Hi-yo selenium: Film sans silver

A new type of photographic film uses "molecular migrants" in place of the precious silver found in conventional film. P. S. Vincett of Xerox Research of Canada in Mississauga, Ontario, described this unique silverless film at the recent 28th International Union of Pure and Applied Chemistry Congress in Vancouver, British Columbia.

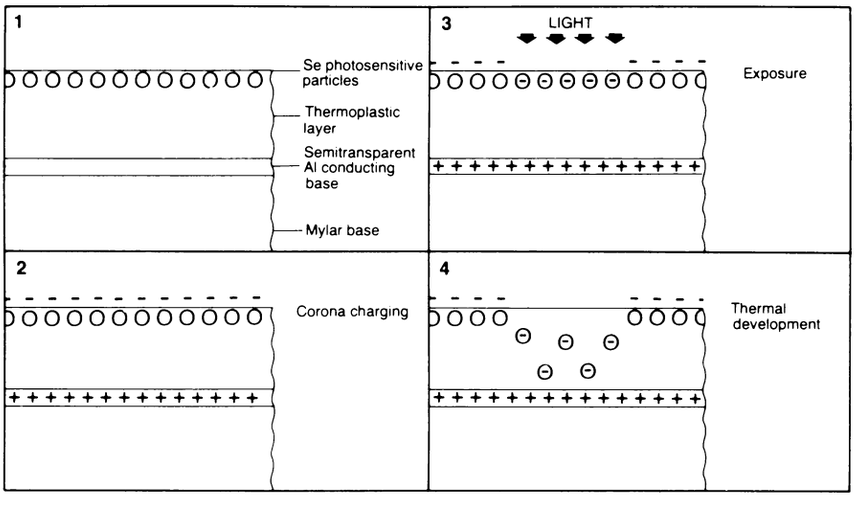
Freedom from silver in photography is an easily understood research goal—film users still cringe at the thought of silver's sky-high soar about 18 months ago to a quadrupled price. Moreover, along with its dependence on an expensive metal, conventional film has other shortcomings that researchers are attempting to remedy. Last year, for example, scientists in the Ilford division of Ciba-Geigy Co. in Paramus, N.J., reported the development of a high-speed but smaller-grained film that uses recyclable silver (SN: 9/13/80, p. 164).

The film gets by with a little help from selenium—specifically, migrating spheres of this element. These closely packed spheres initially sit just below the film's surface, atop a thermoplastic layer. Between the thermoplastic layer and the Mylar base—which holds the components together and gives the film some dimension—is a conducting layer of aluminum.

The multi-layered film is not light-sensitive until it is charged with a corotron, a wired apparatus common in office copiers. This device uses about five kilovolts to essentially break down the air, spraying resulting ions onto the film. Now, wherever the charged film is exposed to light, the negative charges on those portions of the surface move into the selenium spheres. Such spheres migrate toward the positively charged conducting layer after their thermoplastic medium is heat-softened. A pattern of diffused and still subsurface spheres forms. An image is born.

Images in conventional film form after a much lengthier process. Light striking the surface silver halide — usually silver chloride or silver iodide—is only the first in a series of chemical reactions needed to form an image. Chemicals to reduce the silver halide to silver, to wash away the leftovers and to fix the film must follow. The selenium film's ability to "instantaneously" develop without the tedious chemical steps is its tour de photographic force, Vincett says.

But amateur photographers should not yet run to their darkrooms to dump their washers and fixers. "This film is not for the typical guy with the camera slung over his shoulder—at least not for most situations — because its photographic speed [a measure of a film's sensitivity to light] is not as high as [that of] a typical photographic film." Eventually, researchers hope to find a selenium replacement that is sensitive to infrared light; then at night the film *would* be of value to amateur photographers. For now, however, the film's potential applications include use in information recording machines such as microfilm and digital recording — and graphic arts — in which photographic films are used to make printing plate intermediates.



Vincett says his film now is technically ready for such applications. "We just haven't put it on the market yet because we don't know how big the market is." And, says Vincett, the size of that market depends on how quickly film users "are prepared to change." □

Vineyard resigns amidst Isabelle gloom

After nine years, George H. Vineyard has resigned as director of Brookhaven National Laboratory (BNL), saying in a prepared statement that "I should like to return to full-time research at the Laboratory." At any other time, Vineyard's resignation might not have attracted as much attention as it has. But the announcement comes at a particularly unstable time for BNL, considering recently announced budget cuts from the Department of Energy (DOE), its principal patron, and especially the woebegone state of its premier high energy physics project, Isabelle. Consequently, the story of Vineyard's resignation has been widely translated into a story of freshly aroused speculation about the possibility of Isabelle's imminent demise.

George H. Vineyard resigns as BNL *head.*

Begun in 1974, Isabelle was originally designed as an 800 GeV proton-proton colliding beam accelerator perfectly suited for probing the anticipated energy region of the so-called intermediate vector boson, a key kind of particle predicted by high energy theorists. In the intervening years since 1974, Isabelle, beset by magnet-design problems and scooped by the fast-paced completion of comparable European accelerators, has become something of an anachronism in search of a new, updated identity, indeed a new life. More than $130 million has already been spent on digging the two-mile-long tunnel for Isabelle and related R & D costs. With the project now budgeted for $500 million or more, some physicists have expressed concern that continued financial attention to the ailing Isabelle would seriously deprive the rest of the U.S. high energy physics program. Proposals for its redesign and ultimate fate are now being studied by a 15-member committee of physicists who advise the DOE.

In his statement, Vineyard denied any suggested connection between Isabelle's failing health and his decision to resign, stating simply that "the Isabelle project has, I believe, turned the corner by overcoming technical difficulties with superconducting magnets...." Recently, some of the magnet problems were apparently overcome, but a decision hasn't been made regarding the ultimate design of Isabelle's 1,100 magnets. □