ment where food resources are scattered and subject to seasonal or yearly fluctuations.

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LITERATURE CITED

- BENT, A. C. 1948. Life histories of North American nuthatches, wrens, thrashers and their allies. U.S. Natl. Mus. Bull. 195.
- BERGER, D. D., AND H. C. MUELLER. 1959. The bal-chatri: a trap for the birds of prey. Bird-Banding 30:18-26.
- BROWN, R. L. 1967. The extent of breeding by immature Mourning Doves (*Zenaidura macroura* marginella) in southern Arizona. M.S. Diss., Univ. of Arizona, Tucson.
- FRY, C. H. 1972. The social organisation of Beeeaters (Meropidae) and cooperative breeding in hot-climate birds. Ibis 114:1-14.
- HUNGERFORD, C. R. 1964. Vitamin A and productivity in Gambel's Quail. J. Wildl. Manage. 28: 141-147.

HUNTING TACTICS OF A PEREGRINE FALCON ON BLACK TURNSTONES

R. WAYNE CAMPBELL

British Columbia Provincial Museum Victoria, British Columbia Canada

At 10:37 on 8 January 1974, while I was photographing gulls at Clover Point, Victoria, British Columbia, I observed an adult male Peregrine Falcon (Falco peregrinus pealei) swooping on a flock of five Black Turnstones (Arenaria melanocephala) which were foraging together on a lawn. The weather was sunny, but cool $(38^{\circ}F)$ with a wind of 10–15 MPH from the northwest. The initial attack was unsuccessful but it did split the flock. Four turnstones flew low over the ground to nearby intertidal rocks while the other bird flew out over the water and began climbing quickly. The peregrine followed, though at a lower altitude, several times making zig-zag movements ("blocking") which probably prevented the turnstone from coming down. When about 1500 feet in the air and one-quarter mile from the shoreline, the peregrine came up level with the prey and began direct pursuit. Although the falcon was visible to the naked eye, the only glimpses of the turnstone (using 10×40 binoculars) were white flashes from its belly.

- HUNCERFORD, C. R., C. H. LOWE, AND R. L. MADSEN. 1973. Population studies of the desert cottontail (Sylvilagus auduboni) and black-tailed jackrabbit (Lepus californicus) in the Sonoran Desert. Desert Biome, U. S. Int. Biol. Prog., Res. Memo. 73–20. 15 p.
- LACK, D. L. 1968. Ecological adaptations for breeding in birds. Methuen and Co., Ltd., London.
- MADER, W. J. 1975. Biology of the Harris' Hawk in southern Arizona. Living Bird, in press.
- MARSHALL, J. T., JR. 1963. Rainy season nesting in Arizona. Proc. XIII Int. Ornithol. Congr. p. 620-622.
- OHMART, R. D. 1969. Physiological and ethological adaptations of the Rufous-winged Sparrow (*Ai-mophila carpalis*) to a desert environment. Ph.D. Diss., Univ. of Arizona, Tucson.
- SKUTCH, A. F. 1961. Helpers among birds. Condor 63:198–226.
- SMITH, E. L. 1971. The effects of heat and aridity on reproductive success of the Curve-billed Thrasher. Ph.D. Diss., Univ. of Arizona, Tucson.
- STAIR, J. L. 1970. Chronology of the nesting season of White-winged Doves Zenaida asiatica mearnsi in Arizona. M.S. Diss., Univ. of Arizona, Tucson.
- VERNER, J. 1964. Evolution of polygamy in the Long-billed Marsh Wren. Evolution 18:252–261.
- VRIES, TJ. DE. 1973. The Galapagos Hawk: an eco-geographical study with special reference to its systematic position. Free University Press Amsterdam.
- WILEY, J. W. 1975. Three adult Red-tailed Hawks tending a nest. Condor 77:480-482.

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At first it appeared that the turnstone was outdistancing the falcon but after a few seconds the peregrine rose slightly, arched its wings and stooped on the turnstone. It missed. Again from slightly above its prey, another stoop was unsuccessful. By then the turnstone was diving too. After a very short chase the peregrine gained altitude for several seconds, folded its wings and on a fairly long stoop caught the turnstone about 800 feet above the ocean, perhaps a third of a mile northwest of the Point. The peregrine then flew toward a log-littered beach. The episode ended at 10:41, four minutes after it began.

Cade (Univ. California Publ. Zool. 63:221–222, 1960) did not mention such hunting tactics by peregrines in Alaska and other parts of North America. Rudebeck (Oikos 2:65–88, 1950; 3:200–231, 1951), however, documented instances of European Peregrine Falcons forcing their prey up into the air for capture. As Rudebeck suggested, if the prey can stay above the peregrine, it is safe. In my observation, after two swoops the turnstone could not keep above the predator and only then did the turnstone dive towards the ground.

In addition, although it is well known that Peregrine Falcons prey heavily on shorebirds throughout the year, I have found no specific reference to their preying on Black Turnstones.

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