Eagles, hawks and other
day birds of prey have
excellent visual acuity. One
reason is that they have
built-in eye filters that ab-
sorb near ultraviolet and
blue light. Humans do not
have such filters and exper-
iments have shown that ex-
posure to ultraviolet radia-
tion and blue light can
cause a variety of eye disor-
ders, in particular cataracts
and age-related macular
degeneration.

"Cataract and senile mac-
ular degeneration are the
two principal causes of
vision loss in Western
nations," says Dr. Richard
Young of the Department of
Anatomy of the University of
California at Los Angeles. "A
simple, safe and inexpen-
sive way to delay the onset
or progression of these dis-
eases is known: wear protec-
tive filters that absorb the
blue, violet and ultraviolet
when exposure to bright
light is necessary." Other vi-
sion experts go further and
suggest that both the retina
and the lens of the eye
should be protected
throughout life from both
blue light and ultraviolet ra-
diation. Those most subject
to hazard are those who
work or play continuously
in bright light environ-
ments—sunbathers, skiers,
hikers, mountain climbers,
welders, surgeons and
nurses in operating rooms,
seamen, farmers, lifeguards
and aircraft pilots.

Spinoff products that pro-
vide the requisite protection
recently appeared on the
commercial market. They
are amber/orange/brown
lens filters that work in simi-
lar fashion to the retinal fil-
ters of eagle and hawks, se-
lectively blocking blue and
ultraviolet light. Marketed as
Avian Orange™ and PST™
(Polarized Selective
Transmission) lenses by
Suntiger™, La Crescenta,
California, they are available
as sunglasses, visors, ski
goggles and prescription
eyeglasses. A display of
Suntiger glasses of various
tints is shown in the top
photo. Above, Suntiger offi-
cials Lori Paul, Laurie
Johansen and Paul
Diffendaffer model their
product.

The Suntiger lens is a
"spinoff from a spinoff," a
secondary product that
emerged from research toward development of welding curtains designed to protect persons exposed to welding arcs from blue and ultraviolet radiation. James B. Stephens, a systems engineer at Jet Propulsion Laboratory (JPL) shown above, and the late Charles G. Miller, a JPL physicist, spent three years on their own time applying JPL problem-solving methodology to development of a dye formula for a curtain capable of filtering out harmful ultraviolet and blue rays produced by welding operations. The curtain is now being marketed commercially.

Upon completion of the welding project those who had worked on it with Stephens—Laurie Johansen, a NASA scientist, Paul Diffendaffer and Charles Youngberg, NASA engineers, and Dr. Michael Hyson, a JPL contractor—turned their attention to the related matter of protective glasses. Using the biomedical knowledge acquired during the curtain project, they used a computer to analyze hazards and aid in design of sunglasses for various light environments—mountain or desert light, for example, or that experienced in offices with fluorescent lighting. They eventually developed Suntiger lenses for every natural environment and activity.

Suntiger lenses eliminate more than 99 percent of the harmful light wavelengths. The lenses make scenes more vivid in color, as illustrated in the top right photo, which shows a morning glory in natural view and as viewed through a Suntiger lens. The lenses also increase the wearer's visual acuity: distant objects, even on hazy days, appear crisp and clear; mountains seem closer; glare is greatly reduced; clouds stand out in bold relief; and daytime use protects the retina from bleaching in bright light, thus improving night vision.

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