mode might not yield the resolution you'd get from a 50MP full-framer, it does let you capture higher-res images of subjects that aren't in motion.

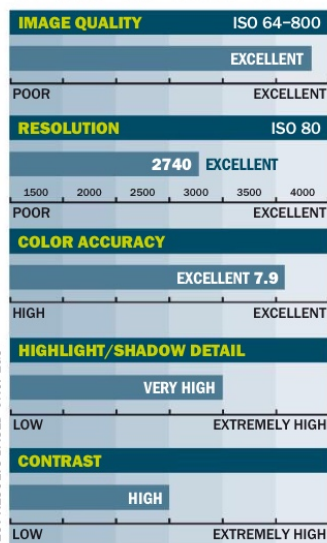
Capable of both Cinema 4K (4096x2160 pixel) and regular 4K (3840x2160 pixel) capture, the E-M1 Mark II puts out competitive video quality. Cinema 4K is limited to 24 fps, while regular 4K offers both 30 and 24 fps; Full HD (1920x1080) capture is possible at up to 60 fps. The footage we captured had lots of detail and pleasing colors. It also



SHOWN WITHOUT LENS

2.7 in.

TEST RESULTS



SPECIFICATIONS

IMAGING: 20.4MP effective, Four Thirds-sized Live MOS sensor captures images at 5184x3888 pixels with 12 bits/color in Raw mode

STORAGE: Dual SD, SDHC, and SDXC card slots store JPEG, ORF Raw, and Raw+JPEG files; slot one is UHS-I/UHS-II compatible; slot two only UHS-I

BURST RATE: Full-sized JPEGs (Normal mode), up to 117 shots at 15 fps (with continuous AF and metering enabled); Raw, up to 84 shots at 15 fps

AF SYSTEM: TTL Hybrid system with 121 phase-detect cross-type points and 121 contrast-detect points; single-shot and continuous AF with tracking and face detection

SHUTTER SPEEDS: Mechanical: 1/8000 to 60 sec, plus B (1/3-EV increments); Electronic: 1/32,000 to 60 sec

METERING: TTL metering with 324-area Digital ESP (evaluative), centerweighted, and spot (size of spot unspecified); range: -2 to 20 EV

ISO RANGE: 200-25,600 in 1- or 1/3-EV increments, expandable down to ISO 64

FINDER: Approx. 2.36 million-dot LCD with 100% accuracy; 1.48X magnification

VIDEO: Records in MOV H.264 format at up to 4096x2160p 24 fps (at 237 Mbps); 3840x2160p 30 fps (at 102 Mbps); 1920x1080p 60 fps (at up to 52 Mbps); built-in stereo microphone; minijack microphone input

FLASH: No built-in flash; ships with FL-LM3 hot-shoe flash, GN 29.9 (feet, ISO 100)

LCD: Articulating 3-in. TFT with 1,228,800-dot resolution; 15-step brightness adjustment

OUTPUT: USB 3.0 Type-C, microHDMI video, Wi-Fi, minijack headphone, wired-remote

BATTERY: Rechargeable BLH-1 Li-ion, CIPA rating 440 shots

SIZE/WEIGHT: 5.3x3.6x2.7 in., 1.3 lb with a card and battery

PRICE: \$1,999, street, body only

INFO: getolympus.com

had greatly reduced jello effect (in which fast-moving subjects get distorted in video)—another positive side effect of speeding up the sensor's readout.

Olympus included a built-in

stereo mic, but the camera also has a mini-jack input, plus a headphone jack and an HDMI port so you can run an external monitor or recorder. Another positive: The image stabilization system works

CARD TIP
If you plan to record Cinema 4K or 4K footage, be sure to record to a UHS-II card in Slot One.

during video shooting.

Although this isn't the first Olympus camera to include them, such features as in-camera focus stacking, HDR, double-exposure, and time-lapse video modes give you lots of avenues for creativity without having to spend a lot of time editing images on your computer. We have a crush on the Live Time and Live Bulb modes that let you see long exposures build in real time on the camera's touchscreen.

The camera's built-in Wi-Fi lets you connect to the Olympus's OI Share app, so you can send images to a mobile device and use your phone as a remote trigger to capture images and change the most common settings. After a fairly simple initial pairing, camera and phone connect automatically when the app is open and the camera's connection settings are on.

The Bottom Line

The OM-D E-M1 Mark II is a great follow-up. It brings more resolution, better noise performance, and a lot of convenient shooting modes to the top of Olympus's line of cameras. It'll help you capture beautiful images that might otherwise take a lot more planning and effort.

The company's growing cadre of lenses fills most photographic needs, and Micro Four Thirds-format lenses from Panasonic and third-party lens makers cover the rest. You can also pair the E-M1 Mark II with tons of vintage glass through mount adapters. Some old C-mount cinema lenses will even cover the Four Thirds sensor, though they may vignette.

Snobby shooters often eschew Micro Four Thirds systems, but those of us who know the versatility of the format and who appreciate the innovative and helpful features that Olympus includes in its cameras should find the E-M1 Mark II to be a formidable image-making machine.

—Philip Ryan

OPTICS ACE

A full-frame ultra-wide zoom for DSLRs stands out

CAMERAS ARE constantly evolving and lenses need to keep up. With high-resolution DSLRs arriving more frequently, Sigma felt the need to update its iconic full-frame, ultra-wide-angle zoom, the 12-24mm f/4.5-5.6, again. This time, however, the lens maker went a step further and produced an f/4 constant-aperture zoom to better team up with those high-end DSLRs for creative landscape, wedding, architecture, and nature photography. The new 12-24mm f/4 DG HSM, in Sigma's Art series, sells for \$1,599 (street) in mounts for Canon, Nikon, and Sigma camera bodies. It is compatible with Sigma's optional USB dock for fine-tuning its features and updating its firmware.

Sigma claims to have the largest aspherical glass mold in the industry, ensuring low distortion, and some of this lens's 16 elements in 11 groups are made with FLD glass similar to calcium fluorite for better optical performance from center to edge. It also has an updated autofocus system with 1.3X torque boost. Its brass bayonet lens mount, plus a dust- and splash-proof construction with rubber sealing, should improve durability.

The faster constant-aperture makes for a larger lens. At 5.22 inches in length, this new Sigma measures about the same as Canon's comparable 11-24mm f/4L EF zoom but about 1/2-inch more than Sigma's 12-24mm f/4.5-5.6, which remains in its lineup. The same goes for

weight: At 2.60 pounds, it is similar to the Canon (2.62 pounds) but almost a pound heavier than its variable-aperture predecessor.

In our field use, the size didn't present much of a problem. The lens balanced well on our test camera, the Canon EOS 5D Mark IV, and the weight was worth the trouble for faster glass.

The barrel is made of a composite material, with nicely sized and ribbed zoom and focus rings. Its petal-shaped lens hood is fixed in place, the better to preserve the huge dome of the front element. This precludes the use of lens-mounted filters—typical of ultra-wide-angle glass. The focus ring turns



What's Hot
Low distortion, improved vignette control

What's Not
Noisy autofocus

Who It's For
Wide-angle fans who want to stretch wider without compromise

smoothly with a pleasingly stiff action for precise manual control. The zoom ring feels similar in action, but it sounded a little bit scratchy on our test sample.

Our only quibbles? We found the

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

	Size	5.7	8.0	11.4	16.25	20.24
12mm	4.0	5.7	8.0	11.4	16.25	20.24
	5.5	8.0	11.4	16.25	20.24	25.0
	8.0	11.4	16.25	20.24	25.0	30.0
	11.0	16.25	20.24	25.0	30.0	35.0
	16.0	20.24	25.0	30.0	35.0	40.0
	22.0	25.0	30.0	35.0	40.0	45.0
18mm	4.0	5.7	8.0	11.4	16.25	20.24
	5.5	8.0	11.4	16.25	20.24	25.0
	8.0	11.4	16.25	20.24	25.0	30.0
	11.0	16.25	20.24	25.0	30.0	35.0
	16.0	20.24	25.0	30.0	35.0	40.0
	22.0	25.0	30.0	35.0	40.0	45.0
24mm	4.0	5.7	8.0	11.4	16.25	20.24
	5.5	8.0	11.4	16.25	20.24	25.0
	8.0	11.4	16.25	20.24	25.0	30.0
	11.0	16.25	20.24	25.0	30.0	35.0
	16.0	20.24	25.0	30.0	35.0	40.0
	22.0	25.0	30.0	35.0	40.0	45.0

KEY: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

autofocus fast but a tad noisy, and the distance scale for feet (marked in yellow in the focusing window) was hard to see.

In the Popular Photography Test Lab, our proprietary SQF tests of contrast and sharpness produced Excellent-rated results at all three focal lengths of 12mm, 18mm, and 24mm, similar

to the Canon lens and slightly better than the earlier Sigma variable-aperture zoom.

Our distortion tests using DxO Analyzer 6.1 showed Visible-rated barrel distortion (0.47%) at 12mm, Imperceptible pincushion (0.09%) at 18mm, and Slight pincushion (0.11%) at 24mm. These are wonderful results for

VISUAL AF CUE
The switch for manual and autofocus reveals a white patch when the lens is in AF mode—easy to see when you hold the camera in shooting position.

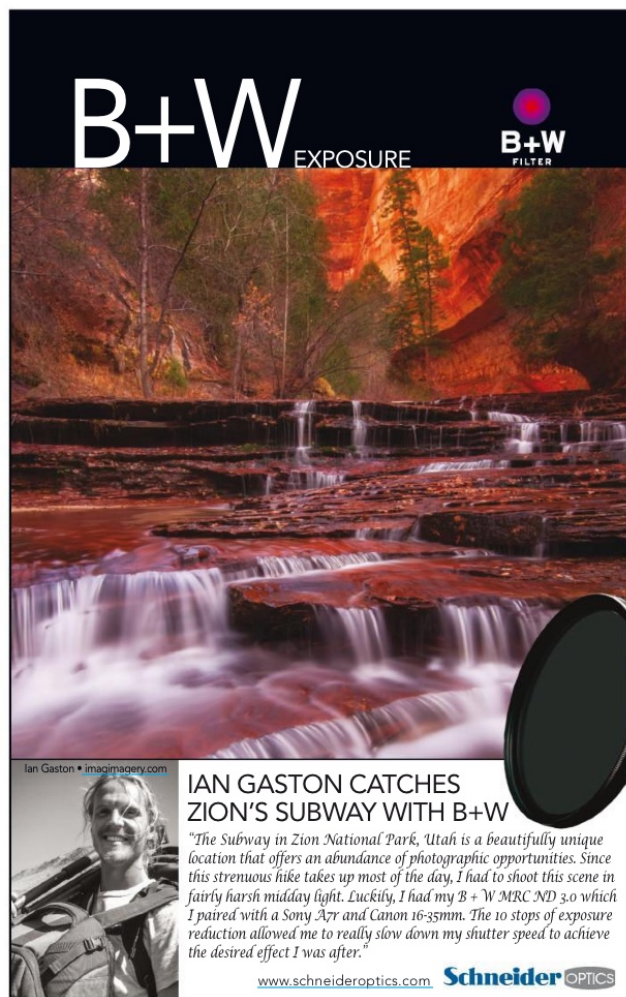
such a wide-angle lens. It outperformed the Canon at 11mm (0.73%, Visible) and blew away its variable-aperture predecessor, for which distortion at the middle focal length was rated Slight (0.18%) and at 24mm Visible (0.34%).

It did far better than its competitors in vignette control in our tests. Light falloff was gone by f/5 at 12mm and 24mm, and there was no falloff at all at 18mm—an incredibly strong result. To compare, the Canon's vignette was not gone until f/6.3 at 11mm and f/5.6 at 12mm and 24mm, and there was no falloff at all at 18mm—an incredibly strong result. To compare, the Canon's vignette was not gone until f/6.3 at 11mm and f/5.6 at 12mm and 24mm, and there was no falloff at all at 18mm—an incredibly strong result.

The new Sigma also shined in close focusing, keeping subjects sharp at an incredible 9.03 inches. That's more than an inch closer than the Canon (10.20 inches) and the older Sigma (10.24 inches). Maximum magnification at 24mm came in at 1:4.07, again much better than the Canon (1:5.09) and the Sigma variable-aperture (1:5.33), another remarkable achievement.

This updated wide-angle wonder has improved in every way. Not only did its constant aperture make it faster throughout the zoom range, but its optical prowess, as determined by sharpness, distortion, and light falloff, proves superior. And its close-focus ability and maximum magnification is the best in its class.

Sure, at \$1,599, the price might seem high, especially considering the variable-aperture Sigma is still on the market for \$950. But this new zoom retails for almost \$1,200 less than the Canon 11-24mm f/4L. So, for Canon users, the question is whether you really need that extra millimeter on the wider end. And for Nikon and Sigma DSLR shooters, the question is simply: What's your budget for glass this year? Because this ultrawide is a real winner. —Julia Silber



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Multiple Exposures

If one cover photo is good, 14 are better, especially when the subject is 16-year-old film and television actress Sharon Hugueny. Photographer Peter Basch shot this multiple portrait on assignment for *Popular Photography* using a Rolleiflex and Ektachrome Daylight film with an exposure of 1/50 sec at f/5.6.

56 YEARS AGO A four-page profile of famed photographer Weegee ran photos of him, not by him.



Super Pro 35mm

Possibly the best-engineered 35mm SLR ever was the big, heavy, awesome Zeiss Contarex. Shown here is the Contarex Special, offering interchangeable viewfinder and focusing screens. The \$300 price tag (about \$2,400 in today's dollars) reflected the quality of workmanship and optics of this beautiful machine aimed at professional photographers.



The Very Good Old Days

Today, when classic prints sell at auction for five and six figures, we feel something other than nostalgia over this article that recommended collecting first-class prints, like this one by Robert Capa, for a song. The author, picture editor Charles Reynolds, noted that people were starting to collect photos, pointing to those sold for \$25 each at a print sale at the Museum of Modern Art.

Take the Abstract Approach

Who says photography has to be representational? Executive editor John Durniak saw abstraction as an invitation to see photographically. This unusual portrait by Erich Locker demonstrated the

challenges offered by abstract imaging. —Harold Martin



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MAN OF STEEL

Capturing a hard-working artisan

"FOR THE LAST two years I've been working on a project titled Pittsburgh Stories, finding interesting and iconic people in the city. I make their por-

traits and accompany the images with brief stories about them. I was referred to John Walter, who has a massive metal shop in the middle of the city, where he collects an eclectic array of scrap metal. John is an artisan; he'll take any kind of

metal and make art out of it. He's typical of the Pittsburgh type—modest, no-nonsense, initially a bit gruff, yet once you're approved, will offer you a beer. My favorite aspect about this image is the way the light reflects off the one goggle, kind of like John has a third eye. It adds another element to the photograph."

—As told to Adam Ryder

STEELY GAZE
Tom M. Johnson shot this with a Canon EOS 6D and 25-105mm f/4L Canon EF lens at 40mm; 1/6 sec at f/6.3, ISO 400. He lit the scene with a Profoto 7B strobe in a Profoto Softbox RFI Octa 90cm.

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Broken Sky Dawn Oxbow Bend on the Snake River in Grand Teton National Park, in October. This panorama is a single image, exp 0.3 sec at f/11 with a Canon 5D mark III and EF24-105mm f/4L IS lens. Jay Caldwell, OutsideShutlineArtPhotos.com

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©Kristofer Rowe Focal Length: 600mm Exposure: F/6.3 1/1600sec ISO: 720



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