

the  
**Henry  
Ford**

**MAGAZINE**

JUNE-DECEMBER 2014

Gain perspective.  
Get inspired.  
**Make history.**

Why is the football  
helmet attracting  
unlikely players to  
**work as a team?**

PAGE  
**22**



+

VIDEO GAME DESIGN  
UNCOVERED  
ETHERNET'S  
CANDID CREATOR  
SWARMING ROBOTS



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**WANT MORE?** THIS ISSUE OF THE HENRY FORD MAGAZINE IS AVAILABLE IN JUNE 2014 ON ITUNES AND GOOGLE PLAY FOR IPAD AND ANDROID TABLETS. ►

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Bob Metcalfe is the inventor of Ethernet, a venture capitalist, pundit and publisher who says you're supposed to stand on the shoulders of giants and, as for enemies, they're a good thing.



MICHELLE ANDONIAN

## ON THE COVER

Athletes, engineers, material scientists, doctors and designers. All are contributing to the safety, performance and appearance of football's next generation of helmets.

COVER PHOTO COURTESY OF SG HELMETS



DAVE LAURIDSEN

## 28

► University of Southern California professor Tracy Fullerton (center) and game designers Elizabeth Swensen (left) and Sean Bouchard take on the roles of different countries as they do a playtest for a game about the causes of World War I. Board games, group play and fun facial props are common to the creative process in the Game Innovation Lab at USC, debunking preconceived ideas about the solitary nature of video game design.



## Behind the Scenes

Who We Are and What We Do

# Gain perspective. Get inspired. Make history.

### THE HENRY FORD: A NATIONAL TREASURE AND CULTURAL RESOURCE

Located in Dearborn, Michigan, The Henry Ford is the cultural destination where people connect with America's history. A national historic landmark with five unique venues, unparalleled collections and world-class expertise, The Henry Ford is an internationally recognized destination and force for fueling the spirit of American innovation and inspiring a can-do culture.

At The Henry Ford, stories and artifacts from 300 years of America's history bring to life the accomplishments of ordinary and extraordinary individuals alike. Nearly 2 million visitors annually experience Henry Ford Museum, Greenfield Village,

Ford Rouge Factory Tour, Benson Ford Research Center and The Henry Ford IMAX® Theatre. A continually expanding array of content available online provides anytime, anywhere access to countless other individuals worldwide.

The Henry Ford is also home to Henry Ford Academy, a public charter high school that educates 485 students a year on the institution's campus and was founded in partnership with The Henry Ford, Ford Motor Company and Wayne County Public Schools. For more information, please visit our website, [thehenryford.org](http://thehenryford.org).

**The Henry Ford** provides unique educational experiences based on authentic objects, stories and lives from America's traditions of ingenuity, resourcefulness and innovation. Our purpose is to inspire people to learn from these traditions to shape a better future.

### OUR CONTRIBUTORS



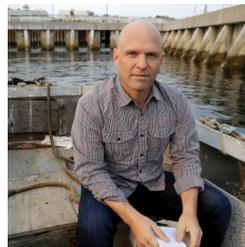
**KRISTEN GALLERNEAUX** is curator of communication and information technology at The Henry Ford. She is a practicing visual artist, working toward a Ph.D. at the University of California, San Diego. She writes alternative histories of media, architecture and design. If you would like to read a novel that centers on the video arcade of her youth, she recommends Emily Schultz's *Joyland*.

Player Up, Page 28



**JEFFREY PHILLIPS** is a senior consultant at OVO Innovation, working with Fortune 500 companies to build innovation capabilities. He is the author of *Relentless Innovation* and writes the Innovate on Purpose blog, [innovateonpurpose.blogspot.com](http://innovateonpurpose.blogspot.com).

OnInnovation sidebars, Pages 40-41



**JASON DEAREN** is a journalist who lives in San Francisco, where he is an environmental writer for the Associated Press. His work has appeared in *The New York Times*, *Los Angeles Times*, *Washington Post* and other newspapers and websites. His freelance reporting focuses on innovation and technology, and in his spare time he likes to surf, travel and go backpacking with his wife.

Making an Impact, Page 22



**DAVE LAURIDSEN** is a Los Angeles-based photographer who spends his time off checking fourth-grade math homework and sixth-grade science projects. In his office, there's usually 5 gallons of beer fermenting in the corner. Dave has recently shot for *Sunset*, *Money*, *Architectural Digest* and Southwest Airlines.

Player Up, Page 28



**JUDE BUFFUM** is a Philadelphia-based artist whose design and illustration clients include AOL, Courtney Love, Disney, HBO, *The New York Times*, Sony, Target, Toyota and UPS. His work has received awards from *Graphis*, *Communication Arts*, AIGA, *Print*, Society of Illustrators, *3x3* and *American Illustration*, and his noncommercial work has been exhibited internationally.

Player Up, Page 28

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The

themes in this issue of *The Henry Ford Magazine* are teamwork and collaboration.

At The Henry Ford, we practice their meaning every day. Each time I walk

through the Josephine Ford Plaza entry to Greenfield Village, I read this dictum carved in stone, "Everything of significance we do today, we do in partnership with others."

Leave corporate speak behind for a moment. Here's what everyone at The Henry Ford and I know to be true about teams and collaboration. When something works, it works.

1. Embrace the fact that you can't do it alone. At The Henry Ford, the work we do is richer and deeper when we search out the perspectives and experiences of those beyond our walls.
2. Be transparent. Always be up front about what you can and want to bring to the table, and how you're going to bring it. Ask the same from a partner.
3. Never collaborate just for the sake of collaboration. Be strategic about your choices, and look beyond the traditional. Sometimes the most rewarding collaborations are the most unlikely ones.

4. Not every collaboration has to be a 50/50 partnership. Mutual benefit doesn't necessarily mean equal benefit, and that can be OK.

5. Recognize that effective collaboration requires more work, not less.

With this issue, we wanted to help our readers explore teamwork and collaboration from unexpected angles, ranging from sharing the story of unity behind a small slave revolt in 1851 to debunking the myth of the lone inventor in designing today's underground video games. We also provide a sneak peek at our new television series, *The Henry Ford's Innovation Nation*. This is our latest collaborative effort with outside partners (see Page 8). The show is slated to debut on CBS this fall, and we can't wait. So far, its creation is proving, once again, that we have much to give as well as gain by collaborating with others and working as a team.

*Patricia*

**PATRICIA E. MOORADIAN, PRESIDENT**



President Patricia Mooradian (center) at Susquehanna Plantation with presenters Pam Stol (left) and Meeta Martin.



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## Ideas in Action

A Sampling of Cool Inventions and Crazy Notions

### COLLABORATION COUNTS

When we put our heads together and work as a team, we often have an advantage.

#### SAFETY UNSEEN

Two students studying industrial design listened as lots of debate swirled around making cycling helmets mandatory for adults in Sweden. The duo thought, if we've got to wear 'em, let's at least make them look good as well as safe. Scrapping the cap, they came up with a collar with a hidden air bag for the head, invisible until you need it.

[hovding.com](http://hovding.com)



COURTESY OF HOVDING

#### ADVERTISING EGALITARIAN

One day, three creative guys had a convo with another creative guy about how cool it would be if writers, directors, animators, even imaginative moms and dads from different places, could collaborate, compete and create their best work for the big brands that need their best work. Now there's an online destination making a profitable game out of connecting companies in need with a less obvious creative community at large.

[tongal.com](http://tongal.com)



COURTESY OF SYNERGY AIRCRAFT



#### DRIVE THE FRIENDLY SKIES

Henry Ford dreamed up the Ford Flivver, the Model T of the air. It (the idea) never flew. A Montana clan — father, son and grandson — is looking to reinvent the notion of personal air travel. This trio is building a five-person family flier in their garage that's economical, quiet and, at more than 40 mpg, pretty darn fuel-efficient.

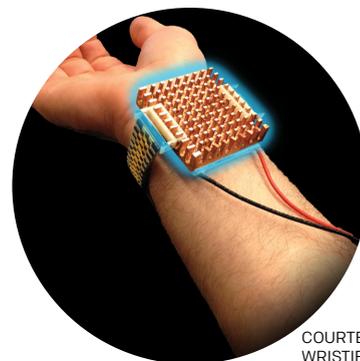
[synergyaircraft.com](http://synergyaircraft.com)

FORD FLIVVER PHOTO FROM THE COLLECTIONS OF THE HENRY FORD

#### KISS ON THE WRIST

Think of all the energy needed to heat and cool the buildings and dwellings we occupy. When four MIT engineering students wrapped their heads around this dilemma, they thought, why not just heat and cool the individual instead of the space? The foursome developed a thermo-electric bracelet that sends pulses of hot and cold wave forms to the body — your own personal HVAC sitting on your wrist.

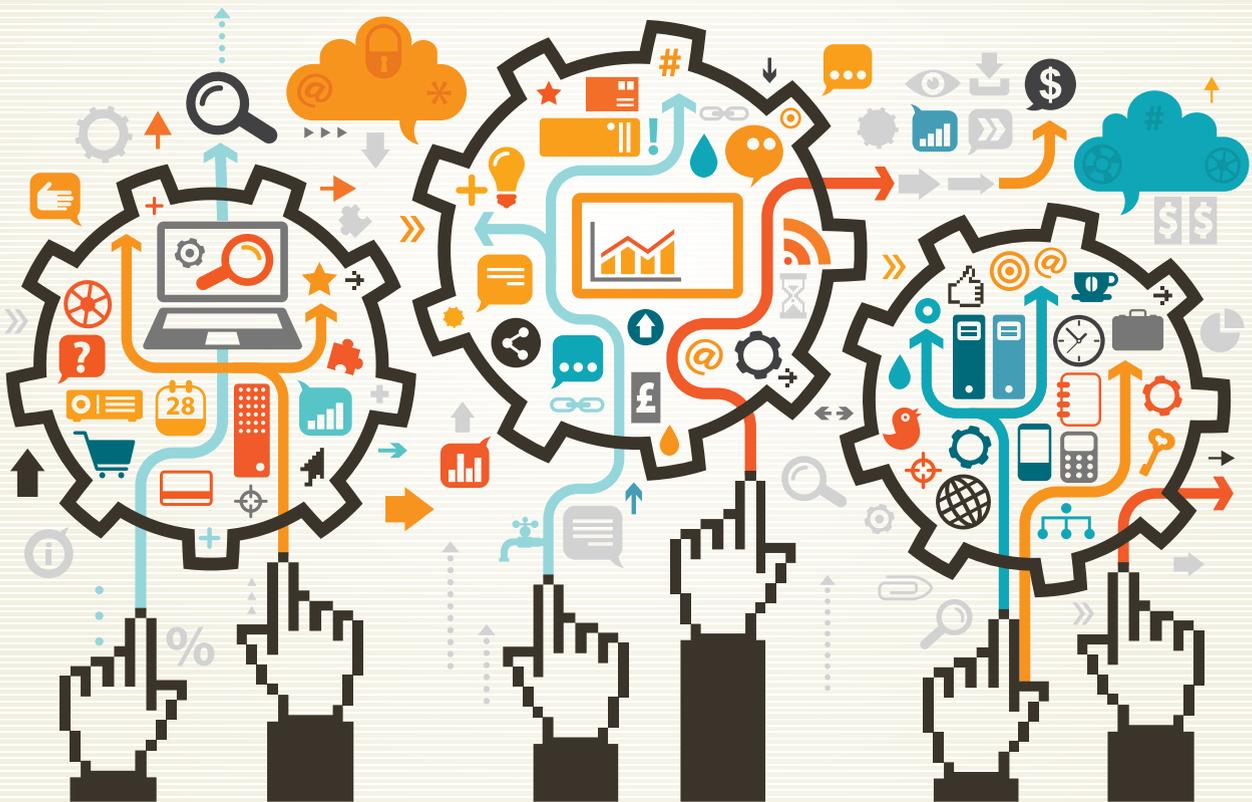
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## ASK: Has the meaning of collaboration changed over time?

**ANSWER:** Today, collaboration transcends the boundaries of geography, culture and time. It is much more adaptive, responding to the rapidly changing context of the 21st century. The key drivers for this changing context: globalization and technology.

We see large companies leaning heavily on multination collaboration. To manage these complex collaborations, work culture changed with a flurry of supportive cloud-based applications and technological tools such as Skype and Lync, which allow people to manage collaboration without losing the social aspect.

The changing nature of collaboration has also made people adapt their individual and organizational behavior and skill sets and find new ways of conflict management. Today, people are open to what others bring with a much higher respect and tolerance for cultural differences. People know and accept that for large-scale collaborations to work, there has to be compromise to achieve the bigger good.

I also see collaboration changing in terms of content creation and management. Traditional strict ownership of content has eased, giving way

to newer concepts of crowdsourcing, crowd funding and co-creation. This, in turn, has led to more fluidity with principles of copyright, giving birth to open-source, creative commons and other shared and malleable content models. Consider social media and how it has given rise to fun types of organic collaboration such as Flickr and Wikipedia, where the world is one family.

The new meanings of collaboration are bringing major change to education, too. The rise in popularity of massive open online courses (MOOCs), flipped classrooms (where students are encouraged to do schoolwork at home, tapping various open-source materials, and to use class time for discussion and analysis) and blended learning (where educators are more than teachers in a traditional classroom) are the result of a need to foster a core collaborative spirit in newer contexts.

These combined reasons are why collaboration is being called out as a 21st-century skill that the current generation of learners must work to acquire and apply in their careers and lives. And the exciting part is that this is not the end. Collaboration is a dynamic phenomenon that keeps changing as contexts change and innovations appear over time.

**PAULA GANGOPADHYAY** is chief learning officer at The Henry Ford.

Turn it **ON**

Explore *The Henry Ford's New TV Show*

# Innovation Nation TV Series

The Henry Ford's new television show will educate audiences on the people and ideas changing our world



**SATURDAY MORNINGS  
ON CBS' DREAM TEAM,  
IT'S EPIC!**

**BETWEEN 9 A.M. AND  
NOON ON CBS NETWORK**

**DID YOU KNOW? /**

The Henry Ford partnered with Litton Entertainment to create *The Henry Ford's Innovation Nation*. Litton also produces shows such as *Jack Hanna's Wild Countdown* and *Lucky Dog*.

Get ready to shake up your Saturday mornings this fall. The Henry Ford is launching *The Henry Ford's Innovation Nation*, its all-new nationally broadcast TV series on all things — yeah, you guessed it — innovative.

Starting in October 2014, the program will air once a week as part of CBS Network's Saturday morning block of educational programming, *CBS Dream Team, It's Epic!* When you tune in, expect stories of historic innovations, current-day marvels and the forward-thinking people who are changing our world. You can also expect an insider's look at The Henry Ford's massive collections, which will serve as a springboard for the show's subject matter.

An extra bonus for viewers: The show's host is Mo Rocca. If Rocca's name and face seem familiar, there's good reason. He is a correspondent for *CBS Sunday Morning* and is also creator and host of Cooking Channel's *My Grandmother's Ravioli*, and appears regularly on NPR's hit news quiz show *Wait, Wait...Don't Tell Me!* He previously served as correspondent on *The Daily Show* and *The Tonight Show*. He also has award-winning children TV series on his resume, including PBS's *Wishbone*.

As host of *The Henry Ford's Innovation Nation*, Rocca — who is known for his witty, sharp and smart style of storytelling — will be guiding each episode on location at The Henry Ford.

"It has always been our vision at The Henry Ford to become a national force for fueling the spirit of American innovation and inspire those inventors, innovators and makers of tomorrow," said Patricia Mooradian, president of The Henry Ford. "With *The Henry Ford's Innovation Nation* and our partnership with CBS and Litton Entertainment, we will now be able to share the stories of perseverance, passion and ingenuity that we tell on our campus every day to audiences across the country."

Filming of the show is set to begin on-site at The Henry Ford this summer. Each episode will tell up to five stories related to food, design, social innovation, technology and transportation.

"This television experience will both entertain and help families better appreciate the science and engineering that touches their lives everyday," said Christian Øverland, executive vice president of The Henry Ford.

ONLINE

See the *The Henry Ford's Innovation Nation* show trailer  
[youtube.com/watch?v=F1QpWT\\_EdQ8&feature=youtu.be](http://youtube.com/watch?v=F1QpWT_EdQ8&feature=youtu.be) ▶

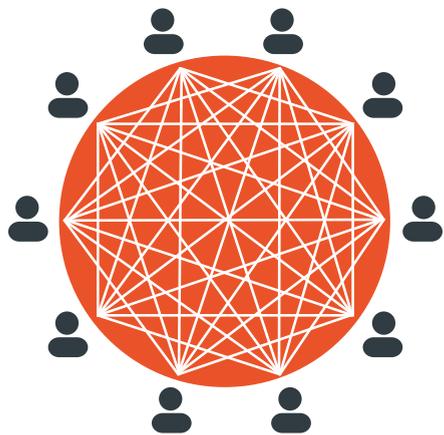


**SHOW HOST**

Author and TV personality Mo Rocca is teaming up with The Henry Ford to create *The Henry Ford's Innovation Nation* television series.

## A Word or Two

Defining People, Places, Pastimes



### METCALFE'S LAW

The value of a network grows as the square of the number of users.

## Indie

(IN-DEE) ADJ.

Short for independent, often used to describe the cool, the quirky, the hip. In this case, we're putting the word in front of games played on screen.

**PAGE 28**

## Posse

(POS-EE) N.

A force to be reckoned with. When a small band of enslaved individuals in a quiet Pennsylvania village takes a stand against a slave owner and his men, their story helps fuel the fight to abolish slavery across America.

**PAGE 46**

## Nerds

(NURD-Z) N.

The dictionary calls them intelligent, yet single-minded, individuals obsessed with a nonsocial pursuit. Ironic that a few of 'em developed a system that "socialized" the personal computer.

**PAGE 39**

## Swarm

(SWAWRM) N.

Insects and the paparazzi chasing Justin Bieber are known to move about in such a concentrated fashion. What if a bunch of high-tech tiny robots could travel together in this purposeful manner and help save lives while they're at it?

**PAGE 19**

## Solo

(SOH-LOH) ADV.

Banish the image of something red and full of brew. Think about how going at it alone is sometimes necessary, but going at it with a crew is almost always better.

**PAGE 15**

## Cross-pollinate

(KRAWS-POL-UH-NEYT) V.

Bees and the breeze spread love from flower to flower. Humans have their moments, too, scattering ideas across departments, industries, even continents for the greater good.

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# Innovation Nation

Personal stories AND perspectives  
from today's forward thinkers

The ballast never works alone; it always works in tandem. Weighted cargo placed in the hull of a sailing ship provides control, stability. But the meaning of the ballast can also refer to positive forces at work in the world — a thing or a person that supports the action or attitude of something or someone else. So people can act as ballasts, too.

The connecting thread that weaves this issue together is the idea of teamwork. We repeatedly see how it is set into motion by a catalyst — something that sparks a bond between people with common values and goals. It takes courage to rally against what has become standard in our culture. Equally, it can be intimidating to surrender to a leveled playing field. But those who live and breathe the culture of cooperation understand the benefits: The interactions that arise through pooled energies and shared skills yield greater meaning in the end.

— KRISTEN GALLERNEAUX, CURATOR OF COMMUNICATION AND INFORMATION TECHNOLOGY, THE HENRY FORD

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→ Design



# Teams in Nature

**In nature, all designs come with a guarantee because anything that exists in nature only survives because it has been refined through millions of years of evolution. Survival only of the fittest.**

Biomimicry, learning from nature's design patterns, is now a respected technique used by many of today's innovators for product design in industries ranging from aerospace and fashion to pharma and IT. A new branch of biomimicry, known as organizational biomimicry, is also fast emerging as researchers try to find patterns in nature that will help organizations in their quest to design successful teams.

What we're discovering is that there are three massive differences between bioteams and our human teams.

**1. Communication/** In human teams, communication is complex, infrequent and two-way. Within bioteams, communication is simple, frequent and one-way. Think of ants. They communicate chemically by laying pheromone trails. These messages are not replied to but simply alert the receiver that there is an opportunity (food) or a threat (predator). The message

contains no information about what to do about this threat or opportunity — that's totally up to the receiver. Surprisingly, this style of fast, simple communication enables an ant colony to react amazingly quickly. In contrast, consider the often-glacial speed of human teams when they have to respond to something unexpected.

**2. Leadership/** We humans have teams led by an individual and sometimes supported by a hierarchy. Bioteams are led collectively by different members depending on the needs at the time. Migrating snow geese, for example, constantly rotate the main navigation role among different birds. We don't fully understand why the geese rotate this role, but there are a number of theories. One theory is that the other birds benefit from the slipstream effect of the lead bird. Another contends that each bird only knows a fragment of the route and they are, in effect, navigating collectively. This style of collective leadership means the success of the geese is not dependent on one key member getting everything right.

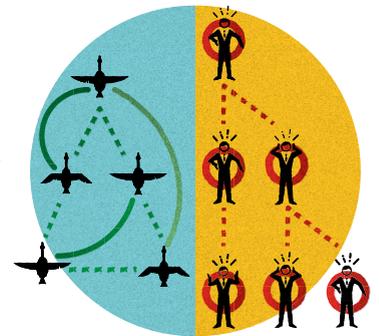
**3. Scalability/** Human teams tend to be small, with rigid boundaries. On the other hand, bioteams can be very small or

have millions of members — it all depends on what the team is for. In human teams, members join at the start and membership is frozen. Bioteams constantly flex their size to suit the job at hand. Ants clearly form teams of different sizes depending on the task. Where the task requires muscle, a large team is assembled where all members do the same thing at the same time — brute force. Where a task requires precise coordination, a small team is assembled where members do different things at the same time — division of labor. Imagine how more effective our teams would be if we could easily pull in virtual team members as and when required.

As humans, we have to start asking the right question, the real question. It's not: Do bioteams work? Instead: Are their designs applicable to our teams? Worth noting before that question is answered: In nature, bad designs are simply not around. •

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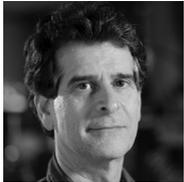
TYLER HOEHNE



**KEN THOMPSON** specializes in high-performing teams and business simulation, allowing teams to test different models virtually before adopting them into an organization. He has published two books, *Bioteams* and *The Networked Enterprise*. His blog is [bioteams.com](http://bioteams.com).



# Q&A: Science as a Sport



Dean Kamen is well-known as the inventor of the Segway Human Transporter and the scientist who invented the first wearable insulin pump. Kamen, however, will tell you that one of his proudest accomplishments to date is FIRST (For Inspiration and Recognition of Science and Technology), an organization dedicated to motivating the next generation to understand, use and enjoy science and technology through innovative projects and robotics competitions.

Kamen spoke to The Henry Ford about this educational outreach and why it is helping kids of all ages fall in love with science, math and so much more.

**THF ▶ What is FIRST?**

**Dean Kamen ▶** FIRST is to the math and science teacher what the NBA is to the phys-ed teacher. It's an exciting "sport" that gets kids passionate about math and science. Even better, everyone that participates in FIRST is a winner who can go pro, while only one in a million kids that play school sports will actually play professionally.

**THF ▶ Math and science as exciting sports?**

**Kamen ▶** I use the sports analogy because it's a simple model that works and is emulated in our society. We as a culture are obsessed with sports and entertainment. Kids' heroes and icons today are coming from the NFL and Hollywood. We even justify sports getting a prime piece of our schools' real estate and funding, claiming that it's not because kids learn how to "bounce, bounce, throw," but because through sports they are learning an important thing called teamwork.

If it's sports that get our kids passionate and teach teamwork, why not use the same model for teaching math and science? Why not create a model where kids can participate in science and math after school, feel nurtured by a coach (their teachers), where dads and moms can come watch them compete in matches?



ADRIANA M. GROISMAN



**THF ▶ What does FIRST teach students about teamwork?**

**Kamen ▶** In the classroom, teamwork is often called cheating, but there's really nothing more important than teamwork when it comes to math and science. Think of how much teamwork is required to put a man on the moon, curing cancer.

We have two terms in FIRST. "Coopertition" is that, yes, you have to compete and push limits to raise the bar, but you have to do it in appropriate, fair ways. No one wins by helping others lose. The second term is gracious professionalism. We want everyone to be highly competitive, but we also want everyone to consider the long-term effects of their actions. That treating one another with respect and kindness is most important.

**THF ▶ How does FIRST avoid the negatives often associated with competitive sports?**

**Kamen ▶** We know if we succeed in making math and science exciting sports, we could end up with the negative aspects. Winning at any cost, cheating. From day one, from year one, unlike "bounce, bounce, throw," with FIRST we remind kids, mentors, parents and teachers that everyone is a winner, that every participant can go pro and build a career around what they start with FIRST. It's a culture, a movement, where learning is taking place in more meaningful ways, where every kid feels rewarded and realizes: "I can do it." ●

**WANT MORE?**  
GO ONLINE/  
[usfirst.org](http://usfirst.org) ▶

**WATCH/** Dean Kamen's OnInnovation interview at [oninnovation.com](http://oninnovation.com) ▶

**READ/** *Reinventing the Wheel: A Story of Genius, Innovation, and Grand Ambition* by Steve Kemper ▶

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→ Food



# Well-Balanced **Plan of Action**

**In our world, like tends to attract like. The fancy term for this is homophily, which refers to a phenomenon in social networks where we tend to find and connect with those who are similar to us. In layman's terms, "birds of a feather flock together."**

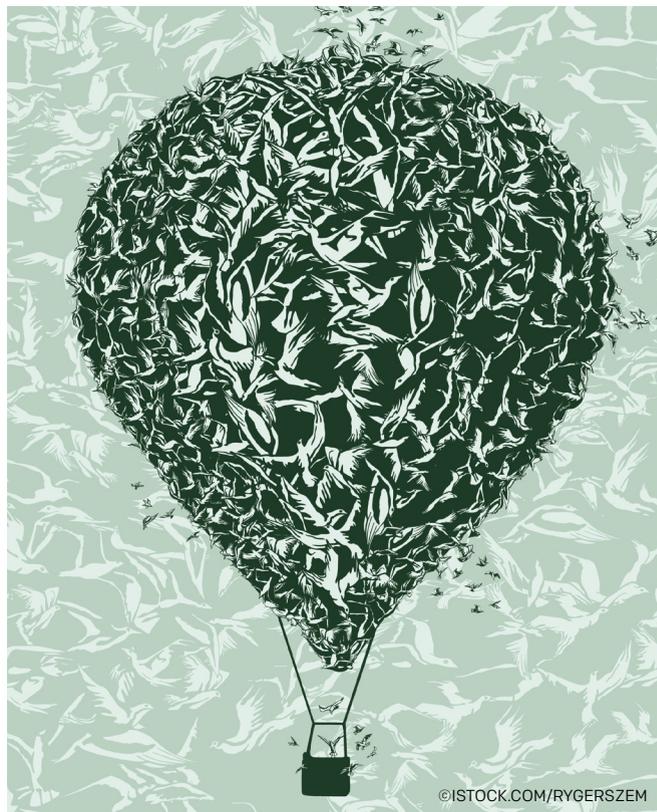
This happens in part because of personal preferences. It's easier for us to communicate and build relationships with people who share common experiences. Also, it's because of opportunity. If you're a young transplant to a new city, for example, and you're spending time out at events and in spaces that are welcoming to young transplants, chances are you'll end up connecting with other folks like you.

As part of a community of food processing, distribution and retail businesses in Detroit working together to realize a more healthy, fair, sustainable, delicious and thriving food economy, I've seen that magic can happen when business owners who seem very different have a chance to build relationships around a passion for good food.

Because when you get down to the deep stuff, people — regardless of race, class and entrepreneurial experience — share a lot: a love for delicious food; a desire for a vibrant, healthy and safe place to raise children; and a need to find new ways of doing business that make our stories and our values more visible.

At FoodLab, we work to cultivate businesses that balance profit with environmental stewardship and community prosperity. But our special sauce is in the way we try to connect businesses with one another to catalyze projects and policy change and push cultural shifts that are bigger than any one business can tackle alone. For example, this year, our crew of 70+ businesses voted to rally around an initiative called Operation Above Ground that will focus on improving the food business licensing process in the city of Detroit.

Our group is far from perfect, but we do our best to be curious and proactive in creating opportunities for birds of seemingly different feathers to flock together. We create space so a second-career senior who has lived deep in the east side for the past 50 years can talk shop with a fresh-



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faced baker from Brooklyn; that helps to surface deeper things we share — love for our region and our neighborhoods, commitment to justice, and care for the environment, which all set a foundation to work together toward specific shared goals. ●

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**JESS DANIEL** is a California native in her fourth year of a tumultuous love affair with Detroit. She is founder and chief enabler of FoodLab, a growing community of good-food businesses, and a 2013-2014 BALLE Local Economy Fellow.



# The Gap Between American and Made

Just when the market for U.S. manufacturing is returning and consumers are demonstrating with their wallets that they prefer U.S.-made products, our country has lost its ability to capitalize on a growing demand. Consider the handbag industry, for example. In 2011, 84 percent of U.S. demand for handbags was met by imports. More disturbing, even if 100 percent of the U.S. capacity to manufacture handbags was utilized, we would have only been able to fill a mere 19 percent of a \$2.7 billion demand. And stats such as these are mirrored across a number of industries, with future projections just as dismal. *Why?*

As CEO of J.W. Hulme in 2011, I saw this problem firsthand. Because of a renewed appreciation for American-made, we were growing at more than 50 percent a year. However, we were turning down work because we couldn't find enough skilled industrial sewers.

I started asking myself: What had we been doing to prevent this skill gap and promote the mastery of our trade? As it turns out, we were doing very little. And J.W. Hulme was not alone, not by a long shot.

Instead of going it solo to solve this big problem, we helped to create The Makers Coalition, a trifecta collaboration among industry, education and private nonprofit services that includes an industrial sewing certificate program designed to help bring our industry back. Earlier this year, the program graduated nearly 80 makers, with 90 percent of former graduates already placed in jobs paying higher than the industry entry-

scale average. A second chapter is now pending in Detroit, where 300 unfilled industrial sewing positions have already been identified.

A good start, yes, but there were other disappointing realities to face. Industry leaders claimed the industry could only afford to pay makers \$9 per hour at most, even though the Department of Labor reported the average hourly wage for sewing was \$11.11 — itself a low wage for a skilled maker.

For me, this represents the real reason for lackluster growth in the skilled trades. This is the "value gap."

Have we lost our courage to place the right value on the real producers? Are we going to continue to let the Wall Street formula of bigger, faster, plus lower cost, trump respect for trades?

If the U.S. is going to retake its position as a global leader in manufacturing and quality, it has to view and treat skilled tradespeople as assets rather

than an expense. We have to challenge our math, our margins and our investment choices.

Ultimately, we must have a purpose larger than profits, and we must be passionate about what we do and who does it. This is the truly sustainable model. And what we produce is much more powerful than just a product. We have the ability to create jobs, impact culture and foster community. That is the real power and value of American-made. ●

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### Jen's practical steps to creating a sustainable 21st-century guild system

1. Make business decisions that demonstrate dignity and respect for skilled tradespeople.
2. Develop, deliver and promote career ladders.
3. Combine training efforts and formalize certificate and apprenticeship programs.
4. Don't stop at initial training. Create higher-level, career-advancing certification.
5. Increase funding for trade certification to support collegiate education.
6. Create work environments where tradespeople can exercise their skills.
7. Develop and promote your trades in collaboration with others for larger impact.



**JEN GUARINO** is an American-made evangelist and vice president of the Leather Division at Shinola in Detroit, where more than 50,000 watches were built last year (in a new factory) by newly trained artisans mentored by the best Swiss movement makers in the world.

→ Social Innovation



# A Massive Paradox

In September 2013, I joined two Penn State colleagues to teach 130,000 students in a massive open online course (or MOOC) on creativity, innovation and change. It was the largest course of any kind Penn State has ever offered. Our aim: to provide students with a creative problem-solving process and innovative tools that would help them promote positive change in their corners of the world.

As with every structure we create, MOOCs present a paradox, enabling us and limiting us at the same time. On the one hand, a MOOC's massive interconnectivity enables individuals from every corner of the globe to communicate and collaborate with people they would never meet in any other way. In our case, for example, students came from 195 countries and 35 disciplines, with ages ranging from 11 to 90. They self-organized into teams of all sizes to study, write, debate and co-create on a wide range of projects. One group was looking at how to engage young people in eastern Romania to be entrepreneurs. Another was made up of Malaysian high school students taking the MOOC as part of a chemistry course, while there was also a team of scientists in Kenya looking at food security for small farms. The power of these collaborations was nothing short of spectacular.

On the other hand, that same massive interconnectivity limited our ability to make

learning personal. With so many students in our MOOC, it simply wasn't possible for us to interact with each person in a meaningful way. Our carefully crafted videos and frequent visits to the discussion forums could only go so far. As with any MOOC, we learned, some students will inevitably get lost in the enormous shuffle, making their educational experience less than ideal.

As weeks passed, though, something else amazing and unexpected emerged. What I call a new kind of teamwork. When we, as instructors, ran out of bandwidth, it was the students who stepped up to the plate. They answered their peers' questions, offered feedback and guidance, diffused tension, drove progress. All we had to do was let go of the reins. Step back and let the students be the teachers, too.

I can only describe the experience as both exhilarating and exhausting. I've actually never felt more alive — or more stressed — during a teaching experience. The tables



JAMES YANG

were turned, and the creative change we wanted our MOOC students to make in the world was happening — and it was happening to us. •

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**KATHRYN JABLOKOW** is an associate professor of mechanical engineering and engineering design at Pennsylvania State University. She is a fellow of the American Society of Mechanical Engineers, a senior member of the Institute of Electrical and Electronic Engineers, and conducts research in engineering creativity funded by the National Science Foundation. She is working on a new book, *Creative Diversity*, as an outcome of her MOOC experience.

“I’m proud and honored that when people think of the pit stop, they think of us having been a big part of it.”  
— Glen Wood

## Q&A: Practice Makes Perfect



NASCAR has hardly known a time without Glen and Leonard Wood. Founders of Wood Brothers Racing, the brothers are the patriarchs of the oldest continuously operating NASCAR Cup series team. The two are also the celebrated architects of the modern-day pit stop, an ultimate example of precise, choreographed teamwork.

The Henry Ford recently talked to Glen Wood about how the pit stop came to be and the discipline and respect required to run a winning racing team and successful family business.

**THF** ▶ The Wood brothers are known for their innovations. How did the idea of the modern-day pit stop come to be?

**Glen Wood** ▶ It didn’t take us long to figure out that if you made a bad pit stop, you would be real far behind when you went back out on the track. I wouldn’t say we invented the pit stop. We concentrated on it more than others. We just figured out before everyone else that it needed to be done fast.

**THF** ▶ As you streamlined the process, what worked and what didn’t?

**Wood** ▶ One of the biggest things we noticed was that it took as many as 15 pumps on the jack to get the car up. My brother Leonard came up with a faster jack that took fewer pumps to get the car off the ground. That jack, which we still have today, was the turning point in our stops.

**THF** ▶ How, as brothers, did you assign roles within the team? Did particular skill sets set each of you apart?

**Wood** ▶ As the group went from race to race, we figured out who was best suited for certain jobs. My brother Delano was tall and

stout and that made him best suited for being the jack man. In the early days, my brother Ray Lee was probably the quickest of the group, so naturally we made him the guy that changed the tires on the front of the car. Leonard was fast, too, so he changed rears. It took time, but we all fell into our roles.

**THF** ▶ Did you practice?

**Wood** ▶ We practiced and practiced, something I don’t believe anybody else did. We tried out different ways, and the ways that felt better and were faster were the ones we decided to go with. Leonard was one of the first guys to do an entire tire change himself. In other words, he carried the tire around to the side he was changing, along with the gun, sat it down, took off the old tire, put the new one on and tightened it, then carried it back over the wall.

**THF** ▶ Is teamwork important to a successful pit stop?

**Wood** ▶ Real important. When you can predict what the guys are going to do, and you’ve practiced it, naturally it’s going to be more efficient. When everybody pulls in the same direction, it just becomes easy. I think that was what set our pit



FROM THE COLLECTIONS OF THE HENRY FORD

stops apart. We practiced, and each brother understood and could predict what the others were going to do.

**THF** ▶ Some feel that working with immediate family can cause conflict. What do you see as some of the key advantages? Potential drawbacks?

**Wood** ▶ I’ve heard that said — that brothers can’t get along if they work together. We always did because we respected each other. Each brother had a specific position on the team that he was best suited for and that was his responsibility. We were a family. Whether it was because the times were different and respect was a bigger thing back then, or whether we were just the exception, we made it work. Our team is still run by family, and I think that’s because we are such a close bunch. ●

▲ Wood Brothers Racing team working on the Lotus-Ford 38 race car during a pit stop at the Indianapolis 500 on May 31, 1965.

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→ Technology

# Attraction, Deception and **Sacrifice**

**When robotics was a young field several decades ago, many of us were working on simply trying to get a machine to intelligently move across a room without crashing into anything. Around that time, I started exploring the idea of teams of robots working together in a cooperative way.**

I encountered lots of skeptics who often asked, “How can you work with groups of these machines when it’s still a challenge to simply get one to behave intelligently?” Undaunted and federally funded, I edged forward.

I’ve always relied heavily on biology for inspiration, and that is where I found my answer — that paradigm shift — identifying that what we needed was multiple team members able to provide distributed sensing, acting and computing in truly novel ways compared with single robots. The hard part was to make it work. How do you make robots move across an area as a team, maintaining consistent positions relative one to another?

Looking at bird flocking and sheep herding, we discovered

underlying mathematical behavioral models in the way the agents (biological or robotic) could be attracted to each other and a destination point while being repelled by obstacles on the way. We studied not only robots that are similar to each other but those that are different, using various biological models such as bird lekking (a kind of tailgating party by prairie chickens); bird mobbing (where groups of birds such as the Arabian babbler attack predators who threaten them); and wolf pack behavior (analyzing the various stages of the hunt and incorporating the roles of young pack wolves and older, heavier members while valuing the importance of each in the pack).

We also considered how humans and robots work and play together as a team, endowing them with artificial emotions to permit people to better relate to these machines. With Sony, for example, we did collaborative research for the AIBO robotic dog and QRIO, a small humanoid. With Samsung, we looked at operations in search-and-rescue situations, trying to determine the best ways for robots to act to ensure cooperation of human

partners through trust and affective demonstration.

More recently, I have considered the interaction between disparate members of a team with respect to robotic deception — trying to draw from human psychology, as well as the common squirrel, to learn when it is best for a robot to deceive another human or robotic agent and just how to do it. In the near future, we plan on exploring altruism and mutuality — when should an agent sacrifice its resources or even its existence on behalf of other team members?

As robots become ubiquitous in our military, homes and industries, questions surrounding teamwork become ever more pressing and ethical in nature, especially considering that teamwork involves not just robots working together or people working together, but robots and humans sharing their tasks and experiences. ●

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GARY MEEK



**RONALD ARKIN** is an American roboticist and roboethicist, and a Regents’ Professor in the School of Interactive Computing, College of Computing at the Georgia Institute of Technology.

# Back to Basics

Imagine being able to deploy a swarm of robots into a collapsed building or multistoried complex in search of victims or terrorists. This swarm could swoop through an area in minutes or even seconds, building three-dimensional, annotated maps and giving first responders or law enforcement officials valuable information.

In my lab, we work on swarms of small aerial and ground robots that could eventually become these first responders of the future, help-

ing us fight wildfires, respond to natural disasters such as earthquakes, and mitigate the effects of terrorist attacks or horrific accidents such as the one in the Fukushima Daiichi nuclear power plant.

Inspiring our work is nature, which is replete with examples of individual organisms that have evolved to be quite simple (as compared with human beings), but have the ability to form cohesive teams that collaborate and perform tasks that could never be individually accomplished. Ants forage over large areas and collaborate to retrieve prey that they could not individually transport. Birds migrate hun-

dreds and thousands of miles in flocks, coordinating their movements to save energy.

While it is difficult to build robots with the intelligence, perception and dexterity that we see in nature, it may be possible to build robot teams using the organizational principles we see in biological swarms.

If we want to build swarms with hundreds or thousands of robots, for example, we must create the group so that individual robots, no matter how primitive, are able to make their own decisions. Thus, control must be decentralized — there can be no robot queen. Second, robots must be able to make decisions based only on local informa-

tion. Just like an ant or a bird in a large group that cannot possibly sense other individuals far away, robots must make decisions based on information they can sense about their immediate neighbors. They must only be able to communicate with a relatively small subset of the swarm. Finally, robots must have the ability to operate in anonymity and be agnostic to the identity of their neighbors. As in nature, to have a truly cohesive team means each individual — human, animal or robot — must be able to work with any other individual.

Indeed, with advances in telecommunication networks, sensor technologies, computers and additive manufacturing, it is getting easier to build swarms of robots that can sense each other and communicate with each other. The challenges, however, lie in creating the intelligence that will allow individuals to self-organize into a cohesive team where the whole is indeed bigger than the sum of the parts. ●



COURTESY OF THE UNIVERSITY OF PENNSYLVANIA



**VIJAY KUMAR** is a professor in the School of Engineering and Applied Science at the University of Pennsylvania and an expert on robotics. He is on sabbatical leave as the assistant director of robotics and cyber-physical systems at the White House Office of Science and Technology Policy.

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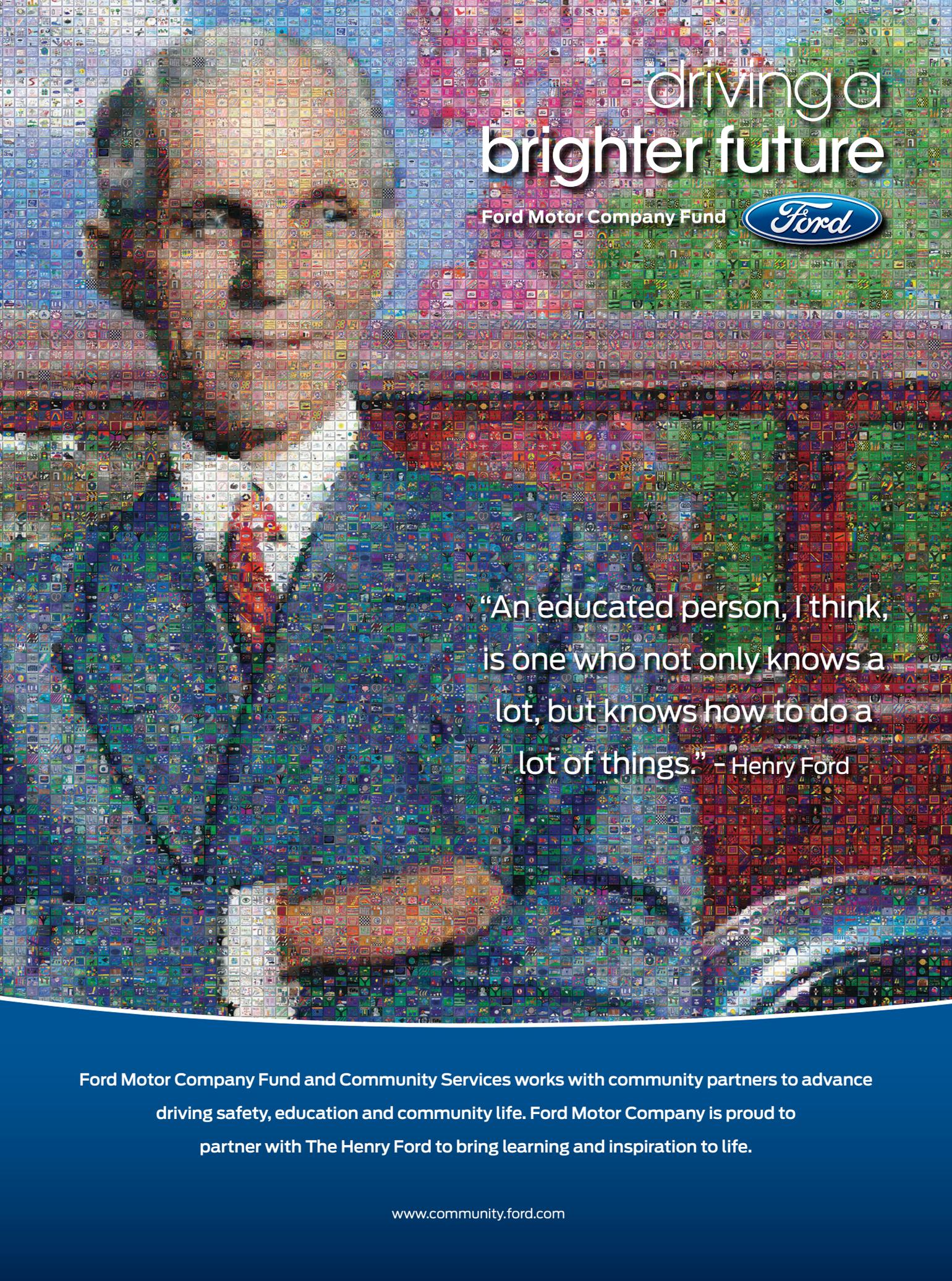
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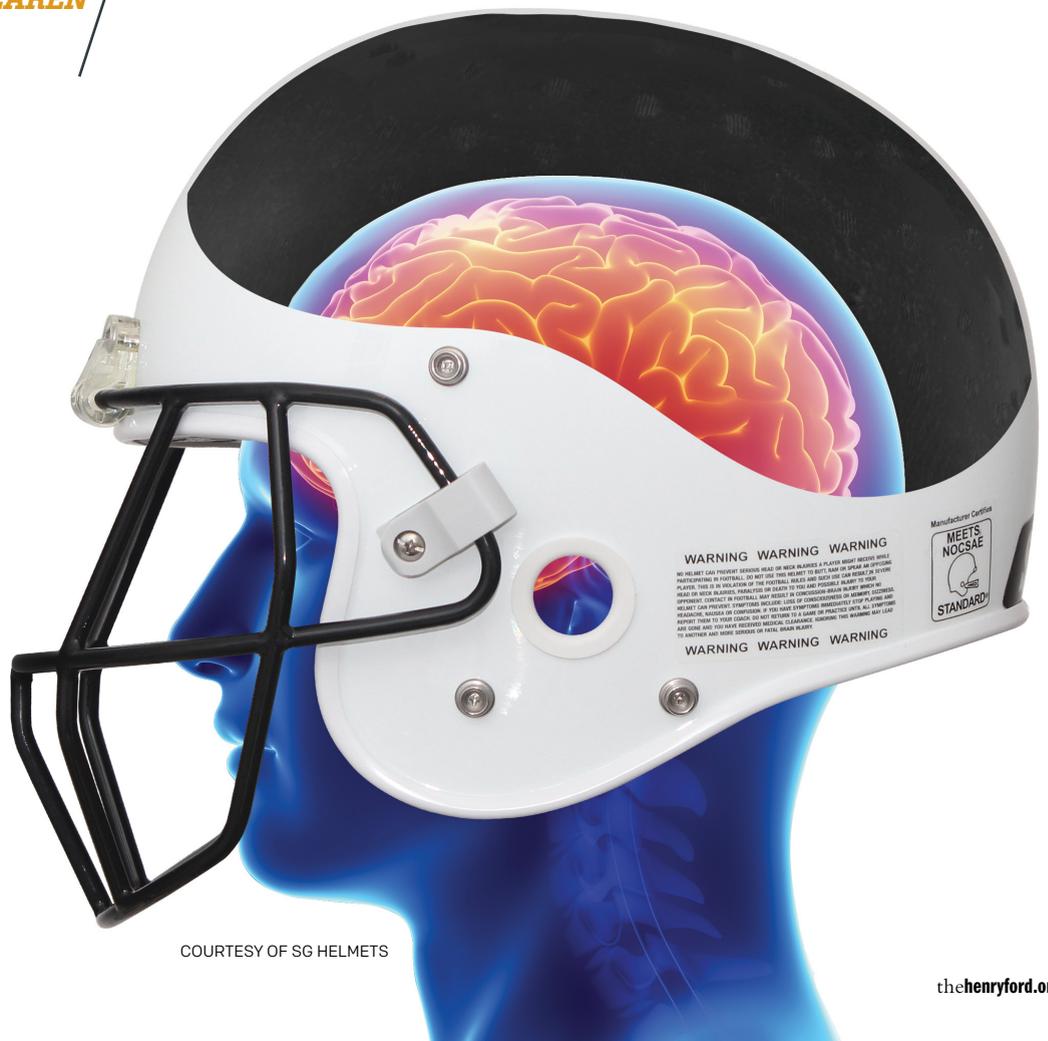


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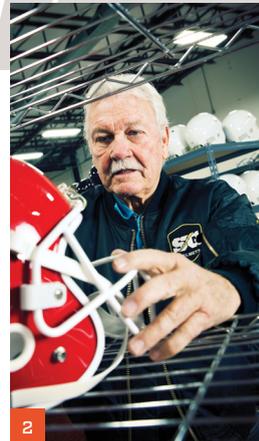
**LIKE WINNING THE BIG GAME, CREATING  
A SAFER HELMET TAKES A TEAM**

# IMPACT

**BY JASON DEAREN**



COURTESY OF SG HELMETS



PHOTOS BY BILL BOWEN

**GODFATHER OF SAFETY**

1. Motor sports legend Bill Simpson and his SG Helmet are top contenders in the world of next-generation football headgear. 2. Simpson conducts a final inspection on a helmet ready for shipment from his Brownsburg, Indiana, manufacturing facility. 3. Each SG Helmet has an inner liner inserted into a carbon-fiber Kevlar shell. 4. Every SG face mask is attached by hand. 5. Once assembled, every helmet is weighed. 6. Expanded polypropylene (EPP) liners undergo a series of rigorous quality tests. 7. SG Helmets uses a dummy head and monitoring devices to measure impact and helmet performance.

# **I**n 2009, at 70 years old, Motorsports Hall of Famer Bill Simpson attended his first NFL game in Indianapolis.

Simpson — known as the “Godfather of Safety” after decades developing helmets and other life-saving equipment for auto racers such as Rick Mears — said he never thought about making football helmets before that day, when he saw two players carried off the field. “I was a little bit shocked. So I went to the [Indianapolis] Colts and did some tests on their helmets,” Simpson said. “I thought I could do better.”

Simpson’s SG Helmet is just one new entrant in an increasingly crowded field of next-generation, high-tech football headgear that seeks to reduce or eliminate concussions. The sport has already come a long way since the days of leatherheads and almost routine on-field fatalities, but newer, safer helmets will help decide if parents feel comfortable putting their children — the next generation’s NFL and NCAA players — on the peeewee or schoolyard field. New ideas range from sci-fi-like shells with sliding parts that adjust on impact to a high-tech polymer designed for the Navy that reduces force during big hits.

## **COLLABORATION IS KEY**

Making a helmet is not as easy as it might seem — it takes a team of engineers, industrial designers, scientists and manufacturers to put one together. And that doesn’t mean players will take to it — helmets must look good, too.

“A lot of people have this grand notion to build a helmet and put it on the field themselves,” said Michael Princip, an industrial designer who has created plans for a helmet with moving segments called The Bulwark. “But you need the right team to develop a helmet correctly.”

Even though Simpson had years of successfully engineering motor sports equipment, he couldn’t go it alone. He enlisted the help of researchers at Purdue University to conduct an independent analysis of his SG Helmet to confirm his main hypothesis: that a lighter helmet is a better one. At 2 pounds, 6 ounces, Simpson’s SG Helmet weighs in at about half the weight of helmets currently used by most players. It’s made of a mixture of Kevlar, carbon fiber and other composites, so is still strong.

The team measured the helmet’s strength on impact and how it reacted in certain situations. The Purdue team found the helmet did well distributing

force and absorbing energy. After testing, Simpson’s product still needed to be put through another round of tests to satisfy NOC-  
SAE, the National Operating Committee on Standards for Athletic Equipment, which must certify a helmet for use in organized sports.

“All the guys in the football business make the same thing, and they’re heavy using materials that I don’t believe are suitable,” Simpson said.

Simpson’s helmet is now certified and in use by some NFL players, but his hope is that it will catch on with youth football teams, too.

## **REDUCING BRAIN MOVEMENT**

The Holy Grail of helmet designers is to find a way to address what’s called “rotational acceleration,” when the brain moves in multiple directions after hits from players and the ground within fractions of a second, said Princip.

“It’s a tricky situation when you’re talking about rotational acceleration within a football helmet,” Princip said. “This sport involves multiple impacts; thus when a running back is blasting through the line, he will be hit by two or three defensive players, then hit the ground ... so, how much movement do you want out of the helmet without causing excessive rotation?”

With so many moving parts required to make an entirely new helmet, one mechanical and aerospace engineering professor at the University of California, Los Angeles, is taking a different approach to solving the concussion problem.

Vijay Gupta was working with the U.S. Navy on a lightweight polymer that would be used as a safety coating for equipment on ships and in the helmets of soldiers to reduce traumatic brain injury. “What we have found is, if we take my material, which is very dense, and layer this material on top of existing (helmet) foams, it tends to reduce the g-force,” Gupta said. “This material can bring down impact energy.”

If successful, Gupta hopes his material would reduce concussions without having to completely redesign current helmets. Still, teams of scientists are working with Gupta to see if the foam’s seeming potential translates to the human head and brain. “There’s a lot of variation we have to look at,” Gupta said.

## **SAFE & LOOKS GOOD, TOO**

Another newcomer making inroads in concussion protection in the NFL is Xenith, which has 80 players on its roster, including Baltimore Ravens running back Ray Rice. While the initial concept of Xenith, an internal system of air-filled pads called a “shock bonnet,” was dreamed up by former Harvard quarterback Vin Ferrara, it took a team to bring the helmet to market.



AARON PETERS

## **HOLY GRAIL OF HELMETS**

The Bulwark, the brain-child of industrial designer Michael Princip, features moving segments to help address rotational acceleration — when the brain moves in multiple directions within fractions of a second.

**MADE BY MANY**

Xenith solicited input from private laboratories and a variety of designers to develop its latest rendition of its X2e helmet, which was given a five-star safety rating by scientists at Virginia Tech.



COURTESY OF XENITH

Chuck Huggins, president of Xenith, said the company used private laboratories to redesign the first generation of the helmet. The new model, the X2e, has a number of new innovations, including a chin cup and lock on the back of the helmet meant to keep it from flying off, as anyone who watches football knows is a common occurrence. A team of designers also changed the black, pillow-like pads near the base of the helmet to make it more comfortable.

While not solving the rotational acceleration conundrum, the X2e was given a five-star safety rating by scientists at Virginia Tech, the highest such rating, along with two Riddell helmets and a Rawlings helmet.

But focusing on safety is only one aspect of making helmets. It's also got to appeal to younger players, so Xenith hired designers to make the new version of the helmet more stylish. "What we did was change some of the vent designs to form an X," Huggins said. "We picked up on something that, over the years our helmet was designed to be traditional, but the kids love the flashier graphics." •



**GRIDIRON GLORY**

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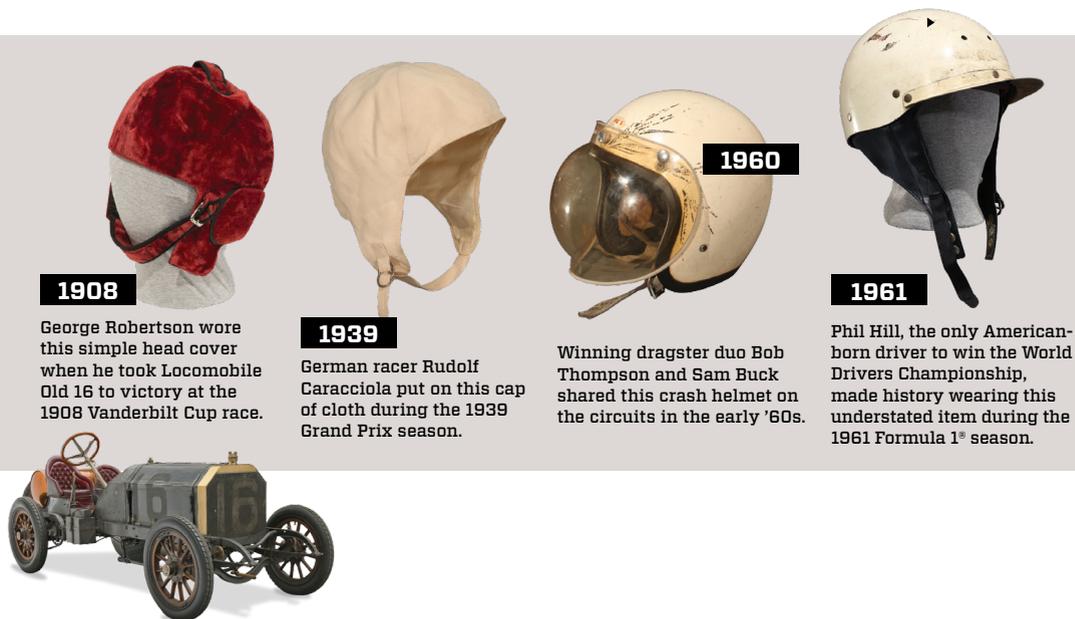
*Gridiron Glory: The Best of the Pro Football Hall of Fame* is the largest traveling exhibition in the history of the Pro Football Hall of Fame. When the 5,000-square-foot exhibit comes to Henry Ford Museum in October, it will feature hundreds of artifacts from the Hall of Fame's collection, many on exhibit for the first time. Also included will be a specially designed Hometown Tribute section dedicated to the Detroit Lions, which will be a collaborative effort between The Henry Ford and the Detroit Lions organization.

*Gridiron Glory is a production of Pro Football Exhibits, LLC, owned and funded by GALLO museum services.*

**ONLINE** For more information, visit [thehenryford.org/gridironglory](http://thehenryford.org/gridironglory)

**PROTECT THE HEAD**

When it comes to professional racing by car, motorcycle or otherwise, much has been done over the years to better protect the head from injury. The Henry Ford has a variety of racing headgear in its collections that attests to the ongoing evolution of the helmet. Yes, it has been, and will always be, about safety first and comfort second. But let's not forget that the colorful athletes who wear these protective caps also like to look good doing it.



**1908**

George Robertson wore this simple head cover when he took Locomobile Old 16 to victory at the 1908 Vanderbilt Cup race.

**1939**

German racer Rudolf Caracciola put on this cap of cloth during the 1939 Grand Prix season.

**1960**

Winning dragster duo Bob Thompson and Sam Buck shared this crash helmet on the circuits in the early '60s.

**1961**

Phil Hill, the only American-born driver to win the World Drivers Championship, made history wearing this understated item during the 1961 Formula 1<sup>st</sup> season.



# FOOTBALL VS. MOTOR SPORTS

## DIFFERENT IMPACTS, DIFFERENT HELMETS

**M**aking a helmet for a linebacker zeroing in on a running back versus one meant to protect a motorcyclist traveling more than 200 miles per hour is a very different task.

“Football helmets are designed to withstand impacts over a full season, whereas a motocross helmet or bike helmet is made for a single impact,” Casey Potter, creative director for Bell Helmets, said. “Motor sports helmets are designed to disperse the energy by the EPS (expanded polystyrene) liner cracking and coming apart in certain areas.”

Aerodynamics is another key difference between designing a motor sports helmet and one for the gridiron. For motorcycle road racers, the helmet’s

ability to channel air flow contributes to the rider’s stability. “We’re designing a helmet that’s stable at speed on the track, whether wind is straight on — or if a rider looks back, it doesn’t catch the wind so much,” said Potter.

Yet that doesn’t mean designers of one kind of helmet can’t use technological advances made in other areas. This air of collaboration is on full display at Easton-Bell, where on the central California coast the company houses a team of 62 people at its technology center called The Dome. The company’s engineers and designers who make Riddell football helmets, Bell motor sports helmets and other technologies work collaboratively to share innovations across distinct sports.

“For instance, if one brand is working on ventilation for bike helmets and has come up with a unique solution for that, a designer for motorcycle helmets can leverage that technology,” Potter said. “It reduces duplicate efforts and allows designers to share findings and cross-pollinate.”

Potter said Easton-Bell is also working with new materials that would be stronger and lighter, hopefully leading to the next generation of motor sports helmets. But for now, those designs are still top secret. “I can’t speak to what, but I can tell you that research is being done in all sorts of materials,” said Potter.

— JASON DEAREN



COURTESY OF EASTON-BELL SPORTS



### AHEAD OF THE REST

Clockwise from left: Easton-Bell designers first sculpt “eggs” to explore concepts and ideas for future helmet features. A Bell Moto-9 Carbon motorcycle helmet is ready for a Snell drop test, which looks at helmet reaction during an impact. A collection of Easton-Bell helmets from the 1950s to present day. Snell test lines are drawn in silver on a Bell Moto-9 Carbon ready for testing.



1965

Bob Summers went bold in gold when he strapped this one on, climbed into Goldenrod and achieved a new wheel-driven land speed record in 1965.



1970

Red and silver is signature Mario Andretti. He wore this stylish headgear during his 1970 racing season.



1971

The band of Royal Stewart tartan identifies this helmet as a Jackie Stewart original. He wore it in race No. 1 of the 1971 Can-Am season.



1975

Kenny Roberts is a motorcycle racing all-time great. His trademark eagle motif decorates his protective headpiece of choice for the 1975 season.

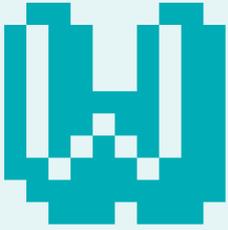


FROM THE COLLECTIONS OF THE HENRY FORD

### ONLINE

To see racing and other helmets in the collections of The Henry Ford, visit [tinyurl.com/HelmetCollection](http://tinyurl.com/HelmetCollection) ▶





hen I tell people that I grew up in a video arcade, I have to emphasize the fact that I didn't simply spend a lot of time feeding quarters into machines and melding with screens of spaceships and descending aliens. When I'm trying to impress someone with my unique nerd cachet, I leave enough room for the punch line: "No, I mean, listen — I literally grew up in a video arcade."

In the early 1980s, in a small town in rural Ontario, Canada, my family managed an arcade called Joyland. I spent my kindergarten years toddling around hulking arcade consoles and the towering teenagers rooted in groups before them.

In 2014, the arcade looks much different than the Joylands of my '80s upbringing. The arcade is everywhere, and calling an image to mind of who plays video games and, for that matter, what video games themselves look like is a nearly impossible task.

#### INDIE WHAT?

Independent games or "indie games" are exactly what they imply. They are often made by small teams of designers swimming against the current of the mainstream game industry, with little to no financial support or guarantee of distribution from major publishers. Games may be created over the course of several years or at rapid prototyping events where projects are completed in as little as 48 hours. With complete creative control, indie designers are free to experiment and innovate within the form. Of course, some go on to great success, and large game-publishing houses have begun to hunt for inspiration in the indie community. Titles like *Minecraft*, *World of Goo* and *Super Meat Boy* are examples that have gone beyond their humble beginnings, breaking out to reach a larger market, achieving cult popularity among gamers.

While indie creators often style games with seemingly primitive graphics, paying homage to the arcade and early console games of the past, there is a focused artfulness to their simplified aesthetic. At their elegant best, the visuals in these games are the product of an intensive process of refinement, leaving only the most essential, potent design elements. And while the look of a game might be very Pac-Man, designers today are at an advantage, harnessing the responsiveness and sophistication of modern-day controllers. The spirit of creation in these "retro games" is very much aligned with the enthusiasm of the early days of computing, when amateur programmers first began to test the boundaries of their systems, realizing their potential as leisure and entertainment devices.

#### NEXT LEVEL

The recent rise of indie games in part stems from the availability of game-building programs like *GameMaker: Studio*, where beginners can learn to create a game using intuitive drag-and-drop features. Game making can begin with nothing more than free software and patience. Access to digital tools is just the beginning, however. Games need to be designed with playability in mind — that is, successful design, interaction and storytelling qualities — and making a highly playable game is rarely a solitary effort.

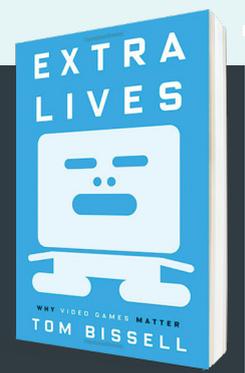


In 2008, the University of Michigan established the Computer and Video Game Archive. The archive contains more than 3,000 games and 35 consoles that represent video game history from the 1970s to the present. Many of the games were donated, and the collection continues to grow. The best part? The archive is open to the public, and there are several stations where you can play any game in the collection.

Learn more at [lib.umich.edu/computer-video-game-archive](http://lib.umich.edu/computer-video-game-archive)

#### HERE IS A TOP 5 OF GOOD BOOKS ABOUT GAME DESIGN AND CULTURE:

- 1 Tracy Fullerton. *Game Design Workshop: A Playcentric Approach to Creating Innovative Games*. Boca Raton, Fla.: A K Peters/CRC Press, 2014.
- 2 Raiford Guins. *Game After: A Cultural Study of Video Game Afterlife*. Cambridge, Mass.: MIT Press, 2014.
- 3 Ian Bogost. *How to Do Things with Videogames*. Minneapolis: University of Minnesota Press, 2011.
- 4 Daniel Goldberg and Linus Larsson. *Minecraft: The Unlikely Tale of Markus "Notch" Persson and the Game That Changed Everything*. New York: Seven Stories Press, 2013.
- 5 Tom Bissell. *Extra Lives: Why Video Games Matter*. New York: Pantheon Books, 2010.



Tracy Fullerton, a professor and chair of the University of Southern California's Interactive Media and Games Division of the School of Cinematic Arts and the director of the school's Game Innovation Lab, is an experimental game designer. She received one of the first National Endowment for the Arts media arts grants for video game development.

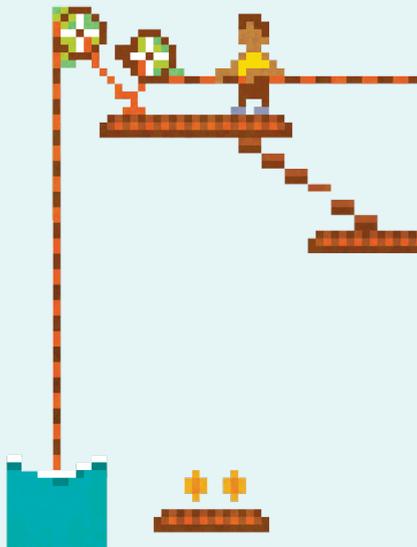
When talking to Fullerton, the "myth of the lone genius" comes to mind. This idea that some of the most important inventions of the industrial era, while often credited to a single inventor, only succeeded because of collaboration in laboratories and improvements upon older devices. Video game development is similar in this regard, acknowledges Fullerton, who has spent her entire career collaborating with design teams — and couldn't imagine working any other way.

"Too often we have the image that digital tools cause us to work on our own. That image of the lone person in front of a screen isn't the truth," said Fullerton. "Digital tools are tools that open up space for collaboration and are the heart of the potential here. Digital media is wonderful, but in the end

it's all about finding new ways of expressing the human experience and making connections — it isn't an end in itself."

At USC, computer programming knowledge is not a prerequisite to entry into Fullerton's program. Students come from a wide variety of disciplines, from the humanities to sciences. "We're looking for people who have an aptitude for the skills, students who exhibit a real ability to balance left- and right-brain thinking," said Fullerton. "An art historian, for example, is someone who has strength in logical thinking and is someone who could learn to code."

On the first day of classes, students take part in a skill-sharing exercise, writing three things they want to learn and three things they can teach. From the first day forward in the program, students form a core cooperative community. "If you harness people's skills side by side in a team like a buggy, that's cooperation, not collaboration," noted Fullerton. "Collaboration is when people have different ideas and skills, and they use them to make each other better, to open each other up to ideas."



**GAME DESIGN REDEFINED**

Photo top right: In USC's Interactive Media and Games Division, ideas for games come from all levels of experience in the field. From left: student Andrea Cao, game designer Simon Wiscombe, professor Tracy Fullerton and program coordinator Akira Thompson brainstorm in the "think tank" area and record their ideas on a clear board. At right: artist Lucas Petersen (left), art director Kurosh ValaNejad and Tracy Fullerton review visual designs for a video game titled Walden.





“Collaboration is when people have different ideas and skills, **and they use them to make each other better, to open each other up to ideas.**”

— **Tracy Fullerton**, professor and chair of the University of Southern California’s Interactive Media and Games Division of the School of Cinematic Arts and the director of the school’s Game Innovation Lab

One of the biggest misconceptions about game design, according to Fullerton, is that game designers sit around all day playing games. "Nothing could be further from the truth," she said. "Love of the field is essential, but making games is a difficult creative process. Designers have to be able to envision a world and know how to build it. Their skills need to include sophisticated math, strategic thinking and social negotiation, as well as other parts of culture that may inspire playful designs."

Indie games using retro, arcade-era visuals are countered by designers working with "reflective gameplay," a particular area of Fullerton's expertise. As anyone who has played the game *Myst* can tell you, this type of game experience involves immersing oneself in a lush world of complex puzzles and detailed narrative.

To this effect, Fullerton's most recent project, *Walden*, allows players to plunge themselves into the author Henry David Thoreau's experiment with rural living. As Fullerton reminds us, *Walden* is not about denouncing society, but learning how we relate to it, of our place within nature and our communities. And how perfect, then, that Fullerton is not creating the digital world of *Walden* by herself, but through an act of teamwork, with a crew of developers.

### GO TEAM GO

The history of video games — its rules, codes and ethics — is also one of teamwork. An oft-cited story about the creation of *Pac-Man* places Toru Iwatani, his creator, at a pizza parlor with friends. When a slice was removed, Iwatani had an epiphany, recognizing the shape of his character in cheese and dough, ready-made before him. The communal spirit of pizza eating played an essential part in this story. Would Iwatani have gone to eat pizza by himself? Probably not. And so the seed that would become one of the most popular cultural phenomena of the 1980s was planted.

In recent years, the underdog mystique of indie developers has given rise to a strong network of supporters who back many of their favorite projects through crowd-funding campaigns. A recent example of this is the video game console project known as the Ouya. Within eight hours, it raised its initial Kickstarter goal of \$950,000, while supporters continued to pour money into the project. The egalitarian spirit of the system, its capabilities, potential and low \$99 price tag all contributed to the groundswell of excitement surrounding the system.

The Ouya was primarily designed with the indie gamer in mind and to encourage the development of independent games designed by its users. Its most revolutionary feature is its integrated game development software. If it reaches its full potential, the Ouya could be the first console to present a level playing field upon which a mix of larger-budget titles, independent games and "home brews" can compete for market share, with enough room for all.

### GAME OVER

The video arcade and its tapestry of bleeps and bloops, its menu of fantasy worlds constructed pixel by pixel, was the center point around which many lifelong gamers organized their lives. The misunderstood communities of youth that gathered competed for high scores and bonded through friendly rivalry. A handful took it further, rising from joystick jockeys to programming superstars in the video game industry. But, since the days of arcades like *Joyland*, the attitude toward video games has changed. Gamers are no longer misfits and social outcasts, if they ever truly were. Today, people from myriad walks of life join the fold.

Simply put, from their earliest days, video games have given rise to gatherings and communities, which have not ceased to grow, whether in real or virtual space. These communities are sites where, aided by technology, players and developers alike can continue to test their hands at creative problem solving together. ●

### WANT MORE?

**GO ONLINE/**

**igf.com has news on the Independent Games Festival, one of the biggest events honoring outstanding development in independent video games. >**

**WATCH/** *Indie Game: The Movie (2012)* >

### DID YOU KNOW?

**The International Center for the History of Electronic Games® (ICHEG) in New York collects, studies and interprets video games and other electronic games and how they are changing the way people play, learn and connect with each other. [icheg.org](http://icheg.org)**



## ALL SYSTEMS GO

When you visit Henry Ford Museum and stroll through the *Your Place in Time* exhibit, keep an eye out for some of the earliest video game systems and handheld electronic games. Remember Merlin? How about Nintendo Game Boy?





COURTESY OF OUYA



## THE TOP 10

The Henry Ford offers a quick Top 10 hit list of video game systems that really changed the “playing” field. Said Kristen Gallerneaux, curator of communication and information technology at The Henry Ford: “I’ve compiled this list based on technological innovation as well as these particular systems being favorites for gamers to ‘hack’ and ‘mod.’”

- 1 Magnavox Odyssey (1972)
- 2 Atari 2600 (1977)
- 3 Nintendo Entertainment System (1983)
- 4 TurboGrafx-16 (1987)
- 5 Atari Jaguar (1993)
- 6 Sony Playstation (1994)
- 7 Sega Dreamcast (1998)
- 8 Microsoft Xbox (2001)
- 9 Nintendo Wii (2006)
- 10 Ouya (2013)

**ONLINE** To see more board games in the collections of The Henry Ford, visit [tinyurl.com/BoardGamesCollection](http://tinyurl.com/BoardGamesCollection) ▶

FROM THE COLLECTIONS OF THE HENRY FORD

Powered by The Henry Ford, OnInnovation is a video oral history project designed to advance a culture of innovation through interviews with today's visionaries. Here are edited excerpts from one of those interviews, which can be viewed in its entirety online at the OnInnovation (OI) website [oninnovation.com](http://oninnovation.com).



BOB  
METCALFE

# Serial INNOVATOR

**HE'S THE INVENTOR OF ETHERNET, A VENTURE CAPITALIST, PUNDIT AND PUBLISHER WHO SAYS YOU'RE SUPPOSED TO STAND ON THE SHOULDERS OF GIANTS AND, AS FOR ENEMIES, THEY'RE A GOOD THING**

Bob Metcalfe considers himself a lucky guy. His first stroke of luck, he says, was being born to Robert and Ruth Metcalfe, who told him to go to college and "do something you're good at." Second on his list, landing a job at the Xerox Palo Alto Research Center (PARC) in the early 1970s as the networking guy asked to figure out a way to connect computers sitting on desks (the first PCs).

He did just that and, unapologetically, accepts the title as inventor of Ethernet — the mysterious high-tech system of wires, cables and devices that makes it possible for computers and their users to talk to each other and work as teams.

When The Henry Ford sat down with the opinionated and outspoken Metcalfe as part of its OnInnovation series in 2008, he did not disappoint. Known for his candor and winner-take-all philosophy, Metcalfe does not hesitate to give credit where it's due — to himself as well as to a select few others. He also jumps at the chance to slam monopolies (Microsoft's Windows, for example, he likens to junk) and the status quo, which he calls nasty, conniving and the killer of innovation. ▶

**DID YOU KNOW? /**

When Thomas Edison built the Menlo Park laboratory in 1876, it was the first industrial research laboratory in the United States.



MICHELLE ANDONIAN

**OUTSPOKEN ORATOR**

Bob Metcalfe doesn't hesitate to credit himself as Ethernet's creator, but also acknowledges the importance of being in the right place (Xerox PARC) at the right time (1970s).

**OI** ▶ Have you always felt you had an innovative nature?

**Metcalfe** ▶ I loved going to school. My parents never went to college, and it was one of their goals for me. My dad was a technician, a union man, a gyroscopic test engineer for aerospace, and the basement was always full of gadgets. I think that's how I got into science and math. One day, he came home and found me unconscious on the basement floor because I had reached into a television (and there's a high-tension, high-voltage line in the back of those big ol' CRTs). Apparently, I grabbed it and fell unconscious. Maybe that was curiosity.

**DID YOU KNOW?** /  
Ethernet's Birthday:  
May 22, 1973

“Innovation and invention are things you do on purpose. It's not a lightning bolt from heaven. You set out to do it. You practice it.”

— Bob Metcalfe

**OI** ▶ Xerox PARC, your old stamping ground, is legendary for being a hotbed of innovation. What was it like?

**Metcalfe** ▶ While I was finishing my Ph.D. at Harvard, I was offered a job at the Xerox Palo Alto Research Center, which was relatively new in 1972. I went. It was just beginning to be called Silicon Valley. And it was known for semiconductors and software. The Internet hadn't happened yet; the personal computer hadn't happened yet.

Some really smart people — George Pake, Bob Taylor, Jerry Elkind — started recruiting people from ARPA, MIT, Utah, Stanford and so on. We quickly believed that we were the best computer science laboratory in the world — naturally.

We pretty much invented the personal computer at Xerox, although people will argue forever about that.

**DID YOU KNOW?** /  
Henry Ford  
reconstructed the Menlo  
Park laboratory in The  
Henry Ford's Greenfield  
Village, where it still  
stands today.

Soon after I got to PARC, my colleagues had this idea for the personal computer, which was called the Alto. They said, “We're going to fill the building with personal computers, one on every desk, but we need a way to connect them together. Why don't you work on that?” From that came the Ethernet. That was my good luck. The breakthrough was not so much the invention; it was being there to get the job. It was the first time in the history of the world that there would be a computer on every desk. There wasn't a flash of genius. It was just sort of the next obvious thing to do.

**OI** ▶ Downplaying a little aren't you?

**Metcalfe** ▶ I generally try to convince people that inventing stuff is something that anyone can do. It's not something that special people who drop out of the sky magically do. It depends on what's around you. It's not a divine gift. It's a skill and something you can practice doing.

**OI** ▶ Can you share the beginnings of inventing Ethernet?

**Metcalfe** ▶ I had to think about how would you go about networking a computer? Not one per city, which is what ARPANET did, but one per desk. I combined the ideas from ARPANET and another network I encountered called the Aloha Network. Those two sets of ideas convolved to become the design of Ethernet. How these computers would all be connected to this passive ether, a piece of co-ax running down the middle of the hall, was the original concept. And then each PC on each desk would run a cable up and tap into this co-ax from which it could send and receive packets through the ether, and it would be part of the Ethernet.

And then I saw the beauty of randomized retransmissions to share a communication channel. Rather than schedule all the transmissions — your turn, your turn, your turn — everyone would just send, and if there was a collision, you would randomize to avoid recolliding over and over again. Cute little idea. An exploitation of randomness.

**OI** ▶ Some say you stole the idea?

**Metcalfe** ▶ There are those nasty people who think I stole the idea — that basically Ethernet is the Aloha Network. There is a germ of truth to that, but just a germ. Aloha was a radio network; the first Ethernet was a co-ax network. Aloha had two radio channels; co-ax Ethernet had just one. And 50 other little differences.

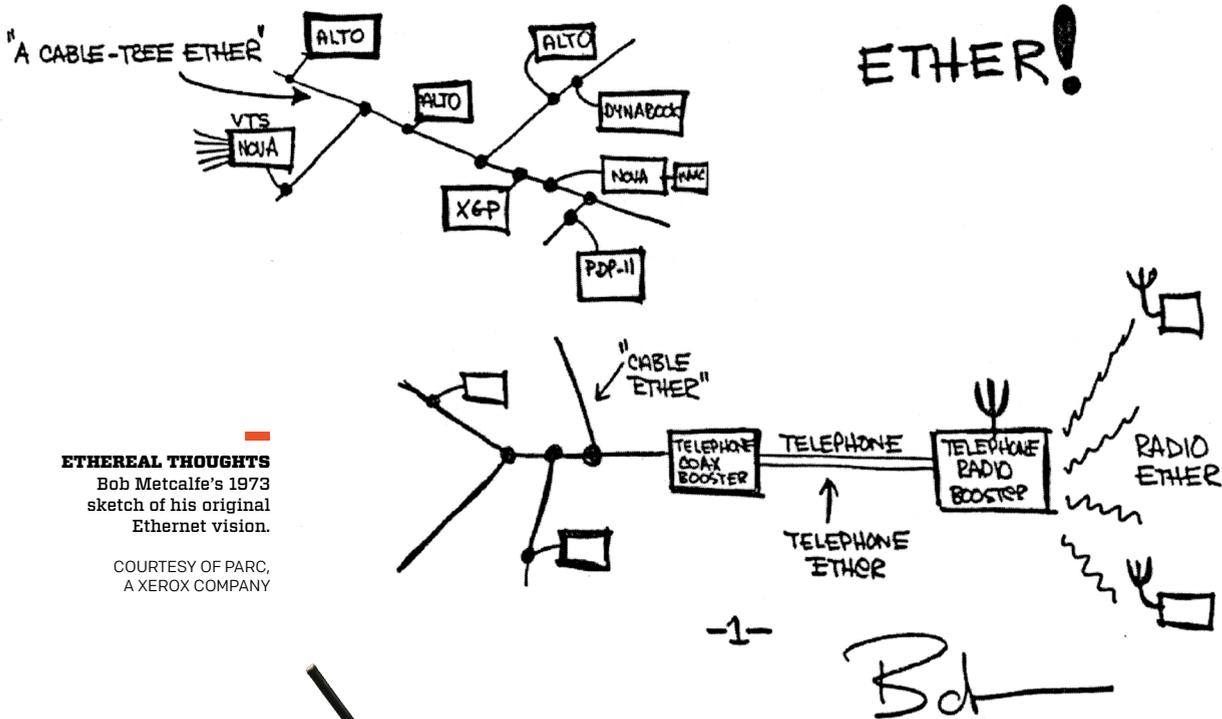
You're supposed to stand on the shoulders of giants, aren't you? Just as long as you acknowledge the giants, I think everything's OK.



© KIM KULISH/CORBIS

**“I would like to be remembered as someone who is enthusiastic. To be enthusiastic about something is a source of happiness.”**

— Bob Metcalfe



**ETHEREAL THOUGHTS**  
Bob Metcalfe's 1973 sketch of his original Ethernet vision.

COURTESY OF PARC, A XEROX COMPANY



**MORE THAN A RED BOX**  
Bob Metcalfe and David Boggs designed this Ethernet transceiver at Xerox PARC in 1973.

FROM THE COLLECTIONS OF THE HENRY FORD

**DID YOU KNOW? /**  
Bob Metcalfe received the National Medal of Technology in 2005.

**OI** ▶ Why is May 22, 1973, special to you?

**Metcalfe** ▶ I think marketing is an important part of innovation. I figured Ethernet needed a birthday, so we could celebrate it and organize promotional energy around it. If you were to ask me when Ethernet was born, if it had a birthday, it would be this day. It was named, and its general principles laid out, in a memo I wrote dated May 22, 1973. Of course, if you're familiar with the innovation process, you realize that it wasn't really invented in one day, by one particular person. It's kind of a cloud of events.

**OI** ▶ Whom do you like to give credit to for helping you invent Ethernet?

**Metcalfe** ▶ A man named David Boggs noticed me fiddling with co-ax cable ineptly in the basement at PARC. He came over to help, and in that moment Boggs and I became a team. We built the first Ethernet together.

The story has repeatedly come up that Dave really invented the Ethernet and then I sorta stole it from him because he's the quiet, introverted, technical person and I am the more outgoing, articulate bullshit

artist. Our personalities invite that interpretation, and everyone runs to Dave trying to get another side of this story. Dave always says, "No, we worked together on the building of it." That's in the record.

**OI** ▶ Why do you think the competition didn't see the potential of interconnectivity of computers right away?

**Metcalfe** ▶ Some of it is just personal animosity. Because when you have a bunch of high-ego individuals like moi, it's easy to get into petty personal disagreements. I have had more than my share of those.

Part of it was also that Dave Boggs and I had some early trouble debugging the Ethernet, and people thought less of us for that. The real problem, however, was that the computer we were using wasn't finished yet.

**OI** ▶ So Ethernet and personal computers sort of evolved together?

**Metcalfe** ▶ Ethernet doesn't do anything if there were no PCs to connect together. And PCs are not as useful stand-alone as they are when there are networks. It's hard to sell Ethernet for PCs when there weren't any PCs. That's kind of a problem.

I estimate that it was around 1994 when connectivity became the dominant reason to buy a personal computer. Before that, people were using them for cockamamie ideas like balancing checkbooks and doing spreadsheets.

**OI** ▶ You seem to have as much respect for the art of selling the technology as the technology itself.

**Metcalfe** ▶ One of the standard failures of a startup today is the technical founders have a low regard for people who know how to sell. You get this attitude problem where there are the “suits” versus the “nerds.” And if they disrespect each other, then the company is dead. Every team needs to have suits and nerds and others on it.

That means a good company looks like the *Star Wars* bar — has its different life forms. And you can’t imagine two more different life forms than nerds and suits or engineers and salesmen.

I like the notion of an innovation ecology. Different people, different stages, different activities. You need engineers who can take knowledge and build it into things that might be useful. And then you need sales and marketing people who can get it out into the world.

Living at PARC for eight years, I knew the future. There was going to be a computer on every desk. We had them. I knew there would be a laser printer in every office. We had one. And I knew it would be connected to the Internet because we were. Having that knowledge, we started going toward a vision, even though it didn’t exist in the real world.

**OI** ▶ Is there anything nowadays like Xerox was back then?

**Metcalfe** ▶ I think that we were the best, and that Xerox hasn’t been the same since we left. There are people at Xerox who disagree with that and think they are hot stuff. Only time will tell.

**OI** ▶ That seems to lead to a bigger question about America in general and its innovative edge. Do you think we still have it?

**Metcalfe** ▶ I do, but things are changing. Innovation is not a zero-sum game. It’s no longer just our game anymore, if it ever was. If it’s innovation you’re after, the best vehicles for innovation are people. And the best place to do research is at research universities. And the United States is blessed with the best. The science, new knowledge developed by research, feeds the innovation machine from underneath.

**OI** ▶ Explain Metcalfe’s Law?

**Metcalfe** ▶ The law is that the value of a network grows as the square of the number of users. All the law is really saying is that it’s good to network things. That when you build a network, there is a certain value of the network that accrues from other people being members of it. And the more of them there are, the better it is. I sold a lot of Ethernet cards with this.

**OI** ▶ Do you see your life compartmentalized in different phases — student, engineer, scientist, inventor, pundit, venture capitalist?

**Metcalfe** ▶ I conceptualize it as a series of careers in technological innovation. During the student period, you’re accumulating knowledge and skills. The scientist period is where you’re discovering new knowledge. Engineering, you’re taking that knowledge and making products. And then there’s the journalism period in which you write about technologies to help build them and help people buy intelligently. And then there is the venture capitalist phase, where you’re financing innovative companies.

**OI** ▶ What advice would you give to those starting a career in technological innovation?

**Metcalfe** ▶ I once asked my father what I should do. He said, “It doesn’t really matter what you do as long as you’re good at it.” Be sure you’re good at something. Second, you’ll never get any good at anything unless you enjoy it. Find something you enjoy, and get good at it.

Innovation and invention are things you do on purpose. It’s not a lightning bolt from heaven. You set out to do it. You practice it. You develop innovation skills.

To be an innovator, you also have to be willing to make enemies. I’m proud that I am the kind of person who makes enemies. And I guess it’s because I think collegiality is overplayed — it’s a pathology of the status quo, which is the enemy of innovation.

You have to be willing to fight the status quo, which is resourceful, nasty, mean and conniving. ●

“To be an innovator, you have to be willing to make enemies ... You have to be willing to fight the status quo.”

— Bob Metcalfe

**DID YOU KNOW?** / Bob Metcalfe was inducted into the National Inventors Hall of Fame in 2007.

**ONLINE**

OnInnovation’s archived interviews, such as the one conducted with Bob Metcalfe, along with related resources, can be accessed at [oninnovation.com](http://oninnovation.com). ▶

# MENLO PARK



# XEROX PARC

by Jeffrey Phillips

**A century may divide the two, but these powerhouse innovation factories have lots in common**

History, Mark Twain said, doesn't repeat itself, but it does rhyme. Where innovation is concerned, it seems we constantly rediscover what has worked in the past and return to those models to innovate for the future. That's why it's not a stretch to compare Xerox PARC (where the personal computer was born and Bob Metcalfe invented Ethernet in the 1970s) and the Menlo Park laboratory from almost a century before (where Thomas Edison "toiled" with this notion of electricity and hundreds of other ideas).



FROM THE COLLECTIONS OF THE HENRY FORD

## LEADERS AND LIGHT BULBS

Thomas Edison and employees in Menlo Park Laboratory, Edison, New Jersey, February 22, 1880.

# MENLO PARK

In just a little more than six years, Edison and his team at Menlo Park in New Jersey penned more than 400 patents in what he called his "invention factory." Ever since, Menlo Park has been the ideal many R&D-centric corporations are modeled upon. Study Edison's insights for his invention factory, which may seem obvious today but were novel at the time, and you'll see why his model stands the test of time.

1. House a number of technicians and engineers in one lab.
2. Purposefully explore several new technologies in different fields simultaneously.
3. Create plenty of opportunities for cross-pollination of different fields of research.
4. Experiment constantly.
5. Define specific goals for innovation produced on a regular basis.
6. Understand the value of marketing, which helps launch new technologies.
7. Create a process for managing, documenting and protecting discoveries.
8. Commercialize the discoveries as quickly and effectively as possible.
9. Have active, engaged sponsors.

Marc Greuther, chief curator of The Henry Ford, says Edison was an exceptionally practical innovator as well as a savvy marketer. After his first invention, an automatic voting system for Congress, failed, he vowed never to create an invention unless there was a demonstrated market for it. He knew how to recruit people with a variety of skills, while he also mastered how to curry favor with deep-pocketed sponsors in New York.

Edison even let his proclivity for good marketing, and a sense for the commercial, determine the location for his lab, identifying an address that was close enough to New York and wealthy sponsors, markets and customers, but isolated enough that he and his team could work in peace while creating a healthy curiosity with the outside world.

Edison also understood the value of teamwork and fostering a collaborative culture. While he could be demanding in the lab, he encouraged his workers to be social with one another and frequently joined the muckers for food and beer in the evening. He was even known to play the organ for their enjoyment.



COURTESY OF PARC, A XEROX COMPANY

# XEROX PARC

When Bob Metcalfe started working at Xerox PARC in the early 1970s, it had many of the same features as Menlo Park (see left). PARC was investigating multiple technologies simultaneously, it recruited some of the most creative people of the time with different skill sets and backgrounds, and it had a deep-pocketed sponsor in Xerox.

When The Henry Ford sat down with Metcalfe as part of its OnInnovation series, he said this about his time at PARC: "It was our job to invent. We were encouraged to think through what would be required of the paperless office of the future and develop technologies that would move in that direction."

There are, however, key differences between Menlo Park and PARC.

PARC lacked leadership, where Menlo Park had a shrewd, yet benevolent, hands-on leader. Edison prided himself on his ability to anticipate market demand and steer his research toward concepts that could be commercialized quickly. PARC, on the other hand, didn't have a sponsor or partner that demanded commercialization of the technologies it was developing. And when it came to launching new products, PARC didn't have the capability or marketing strategy to get the job done.

Many so-called experts and pundits hold up PARC as a failure, citing that it created many of the PC technologies we use today (the mouse, terminal, printer, networks), but failed to commercialize them under the Xerox umbrella. Noted Metcalfe, "Ideas have trouble ... because the owners of those ideas are the status quo. They are the monopoly. Their incentives for bringing the new knowledge to market are lower than, say, a new entity."

Many of PARC's researchers, including Metcalfe, left Xerox to commercialize their technologies elsewhere or watched in frustration as others developed products based on their ideas (as Apple did with the mouse).

Undoubtedly, both Menlo Park and Xerox PARC share in their success for demonstrating the value of heterogeneous research across a number of new technologies and industries. PARC, however, is no match for Edison and his Menlo Park lab when it comes to commercial achievement.

## AFTER ETHERNET

### XEROX PARC EXPLORES WHAT'S NEXT IN NETWORK STANDARDS

For decades, network standards haven't changed much. Our networking standards, in fact, owe a lot to the basics of snail mail. When mailing a letter, we compose a message, place it in an envelope (a container) and send it to a specific address. As computer networks and then the Internet were developed, they followed the same paradigm. Today, our communications and Internet traffic follow many of the same conventions: We create "content" and send it to an "address" — usually an IP address made up of numbers and dots, which is masked by a URL. This networking model works because the sender and receiver are "known."

Xerox PARC is now innovating the network paradigm it had a hand in creating. Its latest foray into networking is an alternative model called Content Centric Networks or CCN. "Creating a new networking protocol and an entirely new Internet architecture, especially one as ambitious as CCN, demands a lot of collaboration and a cross-disciplinary culture, which runs deep in our DNA," said Glenn Edens, general manager, CCN Program, Xerox PARC. "While our development work is still early, we are bringing together partners that have the wherewithal to bring new technologies to market."

CCN emphasizes content over addresses, creating "signed" copies of content, rather than focusing on sending and receiving addresses. This model simplifies distribution and network traffic as networks are used to distribute large content volumes to many people, rather than exchange compact messages between explicit senders and receivers. "The goal of CCN is to make the network disappear," said Eden. "If we are successful, users won't even notice CCN. They'll notice that their applications work better and are more secure, performance is improved and costs are lowered."

— JEFFREY PHILLIPS

# Midnight Lunch: The 4 Phases of Team Collaboration Success from Thomas Edison's Lab

**PAULA GANGOPADHYAY, CHIEF LEARNING OFFICER AT THE HENRY FORD, REVIEWS SARAH MILLER CALDICOTT'S BOOK ON HOW TO APPLY THOMAS EDISON'S COLLABORATION METHODS TO TEAMWORK TODAY.**

Author and seasoned executive Sarah Miller Caldicott unveils Edison's larger-than-life personality and shows us a man who uniquely defined, practiced, nurtured and leveraged the power of collaboration, even though the world often perceived him as a lone genius.

"Midnight lunch" was a colloquial term used by Edison's Menlo Park crew in reference to the meals Edison sometimes ordered in the middle of the night as his R&D team worked late. These unplanned, collegial gatherings allowed the team to continue its intense work, but also enjoy a break, discuss challenges and sing and play music. Many great ideas would have emerged from Menlo during these disruptive discourses.

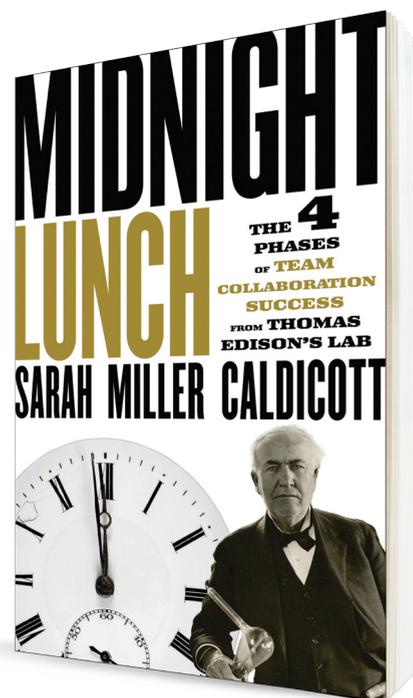
In her book aptly titled *Midnight Lunch*, Caldicott does a neat job of connecting the past to the present. She sprinkles historical vignettes and introduces readers to some of Edison's behind-the-scenes crew. Then she effectively juxtaposes history with relevant examples and references to current-day corporate scenarios, research and trends.

Caldicott also offers a unique interpretation of the prolific innovator's successful collaboration practices, molding them into her own practical, teachable lessons. Per Caldicott, four essential yet intertwined elements form the common denominator of collaborative successes, past and present.

- **Capacity.** The amalgam of people from different disciplines that allows collaboration to flourish.
- **Context.** The approach of reframing a problem that can drive critical problem solving.
- **Coherence.** The ability to encourage debate and dialogue while keeping the shared goals in alignment.
- **Complexity.** The power of optimizing resources to achieve quality results in the most nimble way.

A leader does not just set higher expectations for the team, provide resources and demand results, but deploys these four phases, fosters a culture of collaboration and brings out untapped potential.

What I appreciate about this book is how it effectively shows collaboration as a malleable competency that has sustained its power during the global economic shifts of the agricultural and industrial ages. Following the global reset of 2008, collaboration has now entered a third economic revolution phase, termed the "Innovation Age" (Jobs and the U.S. Economy panel discussion, adapted from the *McKinsey Quarterly*, August 2011). While the current workforce can definitely gain from reskilling efforts to expand collaborative capabilities, the real power to harness some of the yet-to-come practices lies in engaging the current and future workforce (aka Gen Y) that is already intrinsically collaborative in nature.



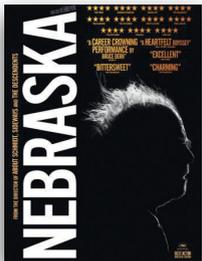
**DID YOU KNOW?**

Sarah Miller Caldicott is a great-grandniece of Thomas Edison from his second wife, Mina Miller.

"Midnight Lunch, though primarily written for the corporate sector, offers many **valuable lessons for the nonprofit and education sectors, as well as for any life-long learner.**"

— Paula Gangopadhyay

# What are we **reading** + **watching**?



**Marilyn Zoidis**  
Director, Historical  
Resources  
The Henry Ford

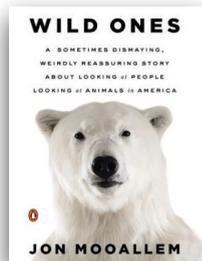
## Nebraska (2013)

Director: Alexander Payne

With America's population aging, it is inevitable that films that realistically probe the family dynamics within an aging household will be produced.

In the film *Nebraska*, Bruce Dern and June Squibb give strong performances as a dysfunctional couple who have endured in spite of themselves. Will Forte, of *Saturday Night Live* fame, also effectively plays the conflicted younger son trying to cut through toxic family dynamics.

The film's premise rests on the idea that Woody Grant (Dern) has won a million dollars through a bogus sweepstakes giveaway. He insists on traveling to Nebraska from Montana to claim his winnings. With the father unable to drive, the dutiful son indulges his father and accompanies him. The trek becomes a journey of insights and revelations that do not obliterate painful memories, but do give them context.



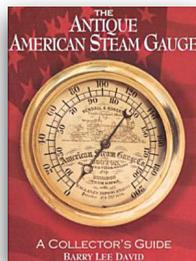
**Aimee Woodruff  
Burpee**  
Collections Specialist  
The Henry Ford

## Wild Ones: A Sometimes Dismaying, Weirily Reassuring Story About Looking at People Looking at Animals in America

By Jon Mooallem

*Wild Ones* is an illuminating look at the intricate relationships between North Americans and the wild-life permeating the landscape. Nuisance and threat? Exterminate. Cherished and crucial for vital ecosystems? Protect and nurture.

Author Jon Mooallem investigates the cyclical and clashing attitudes of past Americans, those presently fighting for endangered species and habitats, and the future generations that will grapple with these issues. Mooallem balances the negative with the positive, leaving readers to draw their own conclusions about human control over the wild, what is worth protecting, how far we are willing to go to save it and the consequences of those decisions.



**Jake Hildebrandt**  
Collections Specialist  
The Henry Ford

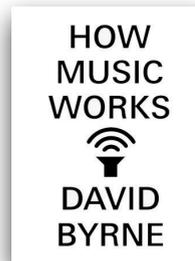
## The Antique American Steam Gauge

By Barry Lee David

When confronted with the size and power of a steam engine, it's easy to overlook what often may be its most elegant feature: the pressure gauges.

Though *The Antique American Steam Gauge* describes itself as "A Collector's Guide," it is much more than a list of makes and valuations. Author Barry Lee David makes a great museum-like show of this niche subject with color photos, period illustrations and technical analyses that show off the artistry and ingenuity that went into these otherwise utilitarian devices.

The collector will also find plenty of information on pricing and buying, as well as repairing and conserving, these brassy jewels of the industrial age.



**Saige Jedele**  
Assistant Curator,  
Special Projects  
The Henry Ford

## How Music Works

By David Byrne

David Byrne is best known for his work with the New Wave band Talking Heads. For fans, *How Music Works* delivers the expected origin stories and autobiographical morsels.

But Byrne's easy writing style allows him to fold in an array of topics — from architecture and anthropology to fashion and finance. Even those unfamiliar with the man, the band or the genre will find plenty to appreciate.

"I like music, but it's not a passion of mine — not even a hobby. **David Byrne's How Music Works was a surprising treat.**"

— Saige Jedele



# WANT MORE?

The free tablet edition of the latest issue of *The Henry Ford Magazine* is available in June 2014 on iTunes and Google Play for iPad and Android tablets.



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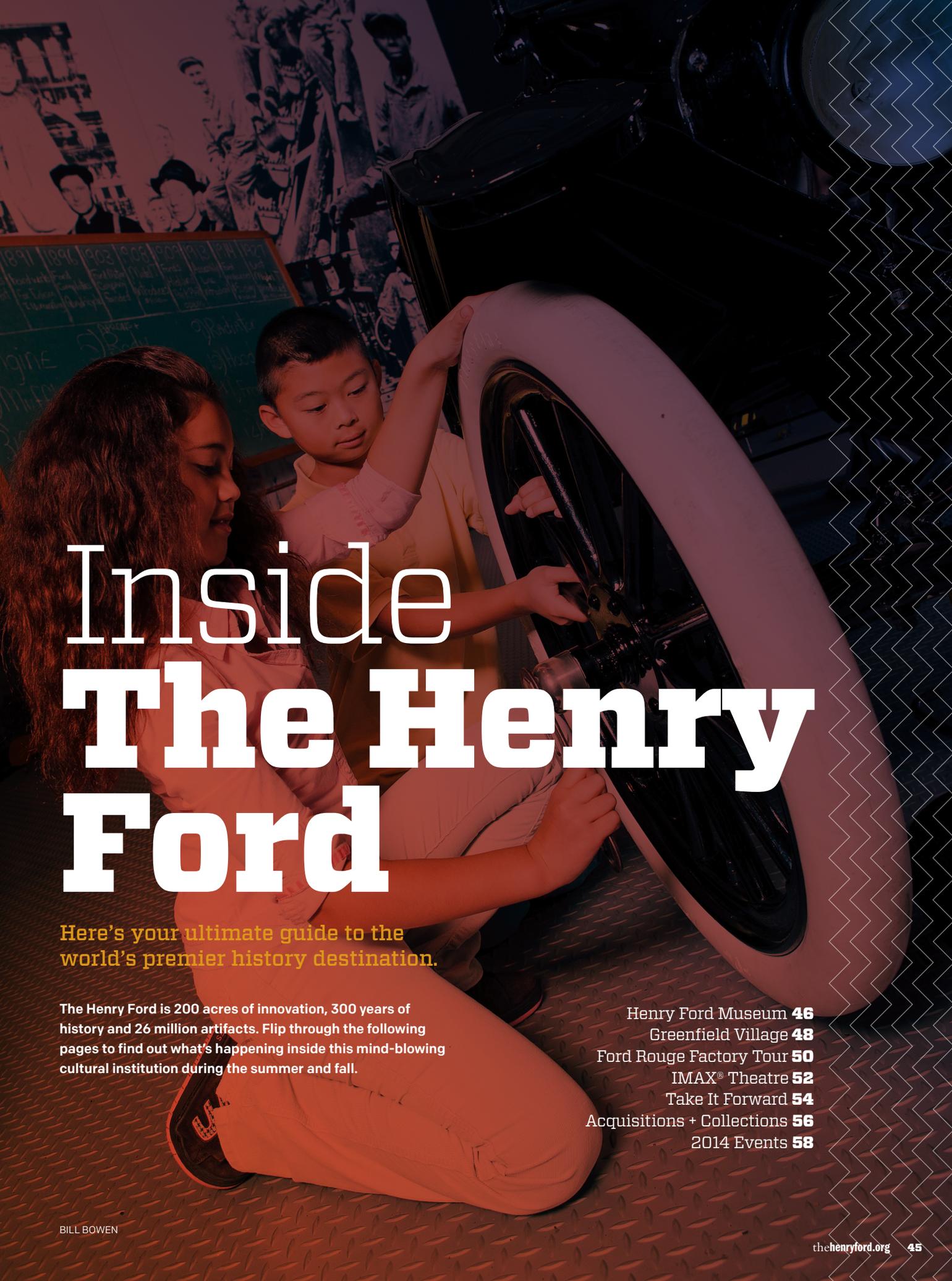
**CURIOUS ABOUT HOW TO ADVERTISE IN THE HENRY FORD MAGAZINE'S NEWSSTAND AND/OR DIGITAL EDITIONS?**

Contact Sherri Howes, 313.982.6028 or [SherriH@thehenryford.org](mailto:SherriH@thehenryford.org).

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visit [thehenryford.org](http://thehenryford.org)

A woman with long dark hair and a young boy are kneeling on a metal floor, examining the front wheel of a vintage car. The woman is on the left, looking towards the boy on the right. The boy is pointing at the wheel. In the background, there are historical photographs and a chalkboard with writing. The scene is lit with a warm, orange glow.

# Inside The Henry Ford

Here's your ultimate guide to the world's premier history destination.

The Henry Ford is 200 acres of innovation, 300 years of history and 26 million artifacts. Flip through the following pages to find out what's happening inside this mind-blowing cultural institution during the summer and fall.

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# A Fight for Freedom

Teamwork defines historic slave revolt

One

fall day in 1851, in the quiet village of Christiana, Pennsylvania, the sound of a horn pierced the steep, wooded hills. The prearranged signal was meant to call fugitive slaves to the aid of one of their own.

On this day, the horn incited a pivotal revolt that left one slave owner dead and marked a turning point in the history of American slavery 10 years before the Civil War.

Known as the Christiana Revolt, this obscure but important uprising is highlighted in Henry Ford Museum's *With Liberty and Justice for All*, an exhibit that explores issues of freedom and equality, from the American colonists' fight for independence from Great Britain to Rosa Parks' refusal to give up her seat on a Montgomery bus.

A multimedia presentation brings key characters of the Christiana Revolt to life, including Edward Gorsuch, a Maryland farmer who discovered four of his escaped slaves were hiding just over the state border in Christiana.

According to Donna Braden, curator of public life for The Henry Ford, Christiana had been known as a haven for escaped slaves. "It was an area where runaway slaves got new lives," Braden said. "They lived, worked and farmed there."

But after the Fugitive Slave Act was passed in 1850, making it legal for slave owners to cross state lines to recapture runaway slaves as well as enlist federal officers and local citizens to help them, slaves in Christiana realized their freedom was in danger.

"They were always on the lookout," Braden said. "They all knew they needed to protect each other. Only in Canada were they truly beyond capture."

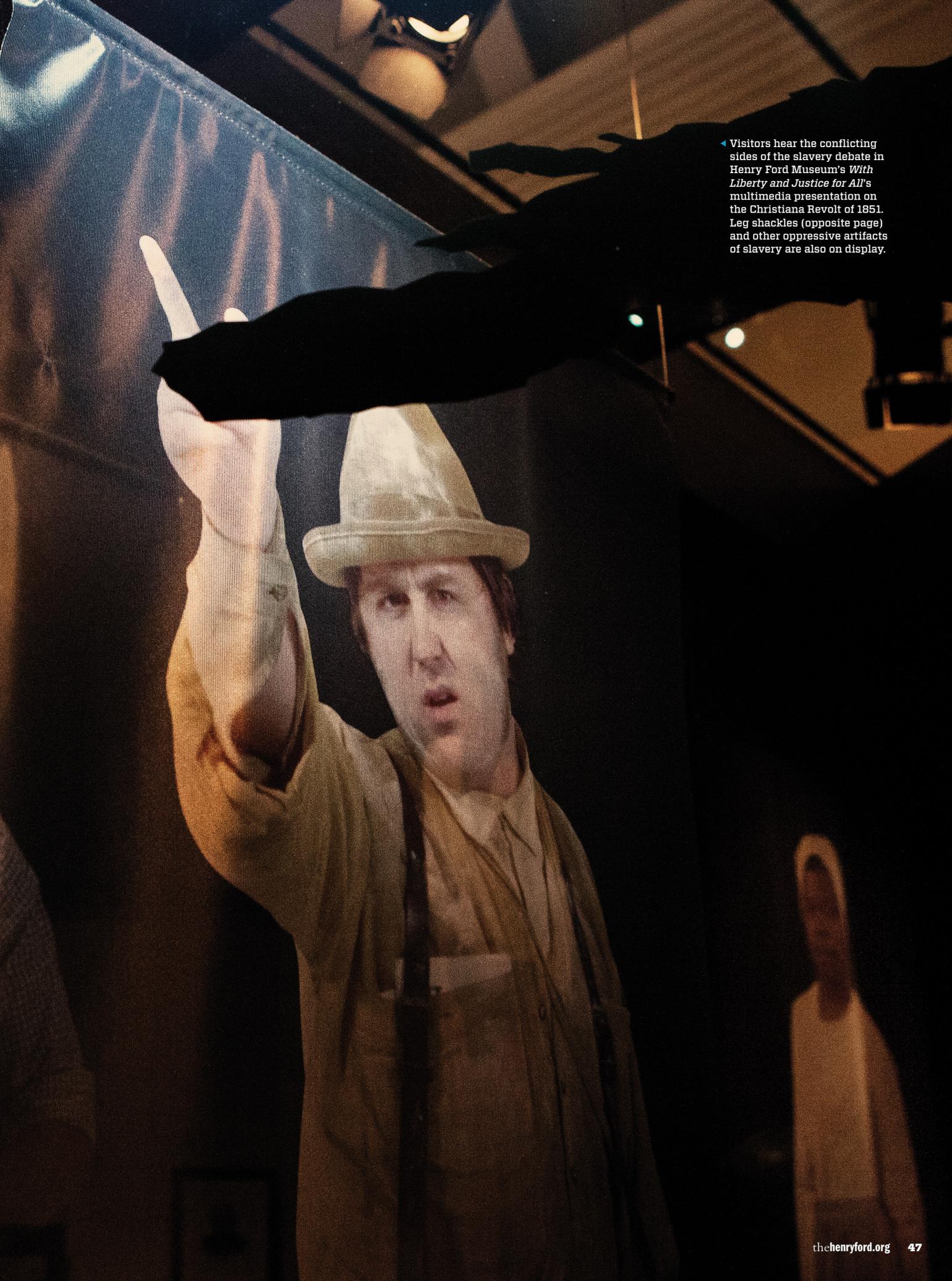
They organized a self-defense team led by fellow escaped slave William Parker, so when Gorsuch arrived with his posse demanding return of his "property," they were ready to fight. Parker signaled his wife to blow the horn. Neighbors soon arrived from every direction, armed with pistols, shotguns, hunting rifles, corn cutters, scythes and farm tools.

A battle ensued that left Gorsuch dead and several members of his group wounded. Nobody was prosecuted for a crime, a fact that bolstered Northern abolitionists, outraged Southerners and helped set into motion a decade of resistance that culminated in the Civil War.

In Christiana, a group of slaves who worked together despite the limitations of their situation successfully fought off an urgent threat to their freedom. More than that, they showed people across the South that slaves could and would fight back.



**ONLINE** For more information, hours and pricing, visit [thehenryford.org/museum](http://thehenryford.org/museum) ▶



◀ Visitors hear the conflicting sides of the slavery debate in Henry Ford Museum's *With Liberty and Justice for All's* multimedia presentation on the Christiana Revolt of 1851. Leg shackles (opposite page) and other oppressive artifacts of slavery are also on display.

# Sharing a Passion

Pottery bears the fingerprints of many

In

the Liberty Craftworks district within Greenfield Village, artisans demonstrate centuries-old techniques daily to blow glass, weave intricate patterns, set type and machine tools. In the Pottery Shop,

skilled hands make nearly 10,000 pieces each year. According to lead potter Melinda Mercer, every one of these pieces is a testament to huge amounts of trust and teamwork.

Three full-time potters and several part-time decorators work in Greenfield Village, and every creation is touched by many hands over a period of weeks — or months — before it's done. "We have a great team," explained Mercer. "We're all passionate about history and pottery, and we all want to create the best product we can."

The Pottery Shop recently underwent a dramatic renovation that included replacement of its indoor salt kiln and expansion of the workshop where visitors can watch as the pottery is made.

For the team, the process is a series of make-or-break moments that requires a great deal of trust, especially as ownership of each piece is transferred down the creation line. It all begins with the clay mixer, who combines powders and water to make the clay. Once the clay is aged, a potter throws it on a potter's wheel to give it shape. After that, a decorator takes the piece, using historic techniques to painstakingly give it personality. And still another potter then enters the picture to do the glazing. "It's a division of labor that allows everyone to focus on their strengths," Mercer said.

Firing the pottery also requires communal effort. The new salt kiln takes the three potters an entire day to load, with each piece painstakingly stacked to avoid breakage. As the pottery is fired based on a historical method, salt turns to vapor, which engages the pottery and reacts with the clay to form a glaze to create one-of-a-kind effects on each piece, depending on their location in the kiln. The end result is a warm, organic and intricate orange peel-like finish that even the most discerning visitors can appreciate.

Outside, there is also a huge wood-fired kiln that takes even more teamwork to manage. The three potters work in shifts to fuel this kiln, feeding it wood every few minutes for 24 to 36 hours, until it reaches a temperature of 2,375 degrees.

Unloading the kilns is always exciting, Mercer said, because the delicate balance of heat and atmosphere inside each kiln determines how the glaze will look in the end. "It's always a surprise," she added.

Greenfield Village pottery artisans make a wide variety of collectible and usable items that are available for purchase on-site and online. And now that the new salt kiln is up and running, beloved salt-fired stoneware is back on the shopping list, with all of the pieces based on historical shapes updated for modern functions.



**ONLINE** For more information, hours and pricing, visit [thehenryford.org/village](http://thehenryford.org/village) ▶

#### DID YOU KNOW? /

Firestone Farm in Greenfield Village uses salt-fired stoneware crafted by the Liberty Craftwork pottery artisans, including pitchers, serving ware and the crocks used to cure sauerkraut in the basement.

#### SHOP

Buy these birdhouses and other items handcrafted in Greenfield Village online at [giftshop.thehenryford.org](http://giftshop.thehenryford.org) ▶



BILL BOWEN



◀ The gas-fired salt kiln is designed for efficiency, with the floor and door built to slide on tracks similar to a railroad car. This arrangement allows the stacking area to be pulled out from the main structure for ease of loading. Once the kiln is filled with wares, the car is pushed back into place before the firing begins.



LEE CAGLE

The Greenfield Village Pottery Shop is housed in a building Henry Ford originally designed as a historic rice mill, with boilers venting underground to a large chimney outside. When the building was transformed into a pottery workshop in 1984, a salt kiln was installed using the same chimney. After 30 years of service, it failed last year. “To replace the kiln, we had to take out the floor,” said Tom Varitek, senior program manager at The Henry Ford. “As we did so, we took the opportunity to expand the building and change the way it’s used. When a guest walks in today, they see the same pottery workshop that has been there for 30 years to the left, but to the right, everything is new.”

**ONLINE** To learn more about The Henry Ford’s Studio Pottery Challenge, visit [blog.thehenryford.org/2014/02/the-studio-pottery-challenge/](http://blog.thehenryford.org/2014/02/the-studio-pottery-challenge/) ▶

# United in Purpose

Ford, UAW and The Henry Ford celebrate 10 years of partnership at the Ford Rouge Factory Tour

The

vehicle assembly line is probably one of the most studied and celebrated examples of teamwork. Thousands of men and women working in concert to build hundreds of our society's most complex, yet most common, machines every day.

When you take the Ford Rouge Factory Tour, you see the art of the assembly line in motion as you walk along the 1/3-mile elevated walkway, following the trim line for final assembly of the Ford F-150 at the Dearborn Truck Plant. Dedicated workers teaming up with each other and advanced tooling to manufacture the best-selling vehicle in the U.S.

Just as important to the Rouge's success is the collaboration between UAW Local 600 and Ford Motor Company. In 1997, the two approved the Rouge Viability Agreement, investing billions in the complex to make it the world-class example of sustainable manufacturing it is today. And as the idea for the Ford Rouge Factory Tour unfolded during this transformation, the UAW was an important partner in creating a visitor experience worthy of the Rouge and its legacy.

The relationship between the UAW and Ford Motor Company hasn't always been so collaborative. "It was one of the worst relationships in the beginning," said Bernie Ricke, president of UAW Local 600. "It has evolved into a place where we now have the best relationship in the industry."

Ricke represented the UAW as part of a committee tasked with reviewing the Rouge's progress and finalizing the visitor elements of

the factory tour. This group of The Henry Ford experts, Ford and Ford Land executives, and entertainment architects met monthly in a special conference room in the basement of Ford Motor Company's world headquarters in Dearborn to brainstorm and collaborate.

"We wanted the tour to have a natural flow, a setup that explained the Rouge's history, the new sustainable plant and the current building of the truck," said Ricke.

Hundreds of ideas were thrown on the table, from adding salmon ladders in the Rouge River to building a strip mall in the Rouge complex to including movie screens on Miller Road for visitors to view as they were bused to the tour entrance. "There was even talk about enclosing the visitor walkway in the plant with glass and making it air-conditioned," noted Ricke, "but we wanted visitors to hear, feel and smell what it's really like on the line, not just see it."

In the end, the Ford Rouge Factory Tour is a five-part, self-guided experience that includes the open, elevated walkway at Dearborn Truck, along with two theater experiences, a vehicle gallery and an observation deck where visitors can view the plant's astonishing living roof.

"The Rouge is famous all over the world," said Ricke. "Once we had a man come all the way from Mongolia to take the tour, telling us that coming to the Rouge was on his bucket list."



▲ A United Auto Workers badge from 1935.

## 10TH ANNIVERSARY SPECIAL

Visit the Ford Rouge Factory Tour FREE! Members can get two FREE tickets to visit the Ford Rouge Factory Tour May-June by subscribing to The Henry Ford eNews. Signup today at [TheHenryFord.org/enews](http://TheHenryFord.org/enews).

**ONLINE** For more information, hours and pricing, visit [thehenryford.org/rouge](http://thehenryford.org/rouge) ▶

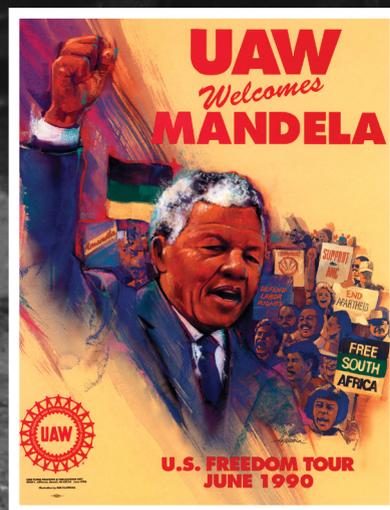
### DID YOU KNOW? /

*Student Travel Magazine* recently voted the Ford Rouge Factory Tour a top U.S. factory tour for a field trip.

ALL IMAGES FROM THE COLLECTIONS OF THE HENRY FORD



◀ Labor organizers distribute United Auto Workers (UAW) newspapers outside Ford's Rouge Plant gates in November 1937. Years later, after a turbulent 10-day strike in April 1941, Ford became the last major automotive manufacturer to recognize the UAW and agree to union demands.



◀ The Rouge complex was the only industrial site that Nelson Mandela visited during his U.S. Freedom Tour in 1990.

# Portrait of a Team

Keeping it *reel* in the projection booth is no one-man show

Few

moviegoers who visit The Henry Ford IMAX Theatre think about who's upstairs running the show. But it takes a group of highly skilled technicians to keep the complex mechanical equipment behind Michigan's largest IMAX screen running picture-perfect seven days a week, 363 days a year.

"We are a close-knit team. We're kind of like brothers to each other," said Ron Bartsch, senior projection and programming manager at The Henry Ford IMAX Theatre. "All of us live by 'the show must go on' philosophy, and we all know what to do on the rare occasion when something gets in the way of that."

Five IMAX projectionists are in constant communication with each other — inside and outside of work — to keep everything running smoothly and on schedule. Yet even as they work in coordination, the nature of the job means they usually spend their shifts alone — beyond after-hours tasks such as equipment maintenance, xenon lamp changes and film print assembly/disassembly.

Shedding light on the operation, guests are welcome to visit the third-floor projection booth viewing gallery to get a rare glimpse behind the scenes. In a climate-controlled,

near-dark room jam-packed with equipment, the team threads the 15-perforation/70 mm film into the projector via a series of rollers and giant film platter transport systems. During the show, constant monitoring of the complex mechanical and digital sound systems that support the million-dollar IMAX film projector is paramount to a perfect presentation.

"Most moviegoers today are totally oblivious to what's happening on the other side of the lens, behind that back wall through that little window," Bartsch said. "Guests don't realize the scope and scale of the operation until they come upstairs to see it firsthand, and then they're fascinated. We can tell by the surprised look on their faces."

Giant-screen, classic IMAX film theaters are truly unique, and their projectionists often lead a life shrouded in mystery, romance and glamour. Maybe that's why Bartsch likens his specialized team to airline pilots and cruise ship officers. To Bartsch and his crew, the stakes are high, especially in today's world of ever-increasing competition for moviegoers' dollars. "We're always working with one goal in mind: to give our guests the best possible IMAX moviegoing experience — one that is free from turbulence and is smooth sailing from start to finish."

**ONLINE** For more information, hours and pricing, visit [thehenryford.org/imax](http://thehenryford.org/imax)

#### DID YOU KNOW? /

You can view the projection room after each movie. It's located on the third floor of The Henry Ford IMAX® Theatre.

#### FILMS AT THE HENRY FORD IMAX THEATRE

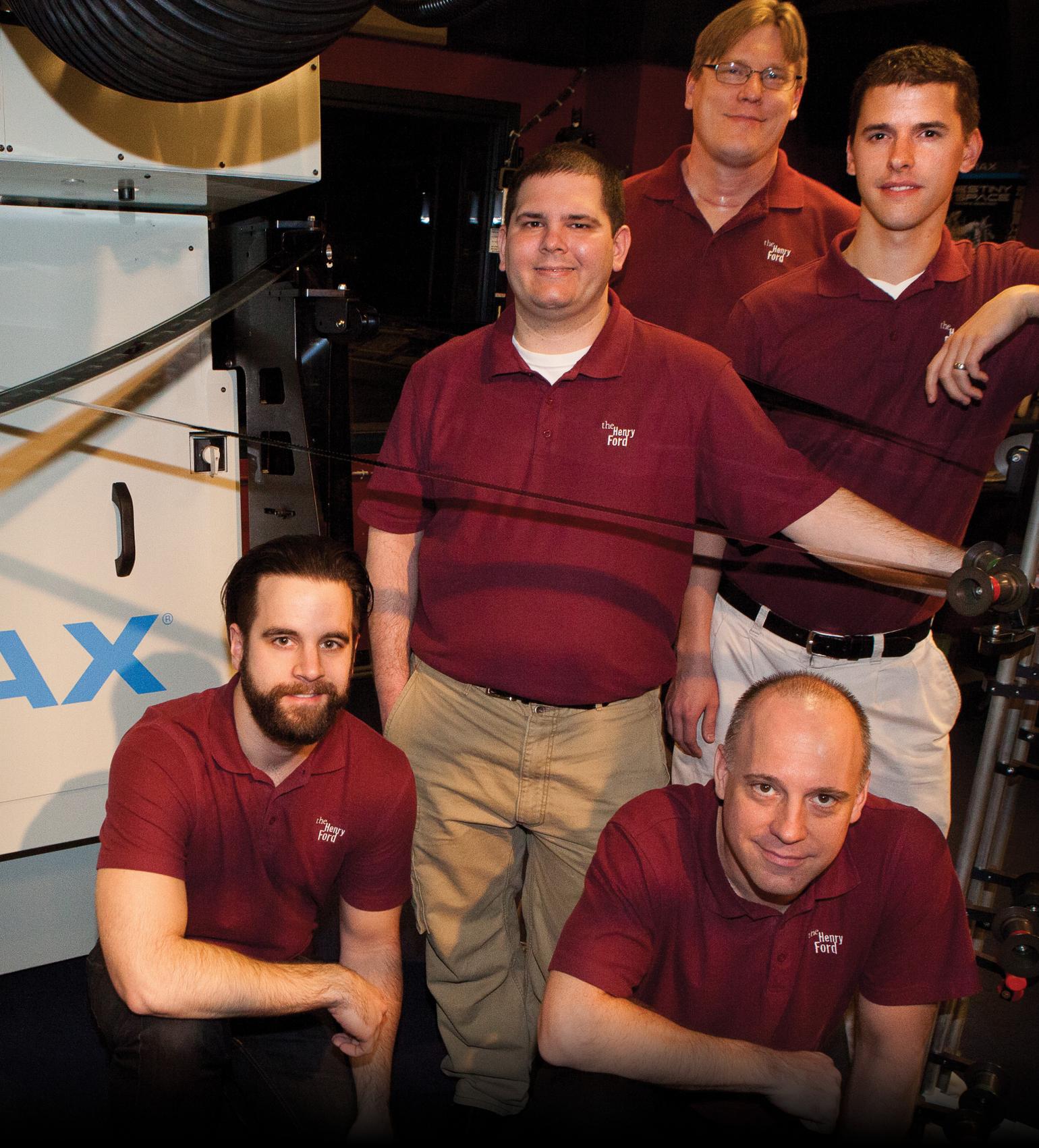
- Jerusalem
- D-DAY 3D: Normandy 1944
- Penguins 3D
- ALL ACCESS: Front Row. Backstage. LIVE!
- Interstellar: The IMAX Experience (opens November 7)

Watch for opening events at [thehenryford.org](http://thehenryford.org).



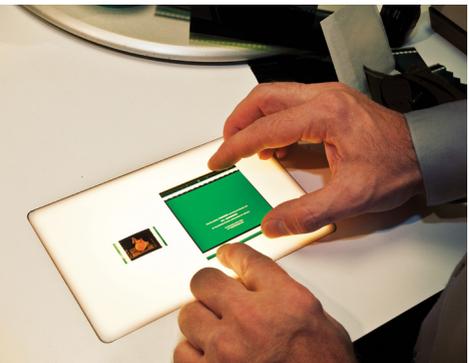
► From left: An overhead view of film prints and platter systems. Size comparison between 15/70mm and 35mm film. Threading up a show.





## MEET THE TEAM

Clockwise from bottom right:  
**Ron Bartsch**, senior manager,  
IMAX projection and programming  
**Matt Naif**, senior IMAX projectionist  
**Chris Belch**, assistant IMAX projectionist  
**Paul Bratfish**, assistant IMAX projectionist  
**Adam Plaskey**, assistant IMAX projectionist



# Take It Forward

BOLD IDEAS SHAPING OUR WORLD

## THE TELEVISION

Philo who?



© BETTMANN/CORBIS

### ◀ YOUNG MIND, BIG IDEAS

In the 1920s, teenage farm boy Philo Farnsworth asks, what if there was a machine that was kind of like a radio but could send pictures instead of sound?

**DID YOU KNOW? /**  
The average American watches more than four hours of TV each day.

## THE CUBICLE

His biggest regret

### GOOD INTENTIONS ▶

Designer Robert Propst studies office workers and the office environment. He begins to develop Action Office in 1964 to increase productivity and communication.



▲ Action Office Communication Center

**DID YOU KNOW? /**  
The Action Office System contained movable walls, shelves, stand-up desks and other modular components.

## THE CHAIR

Two guys, one seat

### NEW IDEAS FOR AN OLDER POPULATION ▶

With the Equa chair in their portfolio in the mid '80s, designers Don Chadwick and Bill Stumpf move on to Metaform, an exploratory residential furniture system for the elderly.

FROM THE COLLECTIONS OF THE HENRY FORD. GIFT OF THE STUMPF FAMILY.



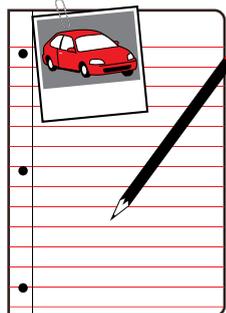
### REIGNING OPTION ▶

Meanwhile, chairs in executive offices convey more than a hint of the throne — vast, plush and usually leather covered. Apparently upholstery and luxury = comfort and status.

## TEAM BUILDING @ THF

Automobiles are more than just a means of transportation to Americans — they are an intrinsic part of who we are. In The Henry Ford's Professional Education Program, a team-building activity called *What Was Your First Car?* helps break the ice, giving everyone in a group something in common upon which to build.

- 1 Ask everyone in the group to write a description and (if possible) bring a photograph of their first car. Keep your info a secret.



- 2 Present the pictures one at a time, with no other info. Ask the group to guess whose car it is.



### OUT OF THIS WORLD ▶

42 years after showing off his prototype, it's his electronic television that unifies the planet around a singular event in human history as some 600 million people watch the first man on the moon.



### TV'S FORGOTTEN FATHER ▶

Farnsworth's invention is the most pervasive mass communication system of the past millennium and perhaps the next. He's called the most famous person you've never heard of.



▲ Farnsworth Television and Radio Corporation television receiver, circa 1948-50



### ◀ A WRONG TURN

The cubicle becomes the single most common workplace environment, but not for reasons of high productivity or better communication as Propst intended.



COURTESY OF HERMAN MILLER

### ◀ UNINTENTIONAL CONTRIBUTOR

Propst laments the loss of his original vision for the office. He refers to today's cubicle wasteland as monolithic insanity.



BILL BOWEN

◀ **DID YOU KNOW?** / The curatorial staff of The Henry Ford has a table and chairs designed by Bill Stumpf for brainstorming about artifacts, collections and events. The set once sat in Stumpf's very own Herman Miller office.

### THE NAME'S AERON ▶

Stumpf and Chadwick emerge in 1994 with new ideas about ergonomics, chair geometry, materials and propose a chair without upholstery and joinery; lightweight mesh and sinuous aluminum are the way forward. Aeron shocks, intrigues and sells. The office gold standard from the reception desk to the boardroom.

Fully Furnished exhibit, Henry Ford Museum

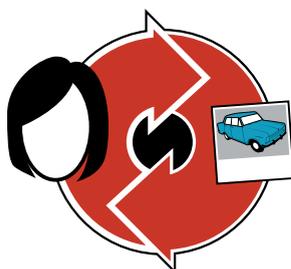


ALL IMAGES FROM THE COLLECTIONS OF THE HENRY FORD UNLESS NOTED

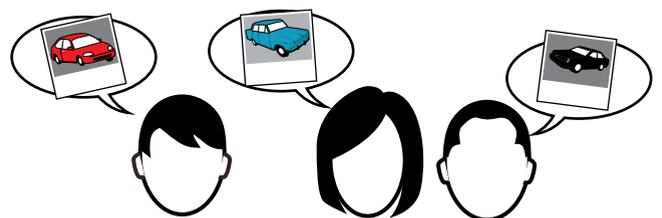
**3** Reveal the identity of the owner, and give the person a chance to talk about his or her car.



**4** Repeat the process until everyone's car and identity are revealed.



**5** Ask the group to consider what everyone has in common concerning their first car, using the identified similarities to create recognition of team.



# Play Around in History

New historically themed playscape adds to experience in Greenfield Village

## Most

playscapes in parks today consist of plastic tunnel slides that are attached to monkey bars that are attached to a swing set. If you're lucky, maybe there will be a random playhouse or a teeter-totter on-site, too.

When The Henry Ford started imagining a play area in Greenfield Village, the team immediately knew it wanted — and needed — to think differently. The space had to feel authentic, look like it belonged in Greenfield Village. It also needed to serve as a model of innovation for others.

“Our intent for our playscape is to fire imaginations, while encouraging exploration and

discovery through a variety of spaces for active and physical as well as quiet and reflective play,” said Patricia Mooradian, president of The Henry Ford. “We also wanted to boldly challenge the traditional segregation of the fully abled from others, adopting design principles that address the interests of children of varying physical, developmental and sensory abilities.”

Avoiding the traditional playground route, the team instead opted to use historical objects, including a 20-foot long boiler tunnel and 1931 Model AA truck, to help create a sympathetically themed play place that would offer kids of all abilities endless amounts of entertainment, varying levels of challenge and lots of opportunities to play together.

### DID YOU KNOW? /

Most activities of the playscape are ground-level accessible or accessible by ramp so children of all physical and mental abilities can enjoy them.

### ONLINE

For more information about the collections of The Henry Ford, visit [collections.thehenryford.org](http://collections.thehenryford.org) ▶



ALL IMAGES BY GARY MALERBA



### WHAT'S INSIDE

The Donald F. Kosch Village Playground is reminiscent of a 1920s construction site. The space is fenced in for added peace of mind for caregivers and includes:

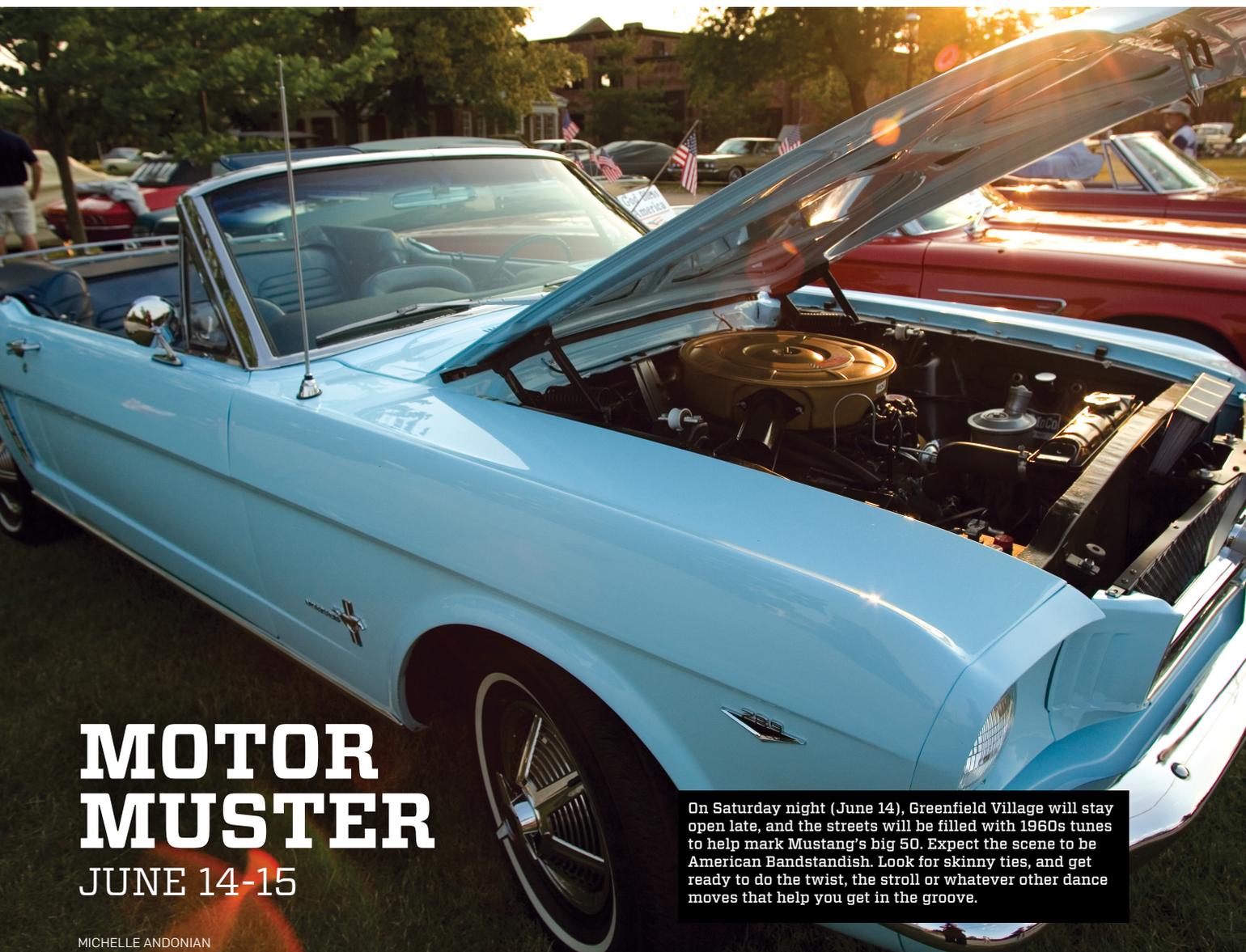
- An interactive steam shovel with levers for digging in sand
- A cement mixer
- A water tower with slides
- Work building and tables
- Tool fence
- Gear climber
- Sluice and hand pumps
- Sculptural swings
- Rock-climbing wall
- Boiler sculpture
- Boardable 1931 Model AA truck
- Seesaw
- Boiler tunnel

Made possible by a generous donation by  
The Donald and Mary Kosch Foundation



# 2014 Events

Celebrate.  
Play.  
Imagine.



## MOTOR MUSTER JUNE 14-15

MICHELLE ANDONIAN

On Saturday night (June 14), Greenfield Village will stay open late, and the streets will be filled with 1960s tunes to help mark Mustang's big 50. Expect the scene to be American Bandstandish. Look for skinny ties, and get ready to do the twist, the stroll or whatever other dance moves that help you get in the groove.

Collect your friends, family and favorite car-lovin' guys and gals, and head over to Greenfield Village on Father's Day weekend to see a stellar collection of transportation greats at Motor Muster. This year, the annual event features two superstar guests from the collections of The Henry Ford — Mustang Serial Number One and Ford Mustang I Roadster Concept Car — to help celebrate 50 years of Mustang. (The Mustang debuted to the world on April 17, 1964.)

Motor Muster always features hundreds of cars, trucks, racers, bikes, scooters and more for the ogling. Throw in some pass-in-review parades, cruising hours, dramatic presentations, a lecture series and best-in-show competitions, and you've got yourself a high-octane weekend ahead of you.

**ONLINE** visit [thehenryford.org/motormuster](http://thehenryford.org/motormuster) ▶



# GRIDIRON GLORY: The Best of the Pro Football Hall of Fame

OCTOBER 3, 2014-JANUARY 4, 2015

COURTESY OF PRO FOOTBALL HALL OF FAME

*Gridiron Glory: The Best of the Pro Football Hall of Fame* is the largest traveling exhibition in the history of the Pro Football Hall of Fame. When the 5,000-square-foot exhibition comes to Henry Ford Museum in October, it will feature hundreds of artifacts from the Hall of Fame's collection, many on exhibit for the first time. Also included will be a specially designed Hometown Tribute section dedi-

cated to the Detroit Lions, which will be a collaborative effort between The Henry Ford and the Detroit Lions organization.

*Gridiron Glory* is a production of Pro Football Exhibits, LLC, owned and funded by GALLO museum services.

**ONLINE** visit [thehenryford.org/gridironglory](http://thehenryford.org/gridironglory) ▶

# 2014 Events

## YEAR-ROUND

### Macy's 2nd Mondays Children's Program

(10 a.m.-noon)  
June 9, July 14,  
August 11, September 8,  
October 13  
Greenfield Village

November 10,  
December 8  
Henry Ford Museum

### Target Family Days

September 1,  
November 4  
Henry Ford Museum  
Presented by Target

### Tinker. Hack. Invent. Saturdays

Every Saturday  
Henry Ford Museum



GARY MALERBA

## JUNE

### Outdoor Living Lab Tour\*

Running through  
October 11  
Ford Rouge Factory Tour

### Women Who Rock: Vision, Passion, Power

Running through  
August 17  
Henry Ford Museum

### Member Appreciation Days

June 6-8  
The Henry Ford

COURTESY OF ROCK AND ROLL HALL OF FAME AND MUSEUM



## Women Who Rock: Vision, Passion, Power

Running through August 17  
Henry Ford Museum

▼ Featuring more than 70 artists, *Women Who Rock: Vision, Passion, Power* celebrates women as engines of creation and change in popular music, with iconic artifacts such as Chrissie Hynde's jacket (below).

## Ragtime Street Fair

July 12-13 (Open Saturday 'til 9 p.m.) ( Greenfield Village

## Maker Faire® Detroit\*

July 26-27 (Open Saturday and Sunday 'til 6 p.m.) (

The Henry Ford

In collaboration with *Make Magazine*

Ultimate Maker Sponsor Ford Motor Company

Maker Sponsor Denso

Shuttle Sponsor University of Michigan

## AUGUST

### Women Who Rock: Vision, Passion, Power

Running through August 17  
Henry Ford Museum

### Historic Base Ball Games

August 2-3, 9-10 and 16-17  
Greenfield Village

### Historic Base Ball Games

June 7-8, 14-15, 21-22 and 28-29

Historic Base Ball in Greenfield Village is made possible through the generous support of Cynthia and Edsel B. Ford II.



### National Get Outdoors Day

June 7  
Greenfield Village

### Motor Muster

June 14-15 (Open Saturday 'til 9 p.m.) ( Greenfield Village

### Summer Discovery Camp\*

June 23-27, July 7-11, July 14-18, July 21-25, July 28-August 1 and August 4-8  
The Henry Ford

### Historic Base Ball Games

July 5-6, 12-13, 19-20 and 26-27  
Greenfield Village

## JULY

### Women Who Rock: Vision, Passion, Power

Running through August 17  
Henry Ford Museum

### Annual Salute to America\*

July 2-5 ( Greenfield Village



GARY MALERBA



BILL BOWEN

► Maker Faire is a family-friendly festival of invention, creativity and resourcefulness, and a celebration of the maker movement.

**Local Roots Evening Dining\***

August 8 ( Pavilion, Greenfield Village

**World Tournament of Historic Base Ball®**

August 9-10 Greenfield Village  
Historic Base Ball in Greenfield Village is made possible through the generous support of Cynthia and Edsel B. Ford II.

**SEPTEMBER**

**64th Annual Old Car Festival**

September 6-7 (Open Saturday 'til 9 p.m.) ( Greenfield Village

**Books, Etc., Sale**

September 6 Benson Ford Research Center

**Fall Flavor Weekend**

September 27-28 Greenfield Village  
Presented by Meijer



BILL BOWEN

**Farmers Market**

September 27 Greenfield Village  
Presented by Meijer

**OCTOBER**

**Gridiron Glory: The Best of the Pro Football Hall of Fame**

October 3, 2014- January 4, 2015 Henry Ford Museum

**Fall Flavor Weekend**

October 4-5 Greenfield Village

**Farmers Market**

October 4 Greenfield Village



BILL BOWEN

**Hallowe'en in Greenfield Village\***

October 10-12, 17-19 and 24-26 ( Greenfield Village

**Hallowe'en in Greenfield Village Dinner Package\***

October 10-11, 17-18 and 24-25 ( Greenfield Village



GARY MALERBA

**NOVEMBER**

**Gridiron Glory: The Best of the Pro Football Hall of Fame**

Running through January 4, 2015 Henry Ford Museum

**Local Roots Evening Dining\***

November 7 ( Lovett Hall, The Henry Ford



ROY RITCHIE

▶ A fabulous fireworks finale and sing-along are just part of the festive fun during Holiday Nights in Greenfield Village.

**Member Appreciation Days**

November 7-9 The Henry Ford

**Members 21st Annual Holiday Lighting Ceremony\***

November 24 ( Henry Ford Museum

**Holidays in Henry Ford Museum**

November 28, 2014- January 4, 2015 Henry Ford Museum

**DECEMBER**

**Gridiron Glory: The Best of the Pro Football Hall of Fame**

Running through January 4, 2015 Henry Ford Museum

**Holidays in Henry Ford Museum**

Running through January 4, 2015 Henry Ford Museum

**Holiday Nights in Greenfield Village\***

December 5-7, 12-14, 18-23 and 26-27 ( Greenfield Village

**Holiday Nights Supper With Santa Package at A Taste of History®\***

December 5-7, 12-14 and 18-23 ( Greenfield Village

**Holiday Nights in Greenfield Village Dinner Package at Eagle Tavern\***

December 5-7, 12-14, 18-23 and 26-27 ( Greenfield Village

**b** Get an inside look at the experiences of The Henry Ford at [blog.thehenryford.org](http://blog.thehenryford.org)

**BEST VALUE!**  
Become a member and receive unlimited free admission to Henry Ford Museum and Greenfield Village. For details, visit [thehenryford.org/membership](http://thehenryford.org/membership).

\* Additional fee and/or advance reservation required

( Special evening hours during these events

All programs and dates are subject to change.

**BEFORE YOU VISIT**

It's a good idea to give a quick call or check online to confirm dates, times and locations for all events.

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You don't have to wonder where you might stay while you explore The Henry Ford. All the info you need about available lodging options, from hotel names and locations to drive times from attractions to descriptions of the many amenities offered, is right here. We've also tossed in a few extras about where you can — and should — grab a bite around town. Making your travel plans will be as easy as pie.

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Accommodations at a Glance

HOTEL	LOCATION AREA	DRIVE TIME*	SLEEPING ROOMS	POOL	PETS	MEETING ROOMS	MEETING SPACE (Sq. ft.)	AD ON PAGE	
FULL SERVICE	<b>Adoba Hotel Dearborn/Detroit</b>	Dearborn	5	773	Indoor	•	30+	62,000	76
	<b>Best Western Greenfield Inn</b>	Dearborn (I-94 corridor)	10	209	Indoor	•	4	1,047	69
	Detroit Marriott at the Renaissance Center	Downtown Detroit	15	1,298			29	100,000	73
	<b>DoubleTree by Hilton Detroit-Dearborn</b>	Dearborn	10	347	Indoor		16	12,000	74
	<b>Holiday Inn Southgate Banquet &amp; Conference Center</b>	Downriver (I-75 corridor)	15	160	Indoor		8	9,000	67
	<b>The Henry, an Autograph Collection by Marriott</b>	Dearborn	5	323	Indoor	• \$	14	26,000	71
HISTORIC	<b>The Dearborn Inn, a Marriott Hotel</b>	Dearborn	3	229	Outdoor		17	17,000	68
	The Westin Book Cadillac	Downtown Detroit	15	453	Indoor/Spa		13	26,000	70
LIMITED SERVICE	A Victory Inn Dearborn	Dearborn	7	77	Outdoor		0		72
	<b>Comfort Inn &amp; Suites - Dearborn</b>	Dearborn	4	116	Indoor		1	250	69
	<b>Comfort Inn &amp; Suites - Taylor</b>	Dearborn (I-94 corridor)	10	78	Indoor		1 (15 people)		71
	<b>Comfort Suites - Southgate</b>	Downriver (I-75 corridor)	15	78	Indoor		1 (50 people)		68
	<b>Country Inn &amp; Suites - Dearborn</b>	Dearborn	7	100	Indoor	•	1 (55 people)		75
	<b>Courtyard by Marriott - Detroit Dearborn</b>	Dearborn	10	147	Indoor		2	1,274	67
	Hawthorn Suites by Wyndham	Detroit	10	128	Outdoor	• \$	0		67
	<b>Holiday Inn Express &amp; Suites - Allen Park</b>	Dearborn (I-94 corridor)	10	163	Indoor		2 (15 people each)		72
	Marriott TownePlace Suites - Livonia	I-275 corridor	20	94	Outdoor	• \$	0		70
	Quality Inn & Suites DTW Metro Airport	Airport (I-94)	15	116			1 (75 people)		72
	Red Roof Inn - Detroit-Dearborn	Dearborn	7	111		•	0		73
	Red Roof Inn - Detroit Southwest-Taylor	Downriver (I-75 corridor)	15	111		•	0		78
SpringHill Suites by Marriott - Southfield	Southfield	15	84	Indoor		1	249	78	
BED & BREAKFAST	Bishop-Brighton Bed & Breakfast	Downriver	20	3			1	350	72
	York House Bed and Breakfast	Dearborn	10	3			0		67
CAMPING	Camp Dearborn	NW Oakland County	45	191	Outdoor		0		73
	Detroit Greenfield Campground/RV Park	I-94 corridor	20	212	On lake	•	Outdoor pavilion	600	72

\*Drive time in minutes to The Henry Ford.

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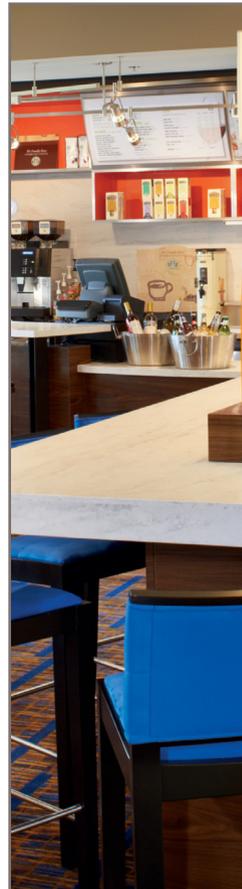


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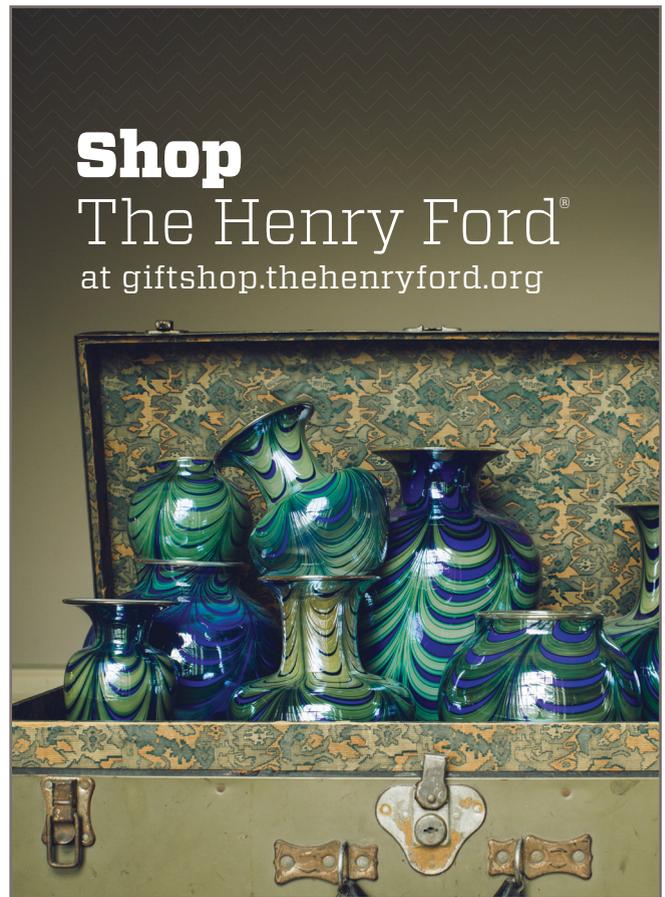
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# ONE LAST LOOK

## HANDBOOK OF WINTER SPORTS (1879)

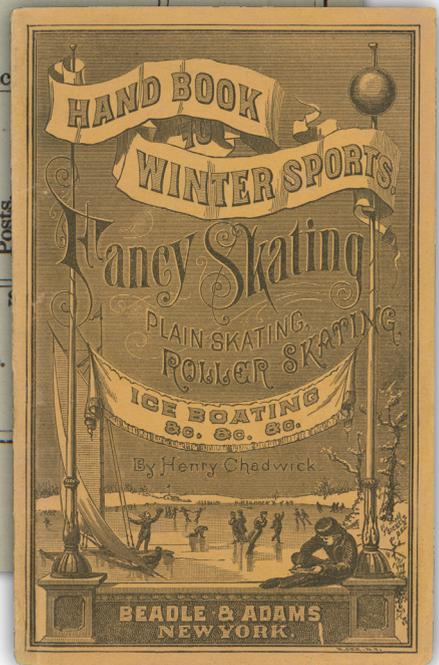
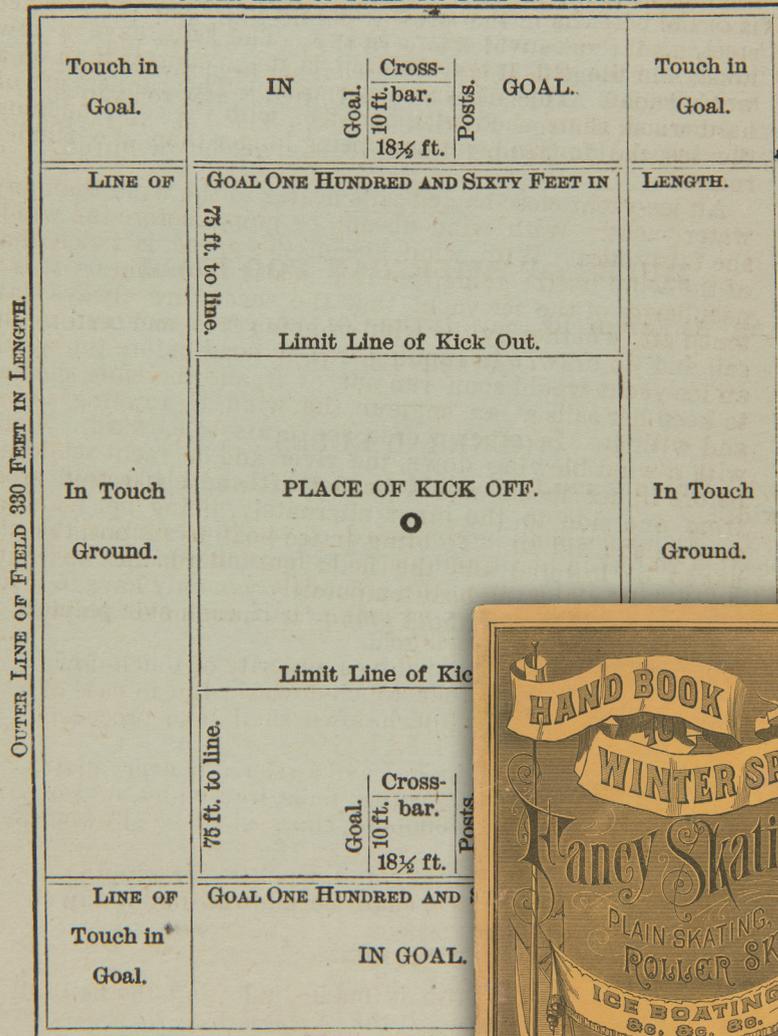
111.5 million folks tuned in to Super Bowl XLVIII in February 2014, making it the most-watched TV show ever. We Americans like us some football. Back in 1879, the game was just getting its footing on U.S. soil. That's when sports nut and journo Henry Chadwick showed off this sketch in his how-to-play manual called *Handbook of Winter Sports*. Most say it's the first known diagram of the gridiron.

### DID YOU KNOW? /

After the Civil War, people began to view sports as a necessary outlet from the pressure and routine of the workplace. "Joining an amateur sports club or team provided a comforting feeling of community," said Donna Braden, curator of public life, The Henry Ford.

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