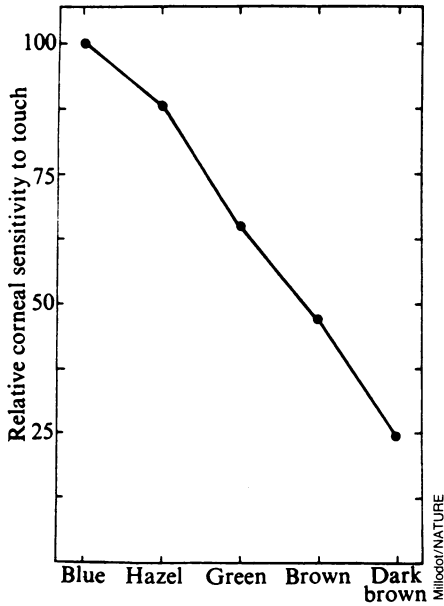


Eye color and pain sensitivity



Eye color correlated with pain sensitivity.

In Gothic novels, blue- or green-eyed persons are usually the heroes. But in the real world, persons with brown eyes may come out ahead. A Welsh ophthalmologist has found that persons with brown eyes, particularly nonwhites with brown eyes, are much less sensitive to pain than are persons with light-colored eyes.

The ophthalmologist is Michel Millodot of the University of Wales Institute of Science and Technology. His results, reported in the May 8 *NATURE*, have implications for drug administration, the wearing of contact lenses and why acupuncture is more acceptable to Eastern than to Western peoples.

In fitting contact lenses, opticians have noted that the sensitivity of the cornea seems to vary depending on whether a person has blue or brown eyes. The cornea is the transparent windshield over the eyeball. It covers the iris, the colored part of the eye, as well as the pupil, which admits light to the retina of the eye. Because corneal sensitivity could reflect the general tactile sensitivity, Millodot decided to test corneal sensitivity among persons with different eye colors.

Millodot chose 112 Caucasian subjects and 44 nonwhite subjects. Of the nonwhites, there were 12 Negroes, 15 Indians and 17 Chinese. All were about 24 years old and had no eye diseases or abnormalities. The subjects were then separated into groups according to the color of the iris: blue, hazel, green, brown and the darker brown of nonwhites. Millodot then applied an aesthesiometer to the cornea of each subject. An aesthesiometer is usually used to measure the depth of anesthesia in the eye, but Millodot used it to apply gentle, but increasing pressure to the cornea. When a subject felt pressure on the

cornea, she or he pressed a bell.

Millodot's results provide statistical evidence that the corneas of blue-eyed people, on the average, are twice as sensitive as the corneas of brown-eyed people. Hazel-eyed and green-eyed persons have slightly more sensitive corneas than those with brown eyes, but do not show as much sensitivity as those of blue-eyed persons. Even more striking, brown-eyed nonwhites have corneas that are only half as sensitive as those of brown-eyed whites, and only a fourth as sensitive as those of blue-eyed nonwhites.

These findings have several practical implications. For one, they confirm the known clinical fact that more drugs must be used in the eyes of brown-eyed persons than in the eyes of blue-eyed persons to achieve the same potency. Also, blue-eyed persons may have more trouble adjusting to contact lenses than brown-eyed persons. Finally, corneal sensitivity may

reflect the general sensitivity of the body. Last year Millodot found that when women's corneal sensitivity is reduced at the time of menstruation, the touch sensitivity of their middle finger also diminishes. So if dark-eyed, dark-skinned individuals are really less sensitive to pain than other persons are, it may help explain, Millodot says, why "the practice of acupuncture may be more acceptable in China than it is in countries inhabited by blue-eyed people."

How does corneal sensitivity, or the general sensitivity of the body for that matter, relate to iris color? Since the cornea does not contain pigment, it is not easy to link its sensitivity with iris color. However, the corneas of blue-eyed persons might contain more nerves than the corneas of brown-eyed persons. Still, if this is the case, nerve density in the cornea would not explain how corneal sensitivity correlates with general bodily sensitivity. So the links between corneal and bodily sensitivity, Millodot hazards, probably arise in the central nervous system. □

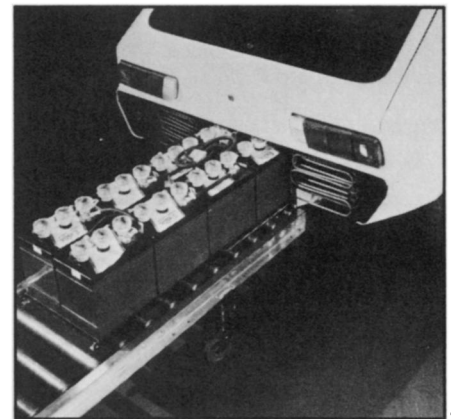
Things look up for electric cars

At the turn of the century a great race was in progress to see which form of automotive power would capture the growing American market. One of the two leading contenders, electric cars, held 38 percent of the market after only 10 years of manufacture in the United States—originating in the great American motor city, Des Moines, Iowa. But electricity still couldn't quite catch up to the 40 percent market lead of the odds-on favorite, steam.

Of course some hardy people didn't mind getting up early on a cold morning to arm-wrestle with their gasoline-powered carriage, but only if their neighbors were understanding about noise and smoke. When the electric starter eliminated the need for cranking gas-driven cars, more people began using them. Noise and smoke levels were reduced. But as these emanated from millions of vehicles, people have begun to examine the

redeeming features of the electric car as a possible solution to the metropolitan traffic mess.

Probably the most influential backer of electric cars is Rep. Mike McCormack (D-Wash.), chairman of the House Sub-



Copper Development Assoc.



Battery tray for new electric car. (Left) McCormack with the car: "Fun to drive."

John H. Douglas

committee on Energy Research, Development and Demonstration. He has presented legislation that would provide \$40 million a year for the next three years to demonstrate the feasibility of the electric "town car" concept by subsidizing introduction of various prototype electric vehicles into every region of the country. Sixty-one legislators have so far signed as co-sponsors, and hearings on the bill will begin June 3.

To encourage publicity for the cause, McCormack last week drove around Washington, D.C., in one of the latest prototype models, the Copper Electric Town Car developed by Copper Development Association, Inc. of Birmingham, Mich. Describing the car as "fun to drive," he told a press conference that further development of electric cars "can have a more beneficial impact for reducing petroleum consumption in this country than almost any other single thing we can do."

Detroit, complacent in spite of its problems, has so far shown no fear of losing the car-buying public back to Des Moines. The advanced Copper Electric prototype illustrates the problems that still beset the electrics: a range limited to 120 miles at a steady cruising speed of 40 miles per hour, or to 75 miles in city traffic; a projected \$1,500 higher purchase price than comparable gasoline models, even after mass production; the need to replace \$600 worth of batteries about every two years; and a relatively high "fuel" cost of 2 to 3 cents per mile.

Nevertheless, time is probably on the side of the electric car. Already the state of the art is up to fulfilling most driving needs: According to the Environmental Protection Agency more than half the total automobile miles driven today consists of trips of 5 miles or less, and McCormack cites figures that show 96 percent of all auto trips involve distances of less than 20 miles. Increasing fuel prices will help, because electric cars would presumably be recharged at night, during off-peak hours of power generation. Besides being a more efficient, less polluting use of energy, this alternative is more dependent on American coal and nuclear power than on imported oil. New technology will also help—the Copper Electric Town Car is a sophisticated machine designed from the ground up to meet national safety and pollution standards, and progress in storage battery design should lower costs in the near future.

McCormack made two predictions at his press conference: that gasoline will be \$1 a gallon in the not too distant future, and that once electric cars are available throughout the country they will be met by an "overwhelming demand." The proposed electric car legislation, coupled with Administration-Congress squabbling on the energy question in general, may put both those propositions to the test soon. □

Station in space: Soviet rendezvous

Thanks perhaps to tenacity as much as technology, the Soviet Union's troubled manned space station program has taken another step with the successful rendezvous of the Salyut 4 station and the Soyuz 18 spacecraft. Launched on May 24, Soyuz 18 carried veteran cosmonauts Pyotr Klimuk (who spent eight days in space aboard Soyuz 13 in December 1973) and Vitaliy Sevastyanov (who endured nearly 18 days aboard Soyuz 9 in June 1970) into orbit, where they docked with the waiting Salyut about 30 hours later.

Since the first Salyut was launched in 1971, Soviet space difficulties have run the gamut from a malfunctioning Salyut 2 that was returned to earth without ever being occupied, to a reentry accident that cost three lives and caused a major redesign of the Soyuz spacecraft. The current craft, in fact, would have been Soyuz 19 instead of 18, except that Soyuz 17, first craft to dock with Salyut 4, was followed by a flight in which two cosmonauts went up and down again without ever getting into orbit, thanks to a malfunctioning rocket. It has remained unnumbered.

Whatever the number of their vehicle, Klimuk and Sevastyanov spent the first few days aboard the station setting up housekeeping, including the preparation of a wide variety of biological, astronomical and other experiments. Earlier, while the spacecraft was approaching the station, the cosmonauts put in some practice using a precise laser distance-measuring system for docking maneuvers.

Although Soviet officials say that the flight is not considered a practice session for July's Apollo-Soyuz rendezvous, preparations for the upcoming joint mission passed a milestone only two days before the Soyuz 18 launch. At what is termed the joint flight readiness review, U.S. and Soviet technicians signed a mutual document giving final approval to joint procedures and equipment for the mission. Final U.S. approval for its own side of the mission is set for June 12 at Kennedy Space Center. □

Quote of the week

"What shall we make of the Congressional furor over biological and social science research? . . . If one is a social scientist, one sees Congress at its worst, meddling in matters it doesn't comprehend while Rome burns. If one is less involved, one may put it down to a tiresome political overreaction to far-out research projects. The serious question is whether we are seeing the beginning of something much deeper: a loss of nerve where science and technology are concerned. . . . The danger is that first-rate biological and social science research will carry unacceptable risks for good investigators, and that funds will be spent only where they can be spent safely, well out of the range of political guns. There is no satisfaction in that sort of cease-fire."

—William D. Carey, SCIENCE

Baboons: From troop to troop

Cultural taboos and even legal codes have outlawed incest and inbreeding in most human societies. And since studies show that inbreeding tends to greatly reduce viability in offspring, the cultural and legal bans serve a biological purpose. It is likely that inbreeding may have similar unhealthy effects in other primates, and now there is evidence to suggest that baboons may have their own set of customs to minimize inbreeding.

Researchers at the Gombe Stream Research Centre in Kigoma, Tanzania, have been observing and collecting data on several troops of olive baboons since 1967. C. Packer, in the May 15 NATURE, reports that inbreeding may be avoided by the transfer of all males out of their home troop. Of 41 baboons who have transferred in or out of the study troops at Gombe, 33 of the 39 males were mature or nearly mature adults. Of the males that have reached maturity since 1967, none has remained in his own troop. Females very rarely leave their home troops.

"It seems," says Packer, "that every male transfers at some time during his life, most likely spending his reproductive life



Olive baboon: Males on the move.

in a troop other than his natal troop." The transfer phenomenon is still being studied, and there may be more than one explanation for it. But Packer's evidence so far indicates that male baboons spend their reproductive life in other than their own troop to avoid inbreeding. □