

enstein and R. W. Wrangham, Eds., 1986, pp. 153–171, Princeton Univ. Press); the incidence of male parental care in Southern Hemisphere dabbling ducks (*Acta XX Congr. Int. Ornithol.*, 1991, pp. 868–875); and courtship, pair formation, and signalling in waterfowl (*Ecology and management of breeding waterfowl*, B. D. J. Batt et al., Eds., 1992, pp. 214–250).

In addition to his achievements as a research scientist, Professor McKinney is an outstanding teacher. Over the past three decades he has been the major advisor for more than two dozen graduate students. While busy with his own research, he has never hesitated to take the time to provide each student with his full, patient, and kind attention. Those requiring guidance and support get it, while those who thrive

on independent work are given the freedom they need.

For the outstanding research by this exemplary scientist and teacher, the American Ornithologists' Union takes great pleasure in presenting the William Brewster Memorial Award for 1994 to Frank McKinney.

Award criteria.—The William Brewster Memorial Award is given to the author or coauthors (not previously so honored) of the most meritorious body of work on birds of the Western Hemisphere published during the 10 calendar years preceding a given AOU meeting. The award consists of a medal and honorarium provided through the endowed William Brewster Memorial Fund of the American Ornithologists' Union.

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ELLIOTT COUES AWARD, 1994:

WOLFGANG WILTSCHKO



Biologists of all bents and ilks have been fascinated for centuries with the amazing abilities of birds to migrate thousands of miles and return unerringly to their place of birth. How do birds accomplish this seemingly extraordinary feat? During the last four

decades significant advances have been made in the study of bird orientation and navigation. These studies have revealed a multiplicity of methods available and used by birds to find their way in space and time. The list of possible systems used for orientation and

navigation seems only limited by the imagination of the researcher and taxa selected for study.

Dr. Wolfgang Wiltschko of the J. W. Goethe-Universität in Frankfurt a. Main, Germany, has made significant and profound advances in this field, owing to his unique turn of mind and broad knowledge of ornithology. In his early work in the 1960s, done with his major professor F. W. Merkel, he was able to demonstrate that the orientation of European Robins was strongly influenced by the earth's magnetic field. This was a milestone in the study of bird navigation even though it was some time before his findings were accepted. Since these early works, he has labored continuously to unravel the secrets of orientation and navigation used by birds. He and his wife Rosewitha employ both homing pigeons and wild birds in their aggressive quest for answers. They have cooperated or collaborated with most North American ornithologists interested in these problems and had a special and productive relationship with William Keeton, visiting Cornell University often.

The fact that migrating birds can fly to a particular location even during cloudy days or nights is best explained by their ability to substitute the magnetic compass for either the sun or the stars. Thus, we have one fewer mystery in this fascinating puzzle. Redundancy, calibration, activation, and ontogeny of the cues have all been fulcrums for the many hypotheses and subsequent tests used in Wolfgang Wiltschko's prolific and elegant research. His ideas on development of and exposure to the relevant cues have helped us understand the great diversity that exists in the findings from different laboratories, different species, and different techniques. Apparently, birds must be

exposed to the natural fluctuations of environmental cues in order for them to use these cues for orientation and navigation.

Professor Wiltschko's keen understanding of the problems associated with unraveling the techniques used for navigation and orientation led him to an ideal blend of laboratory and field experiments. He is an exceptional experimental biologist. His success comes, in part, from his knowledge of the sensory systems of birds and the manner in which environmental cues impinge on these systems.

The mysteries of migration and homing have been illuminated thanks to the tireless efforts during the past 30 years of Wolfgang Wiltschko. For this work, the American Ornithologists' Union is proud to present the Elliott Clues Award for 1994 to Dr. Wolfgang Wiltschko.

Award criteria.—The Elliott Coues Award is given for meritorious contributions having an important influence on the study of birds in the Western Hemisphere, but which have not been recognized through a Brewster Award. Contributions to ornithology not eligible for recognition with a Brewster Award by virtue of its geographic limitations may be honored through a Coues Award, as may works including important innovative ideas that through brevity or publication outside the primarily ornithological literature may not have been selected based on Brewster Award criteria. However, the Coues Award is not necessarily limited to such works. The award consists of a certificate and an honorarium provided through the endowed Ralph W. Schreiber Fund of the American Ornithologists' Union.