Briefings

edited by DAVID P. HAMILTON

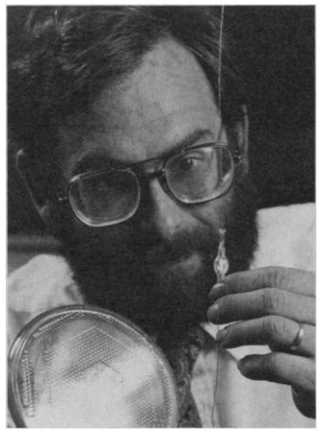
Efficient Bulb Sees (Most of) the Light

Making light from incandescent bulbs is an inherently wasteful process. For instance, when the tungsten filament in the inner bulb of a halogen light is heated to its ordinary operating temperature of 2600°C, nearly 75% of its electric power is consumed producing infrared light—more commonly thought of as plain old heat.

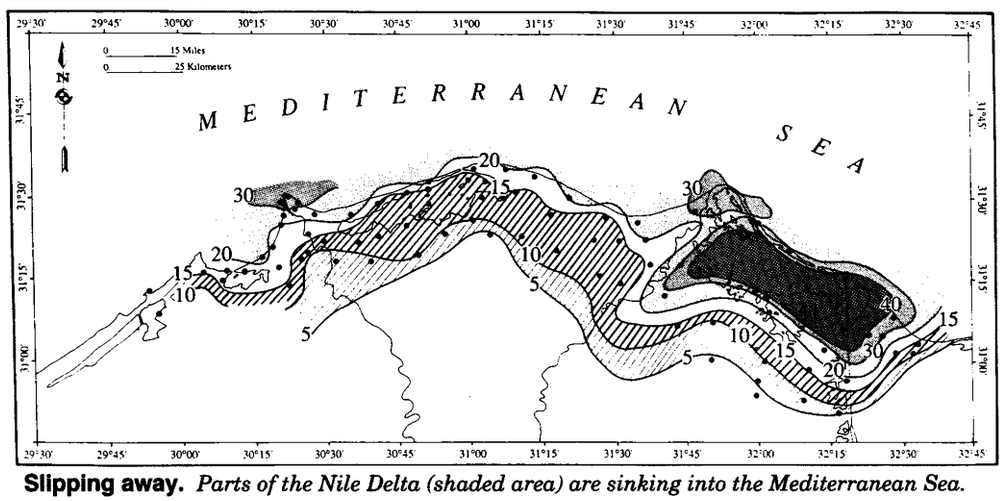
Theoretically, at least, the solution is a simple one: coat a bulb with a thin film that reflects heat back at the filament while transmitting visible light (a technique described more than a century ago by the British physicist Lord Rayleigh). The problem has been figuring out how to fabricate a uniform film only tens of microns thick that can stand up to the temperatures in high-performance light bulbs.

Engineers at General Electric have managed to do just that. Using chemical vapor deposition, a process ordinarily associated with the fabrication of microcircuits, they have developed a multilayer metal oxide film for the company's line of 60-watt halogen bulbs. Company spokespeople say the new bulbs produce as much visible light as conventional 90-watt halogens, at an additional cost of only $1 to $3 a bulb.

Because the bulb's efficiency depends on the precision with which infrared waves are focused back on the filament, GE engineers say their new technique will work only in lights with uniform geometries, such as the cylindrical inner bulb of halogen lamps. GE's next challenge? To develop halogen bulbs for use in standard household lighting—and then to convince consumers to buy them.



No sweat. *A GE engineer examines the heat-reflective inner bulb of a halogen lamp.*



Slipping away. *Parts of the Nile Delta (shaded area) are sinking into the Mediterranean Sea.*

Death of the Nile Delta?

Drilling expeditions conducted in the Nile Delta over the past 5 years show that a large part of the northern delta area is sinking and tilting toward the Mediterranean—a trend that could have a devastating impact on the area's agriculture and urban development. Most of Egypt's 50 million people live in the delta.

International expeditions sponsored by the Smithsonian Institution and the National Geographic Society have collected more than 100 core samples of mud and silt from between 20 and 60 meters below the surface. They show that the weight of the sediments, compaction of deeply buried strata, and recent faulting are causing eastern parts of the delta to sink by as much as 0.5 centimeter per year.

Smithsonian oceanographer Daniel J. Stanley reports that the resulting coastal erosion and encroachment of saltwater are already "severely limiting agricultural development" in the northern delta plain, Egypt's primary breadbasket. Stanley says sediment losses caused by the 1964 closure of the Aswan High Dam and some irrigation projects are compounding the problem, adding that the situation will be further aggravated by the projected rise in world sea levels. Unless Egypt moves promptly with new coastal protection measures, the sea may advance inland by as much as 30 kilometers in the next 100 years, Stanley predicts.

Recruiting the Next Academic Generation

The David and Lucile Packard Foundation last month announced the award of $10 million worth of research fellowships to 20 young scientists and engineers at 20 major universities around the country. Each investigator will receive $100,000 a year for 5 years.

Foundation chairman David Packard, co-founder and chairman of Hewlett-Packard Co., says the aim of the fellowships program, begun in 1988, is to nurture university research at a time when many young scientists are being lured to industry. Fellows are selected from names submitted by university presidents. By 1992, the foundation plans to be supporting 100 scientists and engineers to the tune of $10 million a year.

The Packard Foundation, in Los Altos, California, was established in 1964 to support arts, community, education, and health programs.

Court Bars Shortcut in Nuclear Licensing

Worried because the nuclear industry hasn't constructed any new power plants in more than a decade, the Nuclear Regulatory Commission decided a year and a half ago to change its licensing process to speed their construction. But early this month, the NRC's attempt at regulatory streamlining bit the dust when a federal appeals court ruled that the agency had violated existing law.

Under NRC's proposed reform, utilities would have been able to obtain a "one-step" construction and operating license before breaking ground. Then-NRC chairman Lando Zech hailed the demise of the "two-step" process, in which an already constructed plant must obtain a separate operating license, as "the most important change in our licensing process in more than 30 years."

But it wasn't to be: the federal appeals court declared the