coincide very well with the spread of farming technologies through Europe as inferred from archaeological evidence. Add linguistic data suggesting that Indo-European languages dispersed into Europe from Anatolia, and a strong case emerges for demographic expansion of Anatolian farmers into Europe. The synthetic maps not only provide support for this idea, but because the first principal component explains 28% of the total variation in sampled allele frequencies, the maps indicate that the expansion of Neolithic farming has had a decisive impact on the genetic composition of Europe.

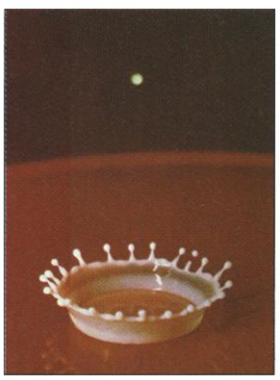
This is not to say that all of Cavalli-Sforza's interpretations are equally persuasive. The weight of evidence supporting a connection between Neolithic farming and the first principal component in Europe is compelling, but his suggestions of historical associations for the second through fifth principal components are less so. For these components, explaining less of the total variation in allele frequencies, the number of alternative historical explanations becomes quite large and the external supporting evidence modest. However, Cavalli-Sforza's aim has never been to be correct in every case, but rather to develop an eye for the subtle and ambiguous clues in genetic data. And some of the clues he sees are breathtaking. Studying synthetic maps of Africa, the author finds indications of an early expansion centered around Mali or Burkina Faso, perhaps near to the time when agriculture was developed. Aware that expansions recorded in synthetic maps would involve settlements on a sufficient scale to leave a material record, he boldly directs archaeologists to search for such settlements. Although he focuses mainly on studies of allele frequency, Cavalli-Sforza also projects infectious excitement about the growing use of high-resolution genealogical inference, which will allow us to chart the movements of individuals with unprecedented accuracy.

One can find minor shortcomings in *Genes, Peoples, and Languages*. The editing is less than attentive in places, there is some repetition, and more attention to heuristics would have helped with some of the tricky concepts. The nonspecialist may not discern the difference between gene genealogies and population trees, and would probably have difficulty defining the former. A more explicit discussion of different demographic models used in human evolution would have also been helpful, and all readers would have benefited from a review of the contexts in which different approaches are most useful: which questions are best addressed with allele-frequency data from unlinked regions, and which with detailed genealogical inference using high-resolution haplotype data from mtDNA, the Y chromosome, or low recombination autosomal regions. These criticisms, however, in no way detract from a highly readable and at times thrilling account of a career that most would consider responsible for how we study human evolution today.

NOTA BENE: PHOTOGRAPHY

# Frozen Moments

When visitors dropped in at his lab at the Massachusetts Institute of Technology, Harold Edgerton might hand them a postcard entitled "How to make applesauce at MIT." It was a photograph of a rifle bullet hitting an apple, captured by his electronic strobe light at the moment of impact. Edgerton started out building cameras to study the rotation of electric motors and ended up revolutionizing the art and science of photography with his innovations in electronic flash and strobe lighting. An inspiring teacher, "Doc" even became a character in the comic strip *Doonesbury*. His life and work is now the subject of a CD-ROM from MIT Press.



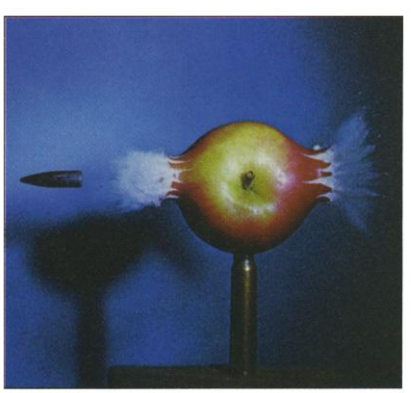
The disc is arranged like a visit to the lab, which was nicknamed "Strobe Alley." The user starts out in a simulated hallway with doors leading to different rooms. One room contains audio and video clips about Edgerton's background. With a click on the notebook, the user sees pages reproduced from his lab notebooks. Another room is an archive of Edgerton's work, arranged in desk drawers with labels such as "Bullets and Blasts" and "Athletes." It is an impressive toy chest of images, which range from the well-known shattering light bulbs and bullets cutting playing cards in half to the other-worldly scenes of atomic explosions captured microseconds after detonation. (During World War II, Edgerton had to develop radically new shutters to handle the quickness and intensity of nuclear blasts.) Also fascinating is Edgerton's undersea work with Jacques Cousteau, for who he developed waterproof strobe lights and imaging sonar equipment.

Still another room is a lab with interactive simulated strobe demonstrations. These are very elementary, but they nicely get their points across. The user can freeze the image of a computer-generated fan blade by adjusting the strobe frequency, or watch as two streams of water drops collide in midair, seemingly defying gravity. Another demonstration shows the innards of a disposable 35-mm camera with its electronic flash circuit made visible. In the same room, one can play with toys like the phenakakistoscope—a crude strobe device that was the 18th-century forerunner of motion pictures.

**Exploring the Art and Science of Stopping Time**
**The Life and Work of Harold E. Edgerton**
***Produced by James Sheldon***

MIT Press, Cambridge, MA, 1999. CD-ROM for Windows and Macintosh. $37.95, £23.50. ISBN 0-262-55031-8.

Although the CD-ROM is well done, the eye hungers for bigger, higher-resolution images of these most visual of records.



One wants to magnify the water drops and bursting bombs again and again to see the detail. And it would be nice to have full-screen video clips rather than the smallish flicker of Quicktime movies. Now that DVD-ROM technology can pack up to 17 gigabytes of info on a single disk (versus the 0.7-gigabyte capacity of CD-ROMs), we can only hope for an updated version 2.0. That could present these images in their fuller glory, possibly with Edgerton's Oscar-winning short film "Quicker 'n a Wink" thrown in as a bonus.

—DAVID VOSS

CREDITS: (BOTH) HAROLD E. EDGERTON/HAROLD & ESTHER EDGERTON FOUNDATION/PALM PRESS