does not see violet light at all. He sees yellow light but it appears colorless to him. The red-blindness and the green-blindness of the two sons are not uncommon among males.

Science News Letter, March 20, 1943

PHYSIOLOGY—PHYSICS

Ability of Electric Fish To Produce Current Studied

➤ ELECTRIC FISH will hardly power war industries, but knowledge of their "shocking" ability may eventually lead to better understanding of how our own nerves work. New research on these strange creatures has just been reported by Dr. R. T. Cox, New York University physicist. (*American Journal of Physics,* February)

Experiments with three small electric eels were first conducted by Dr. Cox and his associates. When the eels were gently prodded, the scientists' instruments recorded quick electrical pulses as high as 200 volts, lasting about two thousandths of a second. These discharges followed each other in trains of three to five.

Single weak discharges came from the rear half of the eel; one of them always preceding a train of major discharges, probably serving as a warning signal to enemies.

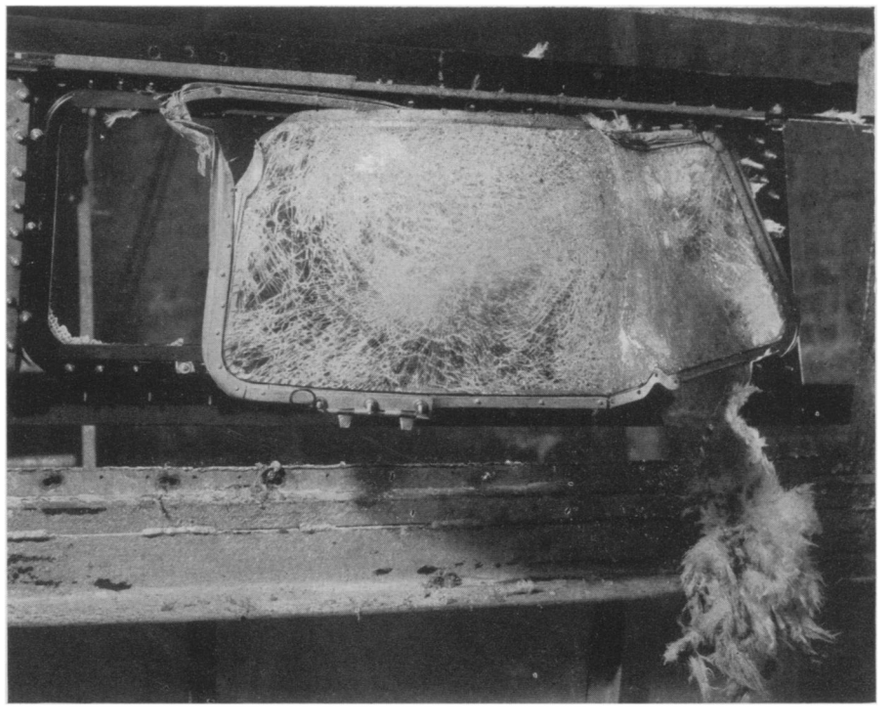
When an eel discharges from fear of enemies or to obtain prey, it serves as an electrical signal for other eels nearby to close in. In fact, the scientists discovered that eels could be called by producing a current in any manner.

When placed in a weak electric current an electric fish swims in the direction of increasing current density, no matter which way the current is going. But in a strong electric current, it swims towards the negative pole.

"This sort of telegraphic communication very likely compensates the electric eel rather well for his partial loss of sight," Dr. Cox states, "the better so in that he commonly lives in muddy water in which the clearest eyes could see no farther than a few feet."

Tests were also made on the largest of all electric fish, *Torpedo occidentalis,* found off the north Atlantic Coast. Measurements revealed a maximum voltage of 220 volts. Peak power of the torpedo was calculated to be a little less than one horsepower per pound of electric organ. These are values for an instant and would be very much less for electric activity over a longer period of time.

Science News Letter, March 20, 1943



FAILURE—This is what happens when a large bird is thrown against a windshield with the speeds encountered in flight. This is a windshield that failed in the test, checking so badly that the vision of the pilot would have been completely obscured.

ENGINEERING

Windshields Duck-Proofed

Tests arranged by Civil Aeronautics Authority show what happens when a large bird is hurled against windshield. Proper shield is developed.

➤ DEAD DUCKS, slammed against airplane windshields at velocities of 300 miles an hour or more, determine the ability of the glass to stand up against actual collision with flying birds in the air, in tests arranged by the Civil Aeronautics Authority.

Planes sometimes collide with ducks, geese, eagles, seagulls and other birds, up to heights of 8,000 feet. The birds' bodies crash through the windshield, and have been known to cause serious accidents. Chances of collision with birds are a special worry of night fliers.

The C.A.A. some years ago interested the National Bureau of Standards in the problem, and preliminary experiments with "synthetic" ducks made of rubber and other substances were carried out in Washington. Later, the project was transferred to the Westinghouse laboratories where manufacturers of the plate glass and plastics used in laminated aircraft windshields collaborated with the C.A.A. in an elaborate research program, using freshly killed ducks and other birds as the missiles. The present "duck-proof" windshields will stop the body of a fifteen-pound bird thrown against it at speeds up to 300 miles an hour or more.

A compressed-air gun with an eight-inch bore and a 20-foot barrel is used. The bird carcasses are weighed and placed in flour sacks. They are then stuffed into the barrel and shot out at speeds simulating flight conditions.

Frosting and icing is prevented by placing a quarter-inch pane of tempered glass in front of the bird-resistant panel with an air space between them. Hot air is circulated through this space. This not only prevents frosting but also keeps the "duck-proof" panel warm, which adds to its strength in resisting impact.

Science News Letter, March 20, 1943