ORNITOLOGIA NEOTROPICAL 6: 19–25, 1995

THE BIOLOGY OF THE CINNAMON FLYCATCHER PYRRHOMYIAS CINNAMOMEA IN VENEZUELA

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Resumen. Pyrrhomyias cinnamomea (Tyrannidae), fue estudiado en la Cordillera costena de Venezuela. Este pajaro habita las areas entre arboles caidos en bosques y otras areas aliertas como a lo largo de caminos y carreteras. Buscan comida pro medio de vuelos aereos. Su mejor vocalizacion consiste en un trillo rapido con frequencia modulada. El nido es una copa abierta generalmente localizado encima de estructuras verticales. El tamano de su grupo de huevos consiste en dos huevos y los periodos de incubacion y pinchone promedian veinte dias. Los pinchones altricial tienen plumon que es corto y leonado. El cuidado de los pichones despues de vuelo primero dura cinco semanas.

Abstract. The Cinnamon Flycatcher, *Pyrrhomyias cinnamomea* (Tyrannidae), was studied in the Coastal Cordillera of Venezuela. This flycatcher inhabits tree-fall gaps, forest openings and edges of roads and trails; foraging is by aerial hawking. Their major vocalization is a rapid, frequency modulated, trill. The nest is an open cup placed on vertical banks; the clutch size is two eggs. Incubation and fledging both average 20 days. The altricial chicks have short tawny natal down. Post fledging parental care lasted for at least five weeks. *Accepted 21 March 1995.*

Key words: Cinnamon Flycatcher, Pyrrhomyias cinnamomea, *breeding biology, natal pterylosis, nestling development, vocalizations, Venezuela.*

INTRODUCTION

The Cinnamon Flycatcher, *Pyrrhomyias cinnamomea*, is a small mainly cinnamon-rufous tyrant flycatcher (Fig. 1) found in mountainous areas of South America. It ranges from the Coastal Cordillera of northern Venezuela from the Paria Peninsula westward to the eastern Andes and south through Colombia (including the Sierra de Perija and the Sierra de Santa Marta), Ecuador and Peru to western Bolivia and northwestern Argentina (Meyer de Schauensee 1970, Hilty & Brown 1986, Ridgely & Tudor 1994). Within this seemingly extensive range the Cinnamon Flycatcher exhibits what has been described as a classic subtropical distribution "about 5800 km long and a 'mile wide' (Chapman 1926:90) along moist Andean slopes" (Traylor & Fitzpatrick 1982). This monotypic genus has usually been placed near the ecologically and morphologically similar tufted-flycatchers, *Mitrephanes* spp., (Traylor 1979). More recently, on the basis of bill and plumage characters, it has been allied with the distinctive Cliff Flycatcher, *Hirundinea ferruginea*, (Fitzpatrick in Traylor & Fitzpatrick 1982) and also by skull and syringeal morphology (Lanyon 1986, 1988). The data we present here have largely been lacking for this distinctive flycatcher despite it being a locally common species throughout its extensive range.

STUDY LOCATION

All observations were made within a 2.5 km radius of Estación Biologíca Alberto Fernandez Yepez de Rancho Grande at an altitude of 1097 m 11.3 km north of Maracay, Aragua, (10° 21' N, 67° 41' W) in Parque Nacional Henri Pittier. The ecology of this montane cloud forest location and environs has been described by Beebe & Crane (1947). The data presented here were collected during two prolonged stays at Rancho Grande: March-July 1972 (Collins) and March–July 1993 (Ryan). Six subspecies of the Cinnamon Flycatcher are currently recognized (Traylor 1979); the population at Rancho Grande is attributable to *P. c. vieillotioides* (Schafer & Phelps 1954, Phelps & Phelps 1963, Traylor 1979).

RESULTS AND DISCUSSION

Habitat and foraging. Several accounts indicate that Cinnamon Flycatchers are typically found in shrubby borders of subtropical to temperate montane forest particularly in tree-fall gaps or the edges or openings along roads, trails and streams (Todd & Carriker 1922, Beebe 1949, Miller 1963, Meyer de Schauensee 1964, Hilty & Brown 1986, Ridgely & Tudor 1994, pers. observ.). They are found at elevations mostly from 1000 to 3000 m although occasionally somewhat lower (Todd & Carriker 1922). We found these flycatchers to be highly sedentary and predictably found, usually in pairs, at specific locations around the buildings at Rancho Grande and near nest sites along the paved road to the north towards Ocumare de la Costa. The sedentary nature of these birds has also been reported elsewhere in the species' range (Hilty & Brown 1986).

Cinnamon Flycatchers are usually found perched on open twigs or branches from which they make characteristically brief sally flights before returning to the same perch (Beebe 1949, pers. observ.). This appears to be more "aerial hawking" of flying insects than "sally gleans" (Fitzpatrick 1980). Their diet appears to be mostly a variety of flying insects (Todd & Carriker 1922, pers. observ.); they were observed to use temporary abundances of insects such as moths attracted to insect lights (Collins & Watson 1983) and the temporary abundance afforded by nuptial flights of ants and termites (pers. observ.). These nuptial flights are similarly exploited by an array of tropical species (Eisenmann 1961). Cinnamon Flycatchers do on occasion include berries in their diet (Beebe 1949).

Vocalizations. Cinnamon Flycatchers are usually located by their characteristic vocalization described as "a distinctive low pitched dry rattling 'tr-r-r-r-r-r'" (Ridgely & Tudor 1994) or a "dull, low-pitched flat rattle, pti-i-i-i-i-i spit out rather suddenly" (Hilty & Brown 1986). Although Cinnamon Flycatchers also produce some short "chip", "tsip", or "pit" calls (Hilty & Brown 1986), they seem to have only the one major vocalization. This was analyzed by the late Paul Schwartz (*in litt.* 1972) as follows: it is "used in a way homologous to primary song in other species and probably serves to maintain contact between members of the pair; in essentially the same form it is also used in stress situations, as in cases of human interference at or near an active nest. No specially developed dawn song has been observed for this species. The major vocalization is a short, unobtrusive, not unpleasant trill which is given sporadically. The pattern is a fairly rapidly frequency modulated 'whistle' at an average frequency of 5000 to 6000 Hz but oscillating between about 3000 and 8000 Hz extremes [Fig. 2]. For the initial three to five cycles of a phrase the frequency modulation is fully developed vocally but is then rather abruptly modified so that essentially only the increasing-frequency element of each cycle is voiced, creating a succession of distinct half-cycle figures [Fig 2c]. The total duration of the phrase is roughly a half second."

Nest and eggs. The nest of the Cinnamon Flycatcher is a typical open cup type which is "the most common, probably primitive nest type" in the Tyrannidae (Traylor & Fitzpatrick 1982). It is usually a small inconspicuous structure placed on a small mossy ledge or rock outcrop on the near-vertical bank of a trail or roadside. It is mostly constructed of the locally abundant mosses, leaves, twigs, lichens, and spider webs. It may be lined with grasses, rootlets and some feathers. The whole structure blends in so well that it is extremely cryptic even though not typically obscured by nearby vegetation (Fig. 1). The nest cup dimensions of five nests of three pairs in 1972 averaged 45.8 mm (range 44—48 mm; SD = 1.47) by 47.4 mm (range 46—50 mm; SD = 1.49) in diameter and 30.3 mm (range 26—37 mm; SD 4.08) deep. One of two nests described by Ewert (1975) was on a "dead stub of a living tree" near Rancho Grande, a less typical site from our observations. A pair of these flycatchers nested on a ledge on the Rancho Grande building in both years. The 1993 nest was a larger, bulkier affair (60 mm wide x 80 mm high; in Colleción Ornitología Phelps) than the nests on smaller natural ledges, partially due to nest materials not being confined or held in place on the larger and sloping concrete ledge, the cup dimensions however were typical of natural site nests.

Naturally occurring nest sites may be limited and are utilized year after year in nearly the same fashion (pers. observ.; P. Schwartz, pers. comm.). Nest sites are very strongly defended by breeding

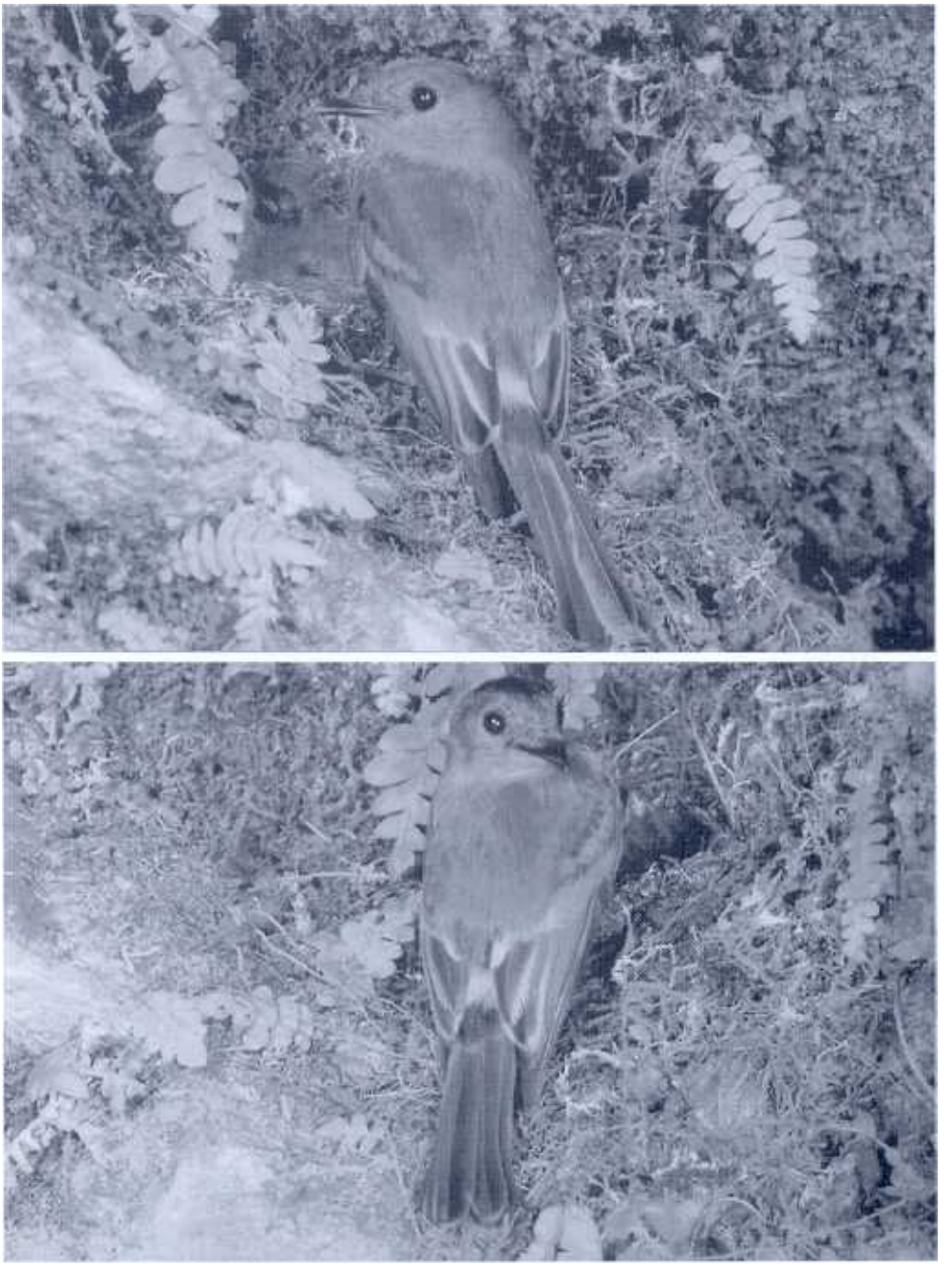

FIG. 1. Cinnamon Flycatcher on nest with less than week-old chicks at nest site studied in 1972. Photograph by P. Schwartz. A color photograph, also by P. Schwartz and probably at same site, was included in "A Portfolio of Venezuelan Birds" distributed with the record, Bird Songs from the Tropics by P. Schwartz, 1963, distributed by Instituto Neotropical and Cornell University (Collins 1964).

pairs and during such intense agonistic encounters the otherwise hidden yellow crown patch is vividly displayed (Beebe 1949).

Egg laying took place between approximately 5 April and 14 May in both years. This is at about the start of the annual rainy season at Rancho Grande (Beebe & Crane 1947). Nests in the Coastal Cordillera near Colonia Tovar and at Rancho Grande reported by Ewert (1975) were also at this season.

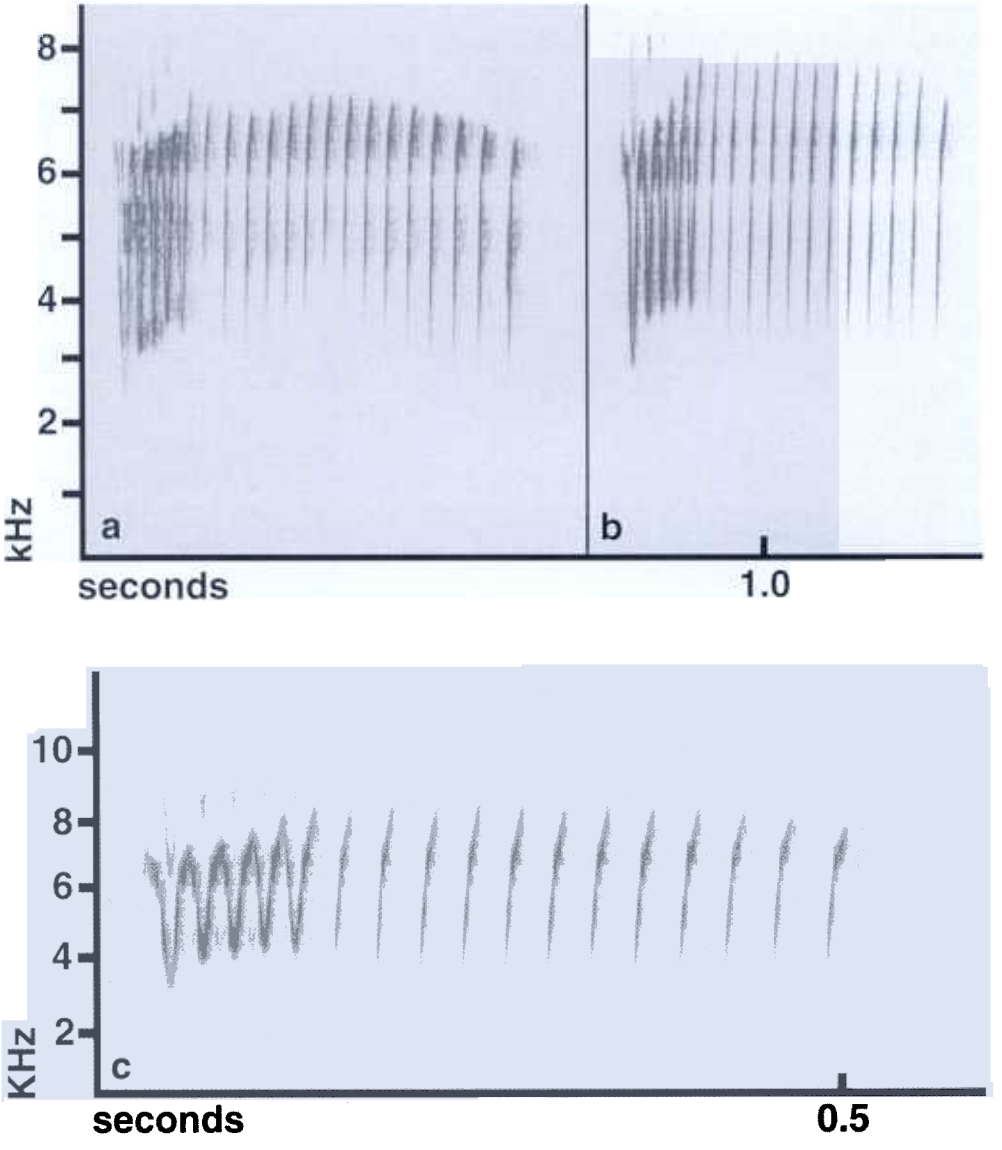

FIG. 2. Sonogram of typical trill or "whistle" vocalization of the Cinnamon Flycatcher: a and b are two songs at normal speed and c is song a at half speed showing the distinct frequency modulation of the initial part of the phrase. Sonogram produced on a Kay Elemetric Sonograph on narrow band setting: sonogram and original recording by P. Schwartz.

In all cases (n = 7) the clutch size was two, including a replacement clutch by the same pair in 1972. Six eggs from three clutches averaged 16.43 (range 15—16.5 mm; SD = 0.67) x 13.10 mm (range 10.5—13.6 mm; SD = 1.0). Egg masses varied somewhat between the two years. In 1972 four eggs had an average mass of 1.46 g (range 1.4—1.5 g), whereas two eggs in 1993 averaged 1.10 g (range 1.05—1.15 g). The mass predicted from egg measurements of *Pyrrhomyias* is 1.25 g (Hoyt 1979). The eggs were off-white in color with reddish brown spots concentrated at the larger end.

Incubation appeared to start with the laying of the second egg and lasted for an average of 20 days (range 17—21; n = 4). Both adults participated in incubation (pers. observ.). Newly hatched chicks had reddish-orange skin, yellow rictal flanges, and were covered with short dense tawny natal down. Egg shells were removed almost immediately by the adults; within 2 hours of hatching in one case. They were usually carried some distance from the nest but were dropped on the ground almost below the nest on one occasion.

Natal Pterylosis. The natal pterylosis was examined in two newly hatched specimens (Stage A, Wetherbee 1957) collected from the same nest on 25 April 1972. The short tawny neossoptiles approximately 1—6 mm long were noted in 13 tracts or regions all on the dorsum (Table 1). The total number of neossoptiles was 147—154. This is a substantially reduced total compared to some other open cup nesting tyrannids (Collins & Keane 1991; Collins, unpubl.) and more similar to the reduced totals recorded from some closed-nest building species (Collins 1990, Collins & McDaniel 1989).

Nestling Development. The chicks grew slowly over a period of nearly three weeks increasing body mass from 1.25 g at hatching to maximum mass of 11.5—12.2 g by day 13—16 before fledging on day 21 at an average mass of 10.5 g (range 10.25—10.75 g, n = 2). This is 102 % of the adult mass of 10.2 g (Dunning 1993: n = 4) which includes the weight of one adult female, 9.7 g, at Rancho Grande (Collins 1972). A female caught at Rancho Grande in 1993 5 days before laying weighed 11.5 g. The growth trajectory was appreciably different between broods followed in 1972 and 1993 due to the presence of parasitic fly larvae in the 1972 nest. Their impact slowed the chick weight growth, decreased the asymptotic weight achieved, and prolonged the pre-fledging period. This is treated in greater detail elsewhere (Ryan & Collins, in prep.).

The overall development of the young flycatchers is summarized in Table 2. The blind

TABLE 1. Neossoptiles per tract or region in two newly hatched chicks of the Cinnamon Flycatcher from the Coastal Cordillera of Venezuela.

Tract/Region	Number of Neossoptiles	
	Specimen 1	Specimen 2
Ocular	3/3*	4/3*
Coronal	10/10	10/12
Auricular	0/0	1/2
Occipital	6/5	5/6
Middorsal	10/11	11/11
Pelviç	4	1
Lateral Pelviç	0/0	0/3
Scapular	9/10	10/9
Femoral	10/8	8/9
Rectrix	6/6	6/6
Primaries	0/0	2/1
Greater Secondary Coverts	10/10	10/9
Middle Secondary Coverts	8/8	7/8
Total	147	

* Number of neossoptiles on right/left sides for all paired tracts or regions.
** Unpaired medial row, all other rows paired.

TABLE 2. Development of Cinnamon Flycatcher chicks from the Coastal Cordillera, Venezuela.

Day 1— 3	Chicks covered with short, dense tawny natal downs; skin yellow-orange, rictal flanges yellow, egg tooth white; chicks lay on sides with head curled down; faint peeping frequently heard during handling.
Day 4— 7	Primaries observable as dark dots under skin (day 4) and body contour feathers on day 5; primary pin feathers through skin on day 4—6 and contours on day 7; egg tooth still observable; eyes partially open (1/2 open on day 7); chicks try to right themselves by day 6.
Day 8—11	Dorsal contour feathers begin to erupt from their sheaths by day 9; eyes are fully open but usually kept closed; chicks can support themselves upright on tarsi by day 10 and attempt to escape during handling by day 11.
Day 12—16	Cinnamon/chestnut colored juvenal feathers emerg ing; adhering natal downs appear as tawny spots; contours emerged from sheaths for about 1/2 length
Day 17—20	Only mid dorsal and belly areas not covered by new contour feathers by day 17—18; primaries exceed length of secondaries in folded wing by day 18; chicks sitting more forward in nest and looking around by day 19; vocalizations, when handled, include short peeps and occasional adult-like buzzy trill.
Day 21	Young are active and "jumpy" when handled and showing tendency to leap from nest when replaced.
Day 22	Nest empty; young fledged.

helpless altricial young soon begin to develop the juvenal plumage; the pin feathers emerge through the skin by day 7, and erupt through their sheaths by day 10. By this time the eyes are open and the egg tooth has largely disappeared. By day 13—14 the cinnamon-colored juvenal contour feathers have largely covered the body of the chicks; by day 15 the still adhering tawny-colored natal downs provide lighter dots making the overall coloration cryptic. The incoming contour plumage has largely covered the body except for the mid ventral and belly area by day 17 and the remaining downs are being lost through abrasion. Some adult-like twittering vocalizations are emitted by day 19 and the young are capable of short flights from the nest a day or so before actual fledging on day 21.

Fledging. Details of fledging were observed for one brood in 1993. On day 20 one of two chicks left the nest in a cleft in the cement facade of Rancho Grande at 08:35 and flew to a 1.5-m-high wall 3 m from the nest. Both adults initially made excited fluttering flights near the fledgling, calling vigorously. Human activity nearby triggered agressive flights by the adults. After this human activity ended, the adults began to bring food to the fledgling; it was fed winged insects four times before it made a second flight to a nearby tree at 09:09. The second young bird left the nest, 27 minutes after the first one, flying to a tree 10 m away at 09:02. Both young birds were located in a tree 30—40 m from the nest site at 09:51 that morning. Both adults guarded the young with agressive flights directed at birds such as Groove-billed Toucanets (*Aulacorhynchus sulcatus*) and Russet-backed Oropendolas (*Psarcolius angustifrons*) and also tree squirrels (*Sciurus grisogena*) intruding near the fledglings. Observations were intermittent thereafter but the adults were observed feeding one of the two, now freely flying, young on 8 July, five weeks after the date of fledging when observations were discontinued. The duration of parental care in most passerines is poorly documented but this is a substantially longer period of parental care than the two to three weeks which has been documented for temperate zone passerine species (Gill 1990). However "in the tropics where long aprenticeships also seem necessary to develop feeding skills, some young passerines stay with their parents for 10 to 23 weeks" (Gill 1990: 376).

The data on nesting success of this flycatcher are sparse. Only one of three nests followed in detail in this study was lost to predation. At the time of predation the nest contained four day old chicks. This would be seem to be a higher nesting success than recorded for the Slate-throated Redstart, *Myioborus mineatus*, in which 5 of 6 nests located on the same sort of vertical banks were lost to predation in 1993 (Collins & Ryan 1994).

DEDICATION

This paper is dedicated to the late Paul Schwartz who by sharing his unequaled familiarity with the birds of Venezuela and their vocalizations made this paper possible.

ACKNOWLEDGMENTS

The Frank M. Chapman Fund of the American Museum of Natural History, the C. S. U. Long Beach Foundation,and Pomona Valley Audubon Society provided essential financial support for our field work in Venezuela. We are grateful to the government of Venezuela, INPARQUES, and PROFAUNA for permission to study in Parque Nacional Henri Pittier and to the Facultad de Agronomia, Universidad Central de Venezuela and Sociedad Cientifica Amigos del Parque Nacional Henri Pittier for use of their facilities. The Sociedad Conservacionista Audubon de Venezuela, Miguel Lentino, Clemencia Rodner, Juan Garcia, Ernesto Fernandez B. and Alberto Fernandez B. and their families provided much appreciated help and hospitality. The late Paul Schwartz contributed his photographs and sonographic analysis to this paper for which we are most appreciative.

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