

The significance of Buffon and Guéneau de Montbeillard's *Histoire naturelle des oiseaux* ([1765]-1783) in the taxonomy of birds: General presentation and correspondence between Buffon's "eagles" and the species acknowledged by Linnaeus (1758, 1766), Brisson (1759-1762), and Gmelin (1788-1789)

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Plate IV: "le Jean-le-Blanc", by De Sève, in Buffon & Guéneau de Montbeillard (1771a). Both represented (lost) specimens belong to the type series of *Falco gallicus* J. F. Gmelin, 1788. Credits: Musée Buffon, Montbard.

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The significance of Buffon and Guéneau de Montbeillard's *Histoire naturelle des oiseaux* ([1765]-1783) in the taxonomy of birds: General presentation and correspondence between Buffon's "eagles" and the species acknowledged by Linnaeus (1758, 1766), Brisson (1759-1762), and Gmelin (1788-1789)

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ABSTRACT

Georges-Louis Leclerc de Buffon and his collaborator Philibert Guéneau de Montbeillard (hereafter Guéneau), published a monumental nine-volume *Histoire naturelle des oiseaux* ("Natural history of birds") from 1771 to 1783, as a part of a more general, unfinished project of a complete description of nature. It was the most exhaustive work on birds of its time, dealing with all the species then known, and describing a lot of new species present, among others, in the rich collection of the *Cabinet royal* (the institution renamed "Muséum national d'Histoire naturelle" in 1793). This collection, now almost completely lost, included many specimens inherited from Réaumur's cabinet, which had previously served as the basis for another comprehensive treatise on birds, Mathurin Jacques Brisson's *Ornithologie* (1759-1762). In addition to the nine quarto volumes of the *Histoire naturelle des oiseaux*, illustrated with 262 black and white copperplates, Buffon also published, from 1765 to 1780, 973 *Planches enluminées* (hand-colored copperplates) drawn by François-Nicolas Martinet (who had also illustrated Brisson's work) and meant to be included in the ten large-format volumes of a limited edition of the *Histoire naturelle des oiseaux*, published from 1771 to 1786. Although Buffon rejected the binomial nomenclature introduced by Linnaeus in zoology in 1758, the *Histoire naturelle des oiseaux* and the *Planches enluminées* had a major influence in bird taxonomy, and they have been, and still are cited in discussions on the definition of species and subspecies to this day, not least since Gmelin and other authors named most Buffon's species, resulting in his specimens or series being holotypes or syntypes. The aims of this and the following articles are, firstly, to retrace the history of this work, to place it in the history of ornithology and to present Buffon's views on classification and nomenclature, in order to provide essential reading keys for approaching the *Histoire naturelle des oiseaux* in taxonomical studies. Secondly, we review all the species and "varieties" addressed by Buffon and Guéneau, and we establish their relation with the species and "varieties" of Brisson (1759-1762) and of the last editions of the *Systema naturæ* published by Linnaeus (1758, 1766) and Gmelin (1788-1789). We propose, as far as possible, an identification of the species, and we discuss, when applicable, the role of Buffon and Guéneau (as well as Brisson) in the taxonomic history of each species. As we follow the order of Buffon's work, this first paper focuses on the group of Buffon's "eagles", which partly corresponds to the genus "Aigle" or "Aquila" of Brisson and to the genus "Falco" of Linnaeus and Gmelin, and mostly comprises Accipitriformes.

KEY WORDS

Planches enluminées,
Buffon's conceptions on
species and classification,
Aquila Brisson, 1760,
nomenclature,
types,
historical taxonomy,
Cabinet royal,
Accipitriformes.

RÉSUMÉ

L'importance de l'Histoire naturelle des oiseaux ([1765]-1783) de Buffon et de Guéneau de Montbeillard dans la taxonomie des oiseaux : présentation générale et correspondance entre les "aigles" de Buffon et les espèces reconnues par Linné (1758, 1766), Brisson (1759-1762) et Gmelin (1788-1789).

Georges-Louis Leclerc de Buffon et son collaborateur Philibert Guéneau de Montbeillard, publièrent de 1771 à 1783 une monumentale *Histoire naturelle des oiseaux* en neuf volumes, composante d'un projet plus général (resté inachevé) d'une description totale de la nature. Il s'agit de l'ouvrage le plus complet de son temps sur les oiseaux, qui traite de toutes les espèces connues à l'époque et décrit un grand nombre d'espèces nouvelles, s'appuyant notamment sur la riche collection du Cabinet royal (l'institution rebaptisée "Muséum national d'histoire naturelle" en 1793). Cette collection, aujourd'hui presque entièrement disparue, comprenait de nombreux exemplaires hérités du cabinet de Réaumur, qui avaient auparavant servi de base à un autre traité exhaustif sur les oiseaux, l'*Ornithologie* de Mathurin Jacques Brisson (1759-1762). En plus des neuf volumes in-quarto de l'*Histoire naturelle des oiseaux*, ornés de 262 planches gravées en noir et blanc, Buffon fit publier séparément, de 1765 à 1780, 973 *Planches enluminées* (gravures peintes à la main) réalisées par le dessinateur François-Nicolas Martinet (qui avait déjà illustré l'ouvrage de Brisson) et destinées à être insérées par la suite dans une édition limitée de l'ouvrage en 10 volumes de grand format, parus de 1771 à 1786. Bien que Buffon ait rejeté la nomenclature binomiale introduite par Linné en zoologie en 1758, son ouvrage, tant le texte que les *Planches enluminées*, a eu une grande importance dans la taxonomie des oiseaux, et il a été cité continuellement jusqu'à nos jours, dans des discussions portant sur la définition d'espèces et de sous-espèces, en particulier parce que Gmelin et d'autres auteurs ont donné des binoms à la plupart des espèces de Buffon, ce qui a fait de ses spécimens ou séries des holotypes ou des syntypes. Les buts de cet article et des suivants sont, premièrement de retracer l'histoire de cet ouvrage, de le replacer dans l'histoire de l'ornithologie et de présenter la pensée scientifique de Buffon en matière de classification et de nomenclature, afin de procurer des clefs de lecture indispensables pour aborder l'*Histoire naturelle des oiseaux*; deuxièmement, de passer en revue toutes les espèces et « variétés » traitées, d'établir les concordances avec Brisson (1759-1762), ainsi qu'avec les dernières éditions du *Systema naturæ* publiées par Linné (1758, 1766) et Gmelin (1788-1789), de proposer dans la mesure du possible une identification des espèces et « variétés » et de discuter le rôle éventuel de Buffon et de Guéneau (ainsi que de Brisson) dans l'histoire taxonomique de chaque espèce. Nous suivrons l'ordre de Buffon, et ce premier article portera par conséquent sur le groupe des « aigles » de Buffon, correspondant partiellement au genre « Aigle » ou « *Aquila* » de Brisson et au genre « *Falco* » de Linné et de Gmelin, et comprenant principalement des Accipitriformes.

MOTS CLÉS

Planches enluminées,
conceptions de Buffon
sur l'espèce et la
classification,
Aquila Brisson, 1760,
nomenclature,
types,
taxonomie historique,
Cabinet royal,
Accipitriformes.

INTRODUCTION

This paper is the first of a series devoted to the presentation of Buffon and his collaborators's *Histoire naturelle des oiseaux* (hereafter *HNO*) and its significance in the history of bird taxonomy. This work, published from 1771 to 1783 (and colored plates from 1765 to 1780), is of particular interest for several reasons. Firstly, the nine quarto (or ten folio) volumes of the *editio princeps*, aiming at an exhaustive description of all the species known in Buffon's time, as well as a great number of new species, are one of the most important contributions to the ornithology of the late Enlightenment, even if only from a quantitative standpoint. Secondly, the *HNO* (text and plates) is largely based on one of the richest collections of mounted birds of the eighteenth century, the cabinet of the Jardin du Roi (today the Muséum national d'Histoire naturelle), of which Buffon was the director from 1739 to his death in 1788. This collection was considerably augmented during that period, thanks to the influx of birds inherited or sent by correspondents. Most of it definitively disappeared as early as the nineteenth century (Steinheimer

2005; Gouraud 2014; Jansen 2015), and therefore Buffon's work is an invaluable (although ambiguous, as we shall see) source on this lost material which included many types. Thirdly, the visual corpus accompanying the text comprised nearly one thousand "illuminated" (hand-painted) plates (*Planches enluminées*: hereafter *PE*), most of which are accurate enough to be used in today's taxonomical discussions. Fourthly, even though Buffon rejected binomial nomenclature, as well as all the Linnaean approach, his ornithological work impacted taxonomy at two different levels. On the one hand, many species described in the *HNO* received a Linnaean name from other naturalists (including Statius Müller, Boddaert, and Gmelin) as soon as the 1770s or 1780s. On the other hand, Buffon's criticism against Linnaeism had deep long-term consequences, because it relied on original reflections on species which led him close to the Biological Species Concept (Mayr 1942), and because he emphasized issues relatively neglected by contemporary scientists (population dynamics and intraspecific variability, influence of climate, biogeography, etc.), which contributed to the emergence of the evolutionary theory (Farber 1972; Sloan

1972, 1973, 1976; Schmitt 2010, 2020). Lastly, Buffon had a comprehensive approach of ornithology, and, in addition to the mere description of species, he provided many other kinds of information, e.g., on reproduction, alimentation, distribution, or behavior, which made his work an impressive corpus of data on birds, with no equivalent until the late twentieth century.

In this series of papers, we make an inventory of all species and “varieties” reported in the *HNO* and we provide their correspondence with those described in four other contemporary works that also aimed to list the bird species exhaustively and are of prime importance in historical taxonomy. Three of them are editions of Linnaeus’s *Systema naturae* (hereafter *SN*): the tenth edition (Linnaeus 1758), which marks the starting point of zoological nomenclature (ICZN 1999: 4, Article 3); the twelfth edition (Linnaeus 1766), the last published by Linnaeus himself, in which many new species are named; and the so-called “thirteenth edition”, published by Johann Friedrich Gmelin from 1788 to 1793 (the birds are in the first two parts of the first volume, published in July 1788: 1-500, and April 1789: 501-1032; see Hopkinson 1907), which includes more new species described, among others, in the *HNO*. The fourth work, Brisson’s *Ornithologie* (1759-1762), is also of prime importance here. Its six large volumes, published from 1759 to 1762 (although the date on the title page of each of the six volumes is 1760; see Mlíkovský 2023: 2112-2113 for the volumes 1, 2, 5, 6; and Anonymous 1760 for the volumes 3 and 4), in French and in Latin, were the most complete ornithological work before the *HNO*, compiling all species and varieties previously mentioned in the literature and adding a considerable number of new (or supposedly new) birds, described from specimens observed in the huge collection of René-Antoine Ferchault de Réaumur or in other Parisian cabinets of natural history (see Farber 1982: 8-15). Many of them were cited as the basis of nomenclatural acts by Linnaeus and Gmelin in the last editions of the *SN*. Brisson’s work has a lot in common with that of Buffon. Firstly, the bulk of Réaumur’s collection was inherited by the *Cabinet du Roi* after his death (1757), so that Buffon and his collaborators often worked on the same specimens as Brisson: it is all the more interesting that the latter often gives much more information on the origin of the specimens and on the donors than the *HNO* does. Secondly, the same draftsman and engraver (François-Nicolas Martinet) carried out the plates of the *Ornithologie* and the *PE*. Thirdly, Buffon was very influenced by Brisson’s classification, even though he did not acknowledge it explicitly, and almost all the species reported in the *Ornithologie* are addressed or, at least, mentioned in the *HNO*. As a result, although the *Ornithologie* was subsequently eclipsed by the considerable success of the *HNO*, it should be emphasized that much of the latter, in terms of taxonomic and descriptive aspects, derives from Brisson’s earlier work.

It is important to note that, in this paper, most of the names we cite are of historical rather than taxonomic value (except in the parts specifically devoted to identification and nomenclature), which is why we always enclose them in quotation

marks. Even names published from 1758 onwards by Linnaeus, Gmelin, etc., and which currently do have taxonomic value, are mostly considered here from a historical point of view (except, again, in the parts devoted to identification and nomenclature): to avoid any ambiguity, they too are enclosed in quotation marks.

Similarly, we mostly use the term “variety” (not “subspecies”) to designate the taxonomic rank lower than species in the texts of the 18th century. This is, in fact, the notion used by Linnaeus, Brisson, Buffon, and Gmelin. Buffon, in particular, discusses at length the nature of “variétés”, their appearance within a species, and their changes in response to various factors (he also uses the French term “race”). As a consequence, the word “variety” in this paper has a purely historical value, and it has nothing to do with modern taxonomy. Also the concept of subspecies emerged much later, and it would be anachronistic to apply it in cases relating to the 18th century; but we use it in our discussions on modern taxonomy. The connection between the historical concept of “variety” and the scientific concept of subspecies only occurs under two conditions: firstly, a variety has been named by an 18th-century author (which is not always the case: for instance, Linnaeus and Gmelin generally only designate “varieties” by Greek letters); secondly, the name in question has been recognized as valid by modern nomenclature (in accordance with articles 10.2 and 45.6.4 of the *International Code of Zoological Nomenclature*, hereafter the *Code*). Under the *Code*, references in published works to names introduced as varieties in this period are required to be treated as if they were trinomials.

For each species or “variety”, we indicate the material and textual mentioned sources by the considered author, namely, the specimen(s) he observed (if applicable), and the references he provided. We also propose identifications when possible, we discuss the confusions in species correspondences as indicated by the authors, and, where appropriate, we specify the direct or indirect role of each author in the current taxonomy of bird species and subspecies. We include in our study the few species and “varieties” acknowledged by Brisson (1759-1762) or Linnaeus (1758, 1766) but absent from the *HNO*. As for the supraspecific classification, we briefly retrace the history of each group (especially genera) from the 16th to the late 18th century, and we compare it with the currently accepted taxa.

In the first part of the paper, we give a general presentation of the *HNO*, we situate it in the context of Buffon’s career and of the history of ornithology, and we expound the principles of Buffon’s thought on species, classification, and nomenclature. Then, we begin the inventory of the species with the first group considered by Buffon, namely, the “eagles” in the larger sense.

THE *HNO* IN BUFFON’S LIFE AND WORK

Buffon’s interest towards birds appeared lately in his career (Roger 1989). He was born in Montbard (Burgundy) on September 7th, 1707, in a family of magistrates, and he would have followed this path had he not showed a strong

interest for mathematics, especially probability and calculus. His research in this field (not least the famous problem that became known as “Buffon’s needle”) granted him admission, in 1733, to the prestigious *Académie royale des Sciences* of Paris. There, he undertook experimental studies on various subjects, such as rockets, burning mirrors, the physical properties of the wood, and silviculture (Hanks 1966). He had, at that time, no expertise in natural history: it was, thus, a surprise when, thanks to the support of the comte de Maurepas, he was appointed “intendant” (director) of the *Jardin du Roi* in 1739, an institution he ran until his death (April 16th, 1788), increasing its collections and developing its international influence considerably.

This appointment had a major impact on Buffon’s scientific research since he was put in charge of carrying out a catalogue of the collections of the *Cabinet du Roi*. From this starting point, he elaborated a much more ambitious project. When the advertisement of the *Histoire naturelle* was published, in 1748, it was already very different from the initial idea, since it announced not only the description of the royal collections, but also a complete treatise on natural history in fifteen volumes, with general texts and monographs on all natural objects, from man to minerals. In this scheme, only two volumes would have been devoted to quadrupeds (i.e., non-cetacean mammals; Linnaeus introduced the class of “*Mammalia*” only in 1758, and Buffon refused it, like the whole Linnaean system), and one to birds (Buffon 2007: 847-848).

In fact, when the first three volumes appeared, in 1749 (with the title *Histoire naturelle, générale et particulière, avec la Description du cabinet du Roi*, Buffon & Daubenton 1749-1767), they only included general issues (principles of the scientific method, geology, theory of reproduction, etc.) and the natural history of man. Buffon realized only gradually that, despite the help of a collaborator, Louis-Jean-Marie Daubenton (who wrote the anatomical description of the animals and the inventory of the related objects of the *Cabinet royal*), the task was considerably huger than he had imagined at the beginning, in particular because of the very numerous exotic species, the diversity of which he had probably not got the measure. Twelve volumes (four to fifteen), published from 1753 to 1767, were eventually needed to cover all known species of viviparous quadrupeds. At that point, Buffon decided to divide his work into separate series: besides the fifteen first volumes, he was able to publish the nine volumes of the *HNO* (see below), the *Histoire naturelle des minéraux* (five volumes, 1783-1788), and seven additional volumes of *Supplément* on geology, man, and quadrupeds (1774-1789). All the other animals and the plants were missing. From 1788 to 1804, Bernard-Germain de Lacépède published eight further volumes on oviparous quadrupeds, snakes, cetaceans, and fishes, which are sometimes considered a part of Buffon’s *Histoire naturelle*.

The *Histoire naturelle* was extremely successful and continuously republished, completely or partially, in French as well as in most other European languages, until the late 19th century. It was, as much as Diderot and D’Alembert’s *Encyclopédie*, emblematic of the French science and philoso-

phy of the Enlightenment and exerted a strong influence in fields as diverse as anthropology, geology, and zoology. The rich illustration of the 36 quarto volumes of the first edition, comprising more than one thousand etched plates in black and white, most of which drawn by Jacques De Sève, also had a significant impact in the visual representation of animals for decades.

The case of the *HNO* is particular, as a result of the complex history of its publication. As a matter of fact, as Buffon was about to finish the part on quadrupeds, he seems to have hesitated regarding his publication strategy for the rest of zoology, and his perplexity was reflected in the successive transformations of the project in the 1760’s (Schmitt 2021). Around 1764, he had to admit that it was not possible to reproduce for birds and for other animals what had been done for quadrupeds. He came to the conclusion that it was necessary to reduce the quantity of text drastically, to discard the anatomical and museological parts (that is, Daubenton’s contributions), and, possibly, to address a selection of species only. Furthermore, he decided to grant more importance to the illustration and to publish illuminated plates, that is, black and white copperplates painted by hand.

The *Planches enluminées* were published from spring 1765 in sets (“cahiers”) of 24 with no text. The first sets represented mostly birds, but also some other animals (reptiles, insects, and corals). Two sizes of sheets were available (“petit papier” and “grand papier”), the size of the figure itself being the same in both. It was evident that both formats were too large to be included in volumes similar to the previously published quarto volumes of the *Histoire naturelle*. However, at that point, the exact nature of the accompanying text to be published remained unclear. On average, three or four sets were published each year, until the 42nd in October 1780 (there are, thus, 1008 plates in total, 973 of which represent birds). From summer 1766 onward (fifth set), only birds were represented on plates. The reason was that Buffon changed his mind and decided not only to focus on ornithology, but also to produce a significant text on birds, not as bulky as for the quadrupeds, but detailed enough and treating not only the species illustrated on the *PE*, but all known species comprehensively. The help of new collaborators (Guéneau de Montbeillard and Bexon) was decisive in the development of this project.

However, a problem arose: considering the great number and the very high price of the illuminated plates, it was not possible to produce more than 450 copies of each (150 in “grand papier”, 300 in “petit papier”: see Buffon 1971: 144-149). Therefore, the print run of the folio volumes in which the *PE* had to be inserted was necessarily much lower than for the quarto volumes of the first series of the *Histoire naturelle*, which had been sold in thousands of copies each. Thus Buffon, probably in concertation with the publisher, resolved to publish two parallel editions. First, to accompany the colored plates that had been being sold since 1765, ten folio volumes were published from 1771 to 1786 (Buffon & Guéneau de Montbeillard 1771-1786): people who had bought the plates previously had to insert them at the proper place

in each volume before binding it. Two sizes of folio volumes were available, corresponding to the two sizes of the plates: the “small folio” volumes have the same text and pagination as the “large folio” volumes (the only differences being the size of the margins and the presence of ornamented frames on the “large folio” pages), and they should not be confused with the quarto volumes, whose number and pagination are different. Second, for people who did not own the colored plates, nine quarto volumes similar to the fifteen volumes of the first series of the *Histoire naturelle* were published from 1771 to 1783, with black and white copperplates by De Sève, different from (and much fewer than) the illuminated plates (Buffon & Guéneau de Montbeillard 1771-1783). These nine volumes are far more widely disseminated than the folio ones. They are similar to those of the other series of the first edition of the *Histoire naturelle* (including the volumes on minerals and the *Supplément*), and, on their half-title pages, they are numbered as the continuation of the first, fifteen-volume series (vol. 1 of *HNO* being vol. 16 of *Histoire naturelle, générale et particulière*, etc.). Consequently, they are generally considered the reference edition of the *HNO*. In this paper, we always refer to the quarto volumes unless otherwise specified.

The text is the same in the quarto and folio editions, but the pagination and the division into volumes are obviously different. There are also some minor variations in the organization (the hummingbirds and the parrots are just after the nighthawks in the illuminated edition, after the treecreepers in the quarto edition), and the instructions relating to the insertion of the *PE* are, of course, absent from the quarto volumes. Interestingly, while De Sève's plates are mentioned only (if ever) in the text of the quarto edition, both editions refer to the illuminated plates, which are considered an essential part of the work, to be seen even by people who do not own it, as Buffon clearly says (Buffon & Guéneau de Montbeillard 1771a: ix-x).

The existence of two parallel editions and the separate publication of illuminated plates result in some dating complexities. The case of the text is relatively simple since the quarto and folio volumes are dated on the title page. However, it should be noted, firstly, that there can be some discrepancy between this date and the actual date of publication (for example, the vol. 1 of the quarto edition and the small folio appeared at the beginning of 1771, as revealed by reviews in journals, whereas the year on the title page is 1770: see Schmitt 2021: 38); and, secondly, that a given text could appear in different years in the quarto and in the folio editions: in that case, the quarto edition was generally published earlier, with the exception of the chapters from the “choughs” to the “orioles” (in the vol. 3 of the quarto edition, published at the beginning of 1775, and the vol. 3 of folio edition, published at the end of 1774), and from the “serins” to the “siskins” (in the vol. 4 of the quarto edition, published at the beginning of 1778, and the vol. 4 of folio edition, published at the end of 1777). As for the *PE*, their dates of publication can only be estimated from information retrieved from journals such as the *Mercur de France* or

the *Journal des Sçavans*, with a variable degree of precision, since a few weeks or even months could elapse between the publication and the review (see Schmitt 2022a).

Even though the black and white quarto plates are not as significant as the *PE* scientifically, it is worthwhile considering them in more detail also. All of them are drawn by De Sève and etched by various engravers who have already contributed to the illustration of quadrupeds in the *Histoire naturelle*, and they are stylistically very similar to the plates of the first fifteen volumes. There are 262 of them, with only one, in general, per bird “genus”. Except in a few cases (like the “sacre”, a raptor: see Buffon & Guéneau de Montbeillard 1771a: plate XIV), every bird illustrated in black and white is also represented in the *PE*. The black and white plates are almost never discussed in the text. Unlike the colored plates, they show an elaborate scenery which includes vegetation, landscape, cloudy sky, human constructions, etc. They are undeniably well-groomed, and the birds are quite accurately represented (as are the quadrupeds in the first series). However, it is clear that Buffon did not grant as much scientific value to them as the illuminated plates, because of the importance of color in the description of bird species.

THE MAKING OF THE *PE*

Many actors were involved in the making of the *PE*. The whole process was under the supervision of Edme-Louis Daubenton or “Daubenton le Jeune” (1730-1785), a poorly known cousin of the anatomist Louis-Jean-Marie Daubenton (see the biographical note by Nadault de Buffon in Buffon 1971: 152; Schmitt 2022b). Buffon, who appointed him as the “garde et sous-démonstrateur” at the *Cabinet royal*, acknowledged that Daubenton alone directed the work of the draftsman, the engravers, and the painters (Buffon & Guéneau de Montbeillard 1771a: viii and 1780: ii-iii); but we ignore how this management was exerted in practice. Besides his work for the *PE*, Daubenton took over the plates of natural history of Diderot's *Encyclopédie*, he wrote their accompanying text, and he is mentioned several times in the *HNO* for information on birds, but no other work of him is known. Since the *PE* appeared independently from the *HNO*, they were sometimes referred to as “Daubenton's *Planches enluminées*”, or “Daubenton's *Miscellanea*” (Cowan 1967, 1968). Even though Buffon remained the head of the project, Daubenton probably had some latitude. At least in some cases, he may have chosen the birds to be illustrated and the names of newly described species: for instance, he coined the neologisms “choucarri” and “calybé” (Buffon & Guéneau de Montbeillard 1775: 81, 173), which were eventually retained in the text of the *HNO* and are still in use: the former in the French vernacular name of *Coracina papuensis* (J. F. Gmelin, 1788), the “échenilleur choucarri”; the latter, in a latinized form, in the scientific name *Manucodia chalybatu*s (Pennant, 1781).

The making of the colored plates consisted of four main steps: the preparatory drawing, the etching of a metal plate, the monochrome printing (generally in black), and the coloring and varnishing. The draftsman of all the *PE* and the

engraver of most of them was François-Nicolas Martinet (1731-c. 1805). According to his biographers, he was trained as an engineer (Hauteceur 1907, 1967-1968: 243-249; Ronsil 1957: 24-26). He published different kinds of etchings during his career, including geographical maps, plates for a book on goldfish (Billardon de Sauvigny 1780), and he made about one hundred plates of zoology and botany for Diderot's *Encyclopédie*; but he was renowned, above all, for his work in ornithology. Besides the *PE*, he published sets of colored plates of birds on his own behalf (Martinet c. 1773-1796; see Ronsil 1957: 28; Zaharek & Overstreet 2001), and he participated in the two main French works on birds of the mid-eighteenth century: he drew and etched all the 31 plates of François Salerne's treatise (1767) and the 261 plates of Brisson's *Ornithologie* (1759-1762). Buffon probably chose him because of the skill he had shown in the latter work, but there was another important reason: since the greatest part of the birds Brisson had described belonged to Réaumur's cabinet, most of which ended up in the Royal Garden, Martinet already knew a great number of the specimens he had to depict in the *PE*. Furthermore, even though the volumes of Brisson's *Ornithologie* were published with unpainted plates, there exists copies of the 261 plates which are illuminated (Bureau 1907; Ronsil 1957: 24-25). A set of colored plates is preserved in the Central Library of the Muséum national d'Histoire naturelle of Paris (Fol Res 207). According to Bureau (1907), Martinet himself may have painted his own plates: if so, he would have studied the colors of many birds of the Réaumur collection before drawing and etching them again for the *PE*. Another set of colored plates of Brisson's *Ornithologie* is preserved in the Bibliothèque nationale de France and can be consulted online (<https://gallic.bnf.fr/ark:/12148/btv1b8623267w>). Unfortunately, almost nothing is known about Martinet's method, since, to our knowledge, no preparatory drawing of the *PE* remains (unlike for De Sève's plates: see Schmitt 2019). We ignore, for example, whether these drawings were monochromes (as De Sève's drawings were) or colored as to serve as models for the painting of the etchings.

Whereas the draftsman and the etcher of a plate of natural history were often two different artists in the 18th century (this is the case for De Sève's plates), Martinet seems to have etched most of the *PE*. Only four plates (plates 3, 27, 33, and 150), published between April 1765 and April 1767, bear the signature of another etcher, namely, the art-lover Denis Pierre Jean Papillon de la Ferté, "intendant" of the "Menus-plaisirs du Roi" (a department in charge of ceremonies, spectacles, and festivities of the Court). It is possible, however, that other etchers were involved, since only 22% of the plates bear the signature of Martinet as the draftsman and the etcher; 52.5% bear his signature with no precision on his role; and 25.5% are not signed at all.

The etching of plates meant to be painted required particular techniques, not least to prevent the final image from being too dusky (Buffon does not give any detail on that, but see, for instance, the advice given by Edwards 1743: xvii-xviii). Furthermore, the etcher could (or should) not

represent some details the painter was able to show in a better way. The paper used for the printing should be of good quality, in order not to be deformed when soaked with the paint. In most of the *PE*, the printing ink is black, or at least very dark, except in a few cases, such as the "Perroquet de Cuba" (plate 336), where it is reddish, in accordance with the "bronze-red-edged feathers" of this bird (Buffon & Guéneau de Montbeillard 1778: 238).

The names of the colorists are unknown, but Buffon wrote that "more than eighty workers and artists were continuously employed" (Buffon & Guéneau de Montbeillard 1771a: viii), which was considerable (although they did not necessarily all work simultaneously), but necessary, since 450 copies of each plate, that is, about 450 000 in total, had to be produced. There was, maybe, some distribution of tasks: for example, each colorist may have applied only one or a few colors; but such a strategy would have been limited by some constraints, since all copies of one given plate had to be done from one model (the bird itself, or possibly the drawing if it was in real colors). One of the greatest problems Buffon and Daubenton had to contend with was the homogeneity of the coloring. Daubenton played a crucial role by supervising the work of the colorists, but, again, we do not know which method he used. Nonetheless, the result was not too bad insofar as differences between copies of a given plate, although sometimes significant from the standpoint of modern taxonomy (see e.g. Jansen & Cheke 2020), are generally relatively slight when compared with those observed in other 18th-century corpuses, especially if we consider the huge number of copies.

THE SOURCES OF THE *PE*

Buffon claimed that all the plates had been made from live birds (Buffon & Guéneau de Montbeillard 1771a: vi). This was true only in the most favorable cases: in those cases, the plates were drawn from live (or at least freshly killed) birds, observed in Buffon's or other people's houses, or in public zoos: for example, the "Pierre de Cayenne" (*PE* 78) was drawn at the *Ménagerie royale* in Versailles (Buffon & Guéneau de Montbeillard 1771c: 383).

In a few other cases, plates were made from illustrations given by correspondents, like the grey peacock-pheasant (*PE* 492 and 493), whose colored drawings were sent by Lord Codrington (Buffon & Guéneau de Montbeillard 1771c: 372), or many birds from East Africa, which Buffon knew only from images given by Scottish traveler James Bruce during his stay in Paris (Buffon & Guéneau de Montbeillard 1775: iii). It is not always mentioned explicitly that an illuminated plate has been made from Bruce's drawings, but it can sometimes be inferred with near certainty, for example, in the case of the "Nubian bee-eater" (*PE* 649), since the only mentioned source in the text is Bruce (Buffon & Guéneau de Montbeillard 1779: 506). Some other cases are dubious, and we will mention them in our papers.

Most frequently, the models were mounted specimens held in collections. In at least one case, the "Guépier rouge et vert du Sénégal" (*PE* 318), the plate was drawn from "the dried skin of the bird" given by Michel Adanson and preserved in

a herbarium, that is, flattened “between two sheets of paper” (Buffon & Guéneau de Montbeillard 1779: 507). It was certainly exceptional since the preserved models were most often mounted specimens; but it raises the more general problem of the realism of stuffing. Exotic birds were often sent as mere unstuffed skins, and they were mounted in Europe, not always in accordance with the natural morphology of the living bird.

The majority of stuffed models of the *PE* belonged to the Cabinet du Roi, inherited from Réaumur's collection or not, but Martinet also made use of a few other Parisian cabinets of natural history. In fact, even though Buffon only rarely explained the origin of the specimen represented on a plate, it can be guessed with a variable degree of likelihood by comparing the text of the *HNO* and Brisson's *Ornithologie* (where the origin of the specimens is generally mentioned). When Brisson writes that a bird is present in Réaumur's cabinet or in another collection (such as the cabinets of Madame de Bandeville, the abbé Jean-Thomas Aubry, and Mauduyt de La Varenne), it is quite likely that the same specimen is represented on the *PE*, unless otherwise specified, or unless it is a common European species. In some cases, the comparison between the *PE* and Brisson's plates leaves no doubt: for example, Buffon's “Perdrix du Sénégal” (*PE* 137) is obviously the specimen of Réaumur's collection illustrated by Brisson (1759a: 231-233, plate XXIV, fig. 1), and the “Aigle de Pondichery” (*PE* 416) is most probably the same as the specimen from the cabinet of Aubry studied by Brisson (1759a: 450-452, plate XXXV): either Aubry gave this bird to the *Cabinet royal* in the meantime, or Buffon had it drawn at Aubry's house (or, perhaps, Martinet copied the plate he had drawn for Brisson).

It must be emphasized, thus, that the *PE* are an invaluable testimony on the collection of birds of the *Jardin du Roi* in the 1760s and 1770s, which almost totally disappeared during the following decades, since specimen preservation methods did not permit effective conservation until the invention of arsenic techniques (see, however, Steinheimer 2005; Gouraud 2014; Jansen 2015; however, a few specimens may have survived); but, frustratingly, this testimony is very incomplete and ambiguous. Even though the initial project of the *Histoire naturelle*, in the 1740's, was a sort of catalogue of the *Cabinet royal*, Buffon's aim was clearly the description of the whole nature, not of a collection. As a consequence, he used the specimens of the *Cabinet royal* whenever possible, and other sources if needed. Unlike Brisson, he did not consider it necessary to specify which specimens he studied and got drawn by Martinet.

DESCRIPTION OF THE *PE* AND THEIR CONNECTION WITH THE TEXT

The sets of 24 plates were probably sold with wrappers and maybe with accompanying documents (such as lists of contents), but no material of this kind has been preserved, to our knowledge. The numbering of the plates (which is almost the same as their order of publication) had nothing to do with the order of the chapters. The plates were always available when the corresponding chapters appeared, but, on the other hand,

there was generally a more or less important time-lag between the publication of a given plate and of the corresponding text. For example, the plate of the “Pétrel de l'Isle S. Kilda” appeared in the third set, in October 1765, whereas its account (under the name “Pétrel cendré”) was published only in the last volume of the folio edition, in 1786, twenty-one years later. The people who had bought the plates had thus to keep them for a long time before having them bound with the text at the right place. Furthermore, the names of the birds on the plates were often different from the final denomination chosen in the text, and many plates depicted two, three, or even four birds, so that their placing in the volume was not self-evident. That explains why “instructions to the binder” were given at the end of each folio volume. However, only few people respected these instructions, and many plates were bound together in separate volumes, with no text, or they were never bound at all, not to mention the volumes that were correctly bound but dismantled later (in general to sell the plates separately). The complete collection of ten folio volumes with the illuminated plates is thus very rare today.

All the *PE*, except the plate 45 (which represents butterflies), have a yellow frame. Sometimes the bird's tail extends slightly beyond it. The signature, if present, is located at the bottom of the plate, within the frame or just above it, whilst the number of the plate is found at the top left corner, above the frame. This number has no meaning except the order of publication, which does not correspond to any principle, neither geographical, nor systematic. Sometimes several species of the same group were published together (for instance, birds of prey in the *cahiers* 18 to 20), probably because the corresponding volume of text was about to appear. As a general rule, the sets of plates were published in the same order as they were numbered, except in 1768 and 1769 (the 12th and 13th sets appeared after the 14th). The title seems to be hand-written, but in fact it is printed with the same ink as the rest of the plate. It gives the name of the bird(s), sometimes with precision on the sex or the age. As we have said, this name is often different from the one adopted in the text.

Out of the 1008 illuminated plates, 35, all of which were published in 1765-1766, represent other animals than birds. They were sometimes bound with the others, but there is no corresponding text. The 973 other plates represent one (753 plates), two (178), three (39), or four (3) birds. When there are several birds on a plate, they can be the male and female, or “varieties” of the same species, or different species (generally belonging to the same “genus”, according to Buffon). Conversely, different specimens of a same species are often represented on two or more plates. If the male and the female of a given species are different from each other, the *PE* show the male in preference, but the female is quite often represented too. More generally, Buffon (Buffon & Guéneau de Montbeillard 1771a: iv) insists on the importance of a good description of the females and the juveniles, since, he says, many naturalists have mistakenly considered them as separate species (which did not prevent him from making similar mistakes).

In the *PE* as well as in Brisson's *Ornithologie* and in most bird books since the 16th century, the postures are rather static: the birds are either perched or on the ground, with a few exceptions like the "Grande Frégate de Cayenne", which is depicted in flight (plate 961), or the "Paille-en-queue" (plate 369), which is represented twice on the same plate at rest and in flight, in order to show the position of the remarkable tail feathers. Many aquatic species are swimming (e.g., the "Macareux", *PE* 275), some birds are eating (the "Cormoran", *PE* 927), parrots are playing with fruits, etc.; but the animal is most frequently drawn at rest and from the side, a representation Daubenton called "portrait" in 1753 (for the quadrupeds), justifying it because it allowed to recognize all parts of the animal, whereas a "tableau" (i.e., a representation in movement) did not give as much information (Daubenton in Buffon 2010a: 209-210). Two plates, 933 and 934, represent only the head and the bill of hornbills. There is also a figure of the head of the "Canard du Nord" or "Marchand" (*PE* 995) viewed from above beside the complete bird, since the three-dimensional shape of the bill cannot be understood with a single figure. Apart from these three cases, all figures are complete birds.

The scenery is generally sober and limited to the branch, the stump, or the ground on which the animal rests. In a few cases, a simple landscape or, even more rarely, human constructions (*PE* 200, 352, 369) appear in the background, with no consideration for the geographical plausibility. For example, the "Poule de Cayenne" (*PE* 352) is in a typically European landscape of steeples and houses with smoking chimneys. The vegetation is generally not specific: even though some species can be recognized (like the lily of the valley, *Convallaria majalis*, on *PE* 27), they have no geographical or biological relation with the birds, except in a few cases such as the cat-tail with an aquatic species (*PE* 346) and a grain field with a quail (*PE* 222). The eggs are never represented, and the nest only once (*PE* 542, the common house martin).

Whenever possible, the birds are represented in full-size: in fact, it is one of Buffon's justifications for the folio format (Buffon & Guéneau de Montbeillard 1771a: viii-ix). If the bird is too big, the scale is given with a "module" whose length is one twelfth of the real length of the animal, from the tip of the bill to the end of the tail (Buffon & Guéneau de Montbeillard 1771a: ix). This is an interesting feature, since the real size of the objects is rarely indicated on zoological or botanical plates in the 18th century (Martinet's plates for Brisson's *Ornithologie* are also an exception), and it shows that Buffon attached great importance to the descriptive value of the *PE*. For some unknown reason, three plates (*PE* 27, 110 and 150) have a graduated scale in addition to the module, and one (*PE* 76) a graduated scale only.

Unlike graduated scales, the principle of the "modules" is not self-evident and has to be explained in the text. Indeed, the *PE* are not conceived independently of the text, and they are closely connected to it. While not all species dealt with in the text are represented in the *PE*, all the colored plates are mentioned in the text, with very rare exceptions. As Buffon himself explains, the mere fact of including references to the

plates avoided long and inevitably imperfect descriptions of the birds' shapes and colors (Buffon & Guéneau de Montbeillard 1771a: ix-x; 1771c: 243; 1775: 138; 1778: 430, etc.). On the other hand, the text sometimes corrects the possible defects of the plates, such as the oversight of the "module", or the inaccuracies of the figures. For example, Buffon warns that the "green manakins" (i.e., *Chiroxiphia pareola* (Linnaeus, 1766) in current nomenclature) "are never, in the state of nature, of the same deep green [*vert décidé*] as on the illuminated plate; their green is darker" (Buffon & Guéneau de Montbeillard 1778: 412), that "the figure on the illuminated plate does not depict the transversal position of the crown [of the crested tyrant of Cayenne] adequately enough" (Buffon & Guéneau de Montbeillard 1778: 552), and that the illumination technique is unable to capture the brightness of certain species such as hummingbirds (Buffon & Guéneau de Montbeillard 1779: 16). Such comments by no means reduce the scientific value of the plates but reinforce their status as references for the descriptions of the birds, as long as they are used with the accompanying text.

THE TEXT OF THE *HNO*

Officially, the *HNO* has two authors: Buffon and his friend Philibert Guéneau de Montbeillard (1720-1785) (Schmitt 2024). The authorship of each chapter is quite clear, since Buffon and Guéneau both signed their contribution in the tables of contents of the volumes 3 to 6, and Buffon revealed at the beginning of the volume 3 which parts of the volumes 1 and 2 Guéneau had written. There are a few inconsistencies between the folio and quarto editions as to the attribution of some chapters (mainly the "grosbeaks" and "sparrows" in the third quarto volume), but even in such cases, the author can be determined with quasi-certainty. Guéneau left after the sixth volume in order to devote himself to the *Histoire naturelle des insectes*, a work which was never published. He can certainly be considered an author of the *HNO* in his own right, and he was not technically subordinate to Buffon; however, he obviously followed Buffon's instructions regarding the organization, the sources, and the contents of the accounts. Guéneau was so keen to adopt Buffon's general views with regards to species, nomenclature, theory of reproduction, etc., that he even imitated Buffon's style as faithfully as possible.

The abbé Gabriel Bexon (1747-1784) was another important collaborator to the text, but his status was very different from Guéneau's since, even though Buffon acknowledged his contributions once (Buffon & Guéneau de Montbeillard 1780: ii), he did not grant him the rank of author (Schmitt 2024). According to Buffon, Bexon provided descriptions, notes on nomenclature, and sundry materials for the *HNO*, but manuscripts held in the Library of the Muséum national d'Histoire naturelle reveal that he wrote a significant part of the chapters signed by Buffon in the volumes 5 to 9. Typically, Bexon wrote the first drafts of the species accounts, and Buffon corrected them. He generally left the most descriptive parts almost unchanged, except a few emendations of style, but he completely re-wrote some parts, especially at the beginning of the accounts.

The sources of the *HNO* are very diverse and include many new data, some of which collected by Buffon and Guéneau themselves from their own observations on stuffed specimens but also from freshly killed, or captive birds (e.g., a goshawk, Buffon & Guéneau de Montbeillard 1771a: 234-236, and barn owls, Buffon & Guéneau de Montbeillard 1771a: 368-369). However, most of the previously unpublished material was provided by correspondents living or traveling in France or abroad (Schmitt 2018a). Some of them were particularly helpful by sending textual information as well as images and real birds, for example Jean-Emmanuel-François Baillon (1742-1801), a lawyer and naturalist from Montreuil-sur-Mer (see e.g., the “Labbe” or “Stercoraire”, *PE* 991); Scottish traveler James Bruce of Kinnair (1730-1794); Philibert Commerson (1712-1773), a naturalist and a traveler who accompanied Louis-Antoine de Bougainville and remained in the Île-de-France (Mauritius); Pierre-Augustin Guys (1721-1799), a traveler, merchant, and writer; René-Joseph Hébert, a tax collector in Dijon; Étienne Lefebvre-Deshayes (1732-1786), a landowner in Saint-Domingue; Antoine-Joseph Lottinger (1725-*c.* 1794), a physician in Sarrebourg; Pierre-Jean-Claude Mauduyt de La Varenne (1733-1792), a physician and a naturalist, the owner of one of the richest collections of birds in Paris; Jean Honoré, Marquis of Piolenc (1742-1800), a magistrate in Grenoble; the Viscount of Querhoënt, a former officer in the Navy; and Pierre Sonnerat (1748-1814), a traveler and a naturalist. The case of the naturalist and traveler Charles-Nicolas-Sigisbert Sonnini de Manoncourt (1751-1812) is particularly interesting, since Buffon was his patron and, after his return from Cayenne, employed him as a secretary for a few months. He is one of the most notable sources on the birds of French Guiana, even though not always specified in the text, and he probably wrote the first draft of many descriptions. In fact, Sonnini's status is between that of an informant like Baillon and that of an assistant author like Bexon (Anderson 1974; Roger 1989: 502).

In spite of the significant amount of new material, Buffon, Guéneau, and Bexon, like all naturalists of the 18th century, relied on printed sources to a large extent, but their practice was, in that respect, quite different from that of other authors of that time. Of course, they copiously used the main reference works on birds, in particular the ornithologists of the Renaissance (Pierre Belon, Conrad Gessner, Ulisse Aldrovandi) and of the 17th century (John Jonston, Francis Willughby), as well as more recent treatises on birds (those of John Ray, Pierre Barrère, Johann Leonhard Frisch, and François Salerne, the latter being an adapted, up-dated French translation of Ray's book) or on animals in general (including the last editions of Linnaeus's *SN* and his *Fauna Svecica*). Very much information was borrowed from Brisson's *Ornithologie*, often tacitly, and this work was the point of reference for the *HNO*, which closely followed it for the distribution of species and genera. However, besides such early modern scientific sources, Buffon and his collaborators used many other works, including ancient authors like Aristotle and Pliny the Elder (Schmitt 2014), and, above all, the travel literature, including writings not only of scientist travelers (e.g., Sonnerat, Joseph Pitton de

Tournefort, Louis Feuillée), but also of laymen in the field of natural history (Schmitt 2017). The important place of such non-scientific sources in the *HNO* was a noteworthy specificity which led Buffon and Guéneau to some interesting findings, such as the identification of the Rodrigues solitaire (*Pezophaps solitaria* (J. F. Gmelin, 1789)), whose description by the traveler François Leguat in 1693 had been totally overlooked before (Buffon & Guéneau de Montbeillard 1771a: 485-496).

The reason why Buffon used such a diversity of sources was that he aimed to address all aspects of the biology of the birds, including those more or less neglected by the contemporary naturalists. Besides the identification and delimitation of species, the nomenclature, and the description of the birds and of their varieties, he gave the available information on anatomy, life span, distribution, habitat, migrations, diet, reproduction, singing, behavior, but also, if relevant, on hunting and other relationships with humans.

In sum, the *HNO* constitutes a considerable and comprehensive ornithological corpus of data, with no equivalent in the 18th century. It recalls, to some extent, the great encyclopedic works of the Renaissance (Gessner, Aldrovandi), but it is deeply influenced by the epistemic context of the Enlightenment. Buffon and Guéneau attempt to fight or rationally explain traditional or folk beliefs (e.g., the mythical metamorphosis of cirripeds into barnacle geese, or the hibernation of swallows at the bottom of lakes), and they often address typical scientific or philosophical problems of their time. For example, Buffon examines the importance of the different senses of birds, in comparison with other animals, in order to point out the connection between the senses and the specific “nature” and “faculties” of birds (Buffon & Guéneau de Montbeillard 1771a: 3-60). Another leitmotif in the *HNO* is the criticism of teleology in science. Buffon considers, for instance, that certain characters, such as the disproportionate bills of the toucans or the hornbills, are not only useless, but also harmful to these birds, and cannot be explained in terms of function (Buffon & Guéneau de Montbeillard 1780: 108-109, 136-138). However, the most recurring issue in the *HNO*, as in the other zoological parts of the *Histoire naturelle*, is the strong criticism of the classification and the nomenclature used by contemporary naturalists, especially the Linnaean system. In this aspect, Buffon departed from Brisson (1759-1762), who had in contrast respectfully and painstakingly cited all of Linnaeus (1758) species and their binomial names throughout his work, and himself adopted a Latin (but not binominal) nomenclature: see next section.

BUFFON'S ORIGINAL POSITION ON THE CLASSIFICATION AND THE NOTION OF SPECIES

The classification of birds in the ornithological tradition (16th-18th centuries)

When the *HNO* was first published, the classification of birds had a long history, but significant new developments had emerged during the preceding century. The ancient authors who dealt with birds exhaustively (Aristotle and Pliny the Elder) did not use a classification in the modern sense, even though they put together species with similar diet (birds of

prey) or habitat (water birds). The works of the naturalists of the Renaissance had been a first step in the rise of the taxonomy of birds, since Belon (1555), Gessner (1560), and Aldrovandi (1559, 1600, 1603) roughly divided all species in a few groups delimited according to various characters including the feeding, the habitat, and the behavior. Belon used, amongst other things, a morphological feature that would become essential in later classifications, namely, the shape of the feet. At the same time, the knowledge of birds made considerable advances, due, in particular, to the exploration of exotic countries, and the boom in the number of described species. From the late 16th century onwards, many comprehensive surveys on the fauna and flora of Mexico (Hernández 1651), Brazil (Markgraf 1648; Piso 1658), or the East Indies (Bondt 1658) appeared, as well as compilations (L'Écluse 1605; Nieremberg 1635; Laët 1633, 1640). This boom of zoological data, associated with the general evolution of the conception of science (the so-called “Scientific Revolution”), contributed to enhance the need for more detailed taxonomies of birds (and other animals) in the second part of the 17th century.

At first, this new trend was mainly represented in England. Walter Charleton (1668) proposed a new classification of animals, still influenced by old criteria, although more elaborate, with several taxonomic levels. The main division was between land and water birds, each group being subdivided according to diet, behavior, song, and shape of feet. An interesting element of Charleton's distribution was the standardized presentation and the use of numbered list, which tended to individualize and to feature the level just above the lowest one (the species), that is, a sort of genus in the modern sense. Furthermore, Charleton named these genera with Latin terms commonly designating single species (“*Bubo*”, i.e., “owl”; “*Aquila*”, i.e. “eagle”; “*Columba*”, i.e., “dove”, etc.), thus suggesting that they corresponded to natural taxonomic units.

The classification of Francis Willughby (1676, 1678) and John Ray (1713), who worked together, marked a turning point in the history of bird taxonomy (Table 1). They still used characters related to habitat and diet but attached particular importance to the shape of the feet and the bill. In that respect, they influenced later naturalists (including Linnaeus) till the nineteenth century.

After Willughby and Ray, in ornithology like in other zoological fields, the naturalists tended to adopt an increasingly systematic approach and to identify one or a few morphological characters lending themselves to a complete classification of birds. An array of classifications arose during the 18th century, most of which using the feet and/or the bill. The most popular of these systems was that of Linnaeus, whose first version was published in 1735, and which underwent several alterations in the following decades (Table 2).

The Linnaean classification was accepted by a majority of naturalists, especially from 1758, when the binomial nomenclature was introduced in zoology. Some authors altered it slightly, like Blumenbach (1779: 179-243), who divided Linnaeus's “*Picæ*” into three orders (“*Levirostres*”, “*Pici*” and “*Coraces*”), and isolated the ostrich, the dodo, and the cassowary in a separate order (“*Struthiones*”). In his *General Synopsis of Birds*

(published from 1781 to 1801), John Latham (1740-1837) did not follow Linnaeus's higher taxonomical levels (instead he referred to Willughby's general classification), nor (initially) his Latin binomial nomenclature, but he used the Linnaean genera and attempted to integrate new species in this frame (Farber 1982: 71-73). The publication of the so-called “13th edition” of the *SN* (1788-1793) by the German naturalist Johann Friedrich Gmelin (1748-1804) contributed to the success of Linnaeus's system. Gmelin thoroughly respected Linnaean classes, orders, and genera, even the numbering of genera and species (though he did not present the species within a given genus in the same order as Linnaeus had), and he included almost all the species described by other authors since 1766 within existing genera, only adding a few new genera (Gmelin 1788, 1789).

However, several other classifications of birds were proposed in the mid-18th century. Most of them relied on the shape of the feet, more or less associated with the shape of the bill or other criteria. For example, Pierre Barrère (1745) divided the birds into four “classes” (“*Palmipedes*”, “*Semipalmipedes*”, “*Fissipedes*”, “*Semifissipedes*”) according to the degree to which the digits were connected by membranes. Klein's system (1750) was based on the morphology of the feet too, but it was completely different since it divided the birds into eight “families”, some of which were very unusual: for instance, the hen, the eagle, the heron, and the hummingbird were in the same family because they all supposedly had four digits, three positioned forwards, one backwards. These families were subdivided into “genera” according to the shape of the bill, and the genera into “tribes” according to diverse characters. As for Paul Heinrich Gerhard Möhring (1752), he defined four “classes” of birds by considering the plumage of the legs.

The most important alternative to Linnaeus's classifications of birds after 1750 is to be found in Brisson's *Ornithologie* (1759-1762). Brisson's initial aim, as explained in his volume of quadrupeds and cetaceans (Brisson 1756: iii), was to find the arrangement of animals that would enable him to put the species in the most convenient places as new specimens would enter Réaumur's collection. Paradoxically, whereas he did not attempt to theorize about taxonomy, he built the most comprehensive classification of birds of his time, taking into account not only the 674 species or varieties present in Réaumur's cabinet (our count, which is probably not exact because in a few cases Brisson did not say if he had seen the birds in Réaumur's collection or elsewhere; two more species were present in Réaumur's collection but represented only by their head or bill), but also all those he was able to identify in other Parisian collections and in the literature of the two preceding centuries. In total, he not only gave diagnoses in the Linnaean style, but also very detailed, standardized descriptions of no less than 1372 species and 142 “varieties” – which is considerably more than Linnaeus in 1758 and even in 1766. Many of these Brissonian species are not distinct species in the modern sense, but a lot of them are, indeed, new species. In order to arrange this considerable amount of material, Brisson deemed it necessary to build a classification with a greater number of supra-specific groups than in

TABLE 1. — Simplified classification of birds according to Willughby (1678: 55, 273)

<p>Land-Fowl</p> <p>Crooked Beak and Talons <i>Carnivorous and rapacious, called Birds of Prey</i> Diurnal, that prey in the day-time [including shrikes and birds of paradise] Nocturnal, that fly and prey by night <i>Frugivorous, called by a general name Parrots</i></p> <p>More straight Bill and Claws <i>Greatest kind; which by reason of the bulk of their bodies and smallness of their wings cannot fly at all, exotic birds of a singular nature; the Ostrich, the Cassowary and the Dodo</i> <i>Middle-sized; which may be divided by their bills into such as have</i> Large, thick, strong, and long ones [crows, pies, kingfishers, woodpeckers, etc.] Smaller, and shorter [gallinaceans, pigeons, thrushes, starlings, etc.] <i>Least kind; called small birds</i> Soft-beak'd, which have slender, straight, and the most pretty bills; which kind feeds chiefly upon insects Hard-beak'd, which have thick and short bills, and feed most upon seeds</p> <p>Water-Fowl</p> <p>Frequent waters and watery places, to seek their food, and are all cloven-footed <i>The greatest of this kind, anomalous birds, as the Crane, Jabiru, etc.</i> <i>The lesser</i> Piscivorous, that feed upon fish, as the Heron, Spoon-bill, Stork, etc. Mudsuckers und insectivorous [curlews, whimbrels, woodcocks, plovers, etc.]</p> <p>Swim in the water <i>Cloven-footed, as Morehens, Coot, etc.</i> <i>Whole-footed</i> Long-leg'd; anomalous birds, the Flammant, the Avosetta and Corrira Short-leg'd [penguins, pelecans, puffins, gulls, geese, ducks, etc.]</p>

TABLE 2. — Evolution of the general classification of birds (class Aves) in the editions of Linnaeus's *Systema naturæ* from 1735 to 1766

1735-1740, 1747	1744-1748	1756	1758	1766
Seven orders: 1. <i>Accipitres</i> , "hooked bill" 2. <i>Picæ</i> , "bill compressed above, vaulted" 3. <i>Macrorhynchæ</i> , "very long sharp bill" 4. <i>Anseres</i> , "tooth-serrated mouth" 5. <i>Scolopaces</i> "cylindrical, a little rounded bill" 6. <i>Gallinæ</i> , "crooked conical bill" 7. <i>Passeres</i> , "thinned conical bill"	Only six orders: the former <i>Macrorhynchæ</i> (cranes, storks, herons) becomes a genus (<i>Ardea</i>) in the <i>Scolopaces</i> .	The same six orders as in 1744-1748, but they are defined according to the shape of the bill (and of the feet in a few cases).	The same orders as in 1756, defined according to the shape of the bill and a few other characters (feet, tongue, nostrils). The <i>Scolopaces</i> are re-named <i>Grallæ</i> . Many genera are moved from one order to another.	The same six orders as in 1758. Many genera are moved from one order to another. Many new species and genera (often deriving from Brisson). Equivalence between the orders of quadrupeds and those of birds: <i>Accipitres/Feræ</i> ; <i>Picæ/</i> <i>Primates</i> ; <i>Anseres/Belluæ</i> ; <i>Grallæ/Bruta</i> ; <i>Gallinæ/Pecora</i> ; <i>Passeres/Glires</i>

the available systems. By using a combination of characters relating to the shape of the feet and the bill, he was able to define 26 orders and 115 genera.

This system strongly (but tacitly) inspired the organization of the *HNO* (see below). It was also followed by a few naturalists in France in the late 18th century (e.g., Mauduyt de La Varenne in the *Encyclopédie méthodique*), but had little influence in other countries. Furthermore, Brisson used a complex, hybrid nomenclature, only partially similar to Linnaeus's binomial system. Some species are designated by the name of the genus only (e.g., "*Colymbus*"), others by the name of the genus plus two (or more) other words (e.g., "*Colymbus cristatus minor*"). Some species are designated by binomens, but the first term is not the name of the genus they belong to: for example, "*Vidua minor*" and "*Linaria montana*" belong

to the genus "*Passer*" in Brisson's classification, which means that, in spite of appearances, "*Vidua*" and "*Linaria*" are not generic names according to Brisson. Consequently, Brisson's specific names are not available in modern taxonomy: even the pseudo-binomial specific names he introduced are considered not conform to articles 5 (Principle of Binomial Nomenclature) and 11.4 (Consistent application of binomial nomenclature) of the *International Code of Zoological Nomenclature* (ICZN 1999). However, his work has taxonomical significance for two reasons. First, many of the generic names he introduces are considered available (and, in some cases, valid) in modern taxonomy. This question was only resolved by the *International Commission on Zoological Nomenclature* (ICZN 1963). Since the use of these names in the main text of the six volumes of the *Ornithologie* was not consistent, the Commission consid-

ered conform to the Code only those “which appear in Latin in the *Tabula synoptica Avium secundum Ordines* reproduced on the left-hand pages (bearing even numbers) in the series of pages numbered 26 to 61 in volume 1 of the foregoing work” (Hemming 1962; ICZN 1963). Second, many of the new species Brisson described received a binomial name in the following years or decades. Indeed, Brisson is one of the most important contributors, although an indirect one, to the increase of the bird species in the last editions of the *SN* (Linnaeus 1766; Gmelin 1788, 1789).

Buffon's alternative views on classification and nomenclature

From 1749 to 1788, Buffon relentlessly criticized not only the Linnaean system, but the very principles of all classifications (Farber 1972; Sloan 1972; 1973; 1976; Schmitt 2010, 2020). In the context of the inexorable rise of Linnaeism, his views on taxonomy could appear as a historical anomaly. However, far from superficial, his reflections, relied on general epistemic considerations. Here we shall give a mere overview of them (for more detail, see Schmitt 2010, 2020).

Firstly, Buffon considers classifications typical examples of “systems”, that is, speculative and purely theoretical views, out of touch with the real knowledge of things based on observation and experiments. In that respect, he thinks that the “nomenclateurs” (as Buffon calls the taxonomists) make the same mistake as some physicists (like Descartes) who misuse mathematics in order to explain complex natural phenomena that cannot be reduced to simple formulas. Similarly, naturalists unduly attempt to reduce the huge diversity and profusion of animals and plants into a few categories arbitrarily defined with one or a very small number of characters, which cannot represent the complexity of the relationships between the species accurately (Buffon 2007: 145-147, 159-169). This results in incongruous and ridiculous connections between completely different plants or animals (e.g., between the human being, the monkeys, the sloth, and the pangolin, all belonging to the Linnaean order of *Anthropomorpha*), and in futile debates between the naturalists who adopt different systems. He notices that Linnaeus himself incessantly changes his own system, and that one edition of the *SN* contradicts the other (Buffon 2016: 365).

At a more fundamental level, Buffon, probably inspired by John Locke's nominalism, claims that taxonomic categories such as the orders and the genera (but not the species, as we shall see) are only words and a matter of pure convention, which does not correspond to any physical reality (Buffon 2007: 160-162, 190). He does not deny the existence of a natural supra-specific order, but he doubts whether the human mind is able to grasp it perfectly, and thinks that, in any case, the systems of the naturalists are of no help for that. This argument is connected to the notion of the great chain of being, that is, the idea that all organisms, instead of being classified into discrete and well delimited groups, can be linearly and continuously ranked from the simplest to the most complex ones. Buffon does not adopt this view in the strictest sense, but he uses elements of it separately (progressivity, linearity, or continuity of nature) in order to criticize

the Linnaean approach (Schmitt in Buffon 2007: 59-60). In particular, according to him, there is no discontinuity between genera since it is always possible to find “anomalous” species which do not belong to any genus but are in the middle of two (or more) genera. Buffon summarizes this notion in the sentence: “all that can be is” (Buffon 2007: 152, 2010b: 167; our translation).

However, Buffon deems it possible to establish a natural taxonomy, provided that it focuses on the species and does not consider higher levels. First of all, instead of taking into account just a few characters (or even one), generally related to the morphology or the external aspect of animals, in the view of building systems which are just figments of imagination, it is rather necessary to get a complete knowledge of each species. To do so, a thorough description of all their characters, not only those related to the morphology, but also the diet, the reproduction, the behavior, the distribution, etc., namely, what Buffon calls the “histoire” (in the etymological sense) of the animal, is required. Most importantly, Buffon thinks that the species, unlike the higher taxonomic levels, have an objective, physical reality, based on reproduction and interfertility. As early as 1749, he writes: “we must regard as one and a same species that which, by means of copulation, perpetuates itself and conserves the similarities of that species, and as different species those that, through the same means, cannot product anything with each other. Thus, a fox will be a different species from a dog if nothing results from the copulation between a male and a female of these two species; and even though it would result in an intermediate [‘mi-parti’] animal, a sort of mule, since that mule would not produce anything, it would be sufficient to establish that the dog and the fox are not of the same species” (Buffon 2008: 108-109; our translation). The consequence of this definition, which is very close to the Biological Species Concept, is that interfertility becomes a clear scientific criterion to identify real species in nature (in this sense, Buffon goes further than earlier authors such as John Ray, who defined species genealogically but without reference to interfertility). Buffon himself performs experiments of that kind, for example with dogs, foxes, and wolves. There is another consequence, regarding the nomenclature (Schmitt 2018b): since, according to Buffon, the species is the only real taxonomical unit in nature, it is the one that should be named, rather than the fictitious genera. He thus discards the common practice of the naturalists (especially Linnaeus) who give the same generic name to two different species. He considers absurd, for instance, to call “*Equus*” both a horse and a donkey, since they clearly belong to distinct species as they cannot produce a fertile offspring with each other. There must be a bijective one species/one noun relation. Buffon admits the use of adjectives, but only for varieties within a same species, not for different species in a so-called “genus”. Since he writes only in French, he uses the common names in that language (e.g., “âne” and “cheval”) rather than Latin binomens. However, in many cases (especially for exotic animals), there is no satisfactory term, as the species has never been named in French or is inadequately named (for example, the names “tigre d'Amérique” and “lion d'Amérique” currently designate

American felines which are neither tigers nor lions). In such cases, Buffon coins new terms, either by borrowing names to local languages (e.g., “ocelot”, modified form of a Nahuatl term, or “harfang”, “snowy owl”, from Swedish “harfång”), or by using some characteristic of the animal (e.g., “quadri-color” for a bird which displays four bright colors, the pin-tailed parrotfinch). This is an important difference between Buffon's and Linnaeus's nomenclatures, since the new names, according to Buffon, must tell something about the birds they designate, whereas the Linnaean specific names may be (and often are) totally arbitrary.

In Buffon's view, the species are strictly delimited because of the mechanism of reproduction. Each species is characterized by an ‘interior mold’ that ensures the organization of the ‘organic molecules’ of the semens coming from both parents after copulation, and the accurate transmission of the specific form from one generation to the other. In other words, one species as a whole is eternal, and no transformation from one species to another can occur over the course of generations. However, a limited degree of variation is possible *within* each species as a response to changes of food, climate, and other external factors. This process (Buffon calls it “dégénération”) results in the formation of more or less constant varieties which can interbreed with each other, since they still belong to the same species, thus producing new varieties.

Buffon was particularly interested in these questions and devoted much energy to distinguish real species from mere varieties, to study the degree of intraspecific changes and to establish the general laws of these alterations. He thought, for instance, that the American climate, supposed cold and humid, resulted in the production of smaller forms than in the Old World (this view was challenged by Thomas Jefferson). He thus founded a sort of microtaxonomy, focusing on species and varieties to the exclusion of all higher levels of classification. He was by no means a “precursor” of Darwin since he rejected the idea of trans-specific changes and had no concept of speciation. However, he admitted a limited transformism, within the species, and his notion of species as a historical, changing, and dynamic entity played a considerable role in the emergence of the evolutionary theory in the late 18th century, especially since his works were very widespread in France and abroad. In his late writings, he even tended to go a little further.

Buffon's further ideas on the species and their variations after 1765

Buffon does not change radically his mind after 1765, but he tends to admit a greater possibility of variations within a given species, so that his notion of species tends to be wider than before, which had consequences on his taxonomy of birds (Roger 1989: 426-441; Schmitt 2010: 58-68, 2020: 74-98). Indeed, new evidence suggests the existence of fertile hybrids between animals Buffon previously considered belonging to different species, such as the horse and the donkey, or the dog and the wolf (Buffon 2020 [1766]: 451-464, 1776: 1-38). The boundaries between commonly acknowledged species of small animals (quadrupeds or birds) seems to be particularly

blurred, as revealed, for example, by the results of crossbreeding between canaries and several other passerines (Buffon & Guéneau de Montbeillard 1778: 10-22). As a consequence, even though Buffon still believes that real physical species do exist and are strictly delimited, he realizes that some of those species correspond to “genera” or even “families” as defined by other naturalists (he calls them “genres physiques”: see Buffon 2018: 517) and encompasses many species in the common sense of the word which thus become mere varieties in Buffon's view. Unfortunately, Buffon is not always consistent in the terminology, using the word “species” sometimes in accordance with his own theory, sometimes in its usual meaning.

As a consequence of this widening of the species concept after 1765, Buffon's transformism, although still limited to the intraspecific level, gains in scope, since animals as different as the horse and the ass can be conceived as derived from a same common ancestor (which Buffon had totally ruled out in 1753). Another consequence is the organization of the *HNO*, which is very different from that adopted in the volumes on quadrupeds, where no clear rule prevailed apart from the very general distinction between domestic, wild European and exotic animals. In the *HNO*, the principle of associating one species with one chapter (or one short note) is maintained, since the species is still the basic unit, but the chapters are now grouped into series corresponding to “genres” or “familles” similar to those commonly acknowledged by most other naturalists (especially Brisson). A section ending the series and often entitled “Oiseaux étrangers qui ont rapport à...” (“Foreign birds related to...”) comprises several short notes devoted to the exotic species of the genus in question. The genera or families are sometimes lumped in higher groups such as the “birds of prey”, and even when they are not, the order of chapters is more or less conform to the classification of the naturalists. For example, in the second volume, there are two series (from the cock to the partridges and the quails, and from the pigeons to the doves) which exactly (though implicitly) correspond to the third and the second order of Brisson's classification, respectively. This organization suggests that the species as they are commonly defined are not totally independent from each other, and that certain groups of species, or genera are genealogically connected with each other or, in other words, correspond to real species. That is the reason why Buffon's practice of nomenclature in the *HNO* is somewhat different from the principles applied to the names of the quadrupeds. In the *HNO* Buffon often uses the same noun, completed with different adjectives (e.g., “grand aigle”, “aigle commun”, “petit aigle”) to designate several species of a same genus.

There are, however, significant differences between the organization of the *HNO* and the other contemporaneous classifications. Most groups in *HNO* are implicit (the existence of the part entitled “Foreign birds related to...” is often the only mark of the end of a series). Furthermore, unlike Linnaeus and Brisson, Buffon does not use any clear hierarchy of taxonomic categories, and his groups are not precisely delimited: they are rather connected to each other with a complex, continuous and non-linear network of relationships.

For example, there is, according to him, a chain going down “gradually and even through almost imperceptible shades” from the lightest flying species to the heaviest flightless ones, eventually dividing into two branches, one leading to terrestrial forms (ostrich, dodo), another to aquatic species (penguins) (Buffon & Guéneau de Montbeillard 1771a: 394-396, 1783: 371-372). At a lower level, it is not possible to define genera that are as clearly delimited as those from other naturalists. Let us consider, for example Buffon’s “aigles” (“eagles”). While Brisson’s “genus of the eagle” (“*Aquila*”) is totally distinct from other genera (either one species belongs to this genus, or it does not), things are not as clear in the *HNO*. First, there are three “eagles” in the strictest sense (“grand aigle”, “aigle commun”, “petit aigle”); then three species which are “eagles” in a wider sense, but different enough from the “real” eagles for having their own names (“pygargue”, “balbuzard”, “orfraie”); and the “jean-le-blanc” (i.e., *Circaetus gallicus* [J. F. Gmelin, 1788]), which is not an eagle, but an intermediate form between the eagles and the buzzards (Buffon & Guéneau de Montbeillard 1771a: 126). Many species are similarly considered intermediates between two or more groups, and sometimes Buffon and Guéneau coin portmanteau names to designate them: for example, the “tourocco” is between the “tourterelles” (doves) and the “hoccos” (curassows) (Buffon & Guéneau de Montbeillard 1771c: 553-554).

These examples show how different Buffon’s views on taxonomy are from those of Linnaeus and Brisson. While his definition of species based on interfertility is simple and clear in theory, in practice there are considerable uncertainties as to the extent, boundaries and relationships of the species, and it is often difficult to grasp the underlying order behind Buffon’s (or Guéneau’s) argument. In particular, Buffon generally says nothing on the genealogical relations (the phylogeny in the modern sense) involved by the organization of the accounts and by the nomenclature of the birds. We can guess, for example, that he considers the “grand aigle”, the “aigle commun”, and the “petit aigle” as genealogically connected, but the nature of their possible relations with the other “eagles” and the “jean-le-blanc” is not specified. This ambiguity results, in Buffon’s mind, from the ignorance of certain facts (such as the existence of hybrids between wild birds) and from the very complexity of nature itself.

THE USE OF THE *HNO* AND THE *PE* BY LINNAEAN NATURALISTS

Brisson and Buffon both defined a great number of species they considered new, whether they had never been described at all, or had been more or less precisely mentioned in printed works (e.g., travel accounts), but not acknowledged by naturalists. However, as we have seen, neither Brisson nor Buffon used the binomial system. Several authors thus found appropriate to give Linnaean names to these new or newly acknowledged species. Four naturalists, in particular, had a significant part in that “translation” (as it were) of Brisson’s and Buffon’s species into the Linnaean binomial nomenclature, henceforth the official language of natural history.

Three of them included these species in new editions of the *SN*. Linnaeus himself, in the twelfth edition, the last one he was able to publish (Linnaeus 1766), made heavy use of Brisson’s *Ornithologie*: out of the 386 species of birds added in that edition, “240 were based exclusively on Brisson, and a large part of the others on Brisson and his citations of authors not previously used by Linnaeus” (Allen 1910: 320). Moreover, out of 15 new genera of birds, 14 were borrowed from Brisson (Allen 1910: 320). In a supplementary volume published in 1771 Linnaeus (1771) still named a few more species in accordance with Brisson and the first sets of the *PE* (called “*Aub. misc.*”): for instance, “*Lanius leucorhyncus*” (i.e., *Artamus leucorhyncus* (Linnaeus, 1771)) is based on Brisson’s “Pie-griesche de Manille” and on the *PE* 9.

Philipp Ludwig Stadius Müller (1725-1776), a German zoologist, published a German adapted translation of the *SN* with a supplement (1776) in which he gave binomial names to many animal species described after 1766 by various authors, including Buffon (Dietz 2016; Müller-Wille 2017). He was able to use the first 24 sets of *PE* (plates 1-576), so that many birds newly described by Buffon entered the scientific nomenclature via Stadius Müller, in accordance with the Principle of Priority (Article 23 of the Code, ICZN 1999), although Stadius Müller’s names have been criticized for their unfitnes (Stresemann 1952: 503). Another problem is that Stadius Müller gives only a short description of the bird and just mentions “Buffon”, with no clear reference to a *PE* or to a page or chapter of the *HNO*. The correspondence of his descriptions and binomial names with Buffon’s species, as established by Cassin (1864), is generally admitted, but it is often not clear whether Stadius Müller’s name is based on the *PE* only or on the text and the *PE*, which has possible consequences for the identification of types.

In the thirteenth Latin edition of the *SN*, published by Gmelin (see above), the number of species was considerably greater than in the twelfth edition because, on the one hand, many new species had been described in the 1770s and 1780s by travelers and naturalists (not least Latham), and, on the other hand, Gmelin thoroughly compiled all the literature of natural history he was aware of. As a consequence, almost all the birds of Brisson’s *Ornithologie* and of the *HNO* not yet endowed with a binomial name received one from Gmelin or were, at least, considered as varieties.

Latham could also have participated in the process of “linnaeizing” of Buffon’s and Brisson’s species, since he systematically described all the species recognized by earlier naturalists in his *General Synopsis of Birds* (1781-1801). However, in this work, he quoted all Linnaeus’s names where they had originally been described but did not establish new binomial names for Brisson’s and Buffon’s species, or even for those he was the first to describe. In some of his other later works, he started using binomials, but Gmelin (1788, 1789) scooped him to almost all of these as a matter of priority.

Besides these general works, Pieter Boddaert (1730-1795), a Dutch physician and naturalist, published an opuscle aiming to link the birds represented on the *PE* with the species named by Brisson, Linnaeus, and a few

TABLE 3. — Position and composition of the “birds of prey” in several works from 1555 to 1760.

Work	Position of the “birds of prey” or equivalent group, and composition of this group	Comments
Belon 1555	Book II “Oyseaux vivants de rapine, tant de jour que de nuit” (39 chapters) = diurnal and nocturnal birds of prey in the modern sense + shrikes, cuckoo, bats, “ <i>Nycticorax</i> ” (unidentified bird)	Parrots are clearly separated from the birds of prey.
Gessner 1560	Order I “Aves rapaces, quae omnes rostris ac unguibus aduncis, & carnivoræ sunt, & interdiu volant” = diurnal birds of prey in the modern sense + shrikes Order II “Aves carnivoræ nocturnæ” = Owls, bats, “ <i>Nycticorax</i> ”, i.e., <i>Nycticorax nycticorax</i> (Linnaeus, 1758)	The parrots and the cuckoo are clearly separated from the birds of prey.
Aldrovandi 1599	Books I-II “Eagles” (“ <i>Aquilæ</i> ”) Book III “Vultures” (“ <i>Vultures</i> ”) Books IV-V “Hawks” (“ <i>Accipitres</i> ”), i.e., small diurnal birds of prey in the modern sense + the cuckoo and the shrikes Books VI-VII “Falcons” (“ <i>Falcones</i> ”) Book VIII “Nocturnal birds of prey” (“ <i>Rapaces nocturni</i> ”), including the nightjar	The birds of prey are not formally brought together in a group, but they are described successively in books I-VIII of the first vol. of the <i>Ornithologia</i> . Books IX to XII are devoted to birds considered more or less related to birds of prey: the book IX to species seen as “intermediate” between birds and quadrupeds (ostrich, bats); the book X to mythical birds somewhat similar to real birds of prey (harpy, griffon...); the book XI to the parrots; and the book XII to corvids and related birds (according to Aldrovandi).
Jonston 1650	First book, “Carnivorous terrestrial birds” Titulus I. “Eagles” Titulus II. “Vultures” Titulus III. “Hawks” (as in Aldrovandi) Titulus IV. “Falcons” Titulus V. “Parrots” Titulus VI. “Corvine birds and a few others, with a hard solid bill” Titulus VII. “Owls” (“ <i>Noctuae</i> ”), including the nightjar Titulus VIII. “Carnivorous [birds] of an intermediate nature”, i.e., bats and ostrich	The classification is similar to that of Aldrovandi, but the birds of prey are formally included in a larger group of “carnivorous terrestrial birds”, in which the nocturnal birds of prey are separated from the diurnal birds of prey in the modern sense by several other groups.
Charleton 1668	Class of “Carnivorous terrestrial birds” I. “ <i>Aquila</i> ”; II. “ <i>Vultur</i> ”; III. “ <i>Accipiter</i> ” (including the shrikes, but not the cuckoo); IV. “ <i>Falco</i> ”; V. “ <i>Cuculus</i> ” (cuckoo); VI. “ <i>Psittaci</i> ”; VII. “ <i>Corvus</i> ”; VIII. “ <i>Pica</i> ”; IX. “ <i>Bubo</i> ” (owls and nightjar), X. “ <i>Struthio</i> ”; XI. “ <i>Emeu</i> ”; XII. “ <i>Vespertilio</i> ”	As in Jonston 1650, but 1) the cuckoo is a separate genus; 2) the magpies are distinct from the corvine birds; 3) “carnivorous birds of an intermediate nature” are divided into three separate genera.
Willughby 1676, 1678; Ray 1713	“Carnivorous and rapacious, called Birds of Prey” (part of the “Land-fowl, which have Crooked Beak and Talons”) 1. “Diurnal, that prey in the day-time” a. “The Greater” “The more generous, called Eagles” “The more cowardly and sluggish, called Vultures” b. “The Lesser, called in Latine <i>Accipitres</i> ” “The more generous, that are wont to be reclaimed and manned for fowling, called Hawks” (including falcons, lanners) “The more cowardly and sluggish, or else indocile, and therefore by our Falconers neglected and permitted to live at large” (buzzards, shrikes, birds of Paradise) 2. “Nocturnal, that fly and prey by night” a. <i>Horned or eared</i> b. <i>Without Horns</i> (including the nightjar)	Much elaborated, hierarchical classification. The parrots are separated from the birds of prey but are close to them. The shrikes and the birds of paradise are included in the diurnal birds of prey. The corvids are clearly separated from them. In the text, the cuckoo is placed at the end of the diurnal birds of prey.
Linnaeus 1735	The birds of prey are in the order “ <i>Accipitres</i> ” (“hooked bill”), which comprises three genera defined according to the position of the four digits: “ <i>Psittacus</i> ” (parrot, one species), <i>Strix</i> (owls, four species), “ <i>Falco</i> ” (10 species, including all diurnal birds of prey in the modern sense: “ <i>Aquila</i> ”, “ <i>Buteo</i> ”, “ <i>Cyanopus</i> ”, “ <i>Nisus</i> ”, “ <i>Vultur</i> ”, “ <i>Falco</i> ”, “ <i>Milvus</i> ”, “ <i>Pygargus</i> ”, “ <i>Tinnunculus</i> ” + “ <i>Lanius</i> ”, i.e., the shrike).	The cuckoo is in the order of “ <i>Picae</i> ”, and the nightjar in the order “ <i>Passeres</i> ”.

Table 3. — Continuation.

Work	Position of the “birds of prey” or equivalent group, and composition of this group	Comments
Barrère 1745	The “birds of prey” are not brought together in a special group. They belong to the Class III (“ <i>Aves fissipedes</i> ”), of which the first genera (out of 40) are: I. “ <i>Percnopterus</i> ” (buzzard, other small diurnal birds of prey, not vultures) II. “ <i>Psittacus</i> ” (parrots) III. “ <i>Falco</i> ” (various small diurnal birds of prey) IV. “ <i>Aquila</i> ” (eagles) V. “ <i>Ulula</i> ” (owls) VI. “ <i>Feliceps</i> ” (horned owls) VII. “ <i>Caprimulgus</i> ” (nightjars)	–
Linnaeus 1748, 1756	Same as in Linnaeus (1735), but the shrikes are no more in the order “ <i>Accipitres</i> ”: they are now placed in the order “ <i>Passeres</i> ” (in the genus “ <i>Ampelis</i> ”); the genus “ <i>Falco</i> ” comprises 15 species of diurnal birds of prey in the modern sense.	–
Klein 1750	The genus “ <i>Accipiter</i> ”, in the family IV, corresponds to the birds of prey; it comprises four “tribes”: “ <i>Aquila</i> ” (“eagles”), “ <i>Vultur</i> ” (“vultures”), “ <i>Falco</i> ” (small diurnal birds of prey + the shrikes), “ <i>Ulula</i> ” (owls)	The nightjar and the corvids are in other genera of the family IV; the parrots and the cuckoo are in the family III.
Linnaeus 1758	The order “ <i>Accipitres</i> ” comprises four genera: “ <i>Vultur</i> ” (six species; vultures in the modern sense + harpy eagle) “ <i>Falco</i> ” (26 species; diurnal birds of prey in the modern sense, except the “vultures”) “ <i>Strix</i> ” (11 species; nocturnal birds of prey in the modern sense) “ <i>Lanius</i> ” (10 species; shrikes + several other Passeriformes)	The shrikes go back in the “ <i>Accipitres</i> ” together with other Passeriformes. The parrots (genus “ <i>Psittacus</i> ”) are now placed in the order “ <i>Picæ</i> ”.
Brisson 1759-1762	The birds of prey constitute the third order, which is divided into two “sections” and five genera: Section I (with a naked skin around the basis of the bill): “ <i>Genus Accipitrinum</i> ” (39 species of small diurnal birds of prey) “ <i>Genus Aquilinum</i> ” (15 species of “eagles”) “ <i>Genus Vulturinum</i> ” (14 species of “vultures”) Section II (the basis of the bill covered with feathers turned forwards): “ <i>Genus Asionis</i> ” (nine species of horned owls) “ <i>Genus Strigis</i> ” (11 species of owls)	All non-raptors in the modern sense (including shrikes) are placed in other orders.

other authors. For the species not yet named in the Linnaean system, Boddaert often coined binomens, a great number of which are still in use today according to the Principle of Priority, if the corresponding species had not been previously named by Statius Müller (whom Boddaert ignored). Several other authors incidentally named a few species in accordance with Buffon, such as the “*Paradisea Magnifica*” by Pennant (in Forster 1781: 40), and the “*Lybius guifobalito*” by Hermann (1783: 217).

Some of these generic or specific names based on Brisson’s and Buffon’s works and introduced in the last decades of the 18th century (including the previous two) are available, and, for some, valid, in modern taxonomy. On the other hand, many others are not available, not least because: another author had previously named the species by relying on Brisson or Buffon (as is often the case with Gmelin’s binomens, which were used for many decades before the Principle of

Priority was enacted and the works of Boddaert and Statius Müller rediscovered); or the species considered new by Buffon or Brisson had been already, in fact, described and named before them; or the birds in question are now considered unidentifiable.

INTRODUCTION TO THE “BIRDS OF PREY”

The “birds of prey” (“oiseaux de proie”) are the first group considered by Buffon: they constitute the greatest part of the first quarto volume (Buffon & Guéneau de Montbeillard 1771a: 61-393) and most of the first folio volume (Buffon & Guéneau de Montbeillard 1771b: 47-313). Both volumes appeared at the beginning of the year 1771, although the latter is dated from 1770 (see Anonymous 1771).

Compared to other groups, this one has been relatively stable from the 16th century to today: these birds were already treated together by most naturalists of the early modern

period, and even though “raptors” are not acknowledged as a whole by the modern taxonomy, they roughly correspond to four definite current orders (Falconiformes, Accipitri-formes, Cathartiformes, and Strigiformes). However, from the Renaissance to Buffon, there were many hesitations as to the boundaries of the group and its internal organization (Table 3). The inclusion of some species in the birds of prey was debated. Shrikes, in particular, were almost always considered diurnal birds of prey from Belon to the early 19th century because they were carnivorous, and they were, consequently, more closely associated with eagles, hawks, etc., than owls were. Up to the mid-18th century (but not afterwards), other species were sometimes included in the diurnal raptors because of the size and the shape of their bills (corvids, the common cuckoo, and parrots), and others in the nocturnal birds of prey because they hunted at night (nightjars, and even bats in some works of the 16th and 17th centuries).

In the classification of Willughby (1676, 1678) and Ray (1713), which is commonly used in the first decades of the 18th century, there is a group of “Carnivorous and rapacious, called Birds of Prey”, divided into diurnal and nocturnal birds of prey, with the shrikes and the birds of paradise in the former subgroup and the nightjars in the latter. In the first edition of the *SN* (1735), Linnaeus also acknowledges a group more or less equivalent to the birds of prey, namely, the order of “*Accipitres*” (literally “hawks”), comprising a genus of diurnal birds of prey, “*Falco*” (including the shrikes), and a genus of nocturnal birds of prey, “*Strix*”; but, unlike Willughby, he places the parrots (genus “*Psittacus*”) within the same order, and the birds of paradise, as well as the nightjars, in other orders (the “*Pica*” and the “*Passeres*”, respectively). This classification does not change in the following editions up to 1756, except that the number of the species mentioned in each genus increases and that, in 1748, the shrikes are shifted into the genus “*Ampelis*”, in the order “*Passeres*”.

More important changes occur in the tenth edition (1758), which marks a turning point in the taxonomy of the birds of prey as in the zoological classification in general. The “*Accipitres*” are now defined more precisely than in previous editions: “Bill (pulling hook) a little hooked downwards; the upper mandible armed with a tooth on both sides near the tip; nostrils open. Legs suitable for perching, short, strong; digits warty under the joints; claws curved and very sharp. Body with muscular head and neck; tenacious skin. Impure [flesh]. Food: butchery and plundering of carcasses. Nest in high places, about 4 eggs. Female larger than the male. Monogamy” (Linnaeus 1758: 81; our translation); and shortly characterized by a “bill projecting a spike from both sides of the upper mandible” (Linnaeus 1758: 86; our translation). The genus of the parrots is now excluded from the “*Accipitres*”, but the shrikes come back into this order as the new genus “*Lanius*”, which also includes several other birds placed today in the Passeriformes (e.g., the Bohemian waxbill). The three other genera of “*Accipitres*” are “*Strix*” (11 species of nocturnal birds of prey), “*Falco*” (26 species of diurnal birds

of prey), and “*Vultur*” (5 species of vultures in the modern sense + the harpy eagle). This relatively simple distribution of the “*Accipitres*”, with all diurnal raptors except the “vultures” in the same genus “*Falco*”, will remain unchanged in Linnaeus (1766) and Gmelin (1788).

Brisson (1759a: 307-526) is the first naturalist who places all birds of prey in the modern sense (Falconiformes, Accipitri-formes, Strigiformes), and only them, in one and the same group, namely, his third order, defined as “birds with four digits lacking membranes, three forward, one backward, all separated from each other up to the basis; legs covered with feathers up to the heel [ankle]; short hooked bill” (our translation). This order is divided into two “sections”, “those with the basis of the bill covered with a naked skin”, and “those with the basis of the bill covered with feathers turned forwards” (our translation), corresponding to the diurnal and the nocturnal birds of prey, respectively. The first section comprises three genera, the “hawks” (“*Accipiter*”), the “eagles” (“*Aquila*”) and the “vultures” (“*Vultur*”): in other words, the Linnaean genus “*Falco*” is split up in two genera, and the “eagles” are separated from the smaller diurnal birds of prey, as in the classification of Willughby and earlier naturalists. The other kinds of birds traditionally included in or related to the birds of prey are placed elsewhere in Brisson’s classification, in accordance with the shape of the bill: in particular, the “shrikes” (i.e., the shrikes in the modern sense with other Passeriformes) are in the fifth order (Brisson 1759b: 139), with the “thrushes”, “cotingas” and other genera.

Buffon defines the “birds of prey”, above all, as the birds which “feed on flesh and wage war on the other birds” (Buffon & Guéneau de Montbeillard 1771a: 61), but he also gives a more complete list of features: very high flight, strong wings and legs, very sharp vision, large head, fleshy tongue, simple membranous stomach, intestines smaller and shorter than those of other birds, life in lonely places and desert mountains, nests in holes of rocks or on highest trees, hooked bill, four fully separate digits (Buffon & Guéneau de Montbeillard 1771a: 64-65). The last two characters are probably borrowed from the definition of Brisson’s third order, but, as a whole, Buffon’s “birds of prey” more closely correspond to Linnaeus’s “*Accipitres*” (as defined in 1758), since they comprise not only the diurnal and nocturnal raptors in the modern sense, but also the “shrikes”.

The internal organization of the group shares two important similarities with the previous systems: the traditional subgroup of nocturnal birds of prey (“oiseaux de proie nocturnes”), which is placed at the end (like Linnaeus’s genus “*Strix*”, and Brisson’s second section of order III); and the more recent subgroup of “vultures” (corresponding to the genus “*Vultur*” of Linnaeus and to the “genus *Vulturinum*” of Brisson). However, Buffon follows neither Linnaeus nor Brisson for the divisions of the diurnal birds of prey. In fact, he does not propose any formal classification of these birds, but from the organization of the chapters (especially the chapters on “foreign birds related to...”) we can infer that he acknowledges at least five subgroups (“eagles and

ospreys”, “vultures”, “kites and buzzards”, “goshawks and hawks”, “falcons and gyrfalcon”) with a few species not formally included in the last subgroup, but apparently related to it (hobby, kestrel, etc.). In any case, he does not view these subgroups as clearly delimited entities since, for him, the only real category is the species, and there are intermediate species between the groups, such as the “jean-le blanc” between the “eagles” and the “buzzards”.

The Buffonian distribution of the birds of prey had little if any immediate influence, even though it may have indirectly contributed to the increase in the number of genera in the 19th century. In the last decades of the 18th century, most naturalists admitted the Linnaean order “*Accipitres*”, sometimes with minor modifications. In particular, Gmelin kept the division of the “*Accipitres*” into four genera and, except in a few cases, the same numbering of the species as in Linnaeus (1766), but he changed their order and added many new species (the genus “*Falco*” had 32 species in 1766, 121 in 1788). However, a few authors proposed alternative classifications in which “shrikes” were excluded from the birds of prey (e.g., Latham 1781; Batsch 1788; Bonaterre & Vieillot 1790-1823). This exclusion was widely accepted after 1800. Then, the group of the birds of prey acquired the composition it would keep more or less till the late 20th century, with its general division into diurnal (*Accipitriformes*, *Falconiformes*) and nocturnal (*Strigiformes*) raptors. It is worth noting that the birds of prey as a whole, as well as the diurnal birds of prey are considered polyphyletic in all recent avian trees of life: the *Accipitriformes* and the *Strigiformes* belong to the clade of Afroaves, together with many other orders of birds, and the *Falconiformes* in the *Australaves* (Kuhl *et al.* 2021).

“EAGLES” IN THE ORNITHOLOGICAL LITERATURE UNTIL 1770
 “Eagles” in the largest traditional sense (i.e., roughly, large diurnal birds of prey except vultures) comprised several Palearctic species known by Greek and Latin authors, especially as these birds had considerable cultural and symbolic significance. However, they were not always clearly distinguished from each other and from other birds, and their identification in ancient texts is often difficult or even impossible. For example, the Greek generic term “*aetos*” or “*aietos*” designated several species of eagles as well as other raptors, including vultures (Arnott 2007: 4-5). This vagueness partly resulted from the very nature of ancient zoology, which generally relied on brief and ambiguous descriptions, did not have any clear concept of species or genus, and admitted the possibility of metamorphoses and hybridizations between very different species. However, there are other reasons, specific to birds of prey in general and to “eagles” in particular. For instance, their observation in nature is difficult, and their color changes a lot during their life, meaning that a juvenile of one species may resemble a juvenile of another species more than an adult of its own species. The identification of the birds mentioned by ancient authors (not least Aristotle and Pliny the Elder), which has been a recurring problem since the 16th century, is beyond the scope of this paper (we mostly rely on Arnott

2007), but we must keep in mind that most ornithologists of the early modern period, including Buffon, very often referred to this heritage.

Using both information borrowed from ancient texts and their own observations, the ornithologists of the 16th century more or less explicitly acknowledged a group of “eagles” within the birds of prey (Table 4). Its composition was not exactly the same in all authors, but the list proposed by Aldrovandi in 1599 was admitted by most naturalists up to Willughby, who modified it by discarding the most uncertain species and by adding a few new ones.

Unlike previous naturalists, Linnaeus did not distinguish “eagles” from other diurnal raptors (except “vultures”), but he placed all these birds in the same genus, “*Falco*”, defined according to the position of the digits (3 forward, 1 backward). Furthermore, in comparison with Aldrovandi, and even with Willughby, he considerably reduced the number of species in the first editions of the *SN*: the genus “*Falco*” comprised ten species altogether, including only two “eagles” in 1735, fifteen (three “eagles”) in 1748-1756. The classification of birds of prey became more precise in the last editions. The genus “*Falco*” was now defined as the “*Accipitres*” having “a hooked bill, equipped with a cere at its basis, the head tightly covered with feathers, and a forked tongue” (Linnaeus 1758: 88, 1766: 124; Gmelin 1788: 250; our translation), it was divided into two groups (“yellow cere” and “dark cere”), and the number of species was much greater than before. In 1758, the genus comprised 26 species, six of which (five with a “yellow cere”, and one with a “dark cere”) corresponded to “eagles” of other naturalists (only four are currently acknowledged species).

Brisson reverted back to the traditional classification and admitted a “genus of the Eagle” or, in a Latin adjectival form, a “genus *Aquilinum*” (Brisson 1759a: 419-452). The Latin noun, “*Aquila*”, was introduced in the table at the beginning of the *Ornithologie* (Brisson 1759a: 28) and is, thus, a valid genus name in modern taxonomy (*Aquila* Brisson, 1759a) (see above; it should be noted that the current nomenclature takes into account only the date on the title page, i.e., 1760, but Brisson’s work was published from 1759 to 1762). Brisson used this noun “*Aquila*” to name most, but not all the 15 species of the genus; the first species was named just “Aigle”, “*Aquila*” (on Brisson’s nomenclature, see above). The genus “*Aquila*” was defined as the birds having “four digits devoid of membrane, three forward, one backward, all separated from each other almost up to their basis; legs covered with feathers up to the heel [ankle]; short, hooked bill, the basis of which is covered with a naked skin; the curve of the bill begins at some distance from its basis; the head covered with feathers” (Brisson 1759a: 419; our translation). As usual, the number of species was much greater in Brisson than in his predecessors, due to the more extensive analysis of the printed sources, as well as to the description of a new species, the “Aigle de Pondichéry”, “*Aquila Ponticeriana*” (i.e., *Haliastur indus*), based on a specimen observed in the cabinet of the abbé Aubry. Brisson described another new species, the “Jean-le-blanc”, “*Pygargus*” (i.e., *Circus gallicus*), but he mistook it for a bird previously described by Belon (1555) (a buzzard). Out of the 15 species of Brisson’s

genus “*Aquila*”, several have a counterpart in Linnaeus (1758), all in the genus “*Falco*”, with the exception of the “Aigle hupé du Brésil”, “*Aquila Brasiliensis cristata*”, which corresponds to Linnaeus’s “*Vultur Harpyja*” (i.e., *Harpia harpyja*). One species of Linnaeus may correspond to two species of Brisson (“*Falco canadensis*” and “*Falco fulvus*” both correspond to Brisson’s “Aigle”, “*Aquila*”), or vice versa (Linnaeus’s “*Falco Albicilla*” is split into the “Aigle à queue blanche”, “*Aquila albicilla*” and the “Petit Aigle à queue blanche”, “*Aquila albicilla minor*”).

In 1766, Linnaeus introduced several new species in the genus “*Falco*”, two of which corresponded to “eagles” of other authors: the “*Falco Ossifragus*” (Brisson’s “Grand Aigle de mer”, “*Aquila Ossifraga*”, which is an immature *Haliaeetus albicilla*) and the “*Falco coronatus*” (Brisson’s “Aigle hupé d’Afrique”, “*Aquila Africana cristata*”, i.e., *Stephanoaetus coronatus* [Linnaeus, 1766]). Both had been described before by Brisson, and it was probably under Brisson’s influence that Linnaeus took them into account in the twelfth edition of the *SN*.

TABLE 4. — Position and composition of the “eagles” in several work from 1555 to 1758 (elements of identification in square brackets).

Work	Place and composition of the group of “eagles”	Comments
Belon 1555	No formal subdivision of the “Oyseaux vivants de rapine” (birds of prey), but the order of the chapters suggests relations between the species. Two chapters are devoted to “eagles” in the strictest sense: the “Grand aigle royal de couleur fauve” (“large tawny eagle”, chap. IV: p. 89-92, fig.) and the “Aigle noire” (“black eagle”, chap. V: p. 92-94, fig.) [both are <i>Aquila chrysaetos</i> (Linnaeus, 1758); the second is juvenile and confused with other species]. The next chapter is devoted to the gyrfalcon, which is thus considered close to the eagles. The chapter VII describes the “Orfraye” (p. 96-97, fig.) [probably <i>Pandion haliaetus</i> (Linnaeus, 1758), confused with <i>Haliaeetus albicilla</i> (Linnaeus, 1758)], and the chapter VIII the unidentifiable “ <i>Ossifragus</i> ” (p. 97-100, fig.) [maybe <i>Gypaetus barbatus</i> (Linnaeus, 1758)].	Belon’s “Jan le blanc” or “oyseau saint Martin” (chap. XI: p. 103-104, fig.) [probably <i>Circus cyaneus</i> (Linnaeus, 1766)] is clearly separated from the eagles; however, since Belon also called this bird “ <i>Pygargus</i> ”, a term which traditionally designated a large unidentified diurnal raptor, the “Jan le blanc” was identified with “ <i>Falco albicilla</i> ” [i.e., <i>Haliaeetus albicilla</i>] by Linnaeus, and with the “ <i>Pygargue</i> ” [i.e., <i>Circaetus gallicus</i>] by Brisson and Buffon.
Gessner 1585	The “eagles” are formally brought together in a series of chapters on “ <i>Aquilae</i> ”. The nine main species are: - “ <i>Aquila germana</i> ” (p. 168-195, fig.) [mainly <i>Aquila chrysaetos</i> ; confused with other species]; - “ <i>Aquila Anataria, Clanga, Planga, Percnus, Morphnus</i> ” (p. 196-199, fig.) [<i>Pandion haliaetus</i>]; - “ <i>Aquila alba sive Cygnea</i> ” (“white eagle”: p. 199) [doubtful, semi-mythical species]; - “ <i>Aquila quam percnopterus et oripelargum et gypaetum vocant</i> ” (p. 199-201, fig.) [<i>Neophron percnopterus</i> (Linnaeus, 1758)]; - “ <i>Haliaeetus, Aquila marina</i> ” (p. 201-202 and 804-805, fig.) [<i>Pandion haliaetus</i>]; - “ <i>Melanaeetus, seu Valeria aquila</i> ” (p. 203) [maybe <i>Clanga pomarina</i> (Brehm, 1831), confused with other species]; - “ <i>Ossifraga</i> ” (p. 203-205) [<i>Gypaetus barbatus</i> confused with other species]; - “ <i>Pygargus</i> ” (p. 205-206) [<i>Haliaeetus albicilla</i>]; - “ <i>Aquila Heteropus</i> ” (p. 207, fig.) [maybe <i>Circaetus gallicus</i>]	Several other dubious species of “eagles” are briefly described, in accordance with ancient and modern authors.
Aldrovandi 1599	The book I (p. 17-107) is on the “eagles” in general; the book II (p. 108-234) on the different species of “eagles”: - “ <i>Chrysaetus</i> ” (p. 110-187, fig.) [<i>Aquila chrysaetos</i>]; - “ <i>Halietus</i> ” (p. 187-197, fig.) [<i>Pandion haliaetus</i>]; - “ <i>Melanaetus seu Aquila valeria</i> ” (p. 197-204, fig.) [<i>Aquila chrysaetos, Clanga pomarina, etc.</i>]; - “ <i>Pygargus</i> ” (p. 205-207, fig.) [<i>Haliaeetus albicilla</i>]; - 2nd and 3rd “ <i>Pygargi</i> ” (p. 208-209, fig.) [<i>Circus cyaneus</i>]; - “ <i>Morphnus seu Clanga</i> ” (p. 209-214) [various species of eagles and <i>Falco rusticolus</i>]; - “ <i>Morphno congener</i> ” (p. 214-215, fig.) [maybe <i>Clanga clanga</i> (Pallas, 1811)]; - “ <i>Percnopterus</i> ” (p. 216-221, fig.) [<i>Neophron percnopterus</i>]; - “ <i>Ossifraga</i> ” (p. 222-231, fig.) [<i>Haliaeetus albicilla</i> , confused with <i>Pandion haliaetus</i> and other species]; - “ <i>Aquila alba seu cycnea</i> ” (p. 231) [unidentified]; - “ <i>Aquila heteropus</i> ” (p. 232, fig., based on Gessner) [maybe <i>Circaetus gallicus</i>]; - “ <i>Scythica avis</i> ” (p. 233-234, fig.) [unidentified, semi-mythical].	—
Jonston 1650	First book, “Carnivorous terrestrial birds”. Titulus I. “Eagles” (p. 9-16, plates I-V): Same list of species as in Aldrovandi 1599.	—
Charleton 1668	Class of “Carnivorous terrestrial birds”. I. “ <i>Aquila</i> ” (p. 62-63): Same list of species as in Aldrovandi 1599.	—

Table 4. — Continuation.

Work	Place and composition of the group of “eagles”	Comments
Willughby 1676, 1678	<p>“Carnivorous and rapacious, called Birds of Prey”. “Diurnal, that prey in the day-time”. “The Greater”. “The more generous, called Eagles”. (1676: 27-34; 1678: 58-65). The list is still largely borrowed from Aldrovandi, but references to Markgraf and new observations are added:</p> <ol style="list-style-type: none"> 1. “<i>Chrysaetus</i>”/“Golden Eagle” (based on Aldrovandi) [<i>Aquila chrysaetos</i>]; “<i>Chrysaetus caudâ annulo albo cinctâ</i>”/“Golden Eagle with a white ring about its tail” (new observation); corresponds to Linnaeus’s “<i>Falco fulvus</i>” [<i>Aquila chrysaetos</i>]; 2. “<i>Haliaetus i.e., Aquila Marina</i>”/“Sea-Eagle or Osprey” (based on Leonhard Baldner) [<i>Haliaeetus albicilla</i>]; 3. “<i>Melanaetus, seu Aquila Valeria</i>”/“Black Eagle” (seen in Middelburg) [maybe juveniles of <i>Aquila chrysaetos</i> or <i>Haliaeetus albicilla</i>]; 4. “<i>Pygargus, Albicilla, Hinnularia</i>”/“Pygarg or White-tail’d Eagle” (seen in Venice) [<i>Haliaeetus albicilla</i>]; 5. “<i>Morphnus seu Clanga, Anataria etiam dicta</i>” (based on Aldrovandi, Gessner) [unidentified species]; 6. “<i>Urutaurana</i>”/“Crested Eagle of Brasil” (based on Markgraf) [<i>Spizaetus ornatus</i> (Daudin, 1800)]; 7. “<i>Urubitinga</i>” (based on Markgraf) [<i>Buteogallus urubitinga</i> (Gmelin, 1788)]; 8. “<i>Percnopterus seu Gypaëtus</i>”, “Vulturine Eagle” (based on Belon, Gessner, Aldrovandi, and new observation in Venice) [<i>Neophron percnopterus</i>]. 	<p>Willughby identifies Aldrovandi’s “<i>Haliaetus</i>” with the “Bald Buzzard” of the English [<i>Pandion haliaetus</i>] and places it with the “<i>Accipitres</i>” (1676: 37). Almost the same list in Ray (1713) and Salerne (1767); the latter adds the “Aigle Malabar”, i.e., Brisson’s and Buffon’s “Aigle de Pondichéry” [<i>Haliastur indus</i> (Boddaert, 1783)].</p>
Linnaeus 1735, 1748, 1756, 1758	<p>The “eagles” do not constitute a separate group but are included in the genus “<i>Falco</i>” (order “<i>Accipitres</i>”), which comprises all the diurnal birds of prey in the modern sense except “vultures” in 1758. The species of the genus “<i>Falco</i>” corresponding to the “eagles” of previous naturalists are different from one edition to the other:</p> <ul style="list-style-type: none"> - in 1735, two species (out of 10): “<i>Aquila</i>” [probably <i>Aquila chrysaetos</i>], and “<i>Pygargus</i>” [probably <i>Haliaeetus albicilla</i>]; - in 1748 and 1756, three species (out of 15): “<i>Chrysaetos</i>” [<i>Aquila chrysaetos</i>], “<i>Haliætus</i>” [<i>Pandion haliaetus haliaetus</i>]; “<i>Pygargus</i>” [<i>Haliaeetus albicilla</i>] - in 1758: six species (out of 26): “<i>Falco Melanætus</i>”, “<i>F. Chrysaëtus</i>”, “<i>F. fulvus</i>”, “<i>F. canadensis</i>”, “<i>F. Albicilla</i>”, “<i>F. Haliætus</i>” (see the identification below in part “results”) 	<p>The species of “eagles” in the editions of 1748 and 1756 can be identified as such more easily than in 1735, since Linnaeus refers to his much more precise <i>Fauna Svecica</i> (1746).</p>

However, he overlooked the “Aigle de Pondichéry” and the “Jean-le-blanc”. Furthermore, several birds changed their genus or their status. The “*Falco Albicilla*” of 1758 became “*Vultur Albicilla*” in 1766 (a misprint, “*Albiulla*”, is emended in an erratum at the end of vol. 2, 1767, of the 12th ed. of *Systema naturæ*). More generally, several great diurnal raptors oscillated between the genera “*Falco*” and “*Vultur*” in the successive editions of the *SN*: in 1788, Gmelin placed the “*Vultur Albicilla*” in the genus “*Falco*” again, and he shifted Linnaeus’s “*Vultur Harpyja*” into the genus “*Falco*”. A bird considered a full species in 1758 (“*Falco canadensis*”) became a mere “variety” of “*Falco fulvus*” in 1766; conversely, a “variety” of “*Falco Albicilla*” in 1758 became a full species, “*Falco leucocephalus*” (and its genus did not change).

Buffon designated the first subgroup of the “birds of prey” as “Aigles” (“eagles”), or, according to the title of the chapter devoted to the foreign birds related to it, as “Aigles et Balbuzards” (“eagles and ospreys”) (Buffon & Guéneau de Montbeillard 1771a: 71-145). He did not give a formal definition of that group, except two shared features, probably inspired from Brisson’s definition of the “genre de l’Aigle”: the “head covered with feathers” (which distinguishes the eagles from the vultures), and the bill “which is straight at its beginning and becomes curved only at some distance from its basis” (Buffon & Guéneau de Montbeillard 1771a:

65; our translation). In any case, the group was not clearly delimited since the “Jean-le-blanc” was not considered a real “eagle”, but an intermediate species between the eagles and the buzzards.

MATERIAL AND METHODS

The relations of the species and the “varieties” described by Linnaeus (1758, 1766), Brisson (1759-1762), Buffon & Guéneau de Montbeillard (1771-1783 and 1771-1786, including the *PE*, published from 1765 to 1780), and Gmelin (1788, 1789) are presented as a list.

Organization

First, we have to make clear that “relation” (as established by each main item of the list) does not mean “synonymy” in the sense of the *Code*, which is a scientific hypothesis as to the identity between the species designated by two or more names. Here the question of the identification of the species in modern taxonomy is examined separately (see below) and is quite distinct from that of the relations between the considered works of the 18th century, which are established on the basis of internal criteria. The easiest case is when an author explicitly cites a previous one: Brisson systematically

cites Linnaeus (1758); Linnaeus (1766) generally cites Brisson; and Gmelin almost exhaustively cites all his predecessors. As for Buffon and Guéneau, they generally refer to Brisson, only sometimes to Linnaeus. Although incomplete, this network of mutual citations makes it possible to establish the correspondence in most cases. For example, Brisson (1760: 110-112) does not refer to Linnaeus's "*Emberiza Quelea*" (1758: 177) in the list of names he gives for the "Moineau à bec rouge du Sénégal", but Linnaeus (1766: 310) cites Brisson's "Moineau à bec rouge du Sénégal" in his own list for "*Emberiza Quelea*". For the same bird, Buffon (*in* Buffon & Guéneau de Montbeillard 1775: 484-485) does not cite Linnaeus nor Brisson (although he most probably observed the same specimen as Brisson), but Gmelin (1789: 877) cites both Brisson and Buffon in the list of names for "*Emberiza Quelea*". In some cases, an author does not cite another one but refers to the same printed sources: for example, Brisson (1759b: 93) and Guéneau (*in* Buffon & Guéneau de Montbeillard 1775: 230) both describe the "Troupiale du Brésil" and the "Japacani", respectively, relying on Markgraf, Klein, and Hans Sloane, but Guéneau does not refer to Brisson. Buffon sometimes describes bird species as if they were new, but it is quite obvious that the studied specimens are those from Réaumur's collection already described by Brisson (e.g., exotic "shrikes"); in such cases, Gmelin generally establishes the relation retrospectively by referring to both Brisson and the *HNO*. It is important to consider that the relations are not always one-to-one. On the one hand, one species from an author may have no counterpart in a previous work (especially if the species is new, of course, but also if it has been described by naturalists but not taken into account, as it is the case with many species acknowledged by Brisson in 1759-1762 but absent in Linnaeus 1758), or in a later one (for instance, Linnaeus did not include all the species of Brisson in 1766). On the other hand, one species for an author may correspond to two or more species for another, one bird considered a distinct species by an author may be seen as a mere "variety" by another, etc. These cases will be explained in the list.

All the species and the "varieties" considered by Linnaeus (1758, 1766) and Brisson are presented here; both authors clearly list and number them ("varieties" are designated by Greek letters in Linnaeus, by Roman letters in Brisson). On the contrary, Buffon does not give a clear list of the "varieties" of each species since, according to him, the possibilities of variations within a species are infinite and continuous: that is why we indicate only Buffon's "varieties" that correspond to species or "varieties" of other authors. As for Gmelin, we only consider the species and "varieties" with counterparts in Linnaeus, Brisson, and the *HNO*; the (generally numerous) other species and "varieties" will be listed for each genus separately.

The global sequence of the lists (and, as a consequence, of the papers of this series) follows the order of the *HNO*, which has only loose relations with the modern classification (for example, shrikes are between falcons and owls, since Buffon considers them birds of prey). Each list thus corresponds to

a group acknowledged by Buffon and Guéneau. However, it is sometimes difficult to establish clear divisions since, as we have seen, Buffon discarded any classification similar to that of Linnaeus. He did not use precisely delimited categories and he admitted the existence of intermediate species. Fortunately, we can often rely on the parts on "foreign birds related to...", which most of the time mark the end of a group. Such difficulties will be discussed in the introductions to their respective papers. Since the organization of the *HNO* is partly inspired by Brisson, there is often a correspondence between a group of birds in the *HNO* and a genus from Brisson, although this is not always the case. In particular, Brisson's vast genera (such as the "genre de la Grive") are generally split into several groups. The correspondence between Buffon's groups and the Linnaean genera, which are vaster than those of Brisson, is even less clear.

The lists follow the order of the chapters and the short notes in the *HNO*. For the species and the varieties which do not constitute entire chapters or notes, we follow the order of Buffon and Guéneau de Montbeillard's text. As a consequence, Linnaeus's and Brisson's species and varieties are in no particular order. A few species or varieties acknowledged by Linnaeus and/or Brisson, but not taken into account by Buffon, are placed at the end of the lists of the corresponding groups. Sometimes their position is self-evident (e.g., Linnaeus's "*Vultur monachus*" at the end of the list of "Vautours"), sometimes it is more or less arbitrary (especially the species belonging to Linnaean genera which are completely broken up in the *HNO*): such cases are explained. For those species or varieties absent from the *HNO*, we follow in each list the order 1) of Brisson, 2) of Linnaeus 1758 (if absent from Brisson), 3) of Linnaeus 1766 (if absent from Brisson and Linnaeus 1758).

Original names of species and varieties

The names used by the authors are considered from a historical perspective and, consequently, are written as they are written in the original publications, with their spelling and capitalization. For binomens in Latin, even features which are incorrect today (capitalization of the specific name, diacritics, ligatures, etc.) are kept. The names in small caps correspond to full species (according to the considered authors), those in lower case letters to varieties. For Linnaeus, Brisson, and Gmelin, the distinction is clear; for Buffon and Guéneau, not always, since they often wonder if a bird belongs to the same species as another or represents a separate species.

Here we indicate the names of Linnaeus (1758, 1766), Gmelin (1788, 1789), Stadius Müller (1776), Boddaert (1783), etc., considered valid by modern taxonomists in the strictest sense of the *Code* by underlining them. More details are given in the section "Nomenclature" on the current status of the names (see below).

General information

For the species and varieties mentioned in the tenth, twelfth and thirteenth editions of the *SN*, we provide the pages, with the numbers of the genus (G) and the species (S). For Bris-

son, we give the number of the species within the considered genus, the reference, as well as the number of the plate and the figure, if need be, in the first, bilingual (Latin and French) edition of 1759-1762. This edition includes an appendix (Brisson 1762), at the end of the last volume, where a few new species are described, and references are added for the species already described in previous volumes: in particular, many references to Linnaeus (1758) are in this appendix. We also give the volume and the pages in the new edition published in Leiden in 1763 (Brisson 1763a, b), only in Latin (otherwise this edition is similar to the first one but does not include all the references). Linnaeus (1766) and Buffon always refer to the edition of 1759-1762, but Gmelin uses both editions.

For the *HNO*, we give the references to the quarto edition (including De Sève's plate number, if required) and to the folio edition. If the considered species or "variety" is represented on a *PE*, we indicate the number of the plate and of the figure, the name of the bird as it appears on the plate's caption, and the date of publication (see Schmitt 2022a), since the plates appeared separately.

Four authors identified all the birds represented on the *PE* with the species defined by themselves or by other naturalists. The first one was Boddaert, in an opuscle published in 1783, as we have seen. A few decades later, the German naturalist Heinrich Kuhl (1797-1821) established correspondences between all the birds of the *PE* and Linnaean names (Kuhl 1820). In 1839, the Dutch zoologist Coenraad Jacob Temminck published colored plates of birds, as a continuation to the *PE*, and he included in his work a general "Tableau méthodique" of all his plates and those of Buffon (Temminck 1839: the date indicated on the title page is 1838, but the actual date of publication of the part of Temminck's work which includes the "Tableau méthodique" is January 29th, 1839; see Dickinson 2001: 7). Finally, the ornithological treatise of the English zoologist George Robert Gray (1808-1872) comprised a table of the "generic and specific names employed in this publication referred to the figures of the following ornithological works" (Gray 1849). We indicate these correspondences. Regarding Boddaert, we specify his references to Brisson, Linnaeus, Latham, and other authors, and the names he coined for the species he considered new. Other names (available or not) based on the *HNO* and/or the *PE*, in particular by Statius Müller (1776), are indicated too.

Sources

When known, we indicate if the author was able to observe specimens of the considered species (alive or not), or to use unpublished material. Linnaeus generally says very little if ever about that. In some cases, he refers to his *Fauna Svecica* (Linnaeus 1746), which itself refers to unpublished drawings of Swedish birds by Olof Rudbeck (e.g., for "*Strix scandiaca*": see Linnaeus 1746: 16, 1758: 92). Linnaeus also cites his student, the traveler Daniel Rolander, but it is unclear what kind of documents (manuscripts, drawings, or real birds) he used (e.g., for "*Falco sufflator*": see Linnaeus 1758: 90). Unlike Linnaeus, Brisson always states whether he has been

able to see the bird, he almost always specifies where he has observed it (in Réaumur's cabinet or in another collection of natural history), and, for the specimens of Réaumur's cabinet, he often indicates their origin and the donors, especially for exotic birds. As for Buffon and Guéneau, they rarely say if they have observed a real bird, but the existence of a plate (whether a black and white plate by De Sève or an illuminated plate) means that they could have, except in the very few cases in which the plates are based on a drawing. As we have seen, the authors of the *HNO* often studied the same specimens that Brisson had previously, but they rarely said so explicitly.

We indicate the printed mentioned sources by each author. For Linnaeus (1758, 1766) and Gmelin (1788, 1789), we give all the references, in the same order as in the original work, notwithstanding the chronology, since this order makes sense (the most important references are mentioned first, for example when Linnaeus refers to his *Fauna Svecica*). For Brisson, who attempts to establish an exhaustive list of names for every species, we give the references in the chronological order (the order of the references in Brisson has nothing to do with their importance for him). The case of the *HNO* is more complex. In general, Buffon and Guéneau give a list of references in a footnote at the beginning of each account, but in practice this list is very variable: it is sometimes a very short selection, sometimes a quasi-exhaustive list of names (generally borrowed from Brisson). Furthermore, other sources relating to various kinds of information (on distribution, biology, behavior, etc.), including travel accounts and ancient authors (even poets), are mentioned elsewhere in the text. We only indicate the references which are relevant to the identification of the species.

The references of Linnaeus, Brisson, Buffon (or Guéneau), and Gmelin to each other are in bold. The obvious mistakes (wrong pages, numbers of plates, etc.) are indicated with inverted commas and corrected ("XXX" = XXX), and some references are completed in square brackets. The names used in the mentioned sources are given in their original form, whether they are reproduced (correctly or not) by Linnaeus, Brisson, Buffon, Guéneau, and Gmelin, the first time the reference appears; they are not rewritten afterwards.

It should be noted that, while Linnaeus refers to the English original edition of Albin's work (1734), Brisson always refers to the French edition (1750). The plates are identical and have the same numbers in both editions, but the pagination of the text is different. Likewise, Gmelin often refers to Willughby's English edition (1678), while the other authors rely on the Latin edition (1676).

Distribution and habitat

Here we indicate the information given by the authors, which is often imprecise (e.g. "America"), or even false; if needed (for example if borders have changed since the 18th century), we give the correspondence with modern regions or countries between brackets. Linnaeus and Gmelin almost always give an indication of the distribution of each species with all its varieties (however, they do not give the distribu-

tion of single varieties). It is important to note that this is by no means a type locality in the modern sense, since this notion, and, more generally, the modern notion of “type”, did not exist in the 18th century (even though such indications were retrospectively interpreted as type localities by later authors). Brisson, Buffon and Guéneau also give elements on the distribution of the species, but not always. In particular, Brisson generally specifies where exotic species are from. When nothing is mentioned in that respect, we can only infer that the species is present in France. It must be emphasized that all these authors (especially Brisson) do not make a clear distinction between the geographical distribution and the habitat.

Identification of the birds

As far as possible, we propose an identification of the species and varieties considered in terms of modern taxonomy (species and subspecies) at the end of each item of the list. We use the nomenclature of del Hoyo & Collar (2014), and, in this section and the next, we mark the valid names (i.e., used in modern taxonomy) with asterisks at the beginning; all other names (in Latin and in other languages) have to be considered historical names.

If the identification is not problematic, we just indicate the species or subspecies in question, but, in many cases, we have to distinguish between the species as it can be identified from the diagnosis and the description (which rely on direct observations and/or a few sources) and the figures (in Brisson's *Ornithologie* and the *HNO*), and the species referred to in the cited sources which often rely themselves on earlier sources. Such cases are explained.

In order to identify the birds described by the four considered authors or in their sources, we use internal information above all, that is, the textual description itself (not least indications relating to the size of the bird) and the figures, if they exist, as well as data regarding the origin of the bird and its behavior (but these data must be used very carefully since mistakes occur, such as the origin of exotic birds). In this respect, the textual and visual information given by Brisson and in the *HNO* is generally quite precise, but the diagnoses and the very short texts of Linnaeus and Gmelin are rarely sufficient, making it necessary to analyze the sources. As a general rule, the identification of the birds mentioned in works from Antiquity is very doubtful (Arnott 2007). The species described by authors of the 16th century (Belon, Gessner, Aldrovandi) can more often be recognized, since many first-hand descriptions and figures are rather accurate, but original information is largely mixed up with data borrowed from ancient works. The birds represented on illustrated works of the 18th century (especially the corpuses in color: Albin, Catesby, Frisch, Edwards) can often be identified, but even in those cases uncertainties remain.

The ornithological literature from the late 18th century to this day is, of course, very helpful, especially the synonyms given by the authors of the 19th century (Gray, Sharpe, Dresser...), which represent a valuable link between earlier

works and the modern taxonomy. However, these works must be used with caution. We also make use of recent studies devoted to several authors of interest, for example the notes from Glardon (1997) in his edition of Belon's work, the book from Springer & Kinzelbach (2009) on Gessner, the papers of Herrmann (1989) and Boesemann *et al.* (1990) on Markgraf, and from Reveal (2015) on Catesby.

We have to emphasize that, even though current taxonomy uses old sources such as Linnaeus's last editions of *Systema natura*, such sources obviously did not respect the principles of current nomenclature regarding the notions of species or genus, or the status of names and types, since these principles were established much later, in the 19th century. Even Linnaeus, who introduced binomial nomenclature, used it and conceived of it in a way very different from today's scientists. This difference may result in ambiguities and misunderstanding between historians and taxonomists, as revealed, for example, by recent debates about Linnaeus's naming of the elephant (Witteveen & Müller-Wille 2020). We will not examine this question here, but it should be kept in mind.

Nomenclature

In this section, we specify, if necessary, the status of the considered binomen. Of course, this section only concerns those authors who use Linnaean nomenclature (mainly Linnaeus and Gmelin, and to a lesser extent Boddaert, Statius Müller, etc.), and neither Buffon and Guéneau, nor Brisson, who do not. It is not an *allocation* of the considered names: in contrast to the previous section, where identification is discussed, the section “nomenclature” simply indicates the acknowledged status of the names in the current state of taxonomy. We cannot exclude that in future articles (but this is not the case in this one), discrepancies will appear between our identification and the current nomenclature, and we will point this out, but it will be up to taxonomists to draw whatever conclusions they deem necessary.

ABBREVIATIONS

HNO Buffon and Guéneau's *Histoire naturelle des oiseaux* (quarto edition, unless otherwise specified);
PE *Planches enluminées*.

CONVENTIONS USED IN THE LIST

Original names in small caps	full species (according to the considered author);
Original names in lower case letters	“varieties” (according to the considered author);
Underlined original binomial names	considered valid by modern taxonomists;
References in bold	references of Linnaeus, Brisson, Buffon, and Gmelin to each other.

* The names preceded by an asterisk are in use in modern taxonomy. All other names are to be considered historical names and thus do not observe the rules of the modern scientific nomenclature.

The correspondence between the species and varieties of Linnaeus, Brisson, Buffon, and Gmelin is summarized in Table 5.

RESULTS:

LIST OF BUFFON'S "EAGLES"
AND THEIR CORRESPONDENCES
WITH LINNAEUS (1758, 1766), BRISSON (1759-
1762) AND GMELIN (1788)

1. Buffon's "Aigle blanc"
(variety)

1.1. Linnaeus (1758): not considered.

1.2. Brisson (1759a: 424-425, 1763a: 122): "AIGLE BLANC", "*AQUILA ALBA*", species 3 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — No direct observation. Description mainly borrowed from Gessner.

REFERENCES. — Belon (1555: 89), "Aigle toute blanche, qu'on nommoit *Cygnia*", based on Pausanias; Gessner (1585: 199), "*Aquila alba sive cygnea*", based on the Ancients and Albertus Magnus; Aldrovandi (1599: 231), idem; Jonston (1657: 6), idem; Nieremberg (1635: 234), "*Aquila alba*", based on Marco Polo; Charleton (1668: 63 no. 9, 1677: 71 no. 9), "*Aquila alba, seu Cygnea*", based on Gessner, Aldrovandi, or Albertus Magnus; Rzączyński (1721: 299), "*Aquila alba*", and Rzączyński (1745: 362), "*Aquila alba seu Aquila Cygnea Aldrovandi*", based on Albertus Magnus, and other sources relating to Poland and Ukraine (Andreas Cnöffel and Joachim von Hirtenberg); Klein (1750: 42 no. 7), "*Aquila Alba, Cygnea*. The white Eagle", based on Charleton and Rzączyński.

DISTRIBUTION/HABITAT. — Alps, "rocks on the banks of the Rhine River" (based on Gessner referring to Albertus Magnus).

MODERN IDENTIFICATION. — Latham (1821: 56) and Sharpe (1874: 235) considered Brisson's "Aigle blanc" a white form of the "*Falco chrysaetos*" of Linnaeus (1758), namely, **Aquila chrysaetos* (Linnaeus, 1758), which is probably not completely true. Indeed, while the "swan-eagle" of the Ancients was certainly mythical (Gardon in Belon 1997: 407), the "white eagle" observed by Albertus Magnus (*De animalibus* 23, 14), as well as those mentioned by Marco Polo and Rzączyński, may have been albinic or leucistic forms of **Aquila chrysaetos* or of other birds of prey (however, the sources relating to Poland are doubtful, since the white eagle is an emblem of this country). Brisson gives a seemingly decisive character (the bird being almost equal to the golden eagle in size), but this piece of information is, in fact, borrowed from Albertus Magnus, who wrote that the "white eagle" was almost as large as the "*herodius*" (an unidentified bird of prey). See also Hume (2017: 412).

1.3. Linnaeus (1766): not considered.

1.4. Buffon *in* Buffon & Guéneau de Montbeillard (1771a: 73), **quarto** edition; (1771b: 58), **folio** edition: according to Buffon, the "aigle blanc" ("white eagle") is not "a species on its own, nor even a constant race belonging to a definite species", but an "accidental variety" of an unspecified eagle, resulting from old age or the cold climate.

OBSERVATION. — No direct observation.

REFERENCES. — None.

MODERN IDENTIFICATION. — See Brisson, above.

1.5. Gmelin (1788: 257-258): "*FALCO ALBUS*" G42, S47, order "*Accipitres*". Gmelin wonders whether it is a mere variety of his "*Falco Chrysaetos*" (see below).

REFERENCES. — Brisson (1763a: "123" = 122); Klein (1750: 42 no. 7); Charleton (1668: 63 no. 9); Latham (1781: 36 no. 12), "White Eagle", based on Brisson, Klein, Charleton; Latham writes: "M. Buffon is of opinion that all White Eagles are varieties only, and in course this should not have place as a distinct species; but as [Brisson] has thought fit to make it so, I here retain it on his authority".

DISTRIBUTION/HABITAT. — Alps, "rocks on the banks of the Rhine".

MODERN IDENTIFICATION. — See Brisson. Latham (1821: 56) and Sharpe (1874: 236) identified the "*Falco albus*" of Gmelin (1788) with the "*Falco chrysaetos*" of Linnaeus (1758), but Gmelin's description and references do not allow for any identification of the bird in question with a single species.

MODERN NOMENCLATURE. — *Falco albus* J. F. Gmelin, 1788, is a *nomen dubium*.

2. Buffon's "Grand Aigle"
(full species)

2.1. Linnaeus (1758: 88): "*FALCO CHRYSÆTOS*" G41, S2, order "*Accipitres*".

REFERENCES. — Linnaeus (1746: [18-19] no. 56), "*Falco cera lutea; pedibus lanatis; corpore rufo*", based on direct observation in Sweden, and reference to the "*Aquila germana*" of Gessner, and to the "*Chrysaetos*" of Jonston, Willughby, and Ray; Willughby (1676: 27, pl. I), "*Chrysaetos*", based on Aldrovandi; Ray (1713: 6 no. 1), idem; Aldrovandi (1599: [110]), "[*Aquila*] *Chrysaetus*", direct observation.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — Linnaeus's diagnosis and his more precise firsthand description in the *Fauna Svecica* (Linnaeus 1746: 18-19) correspond to **Aquila chrysaetos* (Linnaeus, 1758). The birds he observed himself in Sweden belonged more precisely to the subspecies **Aquila chrysaetos chrysaetos* (Linnaeus, 1758). The mentioned sources (which all rely, in the final analysis, on Aldrovandi, and, via the *Fauna Svecica*, on Gessner) refer to the post-Antiquity tradition of natural history, as updated with new observations. They mainly describe **Aquila chrysaetos*, probably confused in some cases with other eagles from Europe and the Mediterranean Basin, or perhaps with other birds of prey.

MODERN NOMENCLATURE. — *Falco chrysaetos* Linnaeus, 1758 is an available and valid name, the protonym of the name currently in use for the species; "restricted type locality, Sweden ex Fn. Suec." according to Peters (1931: 253), who relies on Linnaeus (1761: 19).

2.2. Brisson (1759a: 431-434, 1762: 25-26, 1763a: 124-125): "AIGLE DORÉ", "*CHRYSÆTOS, SEU AQUILA AUREA*", species 7 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

REMARK. — This case shows that Brisson's nomenclature is very different from the Linnaean binomial system, even in Latin, since it uses alternative names for one species ("*Chrysaetos* or *Aquila aurea*") as well as specific uninomials different from the corresponding generic name ("*Chrysaetos*" belongs to the genus "*Aquila*").

OBSERVATION. — Direct observation in Réaumur's cabinet (unspecified origin).

REFERENCES. — Belon (1555: 89, 91), "Grand Aigle Royal de couleur fauve"; Belon (1557: 11 ro., 12 ro.), "Grand Aigle Royal" and "Aigle"; Gessner (1560: 3), "*Aquila*"; Gessner (1585: 168), "*Aquila germana*"; Aldrovandi (1599: 110-115); Schwenckfeld

(1603: 214), “*Aquila regalis*”; Jonston (1657: 2, pl. I, V), “*Aquila, Chrysaetos*”, plates borrowed from Gessner and Belon; Charleton (1668: 62 no. 1, 1677: 70 no. 1), “*Aquila. Chrysaetos*”; Willughby (1676: 27, pl. I); Sibbald (1684: 14), “*Chrysaetos*” (in a list of Scottish birds); Ray (1713: 6 no. 1); Rzączyński (1745: 359), “*Aquila Chrysaetos*”; Barrère (1745: 28), “*Aquila Pyrenaica*”; Linnaeus (1746: [18] no. 56); Linnaeus (1748: [17]), G36, S4 (“*Chrysaethos*” in genus “*Falco*”); Albin (1750: 1, pl. 1), “Aigle”; Klein (1750: 40 no. 1), “*Aquila Chrysaetos*”; Linnaeus (1758: [88]), G41, S2.

DISTRIBUTION. — Europe, common in Germany.

MODERN IDENTIFICATION. — **Aquila chrysaetos* (Linnaeus, 1758), doubtless **A. c. chrysaetos* (Linnaeus, 1758), according to the description. Most of the mentioned references correspond to that subspecies, with the same reservations as for Linnaeus’s “*Falco Chrysaetos*”. Among the mentioned sources by Brisson and not by Linnaeus, some correspond to **Aquila chrysaetos*, other to various birds of prey more or less identified; in particular, many authors refer to the “*aetos gnêsios*” of Aristotle, which was probably a vulture (see Arnott 2007: 87).

2.3. Linnaeus (1766: 125): “*FALCO CHRYSÆTOS*” G42, S5, order “*Accipitres*”.

REFERENCES. — Linnaeus (1761: [19] no. 54), “*Falco Chrysaetos*” (direct observation, and ref. to Linnaeus 1746, Willughby, and Ray); Gessner (1585: 168); Willughby (1676: 27, pl. I); Ray (1713: 6 no. 1); Aldrovandi (1599: 111, 114-115); Brisson (1759a: 431).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — **Aquila chrysaetos chrysaetos* (Linnaeus, 1758); see the comments on Linnaeus (1758) and Brisson.

2.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 76-85, pl. I), quarto edition; (1771b: 60-67, PE 410), folio edition: “*GRAND AIGLE*”.

PLATE I. — “Le grand Aigle”.

PE 410. — “Le Grand Aigle ou l’Aigle royal” (published in March 1770).

OBSERVATION. — Direct observation, maybe specimen(s) from Réaumur’s cabinet.

REFERENCES. — Aristotle (“*aetos gnêsios*”); “Oppien” = Aelianus (“*khruaetos*”); Belon (1555: 89); Gessner (1585: 169), “*Aquila germana*”; Aldrovandi (1599: 110); Brisson (1759a: 431); Pennant (1766: 61, pl. A), “Golden Eagle”; Salerne (1767: 4), “Grand Aigle Royal”; many other sources, including ancient authors and early modern travelers.

DISTRIBUTION/HABITAT. — Greece, France (esp. the mountains of Bugey), Pyrenees; Germany (esp. Silesia), forests of Dantzic (Gdansk), Carpathian Mountains, mountains of Ireland, Asia Minor, Persia, Arabia, “several provinces of Africa and Asia up to Tartary” (but not Siberia nor the rest of Northern Asia); “hot and temperate countries of the Old World”.

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 410. — Boddaert (1783: 25); Brisson (1759a: 431); Linnaeus (1766: 125), G42, S5; Latham (1781: 31 no. 5), “Golden Eagle”; Latham refers to Linnaeus’s “*Falco Chrysaetos*”, Brisson’s “Aigle doré”, Buffon’s “Grand Aigle”, the PE 410, etc., and the Leverian collection.

Kuhl (1820: 7): “*Falco fulvus* L.”, female.

Temminck (1839: 3): “Aigle royal”, middle age; “*Falco fulvus*. Linn.” Gray (1849: 33): “*Aquila chrysaetos*”.

MODERN IDENTIFICATION. — **Aquila chrysaetos* (Linnaeus, 1758), according to the plates (PE 410 and pl. I of De Sève) and the text; the specimen on PE 410 seems to be an adult. It is difficult to determine the subspecies with certainty, especially since Buffon admits a large distribution. It is probable, however, that he observed one or many specimens of the subspecies **A. c. chrysaetos* (Linnaeus, 1758); in any case, the subspecies **A. chrysaetos japonica* Severtsov, 1888, **A. chrysaetos canadensis* (Linnaeus, 1758), and **A. chrysaetos kamtschatica* Severtsov, 1888 can be excluded. As regards the mentioned sources, see the comments on Linnaeus (1758) and Brisson (1759a). Some of the references added by Buffon (not least the Ancients and the travelers) may correspond to other subspecies, or even to other species.

2.5. Gmelin (1788: 256): “*FALCO CHRYSÆTOS*” G42, S5, order “*Accipitres*”.

REFERENCES. — Linnaeus (1761: [19] no. 54); Brisson (1759a: 431); Gessner (1585: 168); Ray (1713: 6 no. 1); Aldrovandi (1599: 111, 114, 115); Buffon & Guéneau de Montbeillard (1771a: 76) and PE 410; Pennant (1776: 161 [no. 42], pl. 16), “Golden Eagle”; Albin (1750: 1, pl. 1); Willughby (1678: 58, pl. I), “Golden Eagle, Chrysaetos [sic]”; Latham (1781: 31 no. 5), based on Linnaeus, Brisson, Buffon, etc., and the Leverian collection.

DISTRIBUTION/HABITAT. — Europe, “Ural deserts of Siberia”.

MODERN IDENTIFICATION. — **Aquila chrysaetos* (Linnaeus, 1758); see the comments on Linnaeus (1758), Brisson, and Buffon. Identification of the subspecies not possible since Gmelin admits a large distribution, but **A. chrysaetos daphanea* Severtsov, 1888, **A. chrysaetos japonica*, **A. chrysaetos canadensis*, and probably **A. chrysaetos homeyeri* Severtsov, 1888 can be excluded.

3. Buffon’s “Aigle Commun” (full species)

3.1. Linnaeus (1758): corresponds to two distinct species (3.1.1. “*Falco fulvus*”, and 3.1.2. “*Falco canadensis*”).

3.1.1. Linnaeus (1758: 88): “*FALCO FULVUS*” G41, S3, order “*Accipitres*”.

REFERENCES. — Willughby (1676: 28), “*Chrysaetos caudâ annulo albo cinctâ*”; Ray (1713: 6 no. 2), “*Aquila fulva seu Chrysaetos, caudâ annulo albo cinctâ*”.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — **Aquila chrysaetos chrysaetos* (Linnaeus, 1758), according to the diagnosis (yellow cere, downy legs, brown back, wide stripe on the tail) and the mentioned sources: Linnaeus relies on the description by Willughby and Ray of several individuals, including a juvenile captured in 1668 in Derbyshire.

MODERN NOMENCLATURE. — *Falco fulvus* Linnaeus, 1758 is considered an available name, and a junior synonym of *Falco chrysaetos* Linnaeus, 1758; type locality is England, according to Peters (1931: 253), who relied on Ray.

3.1.2. Linnaeus (1758: 88): “*FALCO CANADENSIS*” G41, S4, order “*Accipitres*”.

REFERENCES. — Edwards (1743: 1, pl. 1), “White Tailed Eagle”.

DISTRIBUTION. — Canada.

MODERN IDENTIFICATION. — The only source, Edwards, describes a bird brought alive from Hudson Bay. His text and his plate clearly correspond to **Aquila chrysaetos canadensis* (Linnaeus, 1758).

MODERN NOMENCLATURE. — *Falco canadensis* Linnaeus, 1758 is considered an available and valid name, the protonym of the name currently in use for the subspecies; type locality is Hudson Bay, according to Peters (1931: 254), who relied on Edwards.

3.2. Brisson (1759a: 419-422, 1762: 25, 1763a: 121-122): “AIGLE”, “AQUILA”, species 1 of genus IX (“Aigle”, “Aquila”), order III, section 1. Here Brisson uses a specific uninomial which is also the generic name.

OBSERVATION. — Direct observation in Réaumur’s cabinet (unspecified origin).

REFERENCES. — Aldrovandi (1599: 17), “*Aquila*” in general; Worm (1655: 292), “*Aquila*”; Jonston (1657: 1), “*Aquila*” in general; Charleton (1668: 62 no. I, 1677: 70 no. I), idem; Willughby (1676: 28); Ray (1713: 6 no. 2); Besler (1716: 16), “*Aquila alpina saxatilis*”; Rzączyński (1721: 270), “*Aquila*”; Perrault (1733: 89, pl. 49), “Aigle”; Edwards (1743: 1, pl. 1); Ellis (1749: 54, pl. II), “Aigle à queue blanche”; Klein (1750: 41 no. 3), “*Aquila Simpliciter*”; Möhring (1752: 49), genus “*Aquila*”; Linnaeus (1758: [88]), G41, S3 and S4.

DISTRIBUTION/HABITAT. — “High mountains”.

MODERN IDENTIFICATION. — According to the diagnosis and the description (not least the size, “bigger than a turkey”, the color of the head and of the top of the neck, “brown verging to the red”, and the white tail-base), the bird observed by Brisson is **Aquila chrysaetos* (Linnaeus, 1758), probably the nominate subspecies, which is the most common of the three Eurasian subspecies. The references mentioned correspond either (Ray, Willughby, Worm, Besler, Perrault...) to the same subspecies, or (Edwards, Ellis) to **Aquila chrysaetos canadensis* (Linnaeus, 1758). Brisson also refers to chapters of Aldrovandi and other authors on “eagles” in general, covering many species and subspecies.

3.3. Linnaeus (1766): corresponds to a full species (3.3.1. “*Falco fulvus*”) and a variety (3.3.2. Variety β of “*Falco fulvus*”).

3.3.1. Linnaeus (1766: 125): “FALCO FULVUS” G42, S6, order “Accipitres”. Includes a North American variety (β) which was a full species in 1758: see below (3.3.2).

REFERENCES (WITHOUT THE VARIETY). — Aldrovandi (1599: 17); Brisson (1759a: 419); Willughby (1676: 28); Ray (1713: 6 no. 2); “Dodart”, in fact Perrault (1733: 89, pl. 49).

DISTRIBUTION (INCLUDING THE VARIETY). — Canada, Europe.

MODERN IDENTIFICATION. — **Aquila chrysaetos* (Linnaeus, 1758); see the comments on Linnaeus (1758) and Brisson. Unlike in 1758, the identification of the subspecies is not possible, considering the references and the distribution. For the European forms, the subspecies *daphanea*, *japonica*, *canadensis*, and *kamtschatica* can be excluded; for the North American “variety”, see below.

3.3.2. Linnaeus (1766: 125): Variety β of “*Falco fulvus*” G42, S6, order “Accipitres”. (see above, 3.3.1).

REFERENCES. — Edwards (1743: 1, pl. 1); Ellis (1749: 54, pl. 2); Linnaeus (1758: 88), G41, S4.

MODERN IDENTIFICATION. — **Aquila chrysaetos canadensis* (Linnaeus, 1758); see the comments on Linnaeus (1758) and Brisson.

3.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 86-90), quarto edition; (1771b: 68-71, PE 409), folio edition: “AIGLE COMMUN”. Buffon distinguishes between two varieties in this species: the “aigle brun” (in question here), and the “aigle noir” (see below, 4.4).

PE 409. — “L’Aigle commun” (published in March 1770).

OBSERVATION. — Direct observation: maybe specimen(s) from Réaumur’s cabinet.

REFERENCES (FOR THE “AIGLE BRUN” ONLY). — Willughby (1676: 28); Ray (1713: 6 no. 2); Perrault (1733: 89); Edwards (1743: pl. 1); Ellis (1749: 54); Brisson (1759a: 419).

DISTRIBUTION/HABITAT (FOR BOTH VARIETIES). — France, Savoy, Switzerland, Germany, Poland, Scotland, Hudson Bay (Canada); “cold countries” of Old and New Worlds.

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 409. — Boddaert (1783: 25): Brisson (1759a: 434); Linnaeus (1766: 124), G42, S2; Latham (1781: 28 no. 2), “Black Eagle”, refers to Linnaeus’s “*Falco melanaëtos*”, Brisson’s “Aigle noir”, Buffon’s “Aigle commun” and PE 409; Latham (1781: 28, 32), identifies PE 409 with both Linnaeus’s “*Falco Melanaëtos*” and “*Falco fulvus*” (“Ring-tailed Eagle”). Kuhl (1820: 7): “*Falco fulvus* L.”, male juvenile. Temminck (1839: 3): “Aigle royal”, young; “*Falco fulvus*. Linn.” Gray (1849: 33): “*Aquila chrysaetos*”.

MODERN IDENTIFICATION. — PE 409 represents a juvenile of **Aquila chrysaetos* (Linnaeus, 1758), certainly **Aquila chrysaetos chrysaetos* (Linnaeus, 1758). It may be the same specimen as the one described by Brisson. The text mainly corresponds to the same species, but possibly to several subspecies (except *daphanea*, *homeyeri*, *japonica*, and *kamtschatica*). As to the mentioned sources, see the comments on Linnaeus (1758) and Brisson; the birds described by Edwards and Ellis are **Aquila chrysaetos canadensis* (Linnaeus, 1758).

3.5. Gmelin (1788): as in Linnaeus 1766, corresponds to a full species and a variety (3.5.1 and 3.5.2).

3.5.1. Gmelin (1788: 256-257): “FALCO FULVUS” G42, S6, order “Accipitres”. Gmelin wonders whether it is the female of “*Falco Melanaëtos*” (see below). This species includes the variety “ β *canadensis*” (see below 3.5.2).

REFERENCES (WITHOUT THE VARIETY). — Brisson (1759a: 419); Aldrovandi (1599: 17); “Dodart”, in fact Perrault (1733: 89, pl. 49); Ray (1713: 6 no. 2); Buffon & Guéneau de Montbeillard (1771a: 86) and PE 409; Willughby (1678: 59), “Golden Eagle with a white ring about its tail”; Pennant (1776: 165 [no. 43], 1785: 195 no. 87), “Black Eagle”; Latham (1781: 32 no. 6), “Ring-tailed Eagle”, refers to Linnaeus’s “*Falco fulvus*”, Brisson’s “Aigle”, and Buffon’s PE 409. NB: like Latham, Gmelin identifies PE 409 with both “*Falco fulvus*” and “*Falco Melanaëtos*” (see below).

DISTRIBUTION (INCLUDING THE VARIETY). — Europe, America, Northern Asia.

MODERN IDENTIFICATION. — **Aquila chrysaetos* (Linnaeus, 1758); includes at least the subspecies *chrysaetos* and *canadensis*, possibly *kamtschatica*, but not *daphanea*, *homeyeri* nor *japonica*. See the comments on Linnaeus (1758), Brisson, and Buffon.

3.5.2. Gmelin (1788: 256): Variety “ β *canadensis*” of “*Falco fulvus*” G42, S6 (see above).

REFERENCES. — Linnaeus (1758: 88), G41, S4; Edwards (1743: 1, pl. 1); Ellis (1749: 54, pl. 2).

REMARK. — Latham's "White-tailed Eagle", variety of the "Ring-tailed Eagle" (1781: 32 no. 6A), is based on Linnaeus's "*Falco fulvus*" var. β , Buffon's "Pygargue" and *PE* 411, and Edwards's plate 1.

MODERN IDENTIFICATION. — **Aquila chrysaetos canadensis* (Linnaeus, 1758); see the comments on Linnaeus (1758) and Brisson.

4. Buffon's "Aigle noir" (variety of the "Aigle commun")

4.1. Linnaeus (1758: 88): "*FALCO MELANÆTUS*" G41, S1, order "Accipitres".

REFERENCES. — Ray (1713: 7 no. 4), "*Melanaëtus seu Aquila Valeria*", direct observation; Willughby (1676: 30 and pl. 2), "*Melanaetus, seu Aquila Valeria*", idem; pl. 2 based on Aldrovandi; Albin (1734: 2, pl. 2), "Black Eagle. *Aquila Valeria*".

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — The diagnosis ("yellow cere, half-downy legs, rusty-yellow body with yellow stripes") may correspond to several species or subspecies of eagles. The mentioned sources are, on the one hand, Albin, who described a bird of unknown origin, seen in an English collection, "somewhat less than the common Eagle", and "of a dark ferruginous color inclining to black"; on the other hand, Willughby and Ray, who described a bird observed alive in a menagerie in Middelburg, Zeeland (The Netherlands): "It was double the bigness of a *Raven*, but lesser than the *Pygarg* [= **Haliaeetus albicilla*]; [...] The head, neck, and breast black. In the middle of the back between the shoulders was a large triangular white spot dashed with red. The rump red" (Willughby 1678: 61). These two birds cannot be identified with certainty: they were maybe juveniles of **Aquila chrysaetos* (Linnaeus, 1758) or **Haliaeetus albicilla* (Linnaeus, 1758) (according to the synonymy in Sharpe 1874: 236, 302). Furthermore, Willughby refers to Aldrovandi, that is, to a longstanding tradition in natural history which gave the name "*melanaetus*" not only to the above-mentioned species, but also to other birds, such as **Clanga clanga* (Pallas, 1811) or **Clanga pomarina* (Brehm, 1831).

MODERN NOMENCLATURE. — *Falco melanaetus* Linnaeus, 1758, is a *nomen dubium*.

4.2. Brisson (1759a: 434–437, 1762: 26, 1763a: 125): "AIGLE NOIR", "*MELANÆTUS, SEU AQUILA NIGRA*", species 8 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — Direct observation in Réaumur's cabinet (unspecified origin).

REFERENCES. — Belon (1555: 92–93), "Aigle noire"; Belon (1557: 11 vo.), "Petite Aigle Noire"; Gessner (1585: 203), "*Melanaetus, seu Valeria Aquila*"; Aldrovandi (1599: 197, 199–200), idem, direct observation; Schwenckfeld (1603: 218), "*Aquila nigra*"; Jonston (1657: 3, pl. II, III), "*Melanaetus*", based on Aldrovandi and Belon; Charleton (1668: 62 no. 3, 1677: 70 no. 3), idem; Willughby (1676: 30, pl. 2); Sibbald (1684: 14), "*Melanaetos*" (in a list of Scottish birds); Ray (1713: 7 no. 4); Frisch (1733–1763: pl. 69), "Der schwartz-braune Adler, *Aquila melanætus*, Aigle"; Rzączyński (1745: 363, 364), "*Aquila nigra*" and "*Aquila Valeria*"; Albin (1750: 2, pl. 2), "Aigle noir"; Klein (1750: 41 no. 4), "*Aquila Valeria s. Melanaetus*", based on Ray, Albin, Edwards; Linnaeus (1758: [88]), G41, S1.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — The specimen from the cabinet of Réaumur studied by Brisson can hardly be identified: according to the description, it may be **Aquila heliaca* (Savigny, 1809), or a ju-

venile of **Aquila chrysaetos* (Linnaeus, 1758) (Sharpe [1874: 235], admits the latter hypothesis). On the mentioned sources, see the comments on Linnaeus (1758). The references added by Brisson increase the confusion: the "Aigle noire" of Belon, for example, cannot be identified with certainty (it might be a juvenile of **Aquila chrysaetos*: Glardon in Belon 1997: 408), and the "*Melanaetus*" of Gessner is maybe **Clanga pomarina* (Brehm, 1831) (Springer & Kinzelbach 2009: 171). Frisch's "schwartz-braune Adler" is probably **Haliaeetus albicilla* (Linnaeus, 1758).

4.3. Linnaeus (1766: 124): "*FALCO MELANÆTUS*" G42, S2, order "Accipitres".

REFERENCES. — Gessner (1585: 203); Aldrovandi (1599: 197, 199, 200); Ray (1713: 7 no. 4); Willughby (1676: 30, pl. 2); Albin (1734: 2, pl. 2); Brisson (1759a: 434).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — The diagnosis is the same as in 1758 but, because of the references mentioned, the "*Falco Melanaetus*" of Linnaeus (1766) combines the confusions of the "*Falco Melanaetus*" of Linnaeus (1758) and of Brisson's "Aigle noir"; it may thus correspond to **Aquila chrysaetos* (Linnaeus, 1758), **Aquila heliaca* (Savigny, 1809), **Haliaeetus albicilla* (Linnaeus, 1758), **Clanga clanga* (Pallas, 1811), or **Clanga pomarina* (Brehm, 1831).

4.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 86), quarto edition; (1771b: 68), folio edition: "Aigle noir", variety of the "Aigle commun" (see above, 3.4).

OBSERVATION. — Possible direct observation, maybe specimen(s) from Réaumur's cabinet.

REFERENCES. — Aristotle ("*melainaetos*"); Belon (1555: 92); Schwenckfeld (1603: 218); Frisch (1733–1763: pl. 69); Brisson (1759a: 434).

MODERN IDENTIFICATION. — Buffon's "Aigle noir" is defined from the same sources as that of Brisson (Belon, who is mentioned by Brisson, also refers to Aristotle's "*melainaetos*"), and corresponds, thus, to the same confusion of several more or less identifiable species (see Brisson): **Aquila chrysaetos* (Linnaeus, 1758), **Aquila heliaca* (Savigny, 1809), **Haliaeetus albicilla* (Linnaeus, 1758), **Clanga clanga* (Pallas, 1811) or **Clanga pomarina* (Brehm, 1831).

4.5. Gmelin (1788: 254): "*FALCO MELANAËTOS*" G42, S2, order "Accipitres".

REFERENCES. — Gessner (1585: 203); Aldrovandi (1599: 197, 199, 200); Ray (1713: 7 no. 4); Albin (1734: 2, pl. 2); Brisson (1759a: 434); Buffon & Guéneau de Montbeillard (1771a: 86) and *PE* 409; Willughby (1678: 61, pl. 2), "Black Eagle, called *Melanaëtus*, or *Aquila Valeria*"; Latham (1781: 28 no. 2), "Black Eagle", based on Buffon, Brisson, Linnaeus (1766), etc. NB: like Latham, Gmelin identifies *PE* 409 with both "*Falco fulvus*" and "*Falco Melanaëtus*" (see above).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — The diagnosis is the same as in Linnaeus (1758), but the description (translated from Latham, who borrowed it from Brisson) corresponds to the "Aigle noir" of Brisson (and probably of Buffon). Gmelin's "*Falco Melanaëtus*" thus corresponds to a confusion of **Aquila chrysaetos* (Linnaeus, 1758) with a juvenile of **Haliaeetus albicilla* (Linnaeus, 1758) (both identifications are acknowledged by Sharpe 1874: 236, 302), but also, possibly, with **Aquila heliaca* (Savigny, 1809), **Clanga clanga* (Pallas, 1811) or **Clanga pomarina* (Brehm, 1831).

5. Buffon's "Petit Aigle" (full species)

5.1. Linnaeus (1758): not considered.

5.2. Brisson (1759a: 425-426, 1763a: 122-123): "AIGLE TACHETÉ", "*AQUILA NÆVIA*", species 4 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — No direct observation. Description mainly borrowed from Aldrovandi.

REFERENCES. — Aldrovandi (1599: 214-215), "*Morphno congener*", direct observation; Schwenckfeld (1603: 219), "*Aquila naevia*"; direct observation of a living bird captured in 1602; Jonston (1657: 4, pl. II), "*Morphno congener*", based on Aldrovandi; Charleton (1668: 63 no. 6, 1677: 70 no. 6), based on Aldrovandi; Willughby (1676: 32, pl. 2), based on Aldrovandi; Ray (1713: 7 no. 7), based on Aldrovandi; Klein (1750: 41 no. 6), "*Aquila Clanga*", direct observation of a living bird; Frisch (1733-1763: pl. 71), "Stein-Adler oder Gänse-Aar, *Buteo*, Busart", direct observation.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — Sharpe (1874: 246) identifies Brisson's "Aigle tacheté" with Gmelin's "*Falco maculatus*" (which is mainly based on Latham's "Spotted Eagle" and may possibly be **Clanga pomarina*), as well as with Brehm's "*Aquila pomarina*", that is, **Clanga pomarina* (Brehm, 1831). But the sources mentioned by Brisson are doubtful, although Aldrovandi and Klein claim they have directly observed the birds in question. Dresser (1871-1881: 492-494) considers that Schwenckfeld's "*Aquila naevia*" is a common buzzard, **Buteo buteo* (Linnaeus, 1758). The plate 71 of Frisch represents an unidentified bird of prey (not a spotted eagle). Aldrovandi's "*Morphno congener*", which is the main source of Brisson's description, seems to be **Clanga clanga* (Pallas, 1811) (same size as a cock, dark rusty body with many white oval spots on the wings, etc.). Klein's "*Aquila Clanga*" cannot be identified. See also Blanford (1894).

5.3. Linnaeus (1766): not considered.

5.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 91-98), quarto edition; (1771b: 72-77), folio edition: "PETIT AIGLE".

OBSERVATION. — No direct observation.

REFERENCES. — Aristotle ("*plangos*", "*klangos*", "*morphnos*"); Aldrovandi (1599: 214); Schwenckfeld (1603: 219); Frisch (1733-1763: pl. 71); Klein (1750: 41 no. 6); Brisson (1759a: 425); several other sources, including travelers in Africa and the Middle East (Jean Chardin, Peter Kolb).

DISTRIBUTION. — Rare, but present "everywhere" in Europe, Asia, and Africa, as far as the Cape of Good Hope; absent in America.

MODERN IDENTIFICATION. — See the comments on Brisson (1759a). Buffon's "Petit Aigle" is not identified; it may correspond to **Clanga pomarina* (Brehm, 1831) as well as to other eagles, or even to other birds of prey. Buffon increases the confusion, on the one hand, by referring to Aristotle's "*plangos*" or "*morphnos*" which was maybe **Aquila chrysaetos* (Linnaeus, 1758), or **Aquila heliaca* (Savigny, 1809) (see Arnott 2007: 285); on the other hand, by mentioning Asia and South Africa in addition to Europe (on the basis of the travelers' accounts), which broadens the possibilities to several other species of the genus **Aquila*, such as **A. nipalensis* Hodgson, 1833, or **A. rapax* (Temminck, 1828), or of other genera.

5.5. Gmelin (1788: 258): "*FALCO NÆVIUS*" G42, S49, order "Accipitres".

REFERENCES. — Brisson (1763a: 122); Buffon & Guéneau de Montbeillard (1771a: 91); Charleton (1668: 63 no. 6); Latham (1781: 37 no. 14), "Rough-footed Eagle", based on Brisson's "Aigle tacheté", Buffon's "Petit Aigle", Frisch, pl. 71, and Charleton; Frisch (1733-1763: pl. 71).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — Gmelin mentions Buffon but, like Brisson, he restricts the distribution to Europe: his "*Falco naevius*" thus corresponds to the same confusion of species as Brisson's "Aigle tacheté". Sharpe (1874: 246) mentions Gmelin's "*Falco naevius*" in the synonymy of "*Aquila maculata*", but he admits in a note that its identification is controversial.

MODERN NOMENCLATURE. — *Falco naevius* J. F. Gmelin, 1788, is a *nomen dubium*.

6. Buffon's "Pygargue" (full species)

6.1. Linnaeus (1758: 89): "*FALCO ALBICILLA*" G41, S8, order "Accipitres". This species includes a North American variety (see below 8.1).

REFERENCES (WITHOUT THE VARIETY). — Linnaeus (1746: [19] no. 58), "*Falco cera flava; reatricibus albis, versus apices nigris*", based on direct observation in Sweden, and reference to Belon, Gessner, Willughby, and Ray; Belon (1557: 15 ro), "*Pygargus*, Janleblanc, Oyseau saint Martin"; Gessner (1585: 205), "*Pygargus*"; Aldrovandi (1599:[205]), "*Pygargus*"; Willughby (1676: 31), "*Pygargus seu Albicilla quibusdam Hinnularia*", direct observation; Ray (1713: 7 no. 5), "*Pygargus, Albicilla Gazæ, quibusdam Hinnularia*".

DISTRIBUTION (INCLUDING THE VARIETY). — Europe, America.

MODERN IDENTIFICATION. — **Haliaeetus albicilla* (Linnaeus, 1758) according to the diagnosis and most of the mentioned sources, not least the *Fauna Svecica* (Linnaeus 1746), as well as Willughby (1676) and Ray (1713), who write that they observed a freshly killed bird in Venice in 1664. However, Belon's "Jan-le-blanc" is probably **Circus cyaneus* (Linnaeus, 1766) (Gardon in Belon [1997: 410]), and the "*Pygargus*" of Gessner and Aldrovandi (who rely on a tradition going back to the Antiquity) combines elements relating to **Haliaeetus albicilla* and to **Circus cyaneus* (Springer & Kinzelbach 2009: 180).

MODERN NOMENCLATURE. — *Falco albicilla* Linnaeus, 1758 is an available and valid name, the protonym of the name currently in use for the species; "Restricted type locality, Sweden, ex Fn. Suec." according to Peters (1931: 258), who relied on Linnaeus (1761: 19).

6.2. Brisson (1759a: 427-429, 1762: 25, 1763a: 123-124): "AIGLE À QUEUE BLANCHE", "*AQUILA ALBICILLA*", species 5 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — No direct observation. Description mainly borrowed from Willughby.

REFERENCES. — Willughby (1676: 31); Ray (1713: 7 no. 5); Linnaeus (1746: [19] no. 58); Linnaeus (1748: [17]), G36, S6 ("*Pygargus*" in genus "*Falco*"); Klein (1750: 40 no. 2), "*Aquila Pygargus*", based on Willughby, Ray and Catesby's "Bald Eagle"; Linnaeus (1758: [89]), G41, S8.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758), according to the diagnosis and the mentioned sources, since Brisson here excludes the authors of the 16th century who mistook this species with *Circus cyaneus* (however, Klein also mentions Catesby's "Bald Eagle", which is *Haliaeetus leucocephalus*). More precisely, Brisson's description corresponds to a female, since the "Aigle à queue blanche" is bigger than the "Petit Aigle à queue blanche" (see below).

6.3. Linnaeus (1766: 123-124): Species shifted into the genus "*Vultur*" (because of the presence of an almost naked area between the eyes and the nostrils): "*VULTUR ALBIULLA*" [sic] G41, S8, emended as "*VULTUR ALBICILLA*" in an erratum at the end of vol. 2 (Linnaeus 1767), order "*Accipitres*".

REFERENCES. — Linnaeus (1761: [19] no. 55), "*Falco Albicilla*"; direct observation and ref. to Belon, Gessner, Willughby, Ray; Brunnich (1764: [3] no. 12), "*Falco Albicilla*"; Belon (1557: 15 ro.); Gessner (1585: 205); Willughby (1676: 31); Ray (1713: 7 no. 5); **Brisson (1759a: 427)**.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758); see the comments on Linnaeus (1758).

6.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 99-102), quarto edition; (1771b: 78-80), folio edition: "PYGARGUE". Buffon distinguishes between three varieties in this species: the "Grand Pygargue" (in question here), the "Petit Pygargue" and the "Pygargue à tête blanche" (see below: 7.4 and 8.4).

REMARK. — Since this bird, according to Buffon, is not an eagle in the strictest sense, he uses the neologism "pygargue" by gallicization of the Greek word "*pygargos*" ("white rump") which, however, may not have designated the same species in the works of ancient authors.

OBSERVATION. — No direct observation of the "Grand Pygargue".

REFERENCES (FOR THE "GRAND PYGARGUE" ONLY). — Aristotle ("*pygargos*"); Willughby (1676: 31); Linnaeus ([1746: 19 no. 58]); **Brisson (1759a: 427)**; Salerne (1767: 7), "Grosse Bondrée blanche".

DISTRIBUTION/HABITAT (INCLUDING THE VARIETIES). — Plains, cold climates; "all provinces of Northern Europe".

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758), female: see the comments on Linnaeus (1758) and Brisson. On Aristotle, see Arnott (2007: 296).

6.5. Gmelin (1788: 253): back into the genus "*Falco*": "*FALCO ALBICILLA*" G42, S39, order "*Accipitres*".

REFERENCES. — Linnaeus (1766: 123), G41, S8; Linnaeus (1761: [19] no. 55); Brunnich (1764: [3] no. 12); **Brisson (1759a: 427)**; Belon (1557: 15 ro.); Gessner (1585: 205); Ray (1713: 7 no. 5); **Buffon & Guéneau de Montbeillard (1771a: 99) and PE 411**; Willughby (1678: 61), "Pygarg or white-tail'd Eagle"; Pennant (1776: 170 [no. 45], pl. 18), "Cinereous Eagle"; Latham (1781: 33 no. 5), "Cinereous Eagle", refers to Linnaeus's "*Vultur Albicilla*", Brisson's "Aigle à queue blanche", Buffon's "Grand Pygargue" and PE 411, Ray, Frisch's pl. 70, Willughby, Pennant; Frisch (1733-1763: 70); like Latham, Gmelin refers to PE 411 twice (see below, "*Falco leucocephalus*").

DISTRIBUTION. — Europe, not least Scotland and adjacent islands.

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758), female (Gmelin gives this species the same size as Brisson does); see the comments on Linnaeus (1758) and Brisson.

7. Buffon's "Petit Pygargue" (variety of the "Pygargue")

7.1. Linnaeus (1758: 89): Included in "*FALCO ALBICILLA*" G41, S8, order "*Accipitres*": see above.

7.2. Brisson (1759a: 429-430, 1763a: 124): "PETIT AIGLE À QUEUE BLANCHE", "*AQUILA ALBICILLA MINOR*", species 6 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

REMARK. — Here Brisson uses a trinomial.

OBSERVATION. — No direct observation. Description mainly borrowed from Willughby or Aldrovandi.

REFERENCES. — Gessner (1585: 205); Aldrovandi (1599: 205-206); Jonston (1657: 4, pl. III), "*Pygargus*", based on Aldrovandi; Charleton (1668: 63 no. 4, 1677: 70 no. 4), "*Pygargus Hinnularia*"; Willughby (1676: 31), "*Pygargus Aldrovandi*"; Sibbald (1684: 14), "*Pygargus Hinnularius*" (in a list of Scottish birds); Frisch (1733-1763: pl. 70), "Der braun-fahle Adler, *Aquila Pygargus*, Aigle brunatre"; Rzączyński (1745: 361), "*Aquila Pygargus Plinii, Albicilla Gazae*, etc."; based on Aldrovandi, Belon, and a source relating to Poland.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — Brisson, who relies on the literature only, distinguishes this species from the previous one; here he mentions the most ambiguous sources, those mixing up elements relating to both *Haliaeetus albicilla* and *Circus cyaneus*. However, his description of the "Petit Aigle à queue blanche" clearly corresponds to *Haliaeetus albicilla*, more precisely to an adult male (considering the size). Frisch's plate 70 evidently represents the same species.

7.3. Linnaeus (1766: 123-124): Included in "*VULTUR ALBICILLA*" G41, S8, order "*Accipitres*": see above.

7.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 99), quarto edition; (1771b: 78), folio edition: "Petit Pygargue", variety of the "Pygargue" (see above 6.4).

OBSERVATION. — No direct observation.

REFERENCES. — Frisch (1733-1763: pl. 70); **Brisson (1759a: 429)**.

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758), male; see the comments on Linnaeus (1758) and Brisson.

7.5. Gmelin (1788: 258): "*FALCO ALBICAUDUS*" G42, S51, order "*Accipitres*".

REFERENCES. — **Brisson (1763a: 124); Buffon & Guéneau de Montbeillard (1771a: 99)**; Willughby (1678: 62), "Pygargus of Aldrovandus"; Charleton (1668: 63 no. 4); Latham (1781: 39), "Lesser white-tailed Eagle" refers to Brisson's "Petit Aigle à queue blanche", Buffon's "Petit Pygargue", Frisch's pl. 70, etc., and the Leverian collection; Gessner (1585: 205).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — *Haliaeetus albicilla* (Linnaeus, 1758), male (Gmelin mentions the same size as Brisson); see the comments on Linnaeus (1758) and Brisson.

MODERN NOMENCLATURE. — *Falco albicaudus* J. F. Gmelin, 1788, is considered an available name, a junior synonym of *Falco albicilla* Linnaeus, 1758.

8. Buffon's "Pygargue à tête blanche" (variety of the "Pygargue")

8.1. Linnaeus (1758: 89): Variety β of "*Falco Albicilla*" G41, S8, order "*Accipitres*": see above (6.1).

REFERENCES. — Catesby (1731: 1, pl. 1), "*Aquila capite albo*. Bald Eagle. Aigle à tête blanche".

MODERN IDENTIFICATION. — **Haliaeetus leucocephalus leucocephalus* (Linnaeus, 1766), according to Catesby's plate and description. See Reveal (2015).

8.2. Brisson (1759a: 422-424, 1762: 25, 1763a: 122): "AIGLE À TESTE BLANCHE", "*AQUILA LEUCOCEPHALOS*", species 2 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — Direct observation in Réaumur's cabinet (unspecified origin).

REFERENCES. — Catesby (1731: 1, pl. 1); Linnaeus (1758: [89]), G41, S8 var. β .

DISTRIBUTION. — Europe [sic] and North America.

MODERN IDENTIFICATION. — **Haliaeetus leucocephalus leucocephalus* (Linnaeus, 1766). Brisson's description clearly corresponds to this species and subspecies, which is thus correctly identified with Catesby's "Bald Eagle". It is unclear, however, why Brisson mentions Europe in the distribution: perhaps the specimen of Réaumur's cabinet was wrongly labelled.

8.3. Linnaeus (1766: 124): Becomes a full species: "*FALCO LEUCOCEPHALUS*" G42, S3, order "*Accipitres*".

REFERENCES. — Catesby (1731: 1, pl. 1); Brisson (1759a: 423).

DISTRIBUTION. — Europe [sic] and North America.

MODERN IDENTIFICATION. — **Haliaeetus leucocephalus leucocephalus* (Linnaeus, 1766); see the comments on Brisson. Linnaeus copies Brisson's error as to the bird's supposed presence in Europe.

MODERN NOMENCLATURE. — *Falco leucocephalus* Linnaeus, 1766 is an available and valid name, the protonym of the name currently in use for the species; type locality is "Carolina", according to Peters (1931: 258), "South Carolina" according to Stresemann & Amadon (1979: 301), who all rely on Catesby.

8.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 99), quarto edition; (1771b: 78, PE 411), folio edition: "Pygargue à tête blanche", variety of the "Pygargue" (see below 6.4).

PE 411. — "L'Aigle à tête blanche" (published in March 1770).

OBSERVATION. — Direct observation, maybe specimen(s) from Réaumur's cabinet.

REFERENCES. — Catesby (1731: 1, pl. 1); Brisson (1759a: 422).

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 411. — Boddaert (1783: 25); Brisson (1759a: 422); Linnaeus (1766: 124), G42, S3; Latham (1781: 33 no. 8), "Cinereous Eagle", refers to Linnaeus's "*Vultur albiulla*" [sic], to Brisson's "Aigle à queue blanche", and to Buffon's "Grand pygargue", but also to PE 411, which explains Boddaert's mistake.

Kuhl (1820: 7): "*Falco Leucocephalus* L."

Temminck (1839: 3): "Aigle à tête blanche", very old, but with the feet of an "aigle royal"; "*Falco leucocephalus* Linn."

Gray (1849: 33): "*Haliaeetus leucocephalus*".

MODERN IDENTIFICATION. — **Haliaeetus leucocephalus leucocephalus* (Linnaeus, 1766), on the PE 411 as well as in the text and in the mentioned sources (see the comments on Linnaeus (1758) and Brisson).

8.5. Gmelin (1788: 255): "*FALCO LEUCOCEPHALUS*" G42, S3, order "*Accipitres*".

REFERENCES. — Brisson (1759a: 423); Buffon & Guéneau de Montbeillard (1771a: 99) and PE 411; Catesby (1731: 1, pl. 1); Latham (1781: 29 no. 3), "Bald Eagle"; refers to Catesby's "Bald Eagle", Linnaeus's "*Falco leucocephalus*", Brisson's "Aigle à tête blanche", Buffon's "Pygargue" and PE 411, and the Leverian collection; Pennant (1785: 196 no. 89), "White-headed Eagle".

DISTRIBUTION/HABITAT. — Europe [sic] and America, maple forests.

MODERN IDENTIFICATION. — **Haliaeetus leucocephalus leucocephalus* (Linnaeus, 1766); see the comments on Linnaeus (1758), Brisson, and Buffon.

9. Buffon's "Balbuzard" (full species)

9.1. Linnaeus (1758: 91): "*FALCO HALIÆTUS*" G41, S21, order "*Accipitres*".

REFERENCES. — Linnaeus (1746: [19] no. 57), "*Falco pedibus ceraque ceruleis; corpore supra fusco; capite albo*", based on direct observation in Sweden, and reference to Gessner, Aldrovandi, Willughby, and Ray; Gessner (1585: 74), "*Falco* [...] *Cyanopus*"; Aldrovandi (1599:[187]), "*Haliætus*", and (1599:[209]), "*Morphnus seu Clanga*"; Willughby (1676: 37), "*Balbusardus*, The Bald Buzzard"; Ray (1713: 16 no. 3), "*Balbusardus Anglorum, Haliæetus Aldrov.*".

DISTRIBUTION/HABITAT. — Europe, on the ground, among reeds.

MODERN IDENTIFICATION. — **Pandion haliaetus haliaetus* (Linnaeus, 1758), according to the diagnosis and most of the mentioned sources, in particular the *Fauna Svecica* (Linnaeus, 1746) and Willughby and Ray, who observed a freshly killed bird. However, Gessner's "*Falco cyanopus*" is probably **Falco biarmicus* Temminck, 1825 (Springer & Kinzelbach 2009: 189); Aldrovandi's "*Haliaetus*" may correspond to **Pandion haliaetus* or to **Haliaeetus albicilla*, and his "*Morphnus*" to undetermined eagles. Furthermore, Gessner and Aldrovandi refer to a tradition in natural history which goes back to Antiquity and confuses several birds of prey under the name "*haliaetos*" ("marine eagle").

MODERN NOMENCLATURE. — *Falco haliaetus* Linnaeus, 1758 is an available and valid name, the protonym of the name currently in use for the species; "restricted type locality, Sweden ex Fn. Suec." according to Peters (1931: 275), who relied on Linnaeus (1761: 22).

9.2. Brisson (1759a: 440-443, plate XXXIV, 1762: 26, 1763a: 126-127): "AIGLE DE MER", "*HALIÆTUS, SEU AQUILA MARINA*", species 10 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — Direct observation in Réaumur's cabinet of one specimen sent by the bishop of Senlis.

REFERENCES. — Belon (1555: 96), "Orfraye"; Belon (1557: 13 ro.), "Orfraye, ou bien Aigle de mer"; Gessner (1560: 6), "*Aquila anataria*"; Gessner (1560: 129), "*Haliaeetus*"; Gessner (1585: 196-197), "*Aquila Anataria*" or "*Clanga*" or "*Planga*"; Gessner (1585: 201, 804-805), "*Haliætus, seu Aquila marina*"; Aldrovandi (1599: 187-190, 209-211); Schwenckfeld (1603: 216), "*Aquila marina*", direct observation; Belon (1605: 138), "*Haliaeetus*"; Laët (1633: 575), "*Haliætus*" of Brazil; Jonston (1657: 3), "*Haliætus*", based

on Belon and other authors; Jonston (1657: 4, pl. II), “*Morphnos*”, plate borrowed from Gessner; Charleton (1668: 62 no. 2, 1677: 70 no. 2), “*Haliaetus, Aquila marina*”, based on Belon’s “*Ossifragus*”; Charleton (1668: 63 no. 5, 1677: 70 no. 5), “*Morphnos*”; Willughby (1676: 32, pl. 6), “*Morphnos seu Clanga*”, based on Gessner and Aldrovandi; Willughby (1676: 37), “*Balbusardus*”; Sibbald (1684: 15), “*Balbusardus*” (in a list of Scottish birds); Ray (1713: 7 no. 6), “*Morphnos*”; Ray (1713: 16 no. 3), “*Balbusardus Anglorum*”; Kolb (1741: 139-140), “Aigle canardière”, “Aigle marine”; Rzączyński (1721: 283, 1745: 362), “*Aquila Pygargus seu Clanga Aldrovandi*”; Rzączyński (1745: 383), “*Haliaetus seu Aquila marina*”; Barrère (1745: 28), “*Aquila Pyrenaica, leucophæa*”; Linnaeus (1746: [19] no. 57); Linnaeus (1748: [17]), G36, S5 (“*Haliaetus*” in genus “*Falco*”); Linnaeus (1758: [91]), G41, S21.

DISTRIBUTION/HABITAT. — “Rivers and ponds”.

MODERN IDENTIFICATION. — The specimen of Réaumur’s cabinet described and illustrated by Brisson is clearly **Pandion haliaetus* (Linnaeus, 1758), probably the nominate subspecies (especially if it was taken near Senlis, as suggested). On the mentioned sources, see the comments on Linnaeus (1758). Several references added by Brisson correspond to **Pandion haliaetus* (e.g., the “*Aquila anatoria*” and the “*Aquila marina*” of Gessner, the “*Aquila marina*” of Schwenckfeld, and probably the “Orfraye” of Belon: see Glardon in Belon 1997: 408). Charleton’s “*Haliaetus, Aquila marina*”, which is the same as Belon’s “*Ossifragus*”, is unidentifiable, as well as the “eagles” from the Cape of Good Hope mentioned by Kolb and Laët’s “*haliaetus*” of Brazil. Brisson (1759a: 359) considers that Gessner’s “*Falco Cyanopus*” corresponds to another species, the “Faucon étoilé”.

9.3. Linnaeus (1766: 129-130): “*FALCO HALIETUS*” G42, S26, order “*Accipitres*”.

REFERENCES. — Linnaeus (1761: [22] no. 63), “*Falco Haliaetus*”; direct observation and ref. to Gessner, Aldrovandi, Willughby, and Ray; Brisson (1759a: 440, pl. 34); Aldrovandi (1599: 188, 190, 211); Willughby (1676: 37); Ray (1713: 16 no. 3).

DISTRIBUTION/HABITAT. — Europe, on the ground, among reeds.

MODERN IDENTIFICATION. — **Pandion haliaetus haliaetus* (Linnaeus, 1758). On the mentioned sources, see the comments on Linnaeus (1758) and Brisson.

9.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 103-111, pl. II), quarto edition; (1771b: 81-87, *PE* 414), folio edition: “BALBUZARD”.

PLATE II. — “Le Balbuzard”.

PE 414. — “Le Balbuzard” (published in March 1770).

REMARK. — “Balbuzard” is a neologism in French, coined from the English *bald buzzard*.

OBSERVATION. — Direct observation maybe of a specimen from Réaumur’s cabinet (the specimen on *PE* 414 may be the same as on Brisson’s pl. XXXIV).

REFERENCES. — Aristotle (“*haliaetos*”); Gessner (1585:[201]), “*Haliaetus s. Aquila marina*”; Willughby (1676: 37); Ray (1713: 16 no. 3); Linnaeus (1758: [91]), G41, S21; Brisson (1759a: 440, pl. 34); Pennant (1766: 63, pl. A1), “Osprey”; etc. (including travelers).

DISTRIBUTION/HABITAT. — All Europe, from Sweden to Greece, Egypt, “Nigritie” (regions to the South of Sahara), next to rivers and ponds.

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR *PE* 414. — Boddaert (1783: 25); Brisson (1759a: 440, pl. 34); Linnaeus (1766: 129-130), G42, S26; Latham (1781: 45 no. 26), “Osprey”, refers to Linnaeus’s “*Falco Haliaetus*”, Brisson’s “Aigle de mer”, Buffon’s “Balbuzard” and *PE* 414, Pennant’s “Osprey”, etc., and the Leverian collection.

Kuhl (1820: 7): “*Falco Haliaëtus* L.”

Temminck (1839: 3): “Aigle balbuzard”, adult, “*Falco haliaetus*. Linn.” Gray (1849: 33): “*Pandion haliaetus*”.

MODERN IDENTIFICATION. — **Pandion haliaetus haliaetus* (Linnaeus, 1758) on the plates (*PE* 414 and pl. II of De Sève), and, as a whole, in the text. On the mentioned sources, see the comments on Linnaeus (1758), and on Brisson. Aristotle’s “*haliaetos*” was probably **Haliaeetus albicilla* (Linnaeus, 1758): see Arnott (2007: 93).

9.5. Gmelin (1788: 263): “*FALCO HALIAËTOS*” G42, S26, order “*Accipitres*”. Includes three varieties: β “*arundinaceus*” (based on Samuel Gottlieb Gmelin); γ “*carolinensis*” (see below: 18.5); and δ “*cayennensis*” (based on Latham). Variety names are written in the margin, like species names, which is important from the point of view of modern nomenclature (see below).

REFERENCES (WITHOUT THE VARIETIES). — Linnaeus (1761: [22] no. 63); Brisson (1763a: 126); Aldrovandi (1599: 188, 190, 211); Ray (1713: 7 no. 6); Buffon & Guéneau de Montbeillard (1771a: 103, pl. II) and *PE* 414; Willughby (1678: 69, pl. 6), “Bald Buzzard”; Leem (1767: 234), “Fiske-Gjöö”; Pennant (1776:[174] no. 46, 1785: 199 no. 91), “Osprey”; Latham (1781: 45 no. 26), based on Linnaeus, Brisson, Buffon, etc., the British Museum, and the Leverian collection.

DISTRIBUTION/HABITAT (INCLUDING THE VARIETIES). — Europe, America, Siberia, Isle of Pines (New Caledonia); among reeds.

MODERN IDENTIFICATION. — **Pandion haliaetus* (Linnaeus, 1758). Considering the large distribution admitted by Gmelin, it is not possible to identify the subspecies precisely. On the mentioned sources, see the comments on Linnaeus (1758), and Brisson.

10. Buffon’s “Orfraie” (full species)

10.1. Linnaeus (1758): not considered.

10.2. Brisson (1759a: 437-440, 1763a: 125-126): “GRAND AIGLE DE MER”, “*AQUILA OSSIFRAGA*”, species 9 of genus IX (“Aigle”, “*Aquila*”), order III, section 1.

OBSERVATION. — No direct observation. Description mainly borrowed from Aldrovandi (“*Ossifraga*”).

REFERENCES. — Belon (1555: 97-98), “*Ossifragus*”; Gessner (1585: 203), “*Ossifraga*”; Gessner (1585: 542), “*Harpe*”; Aldrovandi (1599: 222-228), “*Ossifraga*”; Aldrovandi (1599: 408), “*Harpa*”; Schwenckfeld (1603: 220), “*Aquila Ossifraga*”, direct observation; Belon (1605: 138), “*Ossifraga*”; Jonston (1657: 5, pl. II, IV, V), based on Aldrovandi; Charleton (1668: 63 no. 8, 1677: 71 no. 8), “*Ossifraga*”, “*Harpa*”; Willughby (1676: 29, pl. 1), “*Haliaetus*”; Sibbald (1684: 14), “*Haliaetus*” (in a list of Scottish birds); Ray (1713: 7 no. 3), “*Haliaetus, seu Ossifraga*”; Kolb (1741: 140), “Orfraie ou Ossifrage”; Rzączyński (1745: 363), “*Aquila Ossifraga*”, based on Aldrovandi, Schwenckfeld, etc.; Klein (1750: 41 no. 5), “*Aquila Ossifraga*”, based on Aldrovandi and other sources.

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — Sharpe (1874: 302) and Dresser (1871-1881: 551) identify Brisson's "Grand Aigle de mer" with Linnaeus's "*Falco albicilla*" (1758). Indeed, Brisson's description, based on textual scholarship only, corresponds to an immature **Haliaeetus albicilla* (Linnaeus, 1758) (a bird almost as large as the golden eagle, body brown, whitish and rusty, twelve brown and white rectrices with a black tip, etc.), that is, the same as the "Aigle à queue blanche" and the "Petit Aigle à queue blanche" (see above). However, some of the mentioned sources mix up data borrowed from ancient authors relating to that species and to **Pandion haliaetus* (Linnaeus, 1758), or to nearly unidentifiable birds of prey (e.g., Belon's "*Ossifragus*" and Gessner's "*Ossifraga*"). Kolb's "Orfraie ou Ossifrague" from South Africa is not identifiable either; in any case, it is not **Haliaeetus albicilla*.

10.3. Linnaeus (1766: 124-125): "FALCO OSSIFRAGUS" G42, S4, order "Accipitres".

REFERENCES. — Gessner (1585: "263" = 203); Aldrovandi (1599: 222, 225, 228); Brünnich (1764: [3] no. 13, "Falco Ossifraga"); Willughby (1676: 29, pl. 1); Ray (1713: 7 no. 3).

DISTRIBUTION. — Europe, including Sweden.

MODERN IDENTIFICATION. — Sharpe (1874: 302) and Dresser (1871-1881: 551) identify Linnaeus's *Falco ossifragus* with the *Falco albicilla* of the same author, namely, **Haliaeetus albicilla* (Linnaeus, 1758); it is overall correct according to the description and the mentioned sources, which better correspond to that species than Brisson's "Grand Aigle de mer" does.

MODERN NOMENCLATURE. — *Falco ossifragus* Linnaeus, 1766 is considered an available name, a junior synonym of *Falco albicilla* Linnaeus, 1758.

10.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 112-123, pl. III), quarto edition; (1771b: 88-96, PE 112 and 415), folio edition: "ORFRAIE".

PLATE III. — "L'Orfraie ou Aigle de mer".

PE 112. — "Le Grand Aigle de mer" (published in July 1766).

PE 415. — "L'Orfraie ou L'Ossifrage. Le grand Aigle de mer femelle" (published in March 1770).

REMARK. — The French term "orfraie", derived from Latin "*ossi-fragā*" ("bone breaker"), designated several large diurnal or nocturnal birds of prey. Buffon assigns it to a precise species, **Haliaeetus albicilla*, but he does not realize that it is the same as his "Pygargue". The English term "osprey" has the same origin and corresponds to **Pandion haliaetus*.

OBSERVATION. — Direct observation of at least two specimens of unknown origin (apparently not from Réaumur's collection); the comparison of PE 415 with the figure of the "Aigle de mer" in Salerne (1767: pl. II) suggests that it may be the same specimen.

REFERENCES. — Aristotle ("*phênē*"); Pliny the Elder ("*haliaetus*"); Aldrovandi (1599: 226); Sagard (1632: 300); Kolb (1741: 140); Brisson (1759a: 437); Salerne (1767: 5), "Aigle de mer, dit Orfraie", direct observation.

DISTRIBUTION. — "Almost everywhere in Europe", "lakes of North America".

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 112 AND 415. — Boddaert (1783: 7, 25); Brisson (1759a: 437); Linnaeus (1766: 124), G42, S4; Latham (1781: 30 no. 4), "Sea Eagle", refers

to Linnaeus's "*Falco Ossifragus*", Brisson's "Grand Aigle de mer", Buffon's "Orfraie", PE 112 and 415, etc., the British Museum and the Leverian collection.

Kuhl (1820: 3, 7): "*Falco Ossifragus* L." (PE 112); "*Falco Ossifragus* L.", juvenile (PE 415).

Temminck (1839: 3): PE 112: "Aigle pygargue", male, "middle age, two-year-old", "*Falco albicilla*. Linn."; PE "405" (= 415): idem, young female of the year.

Gray (1849: 31 and 33): "*Haliaeetus albicilla*".

MODERN IDENTIFICATION. — The birds represented on PE 112 and PE 415 as well as on De Sève's plate III (the latter is maybe the same as that on PE 415) are probably **Haliaeetus albicilla* (Linnaeus, 1758), although the claws of the first one are a little too small, and the bill of the second one not massive enough; in any case, they are juveniles. On the cited sources, see Brisson and Linnaeus (1766). The tradition relating to "marine eagles" is very confused. In particular, the "*phênē*" of the Ancients is unidentifiable. Buffon indicates North America in the distribution of this species because of a passage in the account of French traveler Gabriel Sagard, who briefly mentioned "eagles" living near Canadian lakes, which were probably **Haliaeetus leucocephalus* (Linnaeus, 1766).

10.5. Gmelin (1788: 255-256): "FALCO OSSIFRAGUS" G42, S4, order "Accipitres".

REFERENCES. — Brisson (1763a: 125); Gessner (1585: "263" = 203); Aldrovandi (1599: 222, 225, 228); Brünnich (1764: [3] no. 13), "*Falco Ossifraga*"; Ray (1713: 7 no. 3); Buffon & Guéneau de Montbeillard (1771a: 112, pl. III) and PE 112, 415; Pennant (1776: 167 [no. 44], pl. 17, 1785: 194 no. 86), "Sea Eagle"; Willughby (1678: 59, pl. 1), "Sea-Eagle or Osprey"; Latham (1781: 30 no. 4), based on Linnaeus, Brisson, Buffon, PE 112, PE 415, etc., the British Museum, and the Leverian collection.

DISTRIBUTION. — Europe, North America, "Botany Island" (i.e., Botany Bay, Australia).

MODERN IDENTIFICATION. — **Haliaeetus albicilla* (Linnaeus, 1758). On the mentioned sources, see Brisson, Linnaeus (1766), and Buffon. The erroneous mention of North America is borrowed from Buffon, Pennant, and Latham, and corresponds, in fact, to **Haliaeetus leucocephalus* (Linnaeus, 1766). Latham mentions "Botany Island" (Australia), relying on the account of James Cook's travels; the bird in question was obviously neither **Haliaeetus albicilla* nor **Haliaeetus leucocephalus* (both absent from Australia).

11. Buffon's "Jean-le-blanc" (full species)

11.1. Linnaeus (1758: 89): Linnaeus mentions Belon's "Ian le blanc" in the synonymy of "*Falco Albicilla*" (G41, S8): see above.

11.2. Brisson (1759a: 443-445, 1763a: 127): JEAN-LE-BLANC, "PYGARGUS", species 11 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — Direct observation in Réaumur's cabinet; specimen(s) sent by François Salerne.

REFERENCES. — Belon (1555: 103), "Ian le blanc, autrement nommé l'oyseau saint Martin"; Belon (1557: 15 ro.), "*Pygargus*, Janleblanc, Oyseau saint Martin"; Aldrovandi (1599: 208), "*Pygargi secundum genus*", based on Belon; Jonston (1657: 4, pl. II), "*Pygargus*", based on Belon and Aldrovandi.

DISTRIBUTION. — Common in France.

MODERN IDENTIFICATION. — Brisson's description (total length of 67 cm, coloration, etc.) clearly corresponds to **Circaetus gallicus* (J. F. Gmelin, 1788). It is, indeed, the first unambiguous description of this bird in a work of natural history. However, Brisson mistakenly identifies it with Belon's "Jan-le-blanc" (or Aldrovandi's "second genus of Pygargus"), which is a harrier, most probably **Circus cyaneus* (Linnaeus, 1766) (Glardon *in* Belon 1997: 410). Brisson thus gives a new meaning to the name "jean-le-blanc" which is still in use in French ("Circaète Jean-le-blanc" for **Circaetus gallicus*).

11.3. **Linnaeus (1766: 123-124):** Linnaeus still mentions Belon's "Jan le blanc" in the list of references of "*Vultur Albicilla*" in 1766: see above. That is probably the reason why he does not take into account Brisson's "Jean-le-blanc".

11.4. **Buffon *in* Buffon & Guéneau de Montbeillard (1771a: 124-135, pl. IV), quarto edition; (1771b: 97-105, PE 413), folio edition: "JEAN-LE-BLANC".**

PLATE IV. — "Le Jean-le-blanc". See Figure 1.

PE 413. — "le Jean-le-blanc" (published in March 1770). See Figure 2.

OBSERVATION. — Direct observation, Buffon says he had this bird alive in 1768-1769; it is probably the specimen illustrated on PE 413 (we cannot exclude, however, that Martinet drew a specimen from the cabinet of Réaumur studied by Brisson). The specimens represented on De Sève's pl. IV seem to be different.

REFERENCES. — Belon (1555: 103-104); Aldrovandi (1599: 208); **Brisson (1759a: 443)**; Salerne (1767: 23-24), "Jean le Blanc".

DISTRIBUTION. — Common in France, rare in other countries.

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 413. — Boddaert (1783: 25): Brisson (1759a: 443); Latham (1781: 39 no. 17), "Jean le blanc", refers to Brisson, Buffon, Jonston. Boddaert assigns this bird to the Linnaean genus "*Falco*" but does not give a specific name to it.

Kuhl (1820: 7): "*Falco Gallicus* G. L." (= Gmelin, Linnaeus).

Temminck (1839: 3): "Aigle Jean le blanc", adult, "*Falco brachydactylus*. Wol."

Gray (1849: 33): "*Circaetus gallicus*".

MODERN IDENTIFICATION. — It is clearly **Circaetus gallicus* (J. F. Gmelin, 1788) on PE 413 (which may represent a juvenile, but the color of the tarsi is not accurate) and on De Sève's plate IV (at least the bird in the foreground), as well as in the first-hand description of the bird by Buffon. However, the rest of text is more confused and describes characters relating to harriers (flight close to the ground, nest on the ground, etc.). This confusion results from the sources used (see the comments on Brisson). Salerne's "Jean-le blanc", in particular, is a harrier.

11.5. **Gmelin (1788: 259): "*FALCO GALLICUS*" G42, S52, order "Accipitres".**

REFERENCES. — **Brisson (1763a: 127)**; Jonston (1657: 4, pl. II); **Buffon & Guéneau de Montbeillard (1771a: 124, pl. IV) and PE 413**; Latham (1781: 39 no. 17), based on Brisson, Buffon, and Jonston.

DISTRIBUTION. — France, not common in other European countries.

MODERN IDENTIFICATION. — **Circaetus gallicus* (J. F. Gmelin, 1788), according to the description and the mentioned sources (except Jonston: see the comments on Brisson).

MODERN NOMENCLATURE. — *Falco gallicus* J. F. Gmelin, 1788 is an available and valid name, the protonym of the name currently in

use for the species. The specimens described by Brisson and Buffon belong to the type series.

12. Buffon's variety of the "Jean-le-blanc"

12.1. **Linnaeus (1758):** not considered.

12.2. **Brisson (1759a: 367-370, 1763a: 107): "LANIER BLANC", "LANARIUS ALBICANS",** species 18 of genus VIII ("Épervier", "Accipiter"), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Aldrovandi.

REFERENCES. — Aldrovandi (1599: 380-382), "*Lanarius*", direct observation and various sources; Schwenckfeld (1603: 304), "*Milvus albus*", based on Turner and Aldrovandi; Jonston (1657: 12, pl. IX), "*Lanarius*", based on Aldrovandi; Sibbald (1684: 15), "*Milvus albicans. An Lanius albicans?*" (in a list of Scottish birds); Rzączyński (1745: 395), "*Milvus albus*", based on Aldrovandi and Schwenckfeld.

MODERN IDENTIFICATION. — Doubtful species. Aldrovandi mentioned two "*Lanarii*" and considered them two varieties of the same species: the first one (total length: about 50 cm) was probably a harrier; the second one, bigger (total length: about 70 cm), is not identifiable with certainty (the grey, white, and brown color, as well as the longitudinal rusty spots of the belly and beneath the wings evoke a juvenile male harrier too; however, it is not in accordance with the size). Furthermore, these two birds may have been confused, in the other mentioned sources, with other unidentifiable birds of prey.

12.3. **Linnaeus (1766):** not considered.

12.4. **Buffon *in* Buffon & Guéneau de Montbeillard (1771a: 134-135), quarto edition; (1771b: 105), folio edition: Variety of the "Jean-le-blanc" (see above, 11.4).**

OBSERVATION. — No direct observation. Short description borrowed from Brisson.

REFERENCES. — Aldrovandi (1599: 380-382); Schwenckfeld (1603: 304); **Brisson (1759a: 367)**.

MODERN IDENTIFICATION. — See Brisson. The identification of the second "*Lanarius*" of Aldrovandi with Buffon's "Jean-le-Blanc" (i.e., **Circaetus gallicus*) is very improbable.

12.5. **Gmelin (1788: 276): "*FALCO ALBICANS*" G42, S102, order "Accipitres".** Includes a variety β.

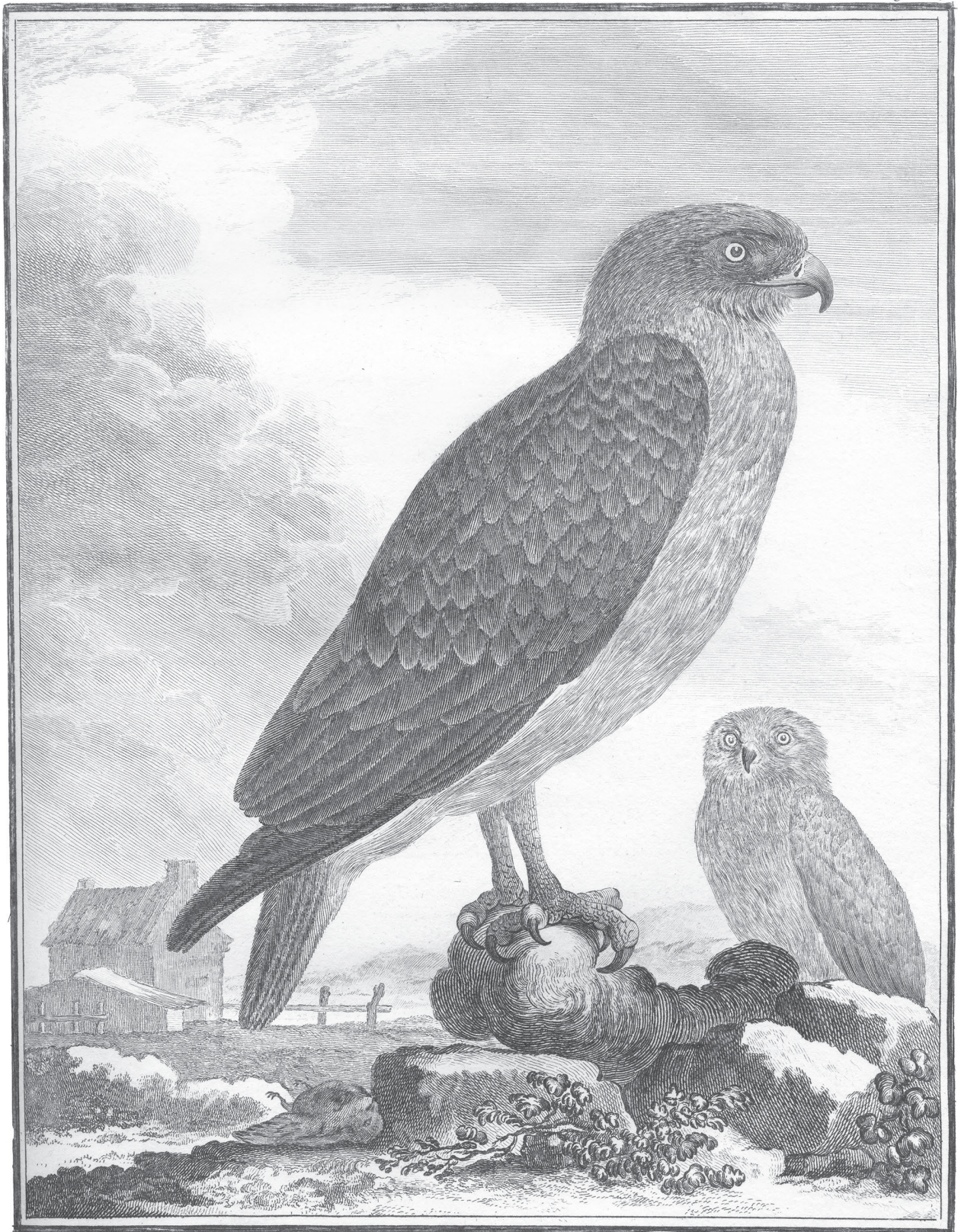
REFERENCES. — **Brisson (1763a: 107)**; Aldrovandi (1599: 380-383); Latham (1781: 87 no. 73), "White Lanner"; based on Brisson and Aldrovandi.

REMARK. — Gmelin distinguishes between the two "*Lanarii*" of Aldrovandi; he considers one of them the main species, and the other the variety β; he wonders whether the species itself, "*Falco albicans*", may be a mere variety of "*Falco Lanarius*" (G42, S24), i.e., Buffon's "Lanier" (among "falcons" and related species).

DISTRIBUTION. — Europe.

MODERN IDENTIFICATION. — See Brisson.

MODERN NOMENCLATURE. — *Falco albicans* J. F. Gmelin, 1788, is a *nomen dubium*.



De Sève delin.

Baron sculp.

LE JEAN-LE-BLANC .

FIG. 1. — Plate IV: "le Jean-le-Blanc", by De Sève, in Buffon & Guéneau de Montbeillard (1771a). Both represented (lost) specimens belong to the type series of *Falco gallicus* J. F. Gmelin, 1788. Credits: Musée Buffon, Montbard.



FIG. 2. — Planche enluminée 413: “le Jean-le Blanc”, by Martinet, in Buffon & Guéneau de Montbeillard (1771b). The represented (lost) specimen belongs to the type series of *Falco gallicus* J. F. Gmelin, 1788. Credits: Musée Buffon, Montbard.

13. Buffon's "Aigle de Pondichéry" (full species)

13.1. **Linnaeus (1758):** not considered.

13.2. **Brisson (1759a: 450-452, pl. XXXV, 1763a: 129-130):** "AIGLE DE PONDICHÉRY", "*AQUILA PONTICERIANA*", species 15 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — Direct observation of a specimen (apparently unique) of the collection of the abbé Jean-Thomas Aubry (1714-1785), sent from Pondicherry (India).

REFERENCES. — None (new species).

DISTRIBUTION. — Pondicherry.

MODERN IDENTIFICATION. — **Haliastur indus indus* (Boddaert, 1783), according to the figure and the description; the specimen studied and illustrated by Brisson is a type, certainly the holotype since Boddaert's "*Falco indus*" (see below) is based on Brisson's work and on the PE 416, which certainly correspond to the same specimen.

13.3. **Linnaeus (1766):** not considered.

13.4. **Buffon in Buffon & Guéneau de Montbeillard (1771a: 136-137), quarto edition; (1771b: 106-107, PE 416), folio edition:** "AIGLE DE PONDICHÉRY".

PE 416. — "Aigle des grandes Indes" (published in March 1770). See Figure 3.

OBSERVATION. — Direct observation of the same specimen as that studied by Brisson.

REFERENCES. — Brisson (1759a: 450, pl. 35); Salerne (1767: 8), "Aigle Malabar".

DISTRIBUTION. — "Grandes Indes" (i.e., modern India).

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR PE 416. — Boddaert (1783: 25); Brisson (1759a: 450); Latham (1781: 41 no. 21), "Pondicherry Eagle"; refers to Brisson and Buffon; Boddaert assigns this bird to the Linnaean genus "*Falco*" (G42) and names it "*Falco Indus*".

Kuhl (1820: 7): "*Falco Pondicerianus* L."

Temminck (1839: 3): "Aigle sacré", very old; "*Falco pondicerianus*. Bris." Gray (1849: 33): "*Haliastur indus*".

MODERN IDENTIFICATION. — **Haliastur indus indus* (Boddaert, 1783), according to the plate and the description. The PE 416 looks like Brisson's plate XXXV so much that it is almost certain that Brisson and Buffon studied the same (apparently unique) specimen of Aubry's collection, which is the holotype. Salerne's "Aigle Malabar" is the same bird (Salerne did not mention Brisson, but he certainly had the opportunity to observe Réaumur's collection: see Stresemann [1952: 502]).

MODERN NOMENCLATURE. — *Falco indus* Boddaert, 1783 is an available and valid name, the protonym of the name currently in use for the species.

13.5. **Gmelin (1788: 265):** "*FALCO PONDICERIANUS*" G42, S71, order "*Accipitres*".

REFERENCES. — Brisson (1763a: 129); Buffon & Guéneau de Montbeillard (1771a: 136) and PE 416; Latham (1781: 41 no. 21, based on Brisson and Buffon).

DISTRIBUTION. — India.

MODERN IDENTIFICATION. — **Haliastur indus indus* (Boddaert, 1783).

MODERN NOMENCLATURE. — *Falco pondicerianus* J. F. Gmelin, 1788, is an available name, a junior synonym of *Falco indus* Boddaert, 1783.

14. Buffon's "Urutaurana" or "Ouroutaran" (full species)

14.1. **Linnaeus (1758: 86):** in the genus "*Vultur*": "*VULTUR HARPYJA*" G40, S2; marked with a cross, which means that Linnaeus never saw the animal, neither alive nor in a collection. However, Linnaeus wonders whether it is the same species as the "crowned Mexican eagle" observed by his student Daniel Zachariae Hallman (1722-1782) in the Royal Menagerie of Madrid.

REFERENCES. — Hernández (1651: 34, "*Yzquauhltli*"); Ray (1713: 161, "*Yzquauhltli*", based on Hernández).

DISTRIBUTION. — "Mexico" (which corresponds to modern Mexico, South of the United States, and continental Central America).

MODERN IDENTIFICATION. — **Harpia harpyja* (Linnaeus, 1758), according to Linnaeus's diagnosis and Hernández's description.

MODERN NOMENCLATURE. — *Vultur harpyja* Linnaeus, 1758 is an available and valid name, the protonym of the name currently in use for the species.

14.2. **Brisson (1759a: 446-448, 1762: 26, 1763a: 128):** "AIGLE HUPÉ DU BRÉSIL", "*AQUILA BRASILIENSIS CRISTATA*", species 13 of genus IX ("Aigle", "*Aquila*"), order III, section 1.

OBSERVATION. — No direct observation. Description mainly borrowed from Markgraf.

REFERENCES. — Nieremberg (1635: 217), "*Aquila cristata*", based on Hernández; Markgraf (1648: 203-204), "*Urutaurana*"; Hernández (1651: 34), "*Yzquauhltli*"; Jonston (1657: 139, pl. 59), based on Markgraf, and (1657: 153), based on Hernández; Willughby (1676: 32, pl. 4), based on Markgraf, and Willughby (1676: 299), based on Hernández; Ray (1713: 7 no. 8), based on Markgraf, and Ray (1713: 161), based on Hernández; Klein (1750: 42 no. 8), based on Markgraf; Browne (1756: 471), "Oroonoko Eagle"; Linnaeus (1758: [86]), G40, S2.

DISTRIBUTION. — Brazil.

MODERN IDENTIFICATION. — Brisson confuses two species: Markgraf's "*Urutaurana*" and Browne's "Oroonoko Eagle" are **Spizaetus ornatus ornatus* (Daudin, 1800) (see Herrmann 1989: 189; Boeseman *et al.* 1990: 127), while Hernández and Nieremberg's "*Aquila cristata*" or "*Yzquauhltli*" is **Harpia harpyja* (Linnaeus, 1758). Except for the size, Brisson's description (feathers and naked parts) mainly corresponds to the former species. Daudin (1800: 77-78) did not refer to any of the authors mentioned here when he defined his *Falco ornatus*.

14.3. **Linnaeus (1766: 121-122):** "*VULTUR HARPYJA*" G41, S2, order "*Accipitres*".

REFERENCES. — Hernández (1651: 34); Markgraf (1648: 203-204); Ray (1713: 161, 7 no. 8); Brisson (1759a: 446).

DISTRIBUTION. — "Mexico".



FIG. 3. — Planche enluminée 416: “Aigle des grandes Indes”, by Martinet, in Buffon & Guéneau de Montbeillard (1771b). The represented (lost) specimen is the holotype of *Falco indus* Boddaert, 1783. Credits: Musée Buffon, Montbard.

MODERN IDENTIFICATION. — The references to Markgraf and Brisson result in a confusion (absent from the 1758 edition) between **Harpia harpyja* (Linnaeus, 1758) and **Spizaetus ornatus ornatus* (Daudin, 1800). Consequently, the given distribution (only “Mexico”) does not make sense.

MODERN NOMENCLATURE. — The confusion made in 1766 has no consequence on the nomenclature of the taxon since *Vultur Harpyja* Linnaeus (ex Hernández) 1758 clearly corresponds to **Harpia harpyja*.

14.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 137-139), quarto edition; (1771b: 107-110), folio edition: “URUTAU-RANA” or “OUROUTARAN” [sic]. Buffon considers that the “Aigle huppé d’Afrique” is a variety of this species (see below, 15.4).

OBSERVATION. — No direct observation. Description mainly borrowed from Brisson, that is, from Markgraf.

REMARK. — In accordance with his own principles of nomenclature, Buffon coined a gallicized form (“ouroutaran”) from the local name of this bird; however, the term never imposed itself in French, because of the underlying confusion, and it disappeared as early as the first decades of the 19th century.

REFERENCES (WITHOUT THE VARIETY). — Markgraf (1648: 203); “Fernandès” = Hernández (1651: 34); Rochefort (1658: 159), “Aigle d’Orénoque”; Garcilaso de La Vega (1744: 275), “Aigle”; Browne (1756: 471); Brisson (1759a: 446).

DISTRIBUTION (WITHOUT THE VARIETY). — South America, “Mexico”.

MODERN IDENTIFICATION. — Confusion of **Spizaetus ornatus* (Daudin, 1800) and **Harpia harpyja* (Linnaeus, 1758): see the comments on Brisson and Linnaeus (1766). Buffon’s description mainly corresponds to the former species. The birds of prey from the New World mentioned by Rochefort and Garcilaso are not identifiable; as for the African “variety”, see below.

14.5. Gmelin (1788: 251): shifted into the genus “*Falco*”: “*FALCO HARPYJA*” G42, S34, order “*Accipitres*”.

REFERENCES. — Linnaeus (1766: 121), G41, S2; Brisson (1759a: 446); Ray (1713: 161); Hernández (1651: 34); Markgraf (1648: 203-204); Ray (1713: 7 no. 8); Willughby (1678: 63, pl. 4), “Crested Eagle”; Latham (1781: 6 no. 2), “Crested Vulture”; refers to Linnaeus, Brisson, Ray, Willughby, and Browne.

DISTRIBUTION. — New Spain (continental Central America and South of the United States); South America.

MODERN IDENTIFICATION. — Confusion of **Spizaetus ornatus* (Daudin, 1800) and **Harpia harpyja* (Linnaeus, 1758); see the comments on Brisson and Linnaeus (1766).

15. Buffon’s “Aigle huppé d’Afrique” (variety of the “Urutaurana”)

15.1. Linnaeus (1758): not considered.

15.2. Brisson (1759a: 448-450, 1763a: 128-129): “AIGLE HUPÉ D’AFRIQUE”, “*AQUILA AFRICANA CRISTATA*”, species 14 of genus IX (“Aigle”, “*Aquila*”), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Edwards.

REFERENCES. — Edwards (1758: 31, pl. 224), “Crowned Eagle”; drawn from a living bird, “brought from the coast of Guiney in Africa”, observed at a fair in London in 1752.

DISTRIBUTION. — “Coasts of Africa”.

MODERN IDENTIFICATION. — Brisson only relies on Edwards’s plate and text, which unambiguously correspond to **Stephanoaetus coronatus* (Linnaeus, 1766), probably immature or subadult.

15.3. Linnaeus (1766: 124): “*FALCO CORONATUS*” G42, S1, order “*Accipitres*”.

REFERENCES. — Edwards (1758: 31, pl. 224); Brisson (1759a: 448).

DISTRIBUTION. — “Guinea” (West Africa).

MODERN IDENTIFICATION. — **Stephanoaetus coronatus* (Linnaeus, 1766).

MODERN NOMENCLATURE. — *Falco coronatus* Linnaeus, 1766 is an available and valid name, the protonym of the name currently in use for the species.

15.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 139), quarto edition; (1771b: 108-110), folio edition: “Aigle huppé d’Afrique”, variety of the “Urutaurana” (see above, 14.4), or very close species. Buffon deems it possible that “Urutaurana” migrates from Brazil to West Africa.

OBSERVATION. — No direct observation. Description borrowed from Edwards.

REFERENCES. — Edwards (1758: 31, pl. 224); Brisson (1759a: 448).

DISTRIBUTION. — West coasts of Africa.

MODERN IDENTIFICATION. — **Stephanoaetus coronatus* (Linnaeus, 1766); it is, of course, completely different from the “Urutaurana” (whether **Spizaetus ornatus* or **Harpia harpyja*).

15.5. Gmelin (1788: 253-254): “*FALCO CORONATUS*” G42, S1, order “*Accipitres*”.

REFERENCES. — Brisson (1759a: 448); Edwards (1758: 31, pl. 224); Latham (1781: 27 no. 1), “Crowned Eagle”, based on Linnaeus, Brisson, Edwards.

DISTRIBUTION. — “Guinea” (West Africa).

MODERN IDENTIFICATION. — **Stephanoaetus coronatus* (Linnaeus, 1766).

16. Buffon’s “Urubitinga” (full species)

16.1. Linnaeus (1758): not considered.

16.2. Brisson (1759a: 445-446, 1763a: 128): “AIGLE DU BRÉSIL”, “*AQUILA BRASILIENSIS*”, species 12 of genus IX (“Aigle”, “*Aquila*”), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Markgraf.

REFERENCES. — Markgraf (1648: 214), “*Urubitinga*”; Jonston (1657: 146, pl. 61), based on Markgraf; Willughby (1676: 32), idem; Ray (1713: 8 no. 9), idem.



FIG. 4. — Planche enluminée 417: "Aigle d'Amérique", by Martinet, in Buffon & Guéneau de Montbeillard (1771b). The represented (lost) specimen is the holotype of *Falco americanus* Boddaert, 1783. Credits: Musée Buffon, Montbard.

DISTRIBUTION. — Brazil.

MODERN IDENTIFICATION. — The description of this bird, entirely based on Markgraf, clearly corresponds to **Buteogallus urubitinga urubitinga* (J. F. Gmelin, 1788); see Herrmann (1989: 192).

16.3. Linnaeus (1766): not considered.

16.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 141), quarto edition; (1771b: 110), folio edition: “URUBITINGA”.

REMARK. — In spite of Buffon, the term “urubitinga” never imposed itself in French, but it was admitted as a specific name in Latin from 1788 onwards.

OBSERVATION. — No direct observation. Description borrowed from Markgraf or Brisson.

REFERENCES. — Markgraf (1648: 214); Brisson (1759a: 445).

DISTRIBUTION. — Brazil.

MODERN IDENTIFICATION. — **Buteogallus urubitinga urubitinga* (J. F. Gmelin, 1788); see the comments on Brisson.

16.5. Gmelin (1788: 265): “*FALCO URUBITINGA*” G42 S70, order “*Accipitres*”.

REFERENCES. — Brisson (1763a: 128); Willughby (1678: 64); Ray (1713: 8 no. 9); Buffon & Guéneau de Montbeillard (1771a: 141); Latham (1781: 41 no. 20), “Brazilian Eagle” based on Brisson, Buffon, Ray, Willughby.

DISTRIBUTION. — Brazil.

MODERN IDENTIFICATION. — **Buteogallus urubitinga urubitinga* (J. F. Gmelin, 1788); see Brisson.

MODERN NOMENCLATURE. — *Falco urubitinga* J. F. Gmelin, 1788 is an available and valid name, the protonym of the name currently in use for the species.

17. Buffon’s “Petit Aigle d’Amérique” (full species)

17.1. Linnaeus (1758): not considered.

17.2. Brisson (1759a): not considered.

17.3. Linnaeus (1766): not considered.

17.4. Buffon in Buffon & Guéneau de Montbeillard (1771a: 142), quarto edition; (1771b: 110-111, *PE* 417), folio edition: “PETIT AIGLE D’AMÉRIQUE”.

PE 417. — “Aigle d’Amérique” (published in March 1770). See Figure 4.

OBSERVATION. — Direct observation of an unknown specimen, seemingly mounted, probably sent from French Guiana. Buffon did not specify if the specimen belonged to the Royal Cabinet or to another collection. According to Mauduyt de La Varenne (1783: 474), this bird “has often been sent from [French] Guiana”, which suggests that it was rather common in Parisian cabinets.

REFERENCES. — None (new species).

DISTRIBUTION. — Cayenne and “other parts of South America”.

IDENTIFICATIONS PROPOSED BY LATER AUTHORS FOR *PE* 417. — Boddaert (1783: 25): Latham (1781: 97 no. 82, “Red-throated Falcon”; refers to Buffon); Boddaert assigns this bird to the Linnaean genus “*Falco*” (G42) and names it “*Falco americanus*” (available and valid name: see below).

Kuhl (1820: 7): “*Falco Aquilinus* L.”

Temminck (1839: 2): “Caracara à gorge nue ou Rancanca”; “*Falco aquilinus*. Linn.”

Gray (1849: 33): “*Ibycter americanus*”.

MODERN IDENTIFICATION. — **Ibycter americanus* (Boddaert, 1783), according to the plate and the description; the (lost) illustrated specimen is the holotype.

MODERN NOMENCLATURE. — *Falco americanus* Boddaert, 1783 is an available and valid name, the protonym of the name currently in use for the species.

17.5. Gmelin (1788: 280): “*FALCO AQUILINUS*” G42, S110, order “*Accipitres*”.

REFERENCES. — Buffon & Guéneau de Montbeillard (1771a: 142) and *PE* 417; Latham (1781: 97 no. 82, based on Buffon).

DISTRIBUTION. — South America.

MODERN IDENTIFICATION. — **Ibycter americanus* (Boddaert, 1783).

MODERN NOMENCLATURE. — *Falco aquilinus* J. F. Gmelin, 1788 is an available name, a junior synonym of *Falco americanus* Boddaert, 1783.

18. Buffon’s “Pêcheur” (full species or variety)

18.1. Linnaeus (1758): not considered.

18.2. Brisson (1759a): corresponds to two full species (18.2.1 and 18.2.2).

18.2.1. Brisson (1759a: 361-362, 1763a: 105): “FAUCON PESCHEUR DES ANTILLES”, “*FALCO PISCATOR ANTILLARUM*”, species 14 of genus VIII (“Épervier”, “*Accipiter*”), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Du Tertre.

REFERENCES. — Du Tertre (1667: 253), “Pêcheur”; maybe direct observation; Ray (1713: 19 no. 2), based on Du Tertre.

DISTRIBUTION. — Antilles.

MODERN IDENTIFICATION. — The only first-hand source is Du Tertre’s very vague description. The characters (bird of prey that eats fish, whose feathers are white on the abdomen and black on the top of the head) and the distribution (Lesser Antilles) may correspond to **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788) or **Pandion haliaetus ridgwayi* Maynard, 1887; the former being present in the Antilles in winter, the latter all year round.

18.2.2. Brisson (1759a: 362-363, 1763a: 105): “FAUCON PESCHEUR DE LA CAROLINE”, “*FALCO PISCATOR CAROLINIENSIS*”, species 15 of genus VIII (“Épervier”, “*Accipiter*”), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Catesby.

REFERENCES. — Catesby (1731: 2, pl. 2), “*Accipiter Piscatorius*”, “Fishing Hawk”, “Faucon pecheur”; Klein (1750: 52 no. 19), “*Falco Piscator Cyanopus*”, based on Catesby.

DISTRIBUTION/HABITAT. — “Mouth of rivers, little bays of the sea” (of Carolina).

MODERN IDENTIFICATION. — **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788), according to Catesby’s plate and description. See Reveal (2015).

18.3. Linnaeus (1766): not considered.

18.4. Buffon *in* Buffon & Guéneau de Montbeillard (1771a: 142-144), quarto edition; (1771b: 111-112), folio edition: “PÊCHEUR”. Buffon thinks that Du Tertre’s “Pêcheur” and Catesby’s “Faucon pecheur” are in all likelihood (“très vraisemblablement”) the same species, and probably the same species as the European Balbuzard (see above).

OBSERVATION. — No direct observation. Description borrowed from Du Tertre and Catesby.

REFERENCES. — Du Tertre (1667: 253); Catesby (1731: 2, pl. 2).

DISTRIBUTION. — Antilles, Carolina.

MODERN IDENTIFICATION. — See the comments on Brisson; it is **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788) in Catesby, probably **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788) or **Pandion haliaetus ridgwayi* Maynard, 1887, in Du Tertre.

18.5. Gmelin (1788: 263): Variety φ “*carolinensis*” of “*Falco Haliaëtus*” G42, S26 (see above, 9.5), order “*Accipitres*”.

REFERENCES. — Brisson (1763a: 105 no. 14 and 15); Ray (1713: 19 no. 2), based on Du Tertre; Buffon & Guéneau de Montbeillard (1771a: 142); Catesby (1731: 2, pl. 2).

REMARK. — Latham’s “Carolina Osprey”, a variety of the “Osprey” (1781: 46 no. 26A), is based on the same sources as Brisson’s “Faucon pescheur des Antilles” and “Faucon pescheur de la Caroline” (i.e., on Du Tertre and Catesby), as well as on a specimen of the Leverian collection.

MODERN IDENTIFICATION. — See the comment on Brisson; it is **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788) in Catesby, probably **Pandion haliaetus carolinensis* (J. F. Gmelin, 1788) or **Pandion haliaetus ridgwayi* Maynard, 1887 in Du Tertre; Gmelin mostly relies on Catesby’s description.

MODERN NOMENCLATURE. — *Falco carolinensis* J. F. Gmelin, 1788, is considered an available and valid name since it respects the articles 10.2 and 45.6.4 of the *Code* on infraspecific names published before 1961; it is the protonym of the name currently in use for the subspecies.

19. Buffon’s “Mansfeni” (full species)

19.1. Linnaeus (1758): not considered.

19.2. Brisson (1759a: 361, 1763a: 104-105): “FAUCON DES ANTILLES”, “*FALCO ANTILLARUM*”, species 13 of genus VIII (“Épervier”, “*Accipiter*”), order III, section 1.

OBSERVATION. — No direct observation. Description borrowed from Du Tertre.

REFERENCES. — Du Tertre (1667: 252), “Mansfeny”; possible direct observation; Ray (1713: 19 no. 1), based on Du Tertre.

DISTRIBUTION. — Antilles.

MODERN IDENTIFICATION. — The species cannot be identified. Ray and Brisson rely on Du Tertre’s very imprecise description (a bird of prey resembling an eagle, same size as a falcon but with bigger claws; eats birds and snakes); furthermore, the word “mansfeni” (whose origin is unclear) seems to have designated several birds in the Antilles, including the frigatebird.

19.3. Linnaeus (1766): not considered.

19.4. Buffon *in* Buffon & Guéneau de Montbeillard (1771a: 144-145), quarto edition; (1771b: 112-113), folio edition: “MANSFENI”.

OBSERVATION. — No direct observation. Description borrowed from Du Tertre.

REFERENCE. — Du Tertre (1667: 252).

DISTRIBUTION. — Antilles.

MODERN IDENTIFICATION. — Unidentified bird of prey: see the comments on Brisson.

19.5. Gmelin (1788: 264): “*FALCO ANTILLARUM*” G42, S65, order “*Accipitres*”.

REFERENCES. — Brisson (1763a: 104); Ray (1713: 19 no. 1); “Du Tartre” = Du Tertre (1667: 252); Buffon & Guéneau de Montbeillard (1771a: 144); Latham (1781: 47 no. 27), “Mansfeny”, based on Brisson, Buffon, Du Tertre, Ray.

DISTRIBUTION. — Antilles.

MODERN IDENTIFICATION. — Unidentified bird of prey: see the comments on Brisson. Gmelin says that the top of the head is black and the abdomen white, which obviously results from a confusion between Brisson’s “*Falco Antillarum*” and “*Falco piscator Antillarum*”; however, Gmelin mentions the latter in the list of references for “*Falco carolinensis*”: see above.

MODERN NOMENCLATURE. — *Falco antillarum* J. F. Gmelin, 1788, is a *nomen dubium*.

DISCUSSION

As revealed by the list, Buffon’s “Aigles et Balbuzards” comprise 13 full species: three “eagles” in the strictest sense (“Grand Aigle”, “Aigle commun”, “Petit Aigle”), three species close to eagles (“Pygargue”, “Balbuzard”, “Orfraie”), the intermediate “Jean-le-blanc”, and six exotic species related to European eagles (“Aigle de Pondichéry”, “Urutaurana”, “Urubitinga”, “Petit Aigle d’Amérique”, “Pêcheur”, “Mansfeni”). The group includes all the species of Brisson’s “genre de l’Aigle”, either as full species or as varieties since, as is his wont, Buffon tended to reduce the number of species (here, the 15 species of Brisson are reduced to 10). On the other hand, two species taken from another genus of Brisson, the “genre de l’Épervier” (“*Accipiter*”), are considered exotic “eagles” (the “Mansfeni” and the “Pêcheur”), and Buffon thinks that Brisson’s “Lanier blanc” (also in Brisson’s “genre de l’Épervier”) is a “variety” of the “Jean-le-blanc”. All “Aigles et Balbuzards”

TABLE 5. — Summary of the correspondences between Buffon's "eagles" and the species and varieties of Linnaeus, Brisson, and Gmelin (full species, as acknowledged by the authors, are in **bold**; numbers in **square brackets** refer to the paragraphs in the present paper).

LINNAEUS 1758 (order <i>Accipitres</i>)	BRISSON 1759 (order III; section 1; genus IX: <i>Aquila</i> , unless otherwise specified)	LINNAEUS 1766 (order <i>Accipitres</i>)	BUFFON 1771	GMELIN 1788 (order <i>Accipitres</i>)	Identification in modern taxonomy
— [1.1]	3. Aigle blanc, <i>Aquila alba</i> [1.2]	— [1.3]	Aigle blanc, "accidental variety" of an unspecified eagle [1.4]	<i>Falco albus</i> G42, S47 [1.5]	—
<i>Falco Chrysaëtos</i> G41, S2 [2.1]	7. Aigle doré, <i>Chrysaetos</i> , <i>seu</i> <i>Aquila aurea</i> [2.2]	<i>Falco Chrysaëtos</i> G42, S5 [2.3]	Grand Aigle [2.4]	<i>Falco Chrysaëtos</i> G42, S5 [2.5]	* <i>Aquila chrysaetos chrysaetos</i> (Linnaeus, 1758)
<i>Falco fulvus</i> G41, S3 [3.1.1]	1. Aigle, <i>Aquila</i> [3.2]	<i>Falco fulvus</i> G42, S6 [3.3.1]	Aigle commun [3.4]	<i>Falco fulvus</i> G42, S6 [3.5.1]	* <i>Aquila chrysaetos chrysaetos</i> (Linnaeus, 1758)
<i>Falco canadensis</i> G41, S4 [3.1.2]	Variety β of <i>Falco fulvus</i> G42, S6 [3.3.2]	Variety β of <i>Falco fulvus</i> G42, S6 [3.3.2]		Variety β <i>canadensis</i> of <i>Falco</i> <i>fulvus</i> G42, S6 [3.5.2]	* <i>Aquila chrysaetos canadensis</i> (Linnaeus, 1758)
<i>Falco Melanætos</i> G41, S1 [4.1]	8. Aigle noir, <i>Melanætos</i> , <i>seu</i> <i>Aquila nigra</i> [4.2]	<i>Falco Melanætos</i> G42, S2 [4.3]	Aigle noir, variety of the Aigle commun (see above) [4.4]	<i>Falco Melanætos</i> G42, S [4.5]	—
— [5.1]	4. Aigle tacheté, <i>Aquila nævia</i> [5.2]	— [5.3]	Petit Aigle [5.4]	<i>Falco naevius</i> G42, S49 [5.5]	—
<i>Falco Albicilla</i> G41, S8 [6.1 and 7.1]	5. Aigle à queue blanche, <i>Aquila</i> <i>albicilla</i> [6.2]	<i>Vultur Albiulla</i> [sic] G41, S8, emended as <i>Vultur Albicilla</i> in an erratum [6.3 and 7.3]	Pygargue [6.4]	<i>Falco Albicilla</i> G42, S39 [6.5]	* <i>Haliaeetus albicilla</i> (Linnaeus, 1758)
Variety β of <i>Falco</i> <i>Albicilla</i> G41, S8 [9.1]	6. Petit Aigle à queue blanche, <i>Aquila albicilla minor</i> [7.2]		Petit Pygargue, variety of the Pygargue 1:99 [7.4]	<i>Falco albicaudus</i> G42, S51 [7.5]	* <i>Haliaeetus albicilla</i> (Linnaeus, 1758)
Variety β of <i>Falco</i> <i>Albicilla</i> G41, S8 [9.1]	2. Aigle à teste blanche, <i>Aquila</i> <i>leucocephalos</i> [8.2]	<i>Falco leucocephalus</i> G42, S3 [8.3]	Pygargue à tête blanche, variety of the Pygargue [8.4]	<i>Falco leucocephalus</i> G42, S3 [8.5]	* <i>Haliaeetus leucocephalus</i> <i>leucocephalus</i> (Linnaeus, 1766)
<i>Falco Haliaëtus</i> G41, S21 [9.1]	10. Aigle de mer, <i>Haliaëtus</i> , <i>seu</i> <i>Aquila marina</i> [9.2]	<i>Falco Haliaëtus</i> G42, S26 [9.3]	Balbuzard [9.4]	<i>Falco Haliaëtus</i> G42, S26 [9.5]	* <i>Pandion haliaëtus haliaëtus</i> (Linnaeus, 1758)
— [10.1]	9. Grand Aigle de mer, <i>Aquila</i> <i>Ossifraga</i> [10.2]	<i>Falco Ossifragus</i> G42, S4 [10.3]	Orfraie [10.4]	<i>Falco Ossifragus</i> G42, S4 [10.5]	—
— [11.1]	11. Jean-le-blanc, <i>Pygargus</i> [12.1]	— [12.3]	Jean-le-blanc [12.4]	<i>Falco gallicus</i> G42, S52 [12.5]	* <i>Circus gallicus</i> (J. F. Gmelin, 1788)

Table 5. — Continuation.

LINNAEUS 1758 (order <i>Accipitres</i>)	BRISSON 1759 (order III; section 1; genus IX: <i>Aquila</i> , unless otherwise specified)	LINNAEUS 1766 (order <i>Accipitres</i>)	BUFFON 1771	GMELIN 1788 (order <i>Accipitres</i>)	Identification in modern taxonomy
— [12.1]	In genus <i>Accipitrinum</i> : 18. Lanier blanc, <i>Lanarius albicans</i> [12.2]	— [12.3]	Variety of the “Jean-le-blanc” [12.4]	<i>Falco albicans</i> G42, S102 [12.5]	—
— [13.1]	15. Aigle de Pondichéry, <i>Aquila</i> <i>Ponticeriana</i> [13.2]	— [14.3]	Aigle de Pondichéry [13.4]	<i>Falco pondicerianus</i> G42, S71 [13.5]	* <i>Haliastur indus indus</i> (Boddaert, 1783)
<i>Vultur Harpyja</i> G40, S2 [14.1]	13. Aigle hupé du Brésil, <i>Aquila</i> <i>Brasilensis cristata</i> [14.2]	<i>Vultur Harpyja</i> G41, S2 [14.3]	Urutaurana or Ouroutaran [14.4]	<i>Falco Harpyja</i> G42, S34 [14.5]	* <i>Harpia harpyja</i> (Linnaeus, 1758) (confused with * <i>Spizaetus ornatus</i> (Daudin, 1800))
— [15.1]	14. Aigle hupé d’Afrique, <i>Aquila</i> <i>Africana cristata</i> [15.2]	<i>Falco coronatus</i> G42, S1 [15.3]	Aigle hupé d’Afrique, variety of the Urutaurana or very close species [15.4]	<i>Falco coronatus</i> G42, S1 [15.5]	* <i>Stephanoaetus coronatus</i> (Linnaeus, 1766)
— [16.1]	12. Aigle du Brésil, <i>Aquila</i> <i>Brasilensis</i> [16.2]	— [16.3]	Urubitinga [16.4]	<i>Falco Urubitinga</i> G42 S70 [16.5]	* <i>Buteogallus urubitinga urubitinga</i> (J. F. Gmelin, 1788)
— [17.1]	— [17.2]	— [17.3]	Petit Aigle d’Amérique [17.4]	<i>Falco aquilinus</i> G42, S110 [17.5]	* <i>Ibycter americanus</i> (Boddaert, 1783)
— [18.1]	In genus <i>Accipitrinum</i> : 14. Faucon pescheur des Antilles, <i>Falco</i> <i>piscator Antillarum</i> [18.2.1]	— [18.3]	Pêcheur [18.4]	Variety <i>γ carolinensis</i> of <i>Falco</i> <i>Haliaeetus</i> G42, S26 [18.5]	* <i>Pandion haliaetus carolinensis</i> (J. F. Gmelin, 1788)
	In genus <i>Accipitrinum</i> : 15. Faucon pescheur de la Caroline, <i>Falco</i> <i>piscator Carolinensis</i> [18.2.2]				* <i>Pandion haliaetus carolinensis</i> (J. F. Gmelin, 1788)
— [19.1]	In genus <i>Accipitrinum</i> : 13. Faucon des Antilles, <i>Falco Antillarum</i> [19.2]	— [19.3]	Mansteni [19.4]	<i>Falco Antillarum</i> G42, S65 [19.5]	—

of Buffon with a counterpart in Linnaeus (1758) and/or in Linnaeus (1766) correspond to species of the genus “*Falco*”, except the “Urutaurana” (“*Vultur Harpyja*” in Linnaeus [1758, 1766]) and the “Pygargue” (“*Vultur Albicilla*” in Linnaeus [1766]). Among Buffon’s “Aigles et Balbuzards”, only one species is totally new (from his point of view): the “Petit Aigle d’Amérique” (Boddaert’s “*Falco americanus*”), described on the basis of an unknown specimen, possibly observed at the *Cabinet royal* and represented on *PE* 417.

From the point of view of modern taxonomy, the case of the “eagles” illustrates the different kinds of relations that can exist between Brisson’s and Buffon’s works and the scientific nomenclature (even though they did not use the binomial system, as we have seen), since, among the species and subspecies here mentioned:

– four species and one subspecies were known before 1758 and named by Linnaeus (1758), thus Brisson and Buffon had no part at all on their nomenclature: *Aquila chrysaetos* and its subspecies *A. c. canadensis*; *Haliaeetus albicilla*; *Pandion haliaetus*; and *Harpia harpyja*;

– two species were known before 1759, not considered full species by Linnaeus (1758), acknowledged by Brisson (1759a), and named by Linnaeus (1766) probably as a consequence of Brisson’s work: *Haliaeetus leucocephalus* and *Stephanoaetus coronatus*;

– one species and one subspecies, known before 1759, were not taken into account by Linnaeus (1758, 1766), although Brisson (1759a) and then Buffon acknowledged both as full species; they were named by Gmelin (1788), most probably as a result of Brisson’s and Buffon’s work: *Buteogallus urubitinga* and *Pandion haliaetus carolinensis*;

– two species were described for the first time by Brisson (1759a), but not taken into account by Linnaeus (1766); they were also described by Buffon, represented on the *PE*, and named by later authors in accordance with Buffon and Brisson: 1) *Circaetus gallicus*: the specimens described by Brisson and Buffon belong to the type series (it may be noted that, in 1771, Samuel Gottlieb Gmelin named *Accipiter ferox* a bird which may have been *Circaetus gallicus*, but the name was suppressed because of the vagueness of the description and the plate: see Mayr 1944: 303; ICZN 1957; Mlíkovský 2011: 86);

2) *Haliaastur indus indus*: the specimen from the cabinet of the abbé Aubry described and illustrated by Brisson, which was apparently unique, and clearly the same as the specimen depicted on *PE* 416, is the (lost) holotype, since Boddaert relied on Buffon and Brisson to define *Falco indus*;

– one species described for the first time by Buffon was given a scientific name by Boddaert (1783): *Ibycter americanus*; the specimen represented on the *PE* 417, which was apparently unique, is the (lost) holotype; it may have belonged to the collections of the *Cabinet royal* or to another Parisian collection.

In the modern taxonomy, *Ibycter americanus* is the only member of the order Falconiformes among Buffon’s “Aigles et Balbuzards”. All the others are Accipitriformes and belong to the family Accipitridae, except the “Balbuzard” and the “Pêcheur”, which are Pandionidae.

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