

MONARCH OBSERVATIONS IN MID-TOWN AND LOWER MANHATTAN, NEW YORK CITY

Late summer and early fall observations in several areas of the northeastern United States indicated 1968 to be a year of unusually high density of the monarch (*Danaus plexippus* (L.)). It seemed of interest, therefore, to plan a day of observation of migration through an area so unnatural and yet so extensive as New York City. Battery Park at the extreme southern tip of Manhattan suggested itself as one vantage point of importance. Wide avenues run approximately north-south through the island and produce a funnel-like effect as the island narrows southward. The northern edge of the Park is a sudden termination to the long trails through the world's greatest concentration of tall buildings.

October 2 was chosen more for convenience than in order to hit the peak of activity. Casual observations at my home in rural Washington, Connecticut, suggests that this date was ten days or more after a decline began. Observations started in mid-town Manhattan with the first sighting of a monarch at 43rd St. and Fifth Ave., 12:58 (E.D.T.). It was drifting southward about eight feet above ground. One block north and one minute later the second was seen. The third followed in three minutes, between 47th and 48th Sts., this individual flying about 40 to 50 feet high. At 1:48 P.M. in the heart of the financial district on lower Broadway, I observed the fourth individual. Strangely enough, there were no more in the last two blocks of Broadway or as the Park was traversed to the waterfront, reached at 2:04 P.M.

In the next hour there were 47 and an additional 30 were tallied in the following 57 minutes. Count was kept minute by minute, interrupted at 4:01 after none had been sighted for eight minutes. A brisk wind had arisen, at times blowing at an estimated 15 mph, and thin cloudiness had formed which reduced the sunlight noticeably from time to time. When observations were resumed a half hour later, ten minutes produced but a single sighting.

The precise point of almost all observation was close to the south end of the paved strip about 50 feet wide and 450 feet long adjacent to the sea wall lining the edge of the park. It is doubtful if any observed individual was more than 75 feet away, so a 150 foot front seems a fair estimate of visual coverage. Thus 77 migrating monarchs were seen to pass the 150 foot front in 117 minutes. The later single individual at the waterfront and the additional four others on the city streets brought the day's total to 82.

All monarchs observed at Battery Park took off over the water in a narrow sector slightly west of south, bounded by the Statue of Liberty and Governors Island. This would bring them to the eastern edge of Staten Island and thence to the New Jersey coast. At times there was obvious difficulty with the wind, but I saw none driven back to shore. The spacings of the sightings was remarkably even until near the rather abrupt ending. On one occasion four were seen at once and on another, four in the same minute. However, there was only one logbook entry of three, and most were singles. In only one instance did I see the migrants take note of each other, an aerial engagement of not more than a few seconds. None were seen at rest or even lingering. The monarchs flew 4-8 feet over the water; buffeting by wind being a disturbing factor to their flight.

As opportunity avails itself observations, attempting to determine the vertical extent of the migration, will be made from vantage points in the tall buildings.—SIDNEY A. HESSEL, *Peabody Museum of Natural History, Yale University, New Haven, Conn.*