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A STUDY OF THE PHILADELPHIA VIREO (*VIREO
PHILADELPHICUS*).

BY JONATHAN DWIGHT, JR., M. D.

Plate II.

THE Philadelphia Vireo was first described as a new species nearly half a century ago by Mr. John Cassin, from a specimen taken near Philadelphia, Pa., in September, 1842 (Proc. Acad. Nat. Sci. Phila., V, Feb. 1851, p. 153, pl. 10, fig. 2). It was many years later before anything was known of the breeding habits of the birds, and an article by Mr. William Brewster (Bull. Nutt. Orn. Club, V, 1880, pp. 1-7), who found the species rather commonly distributed over the Lake Umbagog region in western Maine, remains to-day the only sketch we have of them. I should perhaps except the notes of Mr. E. Seton Thompson who, in 1884, found a nest and eggs near Fort Pelly, Assiniboia, and briefly recorded the circumstance (Seton [= Thompson], Auk, II, 1885, pp. 305, 306). Few other observers have been favored with more than rare glimpses of the birds, which are still considered prizes wherever they are captured. And yet many specimens, almost wholly migrants, have been recorded of late years, so that the geographical distribution of the species is pretty definitely established. It appears to winter in Central America, as far south as

Costa Rica, and during the migration ranges over the eastern United States, being most abundant in the Mississippi Valley. Its breeding range probably covers a large part of Canada east of the Rocky Mountains and a few adjacent portions of the northernmost United States. Breeding specimens have been recorded from New Brunswick (Edmundston), Quebec (near Ottawa), Ontario (Moose Factory), Manitoba (Winnipeg), and Assiniboia (Fort Pelly), the last the westernmost record; also from Maine (Lake Umbagog), New Hampshire (White Mountains), Indiana (Carroll County), Illinois (Chicago), Minnesota and Dakota (Red River Valley), and Nebraska (Lincoln), the last the westernmost record in the United States. There is at present no good evidence of the occurrence of the species, except as a migrant, in Michigan, Wisconsin, and Iowa, where it is to be expected, for it has been recorded as breeding in the adjacent States. Numerous other records need hardly occupy space here for they have received ample treatment elsewhere and have served me only as a basis on which to build the brief summary of facts here presented.

Mr. Brewster was the first to acquaint us with the social side of the Philadelphia Vireo, and it is largely from this point of view that I now wish to consider these modest little birds, dragging them again before the public after they have conducted their domestic affairs quite undisturbed for the last sixteen years. I feel on terms of considerable intimacy with them for I have cultivated their acquaintance during portions of four summers spent among them near the little village of Tadousac, Province of Quebec, Canada, where I have found them to be rather common. My experience with them has been very much like Mr. Brewster's and consequently my remarks must of necessity be somewhat in the nature of a postscript to his graphically penned observations.

It was on the 10th of July, 1893, that a Philadelphia Vireo introduced herself to notice by scolding me most unceremoniously, — at least I took it to be a female and one just off the nest, from the way she kept ruffling and picking at her feathers and shaking herself as many birds do when disturbed from their eggs. Still, no nest could be found, nor was my lady anywhere about at later visits to the same spot. However, profiting by the fact that I had

seen an undoubted Philadelphia Vireo, and stimulated by the recollection of what Mr. Brewster had written about the great similarity between the song of this bird and that of the Red-eyed Vireo, I shortly made the discovery that, like him, I had been living right in the midst of Philadelphias, mistaking them for Red-eyes. No better illustration of the danger of identifying birds by their songs alone could be desired than our similar experiences, and it teaches an obvious lesson. I soon familiarized myself with the new song and, guided largely by it, have found this rare and wilderness-loving Vireo to be irregularly distributed as a summer resident in small numbers over a large area of wild mountainous country about Tadousac.

The village is most picturesquely situated at the junction of the Saguenay with the St. Lawrence River, being hemmed in by low mountains of inconsiderable height, a thousand or fifteen hundred feet, part of the great Laurentian chain which extends for many miles along the north shore of the broad St. Lawrence. Precipices of no mean height, gray with lichens and mosses, frown darkly over the Saguenay, while the adjacent hills and mountains, piled in great confusion, stand out as dull masses of bare granite or are scantily clad with struggling bushes and dwarfed trees that cling in the seams and crevices. In some of the valleys there are small rushing brooks tumbling over the rocks shadowed by a dense growth; in others, filled with the soil brought thither by the erosion of a former epoch, the brooks have sunk deep channels or gulches, which also are oftentimes well wooded. There are, too, terraces of sand, underlaid with clay banks, and eastward from the village they jut boldly, in great bluffs, into the St. Lawrence. In the rocky portions of the country no cultivation is possible, but the terraces and the valleys afford here and there a few fields where slim crops of hay and oats are raised. The wilderness extends eastward, westward, and northward, a sparsely wooded country of towering hills and rocks where there is little to break the monotony save a great number of small lakes, clear and cold, stretches of 'barrens,' and the single road which winds through the valleys.

The forest, even where worthy the name, is thinly scattered over this inhospitable region and much of it has fallen before axe

and fire, giving place, especially in the vicinity of Tadousac, to a second growth in which the bush element predominates and where deciduous trees considerably outnumber the conifers. Poplars or aspens, white and yellow birches and maples are the commonest trees, the poplars and white birches occurring in small straggling groups or scattered broadcast throughout the woods and clearings. There is, too, a goodly sprinkling of evergreens of several sorts — pines, spruces and firs — which grow in squat little patches or quite alone in the woods or on the mountain sides. The northern character of the region is indicated by the abundance of such species (among many others) as the northern scrub pine (*Pinus banksiani*), the Labrador tea (*Ledum latifolium*), the crowberry (*Empetrum nigrum*), the bunchberry (*Cornus canadensis*), and scores of other shrubs and wild flowers. Immense quantities of blueberry and raspberry bushes thrive in the drier places, while the little swamps are masses of vegetation, but the most striking and most abundant of all the bushes is the alder. Alders, large and small, from flat spreading little mats to shady groves of trunks a dozen and more feet in height, are visible at every turn. Flourishing on the sandbanks, dotted on the mountain sides, rooted in cool glens or fringing the swampy margins of the lakes, they tangle up with the general undergrowth or form separate patches all by themselves. When the latter are of any extent they become broad canopies of shade beneath which is found an open space where the breezes and the birds freely circulate.

The summer climate is delightful at Tadousac, its situation, a trifle north of Lat. 48°, and the great body of cold tide-water in its immediate vicinity contributing to keep the summers cool. From the foregoing remarks, I trust that some idea may be gained of the country where I have found the Philadelphia Vireo, — a country resembling in many respects, I fancy, that part of northwestern Maine where Mr. Brewster became acquainted with the species many years ago.

HABITS AND CHARACTERISTICS.

My observations at Tadousac have never extended over more than six consecutive weeks in any one season, but my visits have

been so timed that I have really studied the birds from the middle of June to the first of September. The male Vireos are in full voice during June, but toward the end of the month the song period rapidly wanes, and after the first days of July their notes are not very often heard save as a subdued warble at rare intervals. Now the birds ramble about in the bushes almost exclusively, instead of resorting, as has been their wont, to favorite perches high in the trees. Early in July, in the second week, the young begin to leave the nests (which, I regret to say, I have not been fortunate enough to find) and betray their presence like all inconsiderate fledglings by importunate demands for food; and no sooner are they able to shift a little for themselves than the parents have still further trouble thrust upon them in the shape of the autumn moult. This begins as early as the 20th of July and seems to be pretty well completed during the second week of August. By this time the young have also acquired their fall plumage, which is not appreciably different from that of the adult. Young and old are now found associating with small restless bands of would-be migrants, perhaps a couple of Magnolia or Black-throated Green Warblers, a Red-eyed Vireo, a stray Redstart, in fact almost any of the summer sojourners, not forgetting a Chickadee or two ever ready with their irrepressible remarks. After the middle of August, the Philadelphia Vireos seem to disappear for good — at least I have not found them later than this — and the summer cycle of their life is completed.

The birds are far less abundant than the Red-eyed Vireos over the same area, which outnumber them perhaps ten to one, and frequently the whole day passes without my seeing or hearing a single bird. Each summer I am able to locate upwards of a dozen pairs, but unless the males are singing they may give no token of their presence. The device of squeaking on the back of the hand sometimes has charms for them while at others, particularly when they are moulting, it has no effect whatever. Usually the device does not fail to stir up the nearest White-throated Sparrows, who storm with untiring vigor until all the other birds in the vicinity have come to see what the row is about. The Olive-backed Thrushes, the Magnolia Warblers, the Canadian Warblers, the Redstarts, the Red-eyed Vireos, yes, all the birds

within earshot, rush to the scene, take a hand in the chorus and having expressed their opinions discreetly retire. Very often a Philadelphia Vireo, seldom two, will join in the rumpus for a little while but they soon slip away satisfied, leaving the White-throats as boisterous as ever in their denunciations.

It is impossible not to be struck with the close resemblance between the Philadelphias and the Red-eyes in appearance, actions, and habits, as well as in song. Both frequent the same localities in the wilderness, but the Philadelphias rather shun civilization and rarely appear, like the Red-eyes, in the village trees. Both prefer to sing in the upper branches, but I have seldom found the Philadelphias in the rambling groves of birches which are the especial delight of the Red-eyes, and they are more partial to the low, bushy, second growth or copses of alders sprinkled with stray trees. Both hop from bough to bough in search of food, singing as they go, and in actions the one is almost the counterpart of the other, save that the smaller bodied Philadelphias are quicker in their movements as contrasted with the lazy leisure of the Red-eyes. Another point of difference is in the amount of curiosity displayed, the Philadelphias exhibiting comparatively little while the Red-eyes, fairly brimming over with it, never fail to seek the reason for unusual sights or sounds. The Philadelphia's song is much slower than that of the Red-eye, while his scolding notes are much more rapid and less evenly delivered.

There would seem to be a streak of ill-temper in the mental composition of this little Vireo, which manifests itself in brief outbreaks of scolding. These notes are even interjected into the song, and also greet you unexpectedly in the woods, as if you had disturbed nest or young, but many of these rude birds turn out to be males and can never be found a second time in the same locality. The fact is, unless they are in full song, it is no easy matter to find them in the same neighborhood two days in succession, for the bushes are very thick and afford safe cover. In fine weather their pleasing music may be heard from daybreak till midday, and again in the afternoon, but when it is dull and rainy or hot they often remain perfectly silent. While the female is incubating, her mate will spend hours in song, choosing an elevated perch or roving about, high and low, singing as he goes. Later in the

season he keeps altogether in the bushes, warbling now and then, as if under his breath, in soft and disjointed measures. Sometimes a pair is to be seen rambling together through the low bushes, uttering peculiar soft little clicks and squeaks the while, but I must confess I find them at all times adepts in the art of concealment, although they are never really timid.

There was one bird that I used to watch by the hour. He was usually to be found singing on a particular twig near the top of a tall poplar, one of a small group that he claimed as his exclusive domain. When I first saw him, flakes of poplar-down were filling the air and lay drifted like banks of snow in every nook and corner, for it was then the middle of June and early summer was in full swing. The daily round of life of my little friend *philadelphicus* seemed to closely correspond with that of others that could not be so regularly studied, and his traits differed in small degree from those of his brethren. He would sing the whole of the morning, scarcely skipping a note for upwards of half an hour at a time. During the song he contrived to keep his body in continual, restless motion as if on the point of taking flight, but in reality he did not even shift his hold on the bough. After a time, impelled no doubt by hunger, he would roam about in the adjacent trees, hopping with deliberation from limb to limb and turning his head from side to side in search of food. Occasionally grasping the very end of a branch he would sway upside down while investigating its insect possibilities, or swiftly pursue and catch in the air some heedless fly. His now interrupted snatches of song were infrequent and his scolding, mewing notes would be heard from time to time. At length descending to the adjacent bushes, he would be joined by his mate, doubtless from her nest, and with soft lisping murmurs they would soon be lost in the tangle. Later on, I would hear him again from the old stand, or before returning thither his melody might be heard in some of the small trees that dotted the expanse of bushes. And so the days would slip uneventfully by with alternate periods of song and quiet.

I feel confident the nests are not placed in the trees, for in the localities where I have found the Vireos an examination of their very tops is accomplished without much difficulty. Besides, the only nest ever taken, that found by Mr. Thompson, was suspended

only ten feet from the ground in the twigs of a willow. It contained four eggs on the 13th of June, which resembled the eggs of the Red-eye but unfortunately were accidentally destroyed. I used sometimes to meet with incubating females that made very little fuss, perhaps merely leaning forward from a branch near at hand, the crown feathers raised in silent inquiry. But usually they gave vent to their disapproval of my presence in bursts of vigorous mewling notes in which the male heartily assisted. He does not, however, assist in incubation, like his relation the Warbling Vireo, but devotes himself to melody, and a very cheerful melody it is too.

SONG.

To my ear the song partakes of the liquid sweetness and leisurely irregularity of that of the Solitary Vireo, the notes being sweeter, clearer, and a trifle higher pitched than those of the Red-eye. It is no easy matter to describe the song of a bird intelligently. We do not know their language nor have we alphabetical signs or musical notation, that can convey to us more than a faint idea of bird music. Fortunately we have comparisons to fall back upon, and as the song of the Red-eyed Vireo is well known to many of us, some idea of that of the Philadelphia Vireo may be gained when I say that while the former rapidly ripples out his music, the latter reiterates slowly a series of double or triple notes with marked pauses between. My experience has been that having once heard *philadelphicus* you will seldom mistake it for *olivaceus*, while the reverse will not hold. There is more reduplication of notes in the song of the Red-eye and one might say, less time for taking breath. In Mr. Brewster's account of the birds, which I can corroborate in every particular, he speaks of a "double-syllabled utterance" coming in irregularly with the general song. I would merely emphasize the fact that it is the essence of the song and enters into it at as regular intervals as any of the other notes. It is a liquid note, beginning the song and occupying about three fifths of a second for the two syllables of which it is composed, on both of which considerable emphasis is laid. There seems to be a slight trill or ripple between the

syllables when heard close at hand and the inflection rises slightly on the latter. A pause follows, approximating one and two fifths seconds, and the first note is again repeated, less forcibly and slightly varied. Again the pause ensues, and now it is followed by a triple note, not interrogatory and indistinguishable from one of *V. olivaceus*. Again the pause, this time followed by a repetition of the triple note, slightly varied so as to lose some of its sibilance, and after the customary pause of one and two fifths seconds, the song is repeated from the beginning, nearly eight seconds having elapsed in completing one cycle. The four notes may be suggested by the syllables *chŭr-r'wē*, *chŭr-wē*, *pst'-i-rē*, *psr'-r-rē*. The sequence of the notes, however, may vary a little, owing to the occasional substitution of one for the other, but the same one is not repeated more than twice in succession, even after a break in the continuity of the song. Heard at a distance, it practically reduces to two alternated notes, which I find represented in my note books of different years as *chŭr-wŭp*, *tŭr-ŭ-dŭp* in one place and *psŭ-wŭ'rt*, *psŭ-wŭ-tŭt* in another. The discrepancies are instructive, showing independent efforts on my part to lay hold of the same sound.

The speed at which the song flows on is an interesting factor and is remarkably uniform for each individual songster, — in fact, I could almost identify certain Philadelphias and Red-eyes by timing their songs. *V. philadelphicus* sings at the rate of from twenty-two to thirty-six notes a minute, averaging a trifle over twenty-six, while *V. olivaceus* rattles on at the rate of from fifty to seventy, their song rate averaging a trifle over fifty-nine. I do not mean to assert that there were always just so many notes in a given minute, for both species pause irregularly and drop out notes now and then, but if all were uttered in the same cadence as those actually heard, these figures would be equaled, and, in fact, very often are equaled. They are, however, only to be satisfactorily obtained at the height of the song period, and but for the careful use of a stop-watch I would hardly feel justified in presenting them. Some individuals are better songsters than others, but all follow more or less closely the type I have endeavored to describe. The song is sometimes a softer and disjointed affair and this soliloquizing type is characteristic of the wane of the song period.

Besides the song, this Vireo has the scolding note already mentioned. It does not resemble the corresponding complaint note of *olivaceus*, but is almost exactly like the aggressive nasal *mÿă* of *gilvus*, which has a suggestion of the katydid about it. It is usually rapidly repeated five or six times or intermitted and continued irregularly by series of from three to eight or more. Males and females both make use of it, raising the feathers of the crown into a crest at the same time so as to look quite angry. This is the first sound imitated by the young birds, though usually rendered by them one note at a time and in a rather 'scrapey' voice, while the approach of the food-laden parent will excite a chatter, marked chiefly by its incoherent rapidity.

The other regular notes of the adults are the indescribable soft clickings and squeakings of which I have already spoken, a mine of low music intended as household gossip when the loud song is laid aside. These, as well as the scolding notes, are also interspersed in the intervals of the soliloquized song in which the male indulges when roving at will.

It is evident that but one brood is raised in a season. I have seen young birds as early as July 7, comical little chaps largely bare skin and the promise of a tail. At this tender age they are unwilling to essay flight except when urged by anxious parents to make a clumsy, flying leap from one twig to another, but they are knowing enough to keep quiet when they hear a crashing in the bushes, and as they become older they lose no time in moving quickly away. I have found them in alder thickets or along some of the bushy cattle paths which end abruptly at steep walls of rock or lose themselves in small clearings. In fact I never could tell when or where I might run across the birds, young or old, but during the latter part of July, when the moult is in progress, it is almost impossible to find them anywhere. I associate them, however, with the alder patches where they wander loudly singing in early summer, softly warbling in midsummer, and becoming silent long before the chill of autumn has come. It could be said that the Philadelphia Vireo might well emulate his indefatigable relation, the Red-eye, whose song period extends day in and day out well into the fall, but our little friend undoubtedly knows well what he is about or he would not have successfully

hidden himself from the world for so many years. He is to be expected and should be looked for as a regular summer resident in many of the wilder regions of Canada.

PLUMAGE AND MOULT.

There yet remains something to be said regarding the plumage and moult of the birds. On the accompanying plate is figured an adult male *Vireo philadelphicus* in breeding dress, contrasted with *Vireo gilvus*, the species it most resembles in plumage. It may be seen at a glance how much yellower *philadelphicus* is, a difference that holds in all plumages and at all seasons of the year. A more distinctive character, however, than color is found in the short first primary of *gilvus*, which is abortive and practically absent in *philadelphicus*, the former, therefore, having by actual count ten primaries, the latter apparently only nine. *V. philadelphicus* in the spring is distinctly washed below with pale lemon yellow, which is deeper in the fall dress. When seen in the trees the birds may easily be mistaken for the small females of *Vireo olivaceus*, and they also bear a certain resemblance to *Vireo belli*, which western observers would do well to remember.

My series of twenty-six specimens is an instructive one, containing as it does spring, summer and autumn birds, old as well as young. From among the latter I select the following as typical of the first or nestling plumage here described for the first time.

Young in first plumage (♂ juv., No. 3670. Collection of J. Dwight, Jr., Tadousac, Quebec, July 13, 1893):—Above, olive-brown, paler on the head, nape and rump. Below, pale primrose-yellow deeper on the flanks. Side of head, including the auriculars and superciliary stripe, buff-yellow; orbital ring faintly yellow; trace of dusky loreal and post-ocular streak. Remiges (including coverts) and rectrices clove-brown narrowly edged externally with olive-green, brightest on the secondaries, becoming olive-gray at the apices of the primaries and secondaries and strongly tinged with brown on all the wing-coverts. Iris, deep hazel brown. Feet, pinkish buff, drying to a dusky wood-brown. Bill, pale bistre, the lower mandible flesh tinged, drying to a yellowish raw umber-brown.

The specimen is very young, the wing quills and their coverts only about one half grown, and the tail is barely sprouting. The yellow below serves to at once distinguish it from either *gilvus* or

olivaceus, both of which are silky white below at the same age. Other specimens in my series show the change of the young into autumn plumage, which is acquired, as in *Vireo olivaceus*, without moult of flight-feathers or tail. These remain, although the body-feathers begin to be replaced by new ones before the wings and tail have attained their full growth. The feathers retained are the primaries, their coverts, the secondaries, the tertiaries, and the rectrices, — all the rest of the plumage is evanescent and is renewed soon after the bird leaves the nest. A bird taken July 28 has the wings and tail fully grown but the deciduous sheaths are still in place at the bases of the quills. The brown upper parts are mottled with the bright olive-green autumn feathers which have extensively replaced the others on the nape, back and rump. The forehead and sides of head show many new feathers. A yellow band below in strong contrast to the paler first plumage, has developed on the throat and shows faintly on the flanks beyond the forking of the inferior feather tract. The new wing-coverts (except the primary coverts) are beginning to sprout. A bird taken August 4 is farther advanced. The sheaths of the quill feathers have disappeared; the wing-coverts are nearly full grown; and the new body plumage is nearly complete, only a few feathers still in their sheaths sprouting here and there. A bird of August 6 is almost entirely in fall dress, and others of August 15 are still moulting a few auricular and abdominal feathers, while one of September 24 shows no trace whatever of the moult and is practically indistinguishable from the adult. Still, in average specimens the yellow below is a little richer and extends further over the abdomen and the bill is yellowish instead of blackish as in the adult.

Whether there is any spring moult in this species I am unable to say for I have seen no specimens taken at a time when it might be expected to occur, but the state of the plumage in spring birds indicates that there is none. The fall plumage of young and old is probably worn until the next annual moult, which begins towards the end of July. In spring specimens the amount of yellow is variable, although paler than in the fall, and the abrasion is not at all marked, but this is to be expected in an arboreal species. A specimen of July 22 is the earliest one that shows signs of moult.

There are a few pin-point new feathers on the breast, the crown and the back; the ninth and eighth primaries have been replaced by new quills one quarter grown, the ninth slightly longer than the eighth, and the seventh barely shows as a minute follicle. Specimens taken later show the progress of the moult which is complete, body-feathers, wings and tail. There is considerable individual variation in the sequence of development of the feathers of the different tracts, but the development is pretty uniform on the whole and seems to radiate from various centres. The earliest new feathers appear on the breast, near the forking of the inferior feather-tract, and on the back in the interscapular region. The crown shortly begins to moult and the inner primary (the ninth by count) falls quickly followed by the eighth. The body plumage is quite rapidly renewed, the corresponding primaries of each wing slowly falling in pairs with their coverts so that the body plumage is largely renewed before the outer primaries fall. The wing-coverts begin to be renewed after the primaries begin to fall and are usually complete before the outer primaries are replaced. The outer members of the rows are the first to be moulted and this also applies to the tertiaries which are completely renewed before the secondaries begin to fall. This occurs when only three or four of the old outer primaries remain, and the rectrices also fall at this stage, or a little before, beginning with the middle pair. The outer secondary of each wing falls first while the inner secondary and the alula are the last parts of the wing to be renewed. The renewal of the body plumage is usually very well under way before the moult is conspicuous in the wings, but the last traces of new growth are usually a few auricular and abdominal feathers and perhaps a few on the chin and scapular region. A bird of August 4 is particularly instructive. All that remains of the old dress are a few auricular, scapular and abdominal feathers of the body plumage, the outer pair of rectrices of the tail, the three outer primaries, their coverts, the alula, the five inner secondaries, and much of the lining of the wing.

I have followed the moult with considerable detail because nothing has been known regarding it in this particular species, and it seems probable from the material I have handled that it is typical of all of our Vireos.

I have taken this opportunity of describing the unknown first plumage and I have exploited the birds themselves in a manner which I trust has been of interest to my readers. The Philadelphia Vireos themselves, however, may think I have trespassed too much on my acquaintance with them.

THE TURKEY QUESTION.

BY DR. ELLIOTT COUES.

I WOULD not bring up this vexatious matter if we could flatter ourselves that we had settled it acceptably in the A. O. U. Check-List. That we have not done so is evident; for the British Museum Catalogue of 1893 reverses our decision, in so far as nomenclature is concerned; and we are not likely to be supported in that position by any writers except those who copy us blindly. In my judgment, we are exactly wrong; and I hope to see the wrong righted in the next edition of the List.

My contention is, that the name *Meleagris gallopavo*, as now restricted, belongs to the Mexican Turkey, and that some other name must be found to distinguish the Wild Turkey of the United States. There is no material fact of ornithology in dispute; the issue is simply the proper application of our rules in this instance; it is independent of any question whether the two birds be regarded as full species, or as subspecies; it is independent also of any question of the availability of Bartram's name *americana*. The point is, to which form of *Meleagris* does the Linnæan term *gallopavo* properly attach?

On various former occasions when I was treating of these birds—as in all the editions of the 'Key,' in the 'Birds of the Northwest,' in the 'Century Dictionary,' and in other publications, I have taken the ground that *M. gallopavo* designated the form called *M. mexicana* in 1856 by Gould, on the theory that the Linnæan name was based primarily upon the domestic Turkey,



Dwight, Jonathan. 1897. "A Study of the Philadelphia Vireo (*Vireo philadelphicus*).*" The Auk* 14, 259–272. <https://doi.org/10.2307/4068634>.

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