

## MIGRATIONS OF *VANESSA CARDUI*, THE PAINTED LADY BUTTERFLY, THROUGH UTAH

by GEORGE F. KNOWLTON

For almost as long as the writer can remember anything about Utah insects, he recalls *Vanessa cardui* (Linné). He took its spring flights for granted. He, like so many others in Utah, saw migratory flights northward in spring, watched the adults "blow along" the highways and fields, and assumed that anything about this insect was very common knowledge. Rarely were notes of movements made by him until entomologists wrote for information concerning the movements after they occasionally were reported to the "Insect Pest Survey." Recently he wrote Mr. KELVIN DORWARD, In Charge, Economic Insect Detection and Reporting Section, U.S. Bureau of Entomology and Plant Quarantine, who promptly sent the report sheets dealing with this insect which had been submitted over the years. The following annotations are from the writer's notes, plus a few others where so indicated:

1931: *V. cardui* was in outbreak numbers in Cache County, South of Logan, during 1931. Larvae moved "like an army" from a pasture heavily infested with thistles which had been largely eaten off before the larvae moved to damage nearby fields of beets, alfalfa and other crops. Flights of adults had been noted through northern Utah during the Spring.

1932: Adult collected at Sandy, June 28.

1933: The first adult was observed near Brigham City on April 18.

1935: This was a year of large spring migrations through Utah. E. W. DAVIS, with no indication of locality on the note, stated that "On May 1 a migration of the painted lady, *Vanessa cardui* (Linn.), occurred. These butterflies were all flying in a northerly direction. At one place the car was stopped and 100 feet were stepped off and the number of butterflies crossing the road was counted. It was found that 200 crossed the road in 5 minutes in 100 feet of road. This occurred at 9:30 a.m.; air temperature 68°; soil temperature 98° Specimens were sent to Washington for identification."

On May 3, 1935, the following appeared in *The Salt Lake Tribune*: "Eureka was treated to a rare and freakish phenomenon on Wednesday, when a windstorm of butterflies, literally millions of them, flew through this city, using Main street as a passageway. The insects started their journey through Eureka about 10 a.m., coming from the west and traveling eastward toward Utah county. The flight was not steady, but at intervals of about every 15 minutes the air was filled with butterflies, the effect resembling an autumn day when the wind is whirling the leaves about in great confusion. The migration continued until about noon, when the atmosphere began to clear. Where the butterflies came from and where they were going is a matter of conjecture, which the people of this district would like to have made clear."

On May 6, the same paper recorded the following: "A migration of millions of butterflies, believed to have been the same myriads seen flying through Eureka a few days ago, passed through Provo Sunday afternoon. Captain James C. Snow, veteran member of the Provo city police department who was one of the first to notice the rare phenomenon, recalled that he had once before witnessed such a wind-storm of butterflies approximately 40 years ago. At that time, the butterflies swarmed through the city traveling in the same direction, north-easterly, but were of a larger and much different variety, he said. The butterflies seen Sunday seemed to be of a dark brown variety." These movements extended on north through Box Elder and Cache Counties, and into Idaho.

On May 16, 1935, a letter was received from a county agent, S. R. BOSWELL of Provo, who reported the following: "The last ten days we have had a continuous stream of butterflies and moths through this valley (Utah Valley) going northward and they continue to go. I have heard recently that they have been in the western part of the state as well as the eastern. I am wondering if you could explain what these are." On the same day another letter was received at my office from S. W. WINTER of Ogden with the following statement: "Last week an extensive flight of reddish-colored butterflies was reported traveling north. While I did not see them personally to get you any specimens, I wonder if you know what these were and if they are an injurious species."

Migrations of *V. cardui* were repeatedly observed in northern and central Utah upon numerous occasions, and reported from southern Utah during the first three weeks of May, and even earlier. Inquiries concerning the flight and reports of the movements were received at my office from Provo, Ogden, Richfield, St. George, and Garland. Northward and westward movements of large numbers of the adults were repeatedly observed in various parts of Box Elder, Weber, Davis, Tooele and Salt Lake Counties. On June 11, 1935, *V. cardui* caterpillars collected at Kaysville were damaging sugar beets. These damaged hollyhock and defoliated round-leaf mallow. They also were reported to be abundant and causing some damage at Salina. On June 17, *V. cardui* larvae were reported by several county agents to be abundant upon round-leaved mallow, burdock, and other weeds over much of Utah. When these weeds were destroyed or consumed, the larvae often damaged nearby crops.

1937: On May 18, a *V. cardui* flew into the writer's car at Richmond in northern Utah. This was the first specimen he had observed that spring. Later the same day another specimen was collected at Nibley in Cache County.

1940: Four Painted Lady butterflies were in flight, crossing the highway north of Lynndyl, towards the northeast on April 26. A few others were observed later that day. On April 29, from 30 to 50 *V. cardui* flew past F. C. HARMSTON, traveling northeast with the breeze, at a place 15 miles east of Robinson Ranch. This locality is in Utah, but is northeast of Baker, Nevada. On May 3, the butterflies were feeding at black currant blossoms at Utah Hot Springs. On May 17, approximately 15 *V. cardui* were observed flying northward, through an area west of Johnston. This occurred through a sagebrush, shadscale, semi-desert range area.

1941: On April 24, a light migration of *V. cardui* was encountered flying across the semi-desert between St. George and Hurricane. The flight was in a north to northeasterly direction, and the butterflies were observed in flight every little way while driving across a 15 to 20 mile strip, between 2 and 3 p.m. This butterfly also was migrating north through the Cedar City area on April 26. On May 29, a fairly heavy migration of *V. cardui* was encountered between Vernal and Duchesne. Forty-five flying specimens were counted as the car traveled 1 mile at 45 miles per hour, the flight being in a northeasterly direction. On April 30, *V. cardui* was observed in migration at Vernal and in the Ouray Valley of the Uintah Basin. Also, a large migration was encountered, being present from west of Salt Lake City to Grantsville. This flight was heavy in spots and seldom with skips of more than a few rods, over most of the 35 miles traveled between 1 and 4:10 p.m. Flight was in a north by north-easterly direction, except in one spot where a change in wind upset the flight in a small area. Migration also was noted at Verdure, Tooele, Erda, and Lincoln in Tooele County, and at Salt Lake City and at the Airport west of Salt Lake City. Apparently this was the same movement which had been reported from southern Utah several days earlier.

On May 1, *V. cardui* was migrating throughout the day through Utah County, headed north. They were observed during the day at Alpine, Provo, Orem, the flats north of American Fork and Lehi, from Lehi to Saratoga, and in movement across the various highways. On May 2 forenoon, a few migrating butterflies were observed at Logan. The flight increased to large numbers flying north across the town and foot-

hills of Logan and vicinity by late afternoon. The migration also was heavy through Cove and Richmond in Cache County. On May 3, the migration continued through Cove, Lewiston, Richmond, and Smithfield in Cache County, being heaviest at Smithfield. Smaller numbers were present in North Logan and Logan. On May 4, butterflies migrated northward through Ogden and Riverdale in Weber County, and a few were observed at Logan between showers. On May 5, a heavy migration was noted from Soldier Summit to Price, Carbon County, being conspicuous in some high canyon areas. Flight as usual was toward the north. Migration was also found, but of a smaller flight, at Logan in Cache County, at Perry, Willard, and in larger numbers at Brigham, in Box Elder County, also in progress at Hooper, Ogden, North Ogden, and Pleasant View in Weber County. On May 6, the butterfly was observed feeding on the nectar of alfalfaria (*Erodium cicutarium*) at Lookout Pass, 6 miles west of Vernon, Tooele County. There was an average of approximately three adults per square yard feeding on these blossoms over an area of about 4 acres. A few butterflies also were observed migrating north. On May 7, migration of *V. cardui* still was in progress through Logan, Mendon and Wellsville in Cache County.

Painted Lady migration continued in northern Utah on May 8. Most of the flight was north by northeast, the flight being heaviest near Corinne, Brigham, Perry, and Willard in Box Elder County, and through Riverdale in Weber County. Numerous adults in flight also were seen near Logan, Benson, Cache Junction, Beaver Dam, Fielding, Collinston, Garland, Tremonton, Bear River City, Harrisville, Farr West, Ogden, Pleasant Grove, Lehi, and Provo. Migration was less active on May 10 than during the two preceding days in Utah, Salt Lake, Davis, and Weber Counties. The Thistle Butterfly was very abundant at Wales, Chester, Manti and Moroni in Sanpete County on May 20. No conspicuous migrations had been observed for several days. On May 21, butterflies were quite abundant in Sanpete, Juab, Wasatch, and Summit Counties. At higher altitudes and through some mountain passes, small numbers still were migrating toward the north. However most of them seemed to be settled where they were found. Inquiries concerning the large migration of these butterflies had been received almost daily throughout the period of movement. A large migration was observed through Provo to Pleasant Grove on May 26, coming largely from the west. A heavy migration also was observed from the Duchesne area to Price on May 28, flight being most numerous through the range and desert areas. Movement usually was in a north-easterly direction. On May 29, a heavy migration was in progress from Price to Castle Dale. Large numbers were observed to be congregating around puddles on the roadside.

On June 3, one-half grown Thistle Butterfly larvae had moved from thistle to attack peas in a field at Springdale. Caterpillars also were very abundant on thistle, and some on round-leaf mallow and sunflowers at North Ogden and Clearfield on June 11. Here again, some larvae had moved to feed on peas. Larvae had heavily attacked round-leaf mallow and cockle burr growing in some pea fields at Corinne, Provo, Springville, and Pleasant Grove, by June 14. Some larvae left weeds and moved to peas. On June 13, larvae were very abundant on Canada thistle in one pasture at Heber. Butterflies were abundant in many northern Utah localities at this time. On June 14, the butterflies were numerous in many northern Utah localities and in Washington County in the south-western part of the state. Thistle Butterfly larvae were feeding on hollyhock foliage at Logan and Salt Lake City on July 16, causing some damage. These were found to be riddling hollyhock foliage in a garden at Vernal and at Myton on July 18. Painted Lady butterflies were abundant at Deweyville in Box Elder County on August 12.

1942: A light migration of the Painted Lady Butterfly was encountered moving north through Vernon Creek Canyon across Boulder Pass and south nearly to Tintic Junction, mostly in Tooele County, during June.

1944: Small numbers were noted in migration north at Logan, May 10 and 11, and at Fillmore on May 12. Nearly full-grown larvae were found on thistle at

Minersville, May 15, indicating that the butterflies had reached there earlier. During June, *V. cardui* larvae were found in moderate abundance in a few areas on weeds, and on hollyhock. The adult migration was light and apparently spotted during 1944, so far as the writer was able to observe.

1945: The butterflies were noted moving in considerable numbers in parts of Box Elder County on April 22 and were also observed in Cache County on April 23, in moderate numbers. Most were in flight northward in both areas, but some were feeding on dandelion blossoms in Cache County.

1946: On April 11, a migration was seen in the area between Salt Lake City and Farmington. This migration, while not so large as some noted during the previous season, was very definite. The butterflies were moving from the southwest toward the northeast.

1949: On April 28, butterflies were observed migrating northward in the general areas of Brigham City, Willard, Provo, Ephraim, Richfield, McCornick, Lynndyl, north of Lynndyl about 15 miles, Pleasant Grove, American Fork, "Point of the Mountain" in Salt Lake County, and Draper. This movement had been observed on warm days for approximately ten days. They still were numerous along the highway, bands migrating northward being observed repeatedly between Lewiston and Murray on May 1. An unusually numerous and extended migration was in progress that spring. The migration still was occurring on May 3 and still was quite conspicuous to many people. Larvae of this species were becoming rather numerous by this time in many localities. Adults were still present, and some still in northward flight from May 9 to 11 at Farmington, Logan, Lehi, Springville, Spanish Fork Canyon, Moab, Indian Creek, Greenriver, Monticello, Blanding, Price and Provo. By June 1 many crops were being damaged throughout Davis County by Painted Lady Butterfly larvae which moved from pastures and roadsides in great numbers into beets, potatoes, etc. Much worry occurred on the part of farmers due to this situation which followed the very extensive Painted Lady Butterfly movement throughout most of Utah. By July 11, larvae of these butterflies had moved from thistle and mallow to damage large numbers of home gardens in other localities. These larvae were more numerous and damaging than they had been for a number of years, home owners reported.

1952: The Thistle Butterflies were numerous on dandelion blossoms at Logan by April 22 to 24. By May 11 there appeared to be a substantial northward migration, particularly apparent on two warm days during the week of May 4. By May 14, the northward migration had become very large. Many laymen noted these butterflies and asked about them, referring to their flight and great numbers. A very heavy flight which went through Richfield on May 23 was reported to me by a number of citizens. The movement had been going on to a lesser extent for several weeks. The very large migration still was in progress on May 26, throughout northern Utah, and reports that the migration was still occurring in central and southern Utah were received almost daily at my office. I received five phone calls at my home at Logan on May 25, inquiring what the butterfly was "which was migrating north through Cache Valley by the thousands." This certainly was a year of extremely heavy and long-sustained migration and population build-up of this species. The population and movement in Cache County seemed to be the highest to date for the season in late May. Again a very heavy flight of moths moving northward was repeatedly encountered as I drove from Logan to Delta on May 27. Heaviest flight was observed through Utah County, where three newspaper reporters got in touch with me immediately when I stopped at the county agricultural agent's office. Information on the flight was given and pictures were taken. Central Utah people reported an extremely heavy movement through Utah County on the 26th, even heavier than the one they were experiencing on the 27th, several indicated. A very heavy flight also was noted in Juab County, particularly concentrated at Eureka, Silver City, and Mammoth, on May 27, and this again was reported to have been much heavier on the 26th. This certainly was one of the largest flights of this butterfly which had come through Utah in many years.

A heavy migration through Tooele and Benmore, Tooele County, was in progress May 28 to June 2. This movement still was in progress northward through Cache and Box Elder Counties and into Idaho on June 2. By June 5, larvae in several localities had moved from thistle to gardens, alfalfa, and clover. Some damage was done to gardens at Cove in northern Utah, but no damage was noted to the legumes. On June 28, thistles were heavily attacked by these larvae in several parts of Juab County. By July 8 larvae had been found on thistle and mallow throughout the state. However, less economic damage from this larva occurred than had been anticipated from the unusually large population which migrated through Utah for more than a month during the spring of 1952. In a number of instances larvae were noted attacking hollyhock during July at Logan, Garden City, Provo, Layton, and in other localities.

### SUPPLEMENT

Upon inquiring further of Mr. DORWARD for any 1945 Arizona records which I might have sent in, I received the following records for *V. cardui* movements in various western states other than Utah:

#### ARIZONA:

Reported by V. L. WILDERMUTH on June 16, 1924—"In the June first number of the *Insect Pest Survey Bulletin*, 4: p. 3, "I notice with considerable interest Mr. E. A. McGregor's description of migration of the painted lady butterfly (*Vanessa cardui* L.). It will be of interest to place upon record the fact that the flight of this butterfly also occurred through southern Arizona in approximately the same numbers as estimated by Mr. McGregor. For a period of five days following April 8, the air was full of this painted lady at all times. The general direction of flight being northwest. Observations were made at Tempe, Tucson and Yuma, Arizona, and at all three of these places the numbers seemed to be about the same. I was interested in knowing that Mr. McGregor thought that possibly the source of this migration was either the foothills of the Sierras or the Sierras proper. We have been suspicious that the source was somewhere in central Old Mexico. It would, indeed, be interesting to know the exact source of this unusual flight."

Reported by K. B. MCKINNEY, April 1935—"On April 26, on the desert west of Casa Grande several species of unknown desert plants had been destroyed by the larvae of a butterfly believed to be 'The Painted Lady'. The adults were emerging in large numbers and the countryside could be spoken of as 'swarming' with them."

Reported by C. D. LEBERT, May 15, 1941—"Heavy migrations of caterpillars of the painted lady, *Vanessa cardui* Linn., from *Malva* and other weeds into yards in the Phoenix area. Severe defoliation to some ornamentals resulted in many instances, chrysanthemums, *Lantana*, and petunias suffering most. Larvae crawling into and all over houses are very annoying."

Reported by G. F. KNOWLTON, May 8, 1945—"A few thistle butterflies are flying north between Ashford, Seligna, Hyde Park, and farther west in Arizona." Flight of this butterfly was noted in various parts of Arizona that week, from Flagstaff to south of the Gila River, as I visited and inspected various army posts.

#### CALIFORNIA:

Reported by E. A. MCGREGOR, May 1924—"Continuing from April 11 to 13, inclusive, there was a remarkable migration of the butterfly. All through the day there was a continual flight of these insects. Roughly it was estimated that there was an average of about 300 butterflies per acre at a given moment. The flight direction appeared to be from the southeast to the northwest, and it would seem that the sources of the migration were either the foothills of the Sierras or the Sierras proper. In travelling the flight was not characteristic of butterflies in general, but was of a more steady and purposeful nature. During calm intervals the flight took place on an

average of perhaps 10 or 20 feet altitude, but during periods of windiness the butterflies flew very close to the ground. There appeared to be no attempt toward pairing and the individuals flew well separated—possibly 10 feet apart on an average. It was very noticeable that they all pursued their flight in the same direction. It was rare that individuals were seen to alight on vegetation, but this they did at times.

"The above flight occurred during the warmest period yet experienced this season, temperature maximums ranging from 80 to 88°. The temperature suddenly dropped late on the afternoon of the 13th, accompanied by a chilly wind, and the flight as suddenly terminated. On the 15th the temperature rose again but a gusty wind occurred so that only a very few individuals could be seen migrating. An attempt to estimate the number of individuals comprising this 3-day migration is here presented. The flight was established to be equally dense at Sundland, Porterville, Strathmore, Lindsay, Exeter, Visalia, Woodlake and Lemon Cove. This shows the flight to have been at least 40 miles in width (It no doubt was much wider). The daily duration of the migration was at least 12 hours, or a total for the 3 days of 36 flight hours for any given point.

"Now the rate of travel was estimated at about 12 miles per hour, which would give to the flight a total dispersion length of 432 miles for the 3 days. Within such a zone (40 miles wide by 432 miles long) is contained about 17,280 square miles or 11,051,200 acres. With an estimated occurrence of about 300 butterflies per acre, it is readily computed that at least 3,300,000,000 had passed in the 40-mile-wide zone between Sundland and Lemon Cove. If more data were available regarding the width of the flight, it undoubtedly could be shown that the population of this interesting migratory flight much exceeded the above estimate."

#### COLORADO:

Reported by G. M. LIST, May 23, 1935—"On May 10 the painted lady butterfly appeared in large numbers in a number of localities in the state. Many reports came in of them being numerous on fruit blossoms. Rainy weather during the past week has reduced their activities but whenever the sun appeared they were out in numbers."

Reported by F. C. HARMSTON, May 23, 1947—"Migration of the thistle butterfly was observed over an area approximately 6 miles wide, May 22, 1947, 6 miles east of Las Animas. Insects migrating northward."

#### IDAHO:

Reported by C. R. WAKELAND, May 31, 1935 — "Five specimens of a butterfly which has been reported to be quite numerous in Teton County, Idaho, are enclosed. Farmers say that they were so thick that it was difficult to see the hand extended in front of the face. They are only fairly numerous now and I have noted them in flight as far north as Dubois, Idaho. I think this is the same species that defoliated some of the native shrubs in the vicinity of Sandpoint, Idaho, last year, by the larva, which later showed nearly 100% parasites. I shall make observations on the rest of this trip and send you a record of distribution."

Reported by C. R. WAKELAND, June 22, 1935—"The butterfly about which you wrote me in May has been observed to be state-wide in distribution, but in small numbers, excepting the instance in Teton County, already reported."

#### WYOMING:

Reported by C. L. CORKINS:, July 9, 1935—"The flight of *V. cardui* is now very heavy, they being more abundant than I have ever seen. Some of the flights over the state are like swarms of bees. The preceeding worms did considerable damage, especially to gardens and in Fremont County it was necessary to spray beets on account of them."

Utah State Agricultural College, Logan, Utah, U. S. A.