

## Excerpt: “Illuminating Our Daily Lives”

**Optics has a pervasive impact on our daily lives, but that impact is rarely noticed because the products of optical technology are, ironically, often invisible and because we accommodate so swiftly to modern technology. Today we pay as little attention to infrared remote control, light-emitting diodes, and laser printers as to the mirrors that have been with us since antiquity. Here is a brief story to remind us of some of these pervasive optical technologies.**

John reached over and shut off the *alarm clock*. He turned on the *lights* and got up. Downstairs, he began to make his morning coffee and *turned on* the *television* to check the *weather forecast*. Checking the time on the kitchen *clock*, he poured his coffee and went to the *solarium* to sit and read the *newspaper*.

Upstairs, the kids were getting ready for school. Julie was listening to a favorite *song* while getting *dressed*. Stevie felt sick, so his mother, Sarah, checked his *temperature*. Julie would go to school, but Stevie would stay home.

John drove to work in his new car, a high-tech showcase. He drove across a *bridge*, noticing the *emergency telephones* along the side of the freeway. He encountered *traffic signals*, *highway signs*, and a police officer scanning for *speeders*.

Awaiting John in his office were several *telephone* messages and a *fax*. He turned on his *computer*, checked some reference data on a *CD-ROM*, and *printed* it to look at later. After *copying* some last-minute handouts, he went to the conference room to make a *presentation*.

Meanwhile, Julie was walking to school. As she passed the neighbors' house, a *security light* came on. On the next block she passed a *construction* site for a new apartment building, then a block of *medical* offices. A few blocks away was the *factory* where her uncle worked.

At school, Julie's first class was biology. The students looked for *microbes* in water samples they had collected on a nature walk the previous day. On the walk they had also done some *birdwatching* and taken still and video *pictures* of the plants and wildlife. The teacher put on her *glasses* to read Julie's lab report.

At lunchtime, John left his office to do some grocery shopping. At the *checkout counter* he paid with a *credit card*. Among his purchases were a bag of *apples*, a *bottle* of wine, and a *carton* of milk. Each was labeled with a *bar code*.

At home, Stevie was watching a *movie* on the *large-screen television*. With her sick son occupied, Sarah connected her *laptop computer* to the *office network*. Modern technology let her do her work, despite having to stay home with the child—and at least John was stuck doing the shopping.

*light-emitting diode (LED) displays*  
*energy-saving compact fluorescent lamps*  
*infrared remote controls, laser fabric cutting*  
*optical fibers for distributing cable television*  
*satellite-based optical weather imaging*  
*liquid crystal displays (LCD)*  
*temperature-moderating window coatings*  
*phototypesetting, compact disks*  
*infrared noncontact “ear” thermometers*  
*infrared automobile security systems; optical*  
*monitors for antilock brakes, LED, LCD, and*  
*optical fiber dashboard displays; LED taillights*  
*optical-fiber sensors to monitor bridge integrity*  
*solar power for emergency services*  
*LED traffic lights, laser traffic radar*  
*high-reflectivity surfaces for highway signs*  
*optical fiber telephone cables*  
*optical scanners and fax machines*  
*photolithography for making computer chips*  
*optical data storage, laser printers, photocopiers*  
*overhead and slide projectors, laser pointers*  
*infrared motion sensors for home security*  
*laser range-finders and surveying equipment*  
*laser surgery, optical tools for medical diagnosis*  
*laser welding and cutting, optical stereolithography*  
*microscopes, magnifying lenses*  
*binoculars, eyeglasses, cameras, videocameras*  
*bar-code scanners, credit card holograms*  
*image recognition for produce quality control*  
*optical inspection to ensure clean bottles*  
*optical inspection for labeling and packaging*  
*bar-code readers for inventory control*  
*videodisks and players, TV displays*  
*active-matrix displays for computers*  
*optical fiber LANs*

(This story and the shaded list at the right, which identifies many of the technologies referred to in the story, are reprinted with permission from *Harnessing Light: Optical Science and Engineering for the 21st Century*, National Academy Press, 1998.)