

# The White Whale and the Law of Priority

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THE NON-NATURALIST IS CONFIDENT that the Latin binomial designations (genus and species) of fauna and flora used by biologists have eliminated the ambiguity and confusing similarity of vernacular names. For Americans, the virtue of the Latin binomials is illustrated by the cases in which Old World colloquial names have been extended to refer also to unique New World species. If there is anything to a name, the “elk” of Europe should be quite similar to the American “elk.” In fact, however, the elk of Northern Europe, *Alces alces*, is kin to the moose, *Alces americana*, but is not closely related to the American elk or wapiti, *Cervus canadensis*. English-speaking colonists likewise applied the names “polecat” and “civet cat” to a small American skunk, *Spilogale putorius*, which is generically distinct from the European polecat, *Mustela putorius*, as well as from the civet cats of Africa and Asia.

These and similar problems of folk nomenclature point to the fact that the popular method of classification and naming have been based upon the general appearance and salient habits of the animal in question. The role of analogy in name giving has been strong; if it looks like an “elk,” it must be an “elk.” The taxonomic criteria of the modern biologist, on the other hand, differ substantially from the “folk system” as well as from those used by scientists two hundred years ago. Having learned from the errors of the past, researchers today use multiple and not always obvious anatomical features when classifying species. Yet a common tradition of the past two hundred years of biological science is the system of Latin nomenclature, the lingua franca of international taxonomy. The overriding significance today of these biverbal Latinate names lies not in their function as descriptive labels but in the fact that they express the conclusions of taxonomists as they seek to make accurate generalizations about life forms vis-à-vis one another. The classificatory hierarchy as a whole, with the subspecies as the lowest taxon (level) and the kingdom as the highest, is an extremely useful convention by which significant patterns of interrelationship may be noted for the great

variety of life. Nomenclature as such is merely the servant of classification: it communicates the system which biologists currently see in the natural world.

Nothing could be further from the intentions of biologists than to promote confusing homonyms and synonyms of the sort we find in colloquial language. Since late in the nineteenth century, such problems have been dealt with by the International Commission on Zoological Nomenclature. One method by which the Commission has attempted to avoid synonymy and homonymy is the so-called Law of Priority. It is intended to answer an important question: how is nomenclature "certified" in a world full of independent researchers who may create different names for one species or the same name for different species? Assuming that two or more descriptions and names adequately describe the same species, by what method of selection is the "better" synonym chosen for international use?

Directed specifically at the question of synonyms for a single species is the rule that priority is to be given to the earliest binomial proposed along with a convincing identification of the species. The crucial role of the Swede Carl von Linné in the creation of the modern classificatory system is seen in the mandatory use of the year 1758, in which the tenth edition of *Systema Naturae* was published in Stockholm, as the chronological cutoff. A name suggested in print before January 1, 1758, is unacceptable as such. At the same time, a name first proposed after the cutoff date or one revived then from an earlier publication may become the binomial by which the animal is known today.

The Law of Priority requires that the taxonomist be acutely aware of the history of biological research, and that he be prepared to revise currently used nomenclature when new findings from the past so require. It is meant to be the application of historicity to the very practical problem of what to call a species, whether it was first identified last year or a century or more ago. Although the International Commission on Zoological Nomenclature honors it, the Law of Priority is actually enforced only by the common consent of the biologists who recognize its valid rationale. The willingness of biologists to use in their writing the "senior synonym," that is, the oldest valid binomial, pays tribute to the originator of the scientific name. The Law of Priority ought also to guard against the ambiguity we have seen with the name of the "elk"—but does it?

An example of the contemporary workings of the Law of Priority is provided by the white whale, a small arctic cetacean also known

colloquially by its Russian name “beluga.” Unlike some elusive species about whom many questions remain even today, the white whale has long been under the scrutiny of peoples for whom the North Atlantic and Arctic oceans are home. A very early record is preserved in the thirteenth-century Norwegian *Konungs skuggsjá* (*Speculum Regale*), where the author unmistakably describes the white whale and calls it *hvítíngur* (lit. “whiting”).<sup>1</sup> The unique white color of the adult whale has predictably been the feature which inspired its modern vernacular names in Northern Europe: Icel. *hvítíngur* and *mjaldur*, Norw. *hvitfisk*, Ger. *Weißwal*, Russian *beluga*, etc.<sup>2</sup> Many other aquatic species bear this broadly descriptive name, a situation which prompted an early naturalist to warn against homonyms. Friedrich Martens, a ship’s surgeon whose keen observations of arctic fauna were highly valued by Linnaeus and others, wrote of the “whitefish” three centuries ago: “By these fish I do not mean the small ones which people here in Germany call whitefish [carplike species, e.g., dace, roach, bleak], but rather I mean a large fish, the size of a dolphin.”<sup>3</sup>

The white whale has commonly been hunted by the natives of the circumpolar North, but the European scholars who attempted to integrate the species into their taxonomies had frequently never seen a living specimen, and many relied entirely on the reports of earlier writers. In fact, the description provided by Friedrich Martens in 1675 was freely borrowed by Johann Anderson (1674–1743), a lawyer and naturalist from Hamburg. Anderson adds to Martens’ notes his own puzzling observation, based on a single skull in his collection and on interviews with North German fishermen, that the white whale has teeth in the lower jaw only.<sup>4</sup> This misinformation can perhaps be explained: a

<sup>1</sup>Halfdan Einersen, ed., *Kongs-Skugg-Sjó . . . Speculum Regale* (Soró: Jonas Lindgren, 1768), 123–4. For an English translation, see Laurence M. Larson, *The King’s Mirror*, Scandinavian Monographs 3, (New York: The Scandinavian American Foundation, 1917), 119–26.

<sup>2</sup>Icel. *mjaldur*, lit. “the meal-colored one,” is derived from *mjöl* “meal (flour)” (<Gmc. \**melwa*-). The word is more distantly related to *mjalli* “white color” (<Gmc. \**melno* “powdery snow”). Alexander Jóhannesson, *Isländisches etymologisches Wörterbuch* (Bern: Francke Vlg., 1956), 672–3. The stem of Russian *beluga* is *bel-* “white,” to which is affixed the derivational suffix *-ug-* and the inflectional ending *-a*. *Beluga*, lit. “the white one,” may in Russian also refer to the sturgeon *Acipenser huso*. To avoid confusion, the whale may be specified as *morskaya beluga* “ocean beluga.”

<sup>3</sup>Friedrich Martens, *Spitzbergische oder Groenlandische Reise Beschreibung gethan im Jahre 1671* (Hamburg: Gottfried Schultz, 1675); for information on Martens, see *Allgemeine Deutsche Biografie* (1884; rpt. Berlin: Duncker und Humboldt, 1970), xx, 461.

<sup>4</sup>Johann Anderson, *Nachrichten von Island, Grönland und der Straße Davis . . .* (Hamburg: Georg Christian Grund, 1746), 224–25.

toothless yearling white whale, subsisting largely on crustaceans after weaning, may reach a length of ten or 12 feet before teeth begin to appear. Johann Anderson did not propose a Latin name for the white whale, but his partly mistaken description of the animal was read and accepted by Philipp Ludwig Müller (1725–76), professor at the University of Erlangen. There is no reason to believe that Müller ever saw so much as the skeletal remains of a white whale, but that did not deter him from proposing a scientific binomial for the animal: *Physeter katodon*. A translation of Müller's short entry on *der Weißfisch*, *Physeter Katodon*, reveals how sketchy and open to question these early descriptions are by today's standards:

The Greek name Katodon suggests that this fish has teeth in its lower jaw. On account of its pale white skin it is called *Wittfisch* [Low Ger. "whitefish"] by the Greenland fishermen. It is found near the Orkney Islands in a size of twenty-four *Schuhe* [approx. "feet"], and there is also a smaller species which is not longer than sixteen feet. These fish have no dorsal fins and were hunted by the English fishing fleet before whaling was very common; they do not produce more than about two barrels of blubber. The lower jaw, according to Anderson's report, has eight small, angularly bent teeth on each side; the teeth are somewhat rounded on top, from which one might conclude that they are inclined toward the front.<sup>5</sup>

In its entirety, Müller's description is derivative, and the specific name he proposes repeats the misinformation that the white whale has teeth only in the lower jaw. The generic name *Physeter* in this early taxonomy associates the white whale with the sperm whale.

Müller was not the first to so name the white whale. In 1738 Petrus Artedius had designated it as one of seven genera of "catodon," all whales thought by most to share the feature of "dentes in inferiore maxilla tantummodo."<sup>6</sup> Müller's retention of this name in 1776 indicates that he had not read the report, published six years earlier, by David

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<sup>5</sup>Philipp Ludwig Stadius Müller, *Des Ritters Carl von Linné . . . Natursystem nach der zwölften Ausgabe . . .* (Nürnberg: Gabriel N. Raspe, 1773), 197–8. Müller named the sperm whale *Physeter macrocephalus*. The generic name *Physeter* has an etymology, but, as used in this taxonomy, the word's meaning is actually the class of whales it denotes. Greek *physeter* "blow-pipe; blow-hole; bellows," was used in Latin as a name for various undetermined species of whale. The specific name *catodon* is likewise of Greek origin, meaning "referring to the lower teeth." Müller's binomials for the white and the sperm whale distinguish "the *Physeter* with teeth in the lower jaw" from "the big-headed *Physeter*."

<sup>6</sup>Petri Artedi Sveci *Descriptiones specierum piscium . . .* (Leiden: Conrad Wishoff, 1738), 78–79.

Cranz, a Hutterite clergyman who had spent 1761–62 in southwestern Greenland, where he observed the wildlife closely. Cranz describes the white whale in detail and includes it in his “fifth class,” comprising the small whales which have teeth in both jaws. He did not, however, propose a binomial for the species.<sup>7</sup>

It is clear that accurate zoological data often did not reach the scholars who proposed scientific names. In fact, misinformation was frequently the basis of a name and a classification, as in the case of *Physeter katodon* by P.L. Müller. This, however, is merely a technical problem that does not invalidate the binomial as such.

Given the large number of early commentaries on the white whale, we are surprised to learn that its scientific name in modern international literature is *Delphinapterus leucas*. This binomial, in almost universal use for more than one hundred years, was proposed in a slightly different form by Simon Peter Pallas (1751–1811), a German naturalist who enjoyed favorable connections with the Russian nobility. His expedition in Russia, Siberia and western Asia provided material for an extensive commentary on the native cultures and wildlife he saw there. Pallas’ writings were influential, and taxonomists in Europe (and ultimately North America) registered the observation Pallas made of the white whale at the mouth of the Ob’ River in extreme northern Siberia. This identification, under the name *Delphinus leucas*, was published in 1776.<sup>8</sup> It was the French naturalist, Bernard Lacépède (1756–1825), who in 1804 supplied the alternative name *Delphinapterus beluga*, a binomial which expresses the correct conclusion that the white whale is not close kin to the common dolphin *Delphinus delphinus*, a relationship which Pallas’ name does imply.<sup>9</sup> The currently used binomial, *Delphinapterus leucas*, actually reflects the independent contributions to cetacean classification of both Pallas and Lacépède.

No serious questions have arisen since the early nineteenth century concerning the taxonomic identity of the white whale. Its distinctive adult color of yellowish-white, its relatively small size (a maximum length of 18 feet in Far Eastern arctic waters) and the absence of a dorsal fin are unmistakable external characteristics. Anatomical features which

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<sup>7</sup>David Cranz, *Historie von Grönland enthaltend Die Beschreibung des Landes und der Einwohner . . .* 2nd ed. 2 vols. (Barby: Heinrich Detlef Ebers, 1770), I, 150–51.

<sup>8</sup>Simon Peter Pallas, *Reise durch verschiedene Provinzen des Russischen Reichs* (St. Petersburg: Kayserliche Akademie der Wissenschaften, 1771–76), III, 85.

<sup>9</sup>Bernard G. Lacépède, *Historie naturelle des cétacées* (Paris: Plassan, 1804), xli, 243.

the white whale shares only with the fabled narwhal *Monodon monocerus*—the source in European myth of the unicorn—make these two small arctic whales the sole members of the family Monodontidae. No subspecies of the white whale is generally recognized by zoologists today, although the remarkable variation in size of the adult *D. leucas* over the expanse of its distribution led Soviet researchers in the 1930s to the conclusion that the white whales of the Sea of Okhotsk and the White Sea were separate species of *Delphinapterus*. Exercising editorial authority over scientific nomenclature not known in the West, the journal *Transactions of the Soviet Academy of Sciences* later categorized the proposed species *Delphinapterus freimani* and *D. dorofeevi* as subspecies of *D. leucas*.<sup>10</sup> The validity of these subspecies was indirectly shaken in 1969 when two Canadian cetologists published their study of the relationship between the size of the white whale and nutritional environment in its circumpolar range. Their conclusions, simply stated, are that, in areas where the smaller average sizes are found, white whales escape predation (especially the killer whale) and competition for food by retreating periodically to environments where they are relatively free of anxieties but where their local diet is not adequate for maximal growth.<sup>11</sup> For most zoologists, it will appear that the notable differences in size between white whales in different populations are simply environmentally conditioned and temporary rather than genetic. The evidence does not suggest that nomenclature need be adjusted to accommodate subspecies of *Delphinapterus*.

Although the scientific information does not justify any change in the status of *D. leucas* as the sole species of the genus, the Law of Priority was recently on the verge of altering the whale's binomial name, a change which would have ended a century-old tradition and have affected all handbooks on mammals wherever published. A discussion in 1979 of the name of the white whale, carried on between authorities in systematics at the University of Kansas and the Smithsonian Institution, illustrates the complications of applying the Law of Priority within the context of the *International Code of Zoological Nomenclature*.

In preparation for the forthcoming second edition of his standard

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<sup>10</sup>A.G. Tomlin, *Cetacea*, Vol. IX of *Mammals of the U.S.S.R. and Adjacent Countries*, ed. V.G. Heptner, trans. Omry Ronen (1957) (Jerusalem: Israel Project for Scientific Translations, 1967), 666–96.

<sup>11</sup>D.F. Sergeant and P.F. Brodie, "Body Size in White Whales, *Delphinapterus leucas*," *Journal of the Fisheries Research Board of Canada*, 26, No. 10 (1969), 2561–80.

work, *The Mammals of North America*, E. Raymond Hall noted the seniority of Philipp L. Müller's binomial for the white whale.<sup>12</sup> *Physeter katodon* Müller (1773) would automatically displace to junior status the familiar *Delphinapterus leucas* Pallas (1776) on the strength of the Law of Priority. Such a redesignation would be required by the *Code*; inevitably, it would also provide fuel for the many critics of the Law, who would prefer that a binomial in use for 50 years or more be thereafter exempt from the Law of Priority.<sup>13</sup>

Müller's binomial for the white whale, *Physeter katodon*, is homophonous with the binomial of the sperm whale, *Physeter catodon*. We can easily retrace the history of the white whale in European research and find the origin of this "accident." It was the general assumption in the eighteenth century, shared by Philipp L. Müller, that the white whale had teeth only in the lower jaw, an anatomical feature which is definitely characteristic of the sperm whale, *Physeter catodon* Linnaeus (1758). Although the layman views the similarity of these two binomials of species of whale as a sure source of confusion, the *Code* dictates that the difference of a single letter is sufficient to prevent homonymy.<sup>14</sup> According to the "one-letter rule," *Raphida londinensis* and *Raphida londonensis* (both specific names derived from Londinum and London, words with identical origin and meaning) are not homonyms. So far the way is clear for adopting the binomial *Physeter katodon* as the senior synonym of the white whale.

The "one-letter rule," however, is not valid in the case of certain

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<sup>12</sup>E. Raymond Hall, Professor Emeritus of Systematics and Ecology; Director Emeritus, Museum of Natural History, University of Kansas. *The Mammals of North America*, 2 vols. (New York: Ronald Press, 1959), will be published in its second edition by John Wiley, N. Y. This paper grew out of my collaboration with Hall on the interpretation of early Danish and German literature on whales.

<sup>13</sup>Some naturalists refuse to employ a new senior synonym. Their viewpoint is expressed adamantly by the author of a widely read guide to North American mammals:

We have a minority group whom I should like to call "the grave diggers," a group who delve into old and obscure publications in hopes of finding an early name for some species that has been known by its present name for many years. If they succeed, they then apply the law of priority and a name change is in order. I object to this and tend to be conservative where changes that I consider unnecessary are proposed. I shall continue, regardless of priority, to use names that have been established in the scientific literature and have not been challenged for fifty years or more.

William H. Burt and Richard P. Grossenheider, *A Field Guide to the Mammals*, The Peterson Field Guide Series, 3rd ed. (Boston: Houghton Mifflin, 1976), xviii.

<sup>14</sup>*International Code of Zoological Nomenclature adopted by the XV International Congress of Zoology* (London: International Commission of Zoological Nomenclature, 1961), p. 55.

spelling differences as described in Article 58 of the *Code*. These spelling differences are orthographic variants frequently encountered in the Latin and latinized Greek of early European scholarship.<sup>15</sup>

The spelling variant that pertains to *Physeter katodon* and *P. catodon* is *c/k*, *c* being the graphemic realization in Latin of Greek  $\kappa$ . According to the *Code*, the two names are homonyms by virtue of their common origin and meaning and because *c* and *k* are viewed as one and the same. In the hierarchy of the *Code's* various regulations, the Law of Homonymy takes precedence over the Law of Priority. *P. katodon* is not a valid binomial.

The outcome of the consideration of *P. katodon* as the possible senior synonym of the white whale appears to be a victory for unambiguous biological nomenclature. *Delphinapterus leucas* will continue as the binomial in use. At the same time one has to note that *P. katodon* would have been adopted if its author, P.L. Müller, had spelled the specific name *katadon* rather than *katodon*, a minor difference not covered by the *Code's* article on variable spelling.

The Law of Priority, which is concerned only with the chronology of nomenclature used after January 1, 1758, does not take into account the problems of homonymy. The superior Law of Homonymy, on the other hand, permits a difference of just one letter to distinguish between binomial names, excepting those variant spellings listed in Article 58. The one law favors the situation in which we have two whales named *Physeter katodon* and *Physeter catodon*; the other law invalidates the results of the first because of the particular one-letter difference in these names of like origin.

<sup>15</sup> "Two or more species-group names of the same origin and meaning . . . are to be considered homonyms if the only difference in spelling consists of any of the following . . .

- (1) the use of *ae*, *oe*, or *e* (e.g., *caeruleus*, *coeruleus*, *ceruleus*);
- (2) the use of *ei*, *i* or *y* (e.g., *cheiropus*, *chiropus*, *chyropus*);
- (3) the use of *c* or *k* (e.g., *microdon*, *mikrodon*);
- (4) the aspiration or non-aspiration of a consonant (e.g., *oxyrhynchus*, *oxyryncus*);
- (5) the presence or absence of *c* before *t* (e.g., *auctumnalis*, *autumnalis*);
- (6) the use of a single or double consonant (e.g., *litoral*, *littoralis*);
- (7) the use of *f* or *ph* (e.g., *sulferus*, *sulpherus*);
- (8) the use of different connecting vowels in compound words (e.g., *nigricinctus*, *nigrocinctus*);
- (9) the transcription of the semivowel *i* as *y*, *ei*, *ej*, or *ij*;
- (10) the termination of *-i* or *-ii* in a patronymic genitive (e.g., *smithi*, *smithii*);
- (11) the suffix *-ensis* or *-iensis* in a geographical name (e.g., *timorensis*, *timoriensis*); and
- (12) three pairs of names treated as special cases: *saghalinensis* and *sakhaliensis*; *sibericus* and *sibiricus*; *tianschianicus* and *tianshanicus*."

*International Code of Zoological Nomenclature*, pp. 55–57.



Taxonomy as a science, caught between the Law of Priority and a rather arcane definition of homonymy, today has as its language a code with little overtly descriptive function. The irony in this development since the eighteenth century—when binomials in Latin were coined with descriptive content—*cf. Eutamias ruficaudus* “red-tailed chipmunk”—lies in the false confidence biologists once had that their Latin terminology avoided the lack of clarity which folk language is content with. To be acceptable today it is irrelevant whether a scientific name actually describes a species. Its primary purpose is to denote a species, and its acceptability as a verbal reference depends on its seniority within the period 1758 to the present and on whether it is orthographically distinct from similar names of like etymology. The layman with his sense of language as a spoken tool and the biologist who never learned his Latin are at a loss to appreciate why the *Chrysops calidus* and *Chrysops callidus* are not homonyms while *Physeter katodon* and *Physeter catodon* are. The concerns of the *International Code of Zoological Nomenclature* for seniority and etymology, combined with a special definition of homonymy, often make it appear that scientific nomenclature is serving history but not clarity of communication. The case of the white whale shows the extent to which modern biological Latin, from its origins as the professional language of scholars, has become a system of ciphers which, for clear interpretation even by specialists, must be translated into the vernacular language.

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