

A NEW SPECIES OF OWL OF THE GENUS *BUBO*
FROM THE PLEISTOCENE OF CUBA
(AVES: STRIGIFORMES)

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Abstract.—*Bubo osvaldoi*, new species, is described from three bones from a Pleistocene cave deposit in the Sierra de Galeras, Pinar del Río, western Cuba, with two additional paratypes referred from Baire in the province of Santiago de Cuba, in the eastern part of the island. The species is the only representative of the genus *Bubo* and the tribe Bubonini in the Antilles and in size was larger than any living owl.

Resumen.—Se describe una especie nueva de búho, *Bubo osvaldoi*, de tres huesos del Pleistoceno hallados en una cueva de la Sierra de Galeras, en Pinar del Río, Cuba occidental, y de otros dos huesos paratipos procedentes de Baire, provincia de Santiago de Cuba, en el oriente de la isla. La especie es el único miembro del género *Bubo* y de la tribu Bubonini conocido hasta ahora en las Antillas y era mayor que cualquiera de las formas conocidas de búhos vivientes.

The Quaternary avifauna of Cuba is remarkable for the number and size of the extinct owls that have been discovered there (summarized by Arredondo 1976, 1982). These include the truly enormous strigids of the endemic genus *Ornimegalonyx*, of which four species have been named (Arredondo 1982), and two species of barn owls (*Tyto*) that far exceed in size any living species of Tytonidae. *Pulsatrix arredondoi* (Brodkorb 1969) is slightly smaller than its Neotropical relative *P. perspicillata*, but belongs to a genus otherwise unknown in the Antilles. It was previously known only from the type locality, Cueva Paredones in Habana Province, but Arredondo has recently identified a tarsometatarsus of *P. arredondoi* from Cueva Calero in Matanzas Province.

Here we present evidence of yet another very large extinct Cuban owl, amidst what could already have been regarded as a plethora. Our collaboration on this began when Arredondo forwarded for evaluation three fossil specimens from Pinar del Río, at the

western end of Cuba, along with a manuscript describing them as a new species of *Bubo*. This called to mind two enigmatic bones that Olson had studied some years previously that came from the former province of Oriente, at the opposite end of the island. These had originally been sent in January 1947 by Abelardo Moreno, then of the Museo Poey, to Alexander Wetmore, at the Smithsonian Institution. Wetmore had had a drawing made of these bones and left a folder of correspondence concerning them, but they remained unpublished. We have concluded that these probably belong to the same species as represented by the bones from Pinar del Río, which cannot be referred to any known species of owl, living or fossil.

Class Aves Linnaeus, 1758
Order Strigiformes Wagler, 1830
Family Strigidae Vigors, 1825

The fossil material treated below may be distinguished from *Tyto* (Tytonidae) by the



Fig. 1. Tarsometatarsi of strigid owls. A, anterior view of *Ornimegalonyx oteroi* (MNHN unnumbered, lacking distal end), showing the immense size compared to otherwise very large owls; B, C, D, posterior, anterior, and distal views of *Bubo osvaldoi*, new species, holotype (MNHN Cu-27, coated with ammonium chloride to enhance detail); E, anterior view of *B. bubo* (USNM 610384) female, largest available specimen of the species. Figures three-fourths natural size.

proportionately short, robust tarsometatarsus, the more anteroposteriorly expanded external condyle of the femur, and the shallower brachial depression of the humerus.

Genus *Bubo* Duméril, 1806

The Cuban fossils, although from a very large owl, are nonetheless dwarfed by the

gigantic Cuban owls of the genus *Ornimegalonyx*, in which the proportions of the tarsometatarsus are very different (Fig. 1). They are clearly referable to the group of largest strigid owls (Tribe Bubonini) that includes the genera *Bubo*, *Nyctea*, *Ketupa*, and *Scotopelia*, concerning which Ford (1967:82) wrote: "Each of these genera has some osteological characteristics by which

it can be separated, but the differences are not great and it is questionable as to whether or not they actually warrant separation." We would echo these sentiments, as we likewise find little in the osteology of at least *Nyctea* or *Ketupa* that would merit separating them from *Bubo* (we did not examine skeletons of *Scotopelia*). *Ketupa* and *Scotopelia* are Asian and African genera, respectively, whose traditional generic characters involve external aspects of the feet that are adaptations for fishing. *Nyctea* is hardly more than a *Bubo* adapted to life in Arctic tundra. On geographical grounds alone, *Bubo* is the only genus of Bubonini likely to have colonized Cuba, and we find nothing in the Cuban fossils to suggest a closer relationship to any of the other owls of that tribe than to *Bubo*. In *Strix nebulosa*, the largest New World member of the Strigini, the femur and humerus are proportionately much more elongate and gracile, the wing of the inner trochlea is less pronounced, and the attachment of *M. tibialis anticus* is more distinct and raised than in the Cuban fossils, which conform with *Bubo* in all these respects.

Bubo osvaldoi, new species
Figs. 1-4

Holotype.—Right tarsometatarsus of an adult lacking the proximal end above the attachment for *M. tibialis anticus* (Fig. 1B, C). Deposited in the Museo Nacional de Historia Natural de Habana (MNHNCu-27.1).

Type locality.—Cueva del Mono Fósil, southern side of the Sierra de Galeras, Cordillera de Guaniguanico, Municipality of Viñales, Province of Pinar del Río, Cuba. This is also the type locality of the fossil platyrrhine monkey *Paralouatta varonai* (Rivero and Arrédon, 1991).

Age.—Quaternary, probably Pleistocene, at least as judged by the mineralization and associated fauna of the holotype and topotypes.

Measurements of holotype (mm).—Length from distal end of attachment of *M. tibialis anticus* to trochleae, 63.3; least width of shaft, 11.9; depth of shaft at midpoint, 7.8; distal width across trochleae, 24.8; depths of inner, middle, and outer trochleae, 12.1, 9.8, 14.9.

Topotypical paratypes.—Complete right femur, lacking the internal condyle and abraded about the trochanter, MNHNCu 27.3 (Fig. 2B). Shaft of left tarsometatarsus, lacking the proximal portion and the digital trochleae, MNHNCu-27.2. These specimens and the holotype appear to be very heavily mineralized and are blackish in color, mottled with orangish brown. The paratypical tarsometatarsus is from an individual slightly larger than represented by the holotype and the specimen is highly polished and evidently water worn.

Additional paratypes.—Right femur lacking internal condyle, anterior surface of head, and a piece out of the posterior face of the shaft, USNM 447022 (Figs. 2A, 3A-C). Left humerus lacking proximal end and the external part of the distal articulation, USNM 447023 (Figs. 3D, 4B). The only information we have concerning these specimens is that they came from a "mine" (perhaps a cavern exposed in roadwork or similar activity) in the vicinity of Baire, Oriente Province (now in the Provincia de Santiago de Cuba). They are creamy white in color and are very light to the touch, as though lacking organic constituents, perhaps through leaching. The same site is the type locality of the sloth *Neocnus baireiensis* Mayo (1980), described from material presumably collected at the same time as the owl bones and for which there is likewise no more precise information.

Measurements of paratypes (mm).—Tarsometatarsus MNHNCu-27.2: least width of shaft, 11.5; depth of shaft at midpoint, 7.2 (worn). Femur MNHNCu-27.3: length, 101.5; proximal width 22.7; depth of head 9.4; width and depth of shaft at midpoint, 9.8 × 9.4; depth through external condyle,

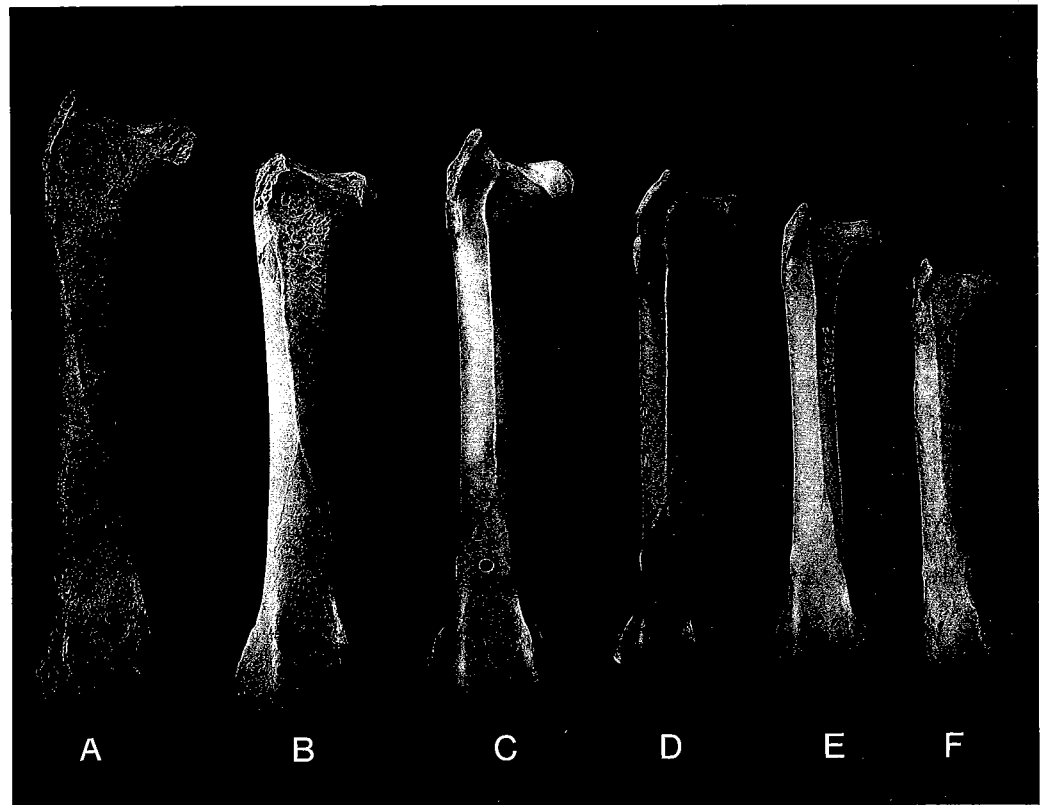


Fig. 2. Femora of *Bubo* in anterior view. A, *B. osvaldoi*, new species (USNM 447022); B, *B. osvaldoi*, new species (MNHN 27.3, coated with ammonium chloride to enhance detail); C, *B. bubo* (USNM 610384) female, largest available specimen of the species; D, *B. bubo* (USNM 343007) male; E, *B. virginianus* (USNM 501314) female; F, *B. virginianus* (USNM 555903), male. Size differences between the two femora of *B. osvaldoi* are closely comparable to those between sexes in other species of the genus. Note the different position of the intermuscular line in *B. osvaldoi*. Figures three-fourths natural size.

19.0. Femur USNM 447022: length, 112.4; proximal width 27.7; depth of head 10.3; width and depth of shaft at midpoint, 11.5×9.9 ; depth through external condyle, 21.9. Humerus USNM 447023: length from distal end of pectoral crest to entepicondyle, 99.1; length (diagonal) of brachial depression, 17.6.

Etymology.—The species is dedicated to the discoverer of the specimens from Pinar del Río, Osvaldo Jiménez, speleologist and amateur paleontologist.

Diagnosis.—Larger than any modern species of Bubonini (Table 1), which includes the largest modern owls. Distal foramen of

tarsometatarsus much larger. The intermuscular line on the anterior face of the shaft of the femur is unique in originating at the distal end of the trochanteric crest and running diagonally across the shaft, whereas in *Bubo* and other owls examined the line originates at the neck of the femur or near the trochanter and runs parallel, or nearly so, to the sides of the shaft (Fig. 2). Humerus small relative to the hindlimb.

Comparative material examined.—Skel-
etons from the collections of the National
Museum of Natural History, Smithsonian
Institution (USNM) as follows: *Bubo bubo*
(4 males, 1 female, 1 unsexed, 1 female

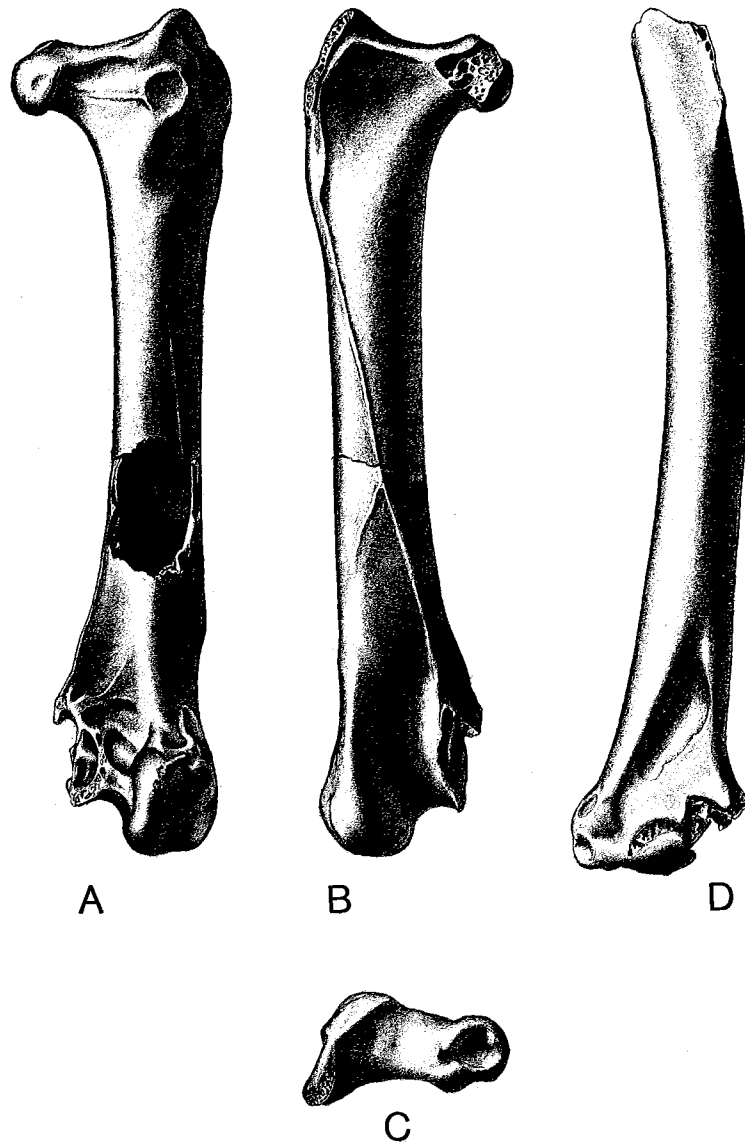


Fig. 3. Drawings of the two paratypes of *Bubo osvaldoi*, new species, from Baire, Santiago de Cuba: A, femur in posterior view (USNM 447022); B, same, anterior view; C, same, proximal view; D, humerus in palmar view (USNM 447023). Natural size.

trunk; Sweden, Greece, and Korea), *Bubo virginianus* (6 males and 6 females; Pennsylvania, District of Columbia, Florida, Minnesota, New Mexico, Arizona, and California), *Bubo africanus* (2 males, 4 females, and 1 male trunk; Sudan, Tanzania, Zimbabwe, and Transvaal), *Bubo lacteus* (1 male

and humeri of a female; Kenya and Zimbabwe), *Bubo philippensis* (1 female; Luzon), *Bubo sumatrana* (1 unsexed; Borneo), *Ketupa ketupu* (1 female and 1 female trunk; Borneo and Java), *Ketupa blakistoni* (1 unsexed; Japan), *Ketupa zeylonensis* (2 females and 1 unsexed; Thailand and un-

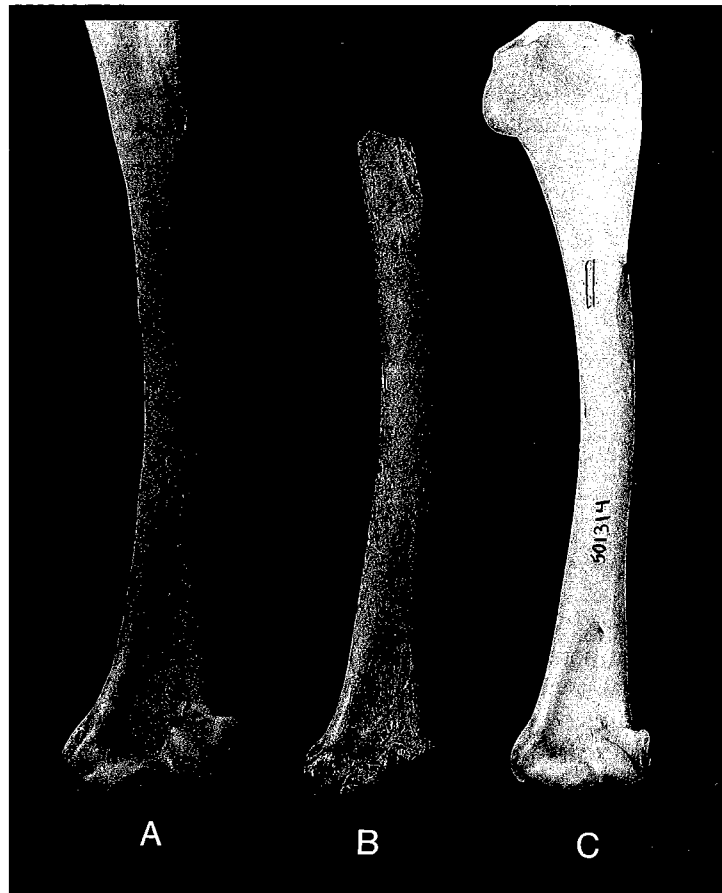


Fig. 4. Humeri of *Bubo* in palmar view. A, *B. bubo* (USNM 610384) female, largest available specimen of the species; B, *B. osvaldoi*, new species (USNM 447023); C, *B. virginianus* (USNM 501314), female. Figures three-fourths natural size.

known localities), *Nyctea scandiaca* (2 males and 2 females; Alaska, Maryland, and District of Columbia). The following specimens of *Scotopelia* in the American Museum of Natural History were measured and examined for us: *S. peli* (2 unsexed; Zaire), *S. bouvieri* (1 unsexed; Zaire), *S. ussheri* (1 female; Sierra Leone).

Comparison with other fossil species.—The only other extinct insular species of *Bubo* is *B. insularis* from Corsica and Sardinia, which was described as being smaller than *B. bubo* (Mourer-Chauviré & Weesie 1986), and hence is even smaller than *B. osvaldoi*. As ascertained from the review in Mourer-

Chauviré & Weesie (1986), most of the other fossil species attributed to the genus *Bubo* are smaller than *B. insularis*. According to Brodkorb & Mourer-Chauviré (1984), *Bubo sinclairi* L. Miller, based on scanty and poorly preserved material from Quaternary cave sites in California, falls within the range of size variation of *B. virginianus* and is probably a synonym of that species.

Bubo floriana Kretzoi, 1958, is based on a pedal phalanx from the early Pliocene of Hungary that probably falls within the range of size variation of *Bubo bubo* (Jánossy 1977). *Bubo bubo davidi* (Mourer-Chauviré 1975) was described from the Pleistocene

Table 1.—Selected measurements of large owls (Strigidae) compared with *Bubo osvaldoi*, new species. For numbers of specimens see Comparative Material Examined. FEM = length of femur. HUM = length of humerus from distal end of pectoral crest to entepicondyle. TMT 1 = length of tarsometatarsus from distal end of attachment of M. tibialis anticus to trochleae. TMT 2 = width of tarsometatarsus across trochleae.

Species	FEM	HUM	TMT 1	TMT 2
<i>Bubo osvaldoi</i>	101.5–112.4	99.1	63.3	24.8
<i>Bubo bubo</i>	93.5–104.5	97.7–110.7	46.6–50.4	18.9–23.0
<i>Bubo virginianus</i>	75.1–86.1	76.9–89.7	36.5–41.0	16.1–19.2
<i>Bubo africanus</i>	64.5–72.2	69.6–74.6	42.0–52.4	13.1–13.9
<i>Bubo lacteus</i>	91.1	104.9–106.4	46.4	23.1
<i>Bubo philippensis</i>	77.2	85.0	43.0	20.8
<i>Bubo sumatrana</i>	60.6	75.3	28.2	17.5
<i>Ketupa ketupu</i>	75.9–78.9	81.8	51.1	15.9
<i>Ketupa blakistoni</i>	102.7	116.7	48.7	21.2
<i>Ketupa zeylonensis</i>	82.0–97.1	87.3–104.1	52.4–56.1	16.3–19.9
<i>Nyctea scandiaca</i>	83.8–92.6	92.8–102.4	28.3–32.0	17.6–20.2
<i>Scotopelia peli</i>	92.1–96.2	—	—	22.2
<i>Scotopelia bouvieri</i>	65.3	—	—	13.2
<i>Scotopelia ussheri</i>	73.8	—	—	14.2

of France as a larger temporal form of the modern species, although there is overlap, particularly with the largest specimen of *Bubo bubo* that we examined, which exceeds any of those reported by Mourer-Chauviré (1975). There were otherwise no qualitative differences shown by the fossil form and it cannot, therefore, be identified with the Cuban bird.

Bubo binagadensis Burchak-Abramovich, 1965, from the Pleistocene of Azerbaijan, was described from a femur that was said to be not less than the size of that in the eastern forms of fishing owls (genus *Ketupa* assumed, although we may wonder if Burchak had access to any comparative material) and much larger than in *Bubo bubo*. Neither illustrations nor measurements accompanied the description, only some indecipherable “indices of massiveness,” so we cannot determine anything further about this taxon at present.

Discussion.—Although bubonine owls are diverse in the Old World, only two taxa occur today in the New World—the Snowy Owl (*Nyctea scandiaca*), which is circumpolar in the high Arctic, and the Great

Horned Owl (*Bubo virginianus*), which has probably the greatest latitudinal breeding range of any bird in the world, nesting from northern Canada and Alaska to Tierra del Fuego. It does not occur in the West Indies, however, and *Bubo osvaldoi* is thus the first and only member of the Bubonini recognized in the Antilles.

In size, *Bubo osvaldoi* exceeds any living owl (Table 1), there being no overlap in tarsal measurements. The smaller of the two fossil femora is exceeded only by the one unsexed specimen of *Ketupa blakistoni* and by the largest female specimen available of *Bubo bubo*. As females are the larger sex in owls, if we assume that the small fossil femur is from a male, then on a sex per sex basis there would probably be no overlap in any hindlimb measurements between *Bubo osvaldoi* and living owls. The humerus in *B. osvaldoi*, however, falls within the size range of several of the larger species of owls (Table 1), suggesting that the wing in this insular form may have been reduced relative to the overall size of the bird.

There is considerable variation in proportions of the hindlimb, especially the tar-

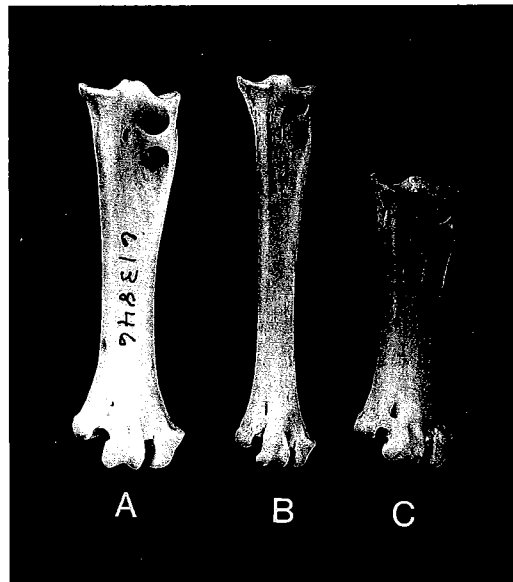


Fig. 5. Tarsometatarsi of *Bubo* in anterior view to show the great differences in proportions between various species. A, *B. virginianus* (USNM 613846); B, *B. africanus* (USNM 490288); C, *B. sumatranus* (USNM 559827). Figures three-fourths natural size.

sometatarsus, in *Bubo*. Compared to *B. bubo*, the tarsometatarsus in *B. africanus*, for example, is quite long and slender, whereas that in *B. sumatranus* is extraordinarily short and stout (Fig. 5). That of *B. osvaldoi* is of more typical proportions and is similar to that of *B. bubo*.

It is not necessary to assume that *B. osvaldoi* is most closely related to *B. virginianus* simply because the latter is the only geographically proximate bubonine in the New World. Olson (1984) reported a mandibular symphysis of a very large owl from the Pleistocene at Ladds, Georgia, that surely represents a species otherwise as yet unknown in North America. Although this specimen seemed to be more similar in morphology to *Strix* than to *Bubo*, it is not very diagnostic. Regardless, it indicates that extinct lineages of large owls remain to be discovered in the fossil record of North America, so that a progenitor of *B. osvaldoi*

from a lineage other than that giving rise to *B. virginianus* may yet be found.

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