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Preliminary Version 4 Nov. and 1 Dec. 2025 (Almost all highlighting in the typeface of the quotations by W.-E. L. except italics for genera and species names)

The Giraffe Fossil Record

Or: Why 'A True Evolutionary Story is Not Available'[1]

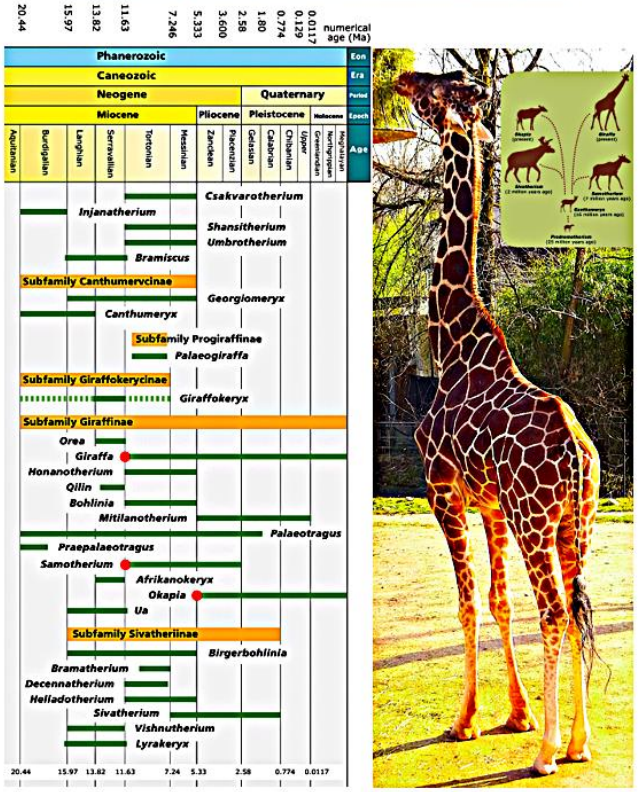
Several new points as well as applications of basic observations from my earlier articles

Abstract:

After recalling the four basic assumptions of the prevailing evolutionary theory (Neo-Darwinism: gradualism, mutations, natural selection, convergence) including some comments on them, the fossil record of the family Giraffidae is addressed in detail, first according to the Paleobiology Database (PBDB 2025) and subsequently as stated in two Wikipedia articles (English and German[2] of 2025). The latter proved to be in some respects more detailed and up-to-date than even that of the PBDB. Thereafter, the geological formations and the age determinations so far stipulated for each genus were listed as attested by different scientific sources in line with the Geologic Time Scale.

In definite contrast to the expectations according to the Neo-Darwinian theory of gradual evolution, the following results have been obtained (see pp. 10 and 11):

Left: The *Giraffe Fossil Record* (Fig. by Roland Slowik, Oct. 2025 for the present article).
Right: *Giraffa camelopardalis* ssp. *reticulata*[4] (Photo W.-E. L. Zoo Duisburg 17 Febr. 2019).



Right above: Picture within the picture: Giraffid evolution according to Nikos Solounias and Melinda Danowitz (see the links in the main text below), ***redrawn and modified by Roland Slowik***. The genera arise geologically abruptly followed by an enormous stasis/constancy. This is in utter contrast to the predictions of gradualism (Neo-Darwinism/Modern Synthesis). "The tree is a bush"[2]. I would add that it is not even a bush: the main types and subtypes appear independently of each other.[3] In consonance with the ID-theory their homologous similarities are due to common design not to common descend.

[1] For reasons given at https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, pp. 92/93 (All the "species" of the extant genus Giraffa can crossbreed. Gray, in her work Mammalian Hybrids (1971, pp. 148/149) lists the following examples" *cf.* the list there.) The German text of the book was kindly translated into English by Prof. Granville Sewell *cf.* https://scienceandculture.com/author/gsewell/ See for example also his video: https://www.youtube.com/watch?v=ph9AwtbebdA
[2] According to a highly qualified giraffe expert in mail of 9 October 2025 to W.-E. L.
[3] As for intermediate forms see https://www.weloennig.de/GIRAFFA.Samotherium.pdf

Inference: A true Neo-Darwinian evolutionary story is not available because it never happened at all. For all the paleontological and many further details (incl. design) see please the discussion on the following pages.

[1] *Cf.* For the formulation of the subtitle see https://www.weloennig.de/GIRAFFA.Samotherium.pdf, p. 7.
[2] "Dieser Artikel wurde am 7. November 2021 in dieser Version in die Liste der exzellenten Artikel aufgenommen" ("This article was added to the list of excellent articles in this [its former] version on November 7, 2021. In the interim (up to 2025) this excellent article has been updated and expanded several times.)

Main Text:

The Giraffe Fossil Record

Or: Why 'A True Evolutionary Story is Not Available'

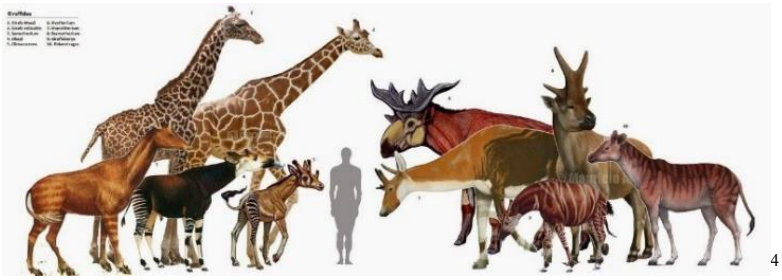
Several new points as well as applications of basic observations from my earlier articles

Carolus Linnaeus

World-renowned "Father of Modern Taxonomy"[3]

***His Guiding Maxims for his Epoch-Making Tenth Edition of Systema Naturae* (1758):**

"O JEHOVA **Quam ampla sunt Tua Opera**! Quam sapienter Ea fecisti! Quam plena est Terra possessione Tua!"
"Magnus est DEUS noster & magna est potentia Ejus. & **potentiae Ejus non est numerus**."
"O JEHOVA! **Quam magnifica sunt Tua Opera**!
Vir insipiens non cognoscit ea & stultus non animadvertit ea. David."



[4]

"As the range of our collections extends, so we invariably enrich our representation
of various groups, and this **necessarily and inevitably entails the appearance of intermediates between the forms in the collection** from the restricted area in which we started. The recognition of this fact,
with respect to the collections of organisms existing here and now, ***does not necessarily commit us to any particular view of the origin of species***;
and the same thing is true of the collection of fossil material."

William R. Thompson, F.R.S.[5]

In his introduction to Darwin's Origin of Species

First a necessarily lengthy introduction ***on the evolutionary background of the present article*** (if already known you are invited to start directly with the GIRAFFE FOSSIL RECORD below).

Although taught in high schools and universities around the globe the ***basic assumptions of the prevailing evolutionary theory*** are often forgotten when concrete biological examples like the origin of the giraffidae are discussed. To answer the question why a true evolutionary story is not available[6] we should clearly keep in mind and apply the evolutionary basics such as:

1. **Gradualism**: "Evolution not only is a gradual process as a matter of fact; ***it has to be gradual if it is to do any explanatory work***" (Dawkins).[7]

So how "small" are the mutations with "only slight or even invisible effects on the phenotype" (Mayr) in the "gradual process" of evolution thought to be?

A few reminders (*cf*. https://www.weloennig.de/Hummingbirds.pdf, p. 6):

> Since this key point of the theory – gradual evolution – , its bottom line, core and essence, even "the same yesterday, and today and forever" – **gradualism in combination with omnipotent natural selection** – can hardly be overemphasized, I would like to continue to point out that Darwin correspondingly imagined the origin of species (and, in fact, of all life forms) by selection of "infinitesimally small changes", "infinitesimally slight variations" and "slow degrees" and hence imagined "steps not greater than those separating fine varieties", "insensibly fine steps" and "insensibly fine gradations", "for natural selection can act only by taking advantage of slight successive variations; ***she can never take a leap***, but must advance by the shortest and slowest steps" or "the transition [between species] could, according to my theory, be effected only by numberless small gradations" (All emphasis added).

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[3] On the question "***Why is Linnaeus world-famous***" the answer at **Linné online**, sponsored by Uppsala University, is this: "Linnaeus' way of classifying Nature was so good that ***this system, called Systema naturae, came to be used all over the world***. He simplified the scientific nomenclature of plants and animals. This system, with two Latin names for every species of animal or plant, **is still used the world over and simplifies communication between scientists, gardeners, birdwatchers etc**. … Linnaeus' idea was that if we learn the Latin names we won't need to know the names in other languages." See references, photographs and **English translations of the quotes** at https://www.weloennig.de/PlantGalls.III.2020.pdf pp. 12-14.
Capital Letters in the quotations above by Linnaeus. As for the **giraffe, Linné first described it in 1758** under the name *Cervus camelopardalis*, corrected by Brisson 1772 to *Giraffa*.

[4] From left above (left group) from left to right: "1. Girafe Masai, 2. Girafe réticulé." Second row: Left: "**3. *Samotherium***, 4. Okapi, 5. *Climacoceras*". Group on the right: "6. *Sivatherium*, 7. *Shansitheriun*, 8. *Brahmatherium*, 9. *Giraffokeryx*, 10. *Paleotragus*" https://valentint.blog.bg/zabavlenie/2015/12/18/encyclopedia-largest-prehistoric-animals-vol-1-vertebrates-p.1415931
https://www.reddit.com/r/Naturewasmetal/comments/rq540n/giraffidae_in_their_variable_splendor_through_time/#lightbox

[5] https://royalsocietypublishing.org/doi/pdf/10.1098/rsbm.1973.0024 and/or https://en.wikipedia.org/wiki/William_R._Thompson

[6] The usual answer is, of course, that we are unable to reconstruct in detail the ***presupposed*** true gradual evolutionary history because the past is not fully accessible to us.

[7] Dawkins R: The Greatest Show on Earth. Free Press, New York (2009, p. 155). Emphasis added. See also comments on Dawkins at https://www.weloennig.de/KoalaPart2.pdf and https://www.weloennig.de/PANDA.Part1.pdf p. 9.

In the 1st edition of Darwin's Origin (1859) we find his assertion that "***Natura non facit saltum***" ("nature doesn't jump") eight times and in the 6th edition (1872) twelve times, so even four times more. Darwin comments inter alia (1872, p. 166): "On the theory of natural selection we can clearly understand the full meaning of that old canon in natural history, "Natura non facit saltum." This canon, if we look to the present inhabitants alone of the world, is not strictly correct; but if we include all those of past times, whether known or unknown, ***it must on this theory be strictly true***."[8]

Virtually the same answer is presented by Neo-Darwinism today (see Barton, Charlesworth (B. and D.), Coyne, Dawkins, Futuyma, Kutschera, Mayr, Moran, Muller and many others[9]).

2. Mutations (accidental/haphazard/random DNA changes):

"No biologist will doubt that the diversity of blueprints for different organs is ultimately due to mutation processes" (Gottschalk).

"Evolution by natural selection could not be faster than the mutation rate, for mutation is, ultimately, the only way in which new variation enters the species" (Dawkins).

"New mutations are the ultimate source of the genetic variation upon which biological evolution depends" (Ayala and Kiger).

Objection concerning evolutionary novelties "I have seen no evidence whatsoever that these changes can occur through the accumulation of gradual mutations" (Margulis; similarly Goldschmid, Gottschalk, Grassé and many other renowned biologists).[10] See perhaps also Lönnig https://www.weloennig.de/Loennig-Long-Version-of-Law-of-Recurrent-Variation.pdf

3. Natural Selection:

"Natural selection, the blind, unconscious, automatic process which Darwin discovered, and which we now know is the explanation for the existence and apparently purposeful form of all life, has no purpose in mind. It has no mind and no mind's eye. It does not plan for the future. It has no vision, no foresight, no sight at all. If it can be said to play the role of watchmaker in nature, it is the blind watchmaker" (Dawkins).

"But there is even more cause for wonder. For the process of evolution – natural selection, the mechanism that drove the first naked, replication molecule into the diversity of millions of fossil and living forms – is a mechanism of staggering simplicity and **beauty**" (Coyne).

"I can see no limit to this power, in slowly and **beautifully adapting** each form to the most complex relations of Life" (Darwin). "Natural selection comes **close to Omnipotence**" (Avise). "…both the **beauty** and the brilliance of natural selection are reflected in **its omnipotence** to explain the myriad observations of life" (Exley). "The **omnipotence of natural selection**" (book title: Weismann). Another author speaks of "The triumph of natural selection" (Mayr).[11]

However: Is this really "a mechanism of …beauty"?

"The progress of evolution walks over billions of corpses."
Ludwig Plate

"I believe natural selection represents a truly hideous sum total of misery."
"We understand that we are here as a result of a truly hideous process.
Natural Selection is an ugly process that has beautiful consequences."
Richard Dawkins

"The evolutionary process is rife with happenstance, contingency, incredible waste, death, pain and horror."
David Hull

"Namely, selection is the blindest, and most cruel way of evolving new species, and more and more complex and refined organisms … The struggle for life and elimination of the weakest is a horrible process, against which our whole modern ethics revolts…"
Jacques Monod

The whole of organic nature on our planet exists only by a relentless war of all against all.
Ernst Haeckel

According to Darwinism, the origin of species is the result of
"primeval stupidity and original brutality" ("Urdummheit und Urbrutalität"
for random mutations and the elimination of the weakest by natural selection).
Anton Neuhäusler

Instincts are the "consequences of one general law leading to the advancement of all organic beings, - namely, multiply, vary, let the strongest live and the weakest die."
However, "If it could be proved that any part of the structure of any one species had been formed for the exclusive good of another species, it would annihilate my theory, for such could not have been produced through natural selection."
"Natural selection will never produce in a being anything injurious to itself, for natural selection acts solely by and for the good of each."
Charles Darwin

A famous Darwin enthusiast ("evolution is not a theory; it is a fact") on the pollination of orchids:
"It's hard to imagine how evolution has produced such a complex combination mechanism."6
Sir **David Attenborough**[12]

Question: "*Can the struggle for existence create? It can and must eradicate, hence kill. But it can't create anything. Just as a sieve cannot create new grains, but can only sift the existing ones*" (Nilsson).[13]

[8] https://darwin-online.org.uk/
[9] https://www.weloennig.de/ExplosiveOrigins.pdf and https://www.weloennig.de/AesV3.html
[10] https://www.weloennig.de/AesV3.html and https://www.weloennig.de/Gesetz_Rekurrente_Variation.html
[11] https://www.weloennig.de/OmnipotentImpotentNaturalSelection.pdf (see text and also footnote on p. 11 for the use of "omnipotence" for natural selection.
[12] https://www.weloennig.de/BeautifulFactsPartI.pdf
[13] See again https://www.weloennig.de/OmnipotentImpotentNaturalSelection.pdf

4. Convergence

"Convergent evolution is the independent evolution of similar features in species of different … epochs in time."[14]

Objections: "Convergence is a deeply intriguing mystery, given how complex some of the structures are. Some scientists are skeptical that an undirected process like natural selection and mutation would have stumbled upon the same complex structure many different times." (Meyer, Minnich, Moneymaker, Nelson, Seelke).

"Now it is precisely the phenomenon of convergence that poses further major problems for neo-Darwinism. For if the one-time emergence of completely "adapted" organs or characteristics through selection of random mutations can hardly be explained, the multiple formation of similar organs elutes the Neo-Darwinian interpretation even further" (Henning Kahle).[15]

See more on the improbabilities involved in convergence due to accidental/haphazard/ random DNA mutations in https://www.weloennig.de/KoalaPart2.pdf, pp. 8-10 and 11-12.

Now, let's apply these four basic evolutionary presuppositions (first) on the origin of the long-necked giraffe and later on the entire giraffe family. As has been discussed in detail in my book on *The Evolution of the Long-necked Giraffe* (2011, pp. 117 and 129), Badlangana et al. have suggested the following points for the gradualistic or "microevolutionary scenario"[16]:

> "If such a microevolutionary scenario holds true, where a series of adaptive morphological changes occurred in response to climatic and vegetative variation during the Miocene, ***then individual cervical vertebral lengths and entire vertebral column lengths for fossil species in the Palaeotraginae should gradually adopt extant giraffe-like proportions***."

PBDB (2025) provides the following data for *Palaeotragus primaevus*, synonym *Giraffokeryx primaevus*[17] as its "Age range: base of the Burdigalian to the top of the Serravallian or 20.45000 to 11.63000 Ma." In detail:

Burdigalian	20.45 - 15.98	Kenya (Northern Frontier District) *Palaeotragus primaevus* (122454)
Serravallian	13.82 - 11.63	Kenya (Central Nyanza) *Palaeotragus primaevus* (21340) [18]

Data for *Palaeotragus germaini*: "Age range: base of the Tortonian to the top of the Zanclean or 11.63000 to 3.60000 Ma"[19]

And for "*Giraffa camelopardalis* Linnaeus 1758 (giraffe)": "Age range: base of the Late/Upper Pliocene to the top of the Holocene or **3.60000** to 0.00000 Ma"[20]

However, the time sequence – *Giraffokeryx primaevus* (20.45000 to 11.63000 Ma), *Palaeotragus germaini* (11.63000 to 3.60000 Ma), *Giraffa camelopardalis* (3.60000 to 0.00000 Ma) – is **definitely not an evolutionary sequence**: *Giraffokeryx primaevus* is not the ancestor of *Palaeotragus germaini* and the latter is not the ancestor of the present long-necked giraffes.

Moreover, there seems to be an exception for the oldest fossils identified as *Giraffa camelopardalis*: "Pliocene – Pleistocene **5.333 -** 0.0117 Malawi *Giraffa camelopardalis* (22323)"[21] Also, *Palaeotragus germaini* does decidedly/undeniably/indubitably not reach

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[14] https://en.wikipedia.org/wiki/Convergent_evolution
[15] https://www.weloenni2025g.de/SauropodDinosaur.pdf
[16] For reasons given at https://www.weloennig.de/ElephantEvolution.pdf, p. 5, I will not discuss "punk eek" here: "…punctuated equilibrium ("punk eek") with its main components of allopatric speciation and species selection have – after much ado in the 1970s and 1980s … – ***eventually ended up in "good, old-fashioned natural selection acting on random mutations and variations – that is, […] the Neo-Darwinian mechanism*** acting over long periods of time on large, relatively stable, populations".
[17] If you look up *Palaeotragus primaevus* in PBDB, you will automatically be directed to *Giraffokeryx primaevus*. Under Taxonomy we are informed that "*Palaeotragus primaevus* was named by Churcher (1970). It was recombined as *Giraffokeryx primaevus* by Harris et al. (2010)." https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=374424&is_real_user=1
[18] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=374424&is_real_user=1
[19] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=374427&is_real_user=1
[20] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=133600&is_real_user=1
[21] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=133600&is_real_user=1 In the Original paper: See please https://paleobiodb.org/classic/basicCollectionSearch?collection_no=22323&is_real_user=1 **three giraffe species** are mentioned: ***Giraffa stillei*, *Giraffa pygmaea*, *Giraffa camelopardalis***. Age range for ***Giraffa stillei***: Age range: base of the Zanclean to the top of the Calabrian or **5.33300 to 0.77400 Ma – 5.333 Ma**: found also in Ethiopia, Kenya, Tanzania, and Uganda. https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=185973&is_real_user=1
(All the links above were retrieved 23 September 2025)

extant giraffe-like proportions (neck vertebrae of *G. pardalis* almost double the length of *P. germaini*; see discussion in Lönnig https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, p. 117.

We'll come back to further evolutionary time questions and additional phylogenetic problems and anomalies below.

Nevertheless, for the argument's sake let's assume with Badlangana et al. a microevolutionary sequence within the Palaeotraginae from unknown fossils *similar* to *Giraffokeryx primaevus* to giraffids of "extant giraffe-like proportions". The authors went on to say – calculating continuous evolution for a "2-Myr period":

> "Over this 2-Myr period, based on a generation time of 5 years between birth and first parturition in extant female giraffes (Dagg & Foster, 1976), and a generation time of less than 3 years in extant okapi (Bodmer & Rabb, 1992), ***between 400 000 and 666 666 generations of palaeotragines*** may have occurred. The lengthening of the cervical region between *P. primaevus* and *P. germaini* was in the range of 350—570 mm (… [method of calculation given]), thus requiring an average increase in CVLs [total cervical vertebrae lengths] of between ***0.72 and 1.19 µm per generation to reach extant giraffe proportions in this time period***."

Since for *Giraffokeryx primaevus* (synonym for *Palaeotragus primaevus*) is noticed an "Age range: base of the Burdigalian to the top of the Serravallian or 20.45000 to 11.63000 Ma", for *Palaeotragus germaini* 11.63000 to 3.60000 Ma, and for the *G. camelopardalis* usually "3.60000 to 0.00000 Ma" (considering moreover the large morphological and further differences between *P. germaini* and *G. camelopardalis*) the author's time basis of a "2-Myr period" for their calculations appears to be relatively short/condensed/compressed.

Even just doubling their numbers to about 1 000 000 (1 million) generations would be a modest attempt to get close to the microevolutionary/gradualistic scenario of evolution by accidental, haphazard, random mutations with "only slight ***or even invisible effects*** on the phenotype" (Mayr), or in Darwin's words, by "infinitesimally small changes", "infinitesimally slight variations" and "insensibly fine steps" and "insensibly fine gradations" etc. Thus, he also said "I do believe that natural selection will generally act ***very slowly***, ***only at long intervals of time***" (Darwin: Origin)

Now, concerning natural selection of random DNA-"micro"-mutations[22] which – for the origin of the long-necked giraffes – no one has ever calculated (not so easy for life forms only known as fossils), I had raised the following question, here somewhat reformulated (2011, p. 129):

> Are there really decisive selective advantages for about one million (!) generations each reaching ca. 1 millionth of 1 meter or ***1 thousandth of 1 mm higher than their ancestors into the canopy of the last leaves during a dearth?*** (i. e. "between 0.72 and 1.19 µm per generation to reach extant giraffe proportions in this [now elongated] time period", not to mention the smaller females, juveniles and Haldane's dilemma.)

So, what does this have to do with the question, why a true evolutionary story is not available? Considering the utmost inner improbability of natural selection for a million (and perhaps more) generations, ***each 1 thousandth of 1 mm higher than their ancestors*** (each new step implying the substitution of the entire former "smaller" giraffe population by those with the "longer" necks) – ***could it perhaps be that the evolutionary presuppositions of gradualism are illusory/unreal and almost totally false?*** In that case "a true evolutionary story" of the giraffes is not available/achievable/obtainable ***simply because it has never happened at all***.

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[22] Another reminder could also be revealing in this context: "As has already been emphasized repeatedly, **98% of mutations with a 1% selection advantage** [***which most probably will not be achieved with 1 thousandth of 1 millimeter higher in the neck of the giraffe***] **are lost again due to genetic drift**. And such a mutation [1 % advantage] would have to appear recurrently around 50 times in order to become established in a population." https://www.weloennig.de/Hummingbirds.pdf, p. 19.
See also: https://www.weloennig.de/NaturalSelection.html and https://www.weloennig.de/jfterrorchipmunks.pdf

Perhaps an informative addendum on the subject of mutations:

> As the extensive wealth of research experience **over more than 100 years** with ***billions of mutations in a wide variety of organisms*** — from *Drosophila* to barley, rice, and corn — shows, even ***systematic mutagenesis of the entire genome (saturation mutagenesis) would never result in completely new species that are stable in nature***.[23]. Against this background, the idea of a genetic transformation of a species similar to *Giraffokeryx primaevus* into a type resembling *Palaeotragus germaini* and finally *Giraffa camelopardalis*, achieved through random mutations and selection, **seems very implausible**.[24]

Hence, several geneticists and paleontologists have come to the conclusion that the genus[25] is constant. Why the genus? "The genus has traditionally been regarded as the lowest unit of rough comparability in paleontological data" (Gould)[26].

The Giraffe Fossil Record

Now let's return to the fossil record: Does it agree with the arguments presented so far?

Concerning the gradualistic scenario of evolution, ruling evolutionary biology for ***more than 160 years*** now, Darwin stated that "…**the number of intermediate varieties**, which have formerly existed on the earth, [must] be **truly enormous**. Why then is not every geological formation and every stratum full of such intermediate links?" His answer – still given by the majority of evolutionists today is – "the **extreme imperfection** of the geological record" … which he thought to be "**imperfect to an extreme degree**"[27].

In that context I would like to remind the reader[28] of the answer given by distinguished paleontologist **Oskar Kuhn** **106 years later** (similarly 122 years later):

> "The prejudice that the phylogenetic history of life could only be an accumulation of the smallest variational steps and that a more complete knowledge of the paleontological documents would prove [the assumed] gradual evolution, is deeply rooted and widely accepted. But the paleontological facts have long spoken against this prejudice! Especially German paleontologists such as B e u r l e n, D a c q u é and S c h i n d e w o l f have emphatically pointed out that in many animal groups such a rich, even *overwhelming amount of fossil material exists* (foraminifers, corals, brachiopods, bryozoans, cephalopods, ostracods, trilobites etc.), **that the gaps between the types and subtypes *must be viewed as real***".[29]

Many highly qualified paleontologists have principally come to the same conclusion. Let's take **David M. Raup**, at that time curator of geology at Chicago's Field Museum of Natural History **120 years** after Darwin's *Origin of Species* (1859):

> "Instead of finding gradual unfolding of life, what geologists of Darwin's time and geologists of the present-day actually find is a highly uneven or jerky record; that is, ***species appear in the sequence very suddenly, show little or no change during their existence in the record, then abruptly go out of the record***."

AI appropriately agrees here and explains this significant, far reaching and substantial description on the fossil record by Raup as follows (retrieved 27 September 2025):

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[23] See the empirically verified and further verifiable law of recurrent variation at http://www.weloennig.de/Gesetz_Rekurrente_Variation.html and http://www.weloennig.de/Loennig-Long-Version-of-Law-of-RecurrentVariation.pdf and/or https://www.weloennig.de/ShortVersionofMutationsLawof_2006.pdf

[24] In part rephrased for our topic of the origin of the giraffes according to my book here https://www.weloennig.de/Utricularia2011Buch.pdf

[25] See discussion in https://www.weloennig.de/ElephantEvolution.pdf quoting Gould *The Structure of Evolutionary Theory* 2002, p. 127.

[26] *Cf.* also https://www.weloennig.de/Hippo.pdf, pp. 15-19. Some authors like Benton, have taken the family as the basic unit: M. J. Benton: The Fossil Record 2 (Edited by M. J. Benton), Chapman and Hall, London 1993. For an extensive discussion on species concepts check: https://www.weloennig.de/Artbegriff.html, see perhaps also https://www.weloennig.de/AngiospermsLivingFossils.pdf, footnote "If **genera, families, and other higher categories** are relatively old…"

[27] Full quotation: Darwin 1859, pp. 279/280: "But just in proportion as this process of extermination has acted on an enormous scale, so must the number of intermediate varieties, which have formerly existed on the earth, be truly enormous. Why then is not every geological formation and every stratum full of such intermediate links? **Geology assuredly does not reveal any such finely graduated organic chain**; and this, perhaps, **is the most obvious and gravest objection which can be urged against my theory**. The explanation lies, as I believe, in **the extreme imperfection** of the geological record."
For all occurrences of his statements "I look at the natural geological record, as a history of the world imperfectly kept,…" which he repeated many times, see https://darwin-online.org.uk/, later p. 475 also "If we admit that the geological record is **imperfect in an extreme degree**…"

[28] https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, p. 64, as well as in several other articles of mine as https://www.weloennig.de/KoalaPart2.pdf

[29] Italics and spacing by Kuhn, bold and colour by me.
Kuhn, O. (1965): Die Abstammungslehre. Tatsachen und Deutungen. Verlag Oeben, Krailling bei München. Kuhn, O. (1981): Die Evolution. Ergebnisse und Probleme. Verlag Gebr. Geiselberger, Altötting. (By the way, Professor Kuhn once unsolicitedly sent me a package full of exemplars of his little book about *Die Abstammungslehre* in order to distribute them – should have been in 1965/1966 as far as I remember.)

> "The statement from paleontologist David Raup highlights a central challenge for Darwin's theory of gradual evolution: the fossil record often appears "jerky," showing ***species emerging suddenly, remaining relatively unchanged, and then disappearing abruptly***. While Darwin attributed this to the fossil record's incompleteness, Raup's observation was a key insight that later contributed to the development of punctuated equilibrium theory, which posits that species experience long periods of stasis followed by rapid changes."[30]

A series of 6 similar, likewise completely correct statements (so altogether 7) by David Raup has been shown by the well-informed scientist and author **Richard William Nelson.** See his ***Fossil Record by Decade*** up to **2014**)[31]. In this extensive document R. W. Nelson has shown that according to the descriptions of the world's best paleontologists (and several further (mostly) evolutionary authorities) of the **155 years** up to 2014 (so far) that "***after more than 150 years of exhaustive geological explorations, Darwin's dilemma has only deepened***" (his résumé).

At present Nelson could have added several statements agreeing and further corroborating his résumé by paleontologist **Günter Bechly** up to **2024/Jan. 2025**[32] and geologist **Casey Luskin** to **2025**[33].

In this context keep please also in mind the series/range/string of clear pronouncements on the ***constancy/stasis of fossil forms*** by **Ernst Mayr**, **Donald R. Prothero**, **Steven M. Stanley**, **Stephen Jay Gould**, **Niles Eldredge**, and **Tom S. Kemp** (see below)[34].

So, what does the giraffe fossil record look like? For the Classification of the Family Giraffidae PBDB (2025) lists the following 17 genera[35] (to be added is *Oreo leptia* 2025[36] and several others – see below, last not least *Giraffa* [tribe giraffini] Brisson 1762[37]):

G. †**Alcicephalus** Rodler and Wiethofer 1890hide
†Alcicephalus neumayri Rodler and Weithofer 1890
†Alcicephalus sinensis Schlosser 1903
G. †**Birgerbohlinia** Crusafont Pairó and Villalta 1951+
G. †**Bohlinia** Matthew 1929+
G. †**Bramiscus** Ríos et al. 2024+
Subfm. †Canthumerycinae Hamilton 1978+
G. †**Decennatherium** Crusafont Pairo 1952+
G. †**Georgiomeryx** Paraskevaidis 1940+
Tr. Giraffini+
Subfm. †Giraffokerycinae Solounias 2007+
G. †**Helladotherium** Gaudry 1860+
G. †**Honanotherium** Bohlin 1926+
G. †**Lyrakeryx** Rios and Solounias 2025+
Subfm. †Okapiinae Bohlin 1926+
Tr. Okapini+
G. †**Palaeogiraffa** Bonis and Bouvrain 2003+
Tr. †**Palaeotragini** Pilgrim 1911+
G. †**Palaeotragus** Gaudry 1861+
G. †**Progiraffa** Pilgrim 1908
G. †**Propalaeomeryx** Lydekker 1883
G. †**Schansitherium** Kilgus 1922+
Subfm. †Sivatheriinae Zittel 1893+
G. †**Umbrotherium** Hurzeler and Engesser 1976+
G. †**Vishnutherium** Lydekker 1876+

Invalid names: Bohlininae Solounias 2007 [empty], Giraffinae [empty], Sivatheriini Zittel 1893 [empty]
[WEL: Roman/upright of the genus names by the authors of PBDB]

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[30] Although punk eek's general description of the fossil record has all the more been corroborated by further research during the last decades ("long periods of stasis followed by rapid changes"), its factorial system with its main components of allopatric speciation and species selection has eventually ended up in "good, old-fashioned natural selection acting on random mutations and variations – that is, […] the Neo-Darwinian mechanism acting over long periods of time on large, relatively stable, populations". Details in https://www.weloennig.de/ElephantEvolution.pdf, p. 5

[31] https://darwinthenandnow.com/understanding-evolution/evolution-and-science/fossil-records/fossil-record-by-the-decade/ 63 pp. references in his book (2009). For 2014 he could have added Chen Junyuan (Chen Jun-Yuan): "I do not believe the animals developed gradually from the bottom up, I think they suddenly appeared." https://www.weloennig.de/KoalaPart2.pdf, p. 6

[32] https://scienceandculture.com/author/gbechly/

[33] Partially overlapping with: https://scienceandculture.com/?s=Fossil+record and https://scienceandculture.com/?s=Fossil+record
For references from 1908 to 1987 see also https://www.weloennig.de/AesIV5.SysDis.html

[34] https://www.weloennig.de/AngiospermsLivingFossils.pdf, pp. 8 to 9 and 10 to 14.

[35] https://paleobiodb.org/classic/classify?taxon_no=42690 (Retrieved 29 September 2025)

[36] Solounias and Maria Ríos (2025): https://www.tandfonline.com/doi/abs/10.1080/14772019.2025.2509642

[37] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42695&is_real_user=1

A thorough/in-depth/detailed classification including the most recent papers is given by the anonymous author(s) of the Wikipedia article[38] on the **Family Giraffidae** (last edited on 1 October 2025, same sequence of Giraffidae as shown below as of 22 August 2025)[39]. The following **26 genera** are listed in the ensuing text – presented here without their species, which are also cited in this article:[40]

"Below is the total taxonomy of valid extant and fossil taxa
(as well as junior synonyms which are listed in the brackets)."

Family Giraffidae J. E. Gray, 1821

Basal extinct giraffids

- †***Csakvarotherium*** Kretzoi, 1930
- †***Injanatherium*** Heintz, Brunet & Sen, 1981
- †***Propalaeomeryx*** Lydekker, 1883 [*Progiraffa* Pilgrim, 1908]
- †***Shansitherium*** Killgus, 1922 [*Schansitherium* [*sic*]]
- †***Umbrotherium*** Abbazzi, Delfino, Gallai, Trebini & Rook, 2008

Subfamily †Canthumerycinae Hamilton, 1978

- †***Georgiomeryx*** Paraskevaidis, 1940
- †***Canthumeryx*** Hamilton 1973 [*Zarafa* Hamilton, 1973]

Subfamily †Progiraffinae Pilgrim, 1911

- †***Palaeogiraffa*** Bonis & Bouvrain, 2003

Subfamily †Giraffokerycinae Solounias, 2007

- †***Giraffokeryx*** Pilgrim, 1910

Subfamily Giraffinae J.E.Gray, 1821

Tribe Giraffini J.E.Gray, 1821

- †***Orea*** Solounias & Ríos, 2025
- ***Giraffa*** Brisson, 1762 [*Camelopardalis* von Schreber, 1784 and *Orasius* Oken, 1816]

Tribe †Bohlinini Solounias, 2007

- †***Honanotherium*** Bohlin, 1927
- †***Qilin*** Wang et al., 2025
- †***Bohlinia*** Matthew, 1929

Tribe Palaeotragini Pilgrim, 1910

Subtribe †Palaeotragina Pilgrim, 1910

- †***Mitilanotherium*** Samson & Radulesco, 1966 [*Macedonitherium* Sickenberg, 1967; *Sogdianotherium* Sharapov, 1974]
- †***Palaeotragus*** Gaudry, 1861 [*Achtiaria* Borissiak, 1914
- †***Praepalaeotragus*** Godina, Vislobokova & Abdrachmanova, 1993
- †***Samotherium*** Forsyth Major, 1888 [*Alcicephalus* Rodler & Weithofer, 1890; *Chersenotherium* Alexajew, 1916 and *Amotherium* [*sic*]

Subtribe Okapiina Bohlin, 1926

- †***Afrokanokeryx*** Harris, Solounias & Geraads, 2010
- ***Okapia*** Lankester, 1901

†Subfamily Sivatheriinae Bonaparte, 1850

- †***Birgerbohlinia*** Crusafont Pairó, 1952
- †***Bramatherium*** Falconer, 1845 [*Hydaspitherium* Lydekker, 1876]
- †***Decennatherium*** Crusafont Pairó, 1952
- †***Helladotherium*** Gaudry, 1860
- †***Sivatherium*** Falconer & Cautley, 1836 [*Griquatherium* Haughton, 1922; *Indratherium* Pilgrim, 1910; *Libytherium* Pomel, 1892 and *Orangiatherium* van Hoepen, 1932]
- †***Vishnutherium*** Lydekker, 1876

"Total of 497 collections including 707 occurrences" according to PBDB (Retrieved 2 October 2025).

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[38] For detailed answers to their questions many people first check Wikipedia: In the present case the Wikipedia articles in English and German are more detailed and in certain points more up-to-date than even PBDB. Also interesting: "In 2024, Wikimedia projects had 296 billion page views; this figure is similar to the number of stars in the Milky Way. On average, Wikimedia projects have over 24 billion page views per month, or almost 10,000 page views every second," https://en.wikipedia.org/wiki/Wikipedia:Statistics#Page_views (Retrieved 22 October 2025.)

[39] https://en.wikipedia.org/wiki/Giraffidae (Retrieved 29 September 2025 and 2 October 2025)

[40] Further literature references (altogether 96) in the German article "Giraffenartige": Two additional subfamilies are set apart there: Palaeotraginae (Pilgrim 1911) and Samotheriinae (Hamilton 1978) and 7 more genera: 5 (?) of them valid (comments in quotation marks according to PBDB); ***Bramiscus*** Ríos et al. 2024 (Middle Miocene), ***Lyrakeryx*** Rios and Solounias (2025) (Middle Miocene), *Chersonotherium/Khersonotherium* Alexejev 1915 ("no matching results"), ***Ua*** Solounias et al. (Middle Miocene), *Karsimatherium* ("no matching results"); 2 invalid: for *Progiraffa* see *Propaleomeryx*; for *Libytherium cf. Sivatherium* (as far as I could find out, the additional genera all belong to short-necked giraffids). https://de.wikipedia.org/wiki/Giraffenartige (last edited 12 September 2025) (Retrieved 2 October 2025)

In which geological formations[41] do these "Basal extinct giraffids", the 5 Subfamilies, 3 tribes, 2 subtribes and altogether 26 genera of the Family Giraffidae appear?

Csakvarotherium (probably short-necked giraffid): Upper/Late Miocene: **11.63 –5.333 Ma**
Injanatherium (short-necked giraffid): Early to Middle Miocene: 23.03(?)/**20.44 – 15.97 Ma**
Propalaeomeryx (short-necked giraffid): "No collection or age range data are available"[42]
Shansitherium (short-necked giraffid[43]): Late Miocene: **11.63 –5.333 Ma**
Umbrotherium (short-necked giraffid): Late Miocene: **11.63 –5.333 Ma**

Subfamily Canthumerycinae

Georgiomeryx (short-necked giraffid): Middle Miocene: **15.89–11.65 Ma**[44]or Late Miocene: **11.63 –5.333 Ma**[45]?
Contradictory time information (**abbreviated: CI.** Note also some minor time differences on this page)
Canthumeryx (short-necked giraffid): **20.45 to 13.82 Ma**[46]

Subfamily Progiraffinae

Palaeogiraffa ("**medium to large size**"[47]**?**) Late Miocene (Tortonian to Messinian) **9.7–8.7 Ma**[48]

Subfamily Giraffokerycinae

Giraffokeryx (short-necked giraffid): Miocene: **14–11** Ma[49] or **20.45–7.246 Ma**[50]? (**CI**)

Subfamily Giraffinae J.E.Gray, 1821

Tribe Giraffini J.E.Gray, 1821

Orea (**long-necked giraffe**): Middle Miocene: **13.6–11.4 Ma**
Giraffa (**long-necked giraffe**): Miocene to Recent: **11.61–0 Ma**

Tribe Bohlinini

Honanotherium (**short-necked giraffe,** but neck somewhat longer than in *Okapia*[51]) Late Miocene: **11.63 –5.333 Ma**
Qilin (short-necked(?) giraffid): Middle Miocene: **12.8 Ma – ~11.7**
Bohlinia (syn. *Giraffa attica*) (**long-necked giraffid: as long as in *G. camelopardalis***): Late Miocene: **11.6–5.33 Ma**

Tribe Palaeotragini

Subtribe Palaeotragina: PBDB: "Base of the Sarmatian to the top of the Gelasian" **12.8 to 1.8 Ma (CI)**

Mitilanotherium (short-necked giraffid): Pliocene to Pleistocene **5.33 Ma–11.7 *thousand* years**
"It was a medium-sized giraffid, resembling the modern okapi,.."
Palaeotragus: ("ancient goat" – short-necked giraffid): Miocene–Early Pleistocene.
"…is a genus of very large, primitive, **okapi-like giraffids** from the Miocene to Early Pleistocene of Africa and Eurasia." "Age range: base of the Burdigalian to the top of the Villafranchian or **20.45000 to 1.80000 Ma**"[52]
Praepalaeotragus (short-necked giraffid): Lower Miocene[53]: Aktau-Formation: AI: Not strictly defined[54]
If Burdigalian: Ca. **20.49 Ma**. Originally: "Discovery of an archaic giraffid, *Praepalaeotragus actauensis* GODINA, VISLOBOKOVA & ABDRAKHMANOVA, 1993, also provides evidence of a **middle Miocene** age."[55] (**CI**)
Samotherium (short-necked giraffid: *S.major* ca.**1m** (3.2 feet), our giraffe: up to **2.4m**): Miocene to Pliocene: **11.608 – 2.588 Ma**[56]

Subtribe Okapiina

Afrikanokeryx (short-necked giraffid): Miocene (Serravallian-Tortonian), **~13-11 Ma**
"…is an extinct monotypic genus of giraffid artiodactyl, closely related to the modern okapi."
Okapia (short-necked giraffe): "Maximum range based only on fossils: base of the Zanclean to the top of the Calabrian or **5.33300 to 0.77400 Ma**"[57]

Subfamily Sivatheriinae

Birgerbohlinia (short-necked giraffid): Middle to Late Miocene (Turolian): **15.98–5.333 Ma**[58]
Bramatherium (short-necked giraffid): Late Miocene to Pliocene: "**9.67000 to 7.24600" Ma**[59]
Decennatherium (short-necked giraffid): Late Miocene (Tortonian): **11.6–7.8 Ma**[60]
Helladotherium (short-necked giraffid): Late Miocene: **11.63000 to 5.33300** Ma[61]
Sivatherium (short-necked giraffid): Late Miocene to Pleistocene: **7.24600 to 0.77400 Ma**[62]
Vishnutherium: Syn. *Giraffa priscilla*[63] (neck length unknown): Middle Miocene? **15.98000 to 11.63000 Ma**[64]

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[41] For ± of the age declarations see the corresponding Wikipedia articles.
[42] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42707&is_real_user=1 (Retrieved 29 September 2025)
[43] No exact measurement of the neck known, but possibly somewhat longer than in the Okapia.
[44] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=397375&is_real_user=1 (Retrieved 30 September 2025)
[45] https://en.wikipedia.org/wiki/Georgiomeryx "...in the areas of Greece and Spain about 15.97 million to 11.608 million years ago.")
[46] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=374416&is_real_user=1
"Age range: base of the Burdigalian to the top of the Langhian or 20.45000 to 13.82000 Ma" (Retrieved 30 September 2025)
[47] Kostantis Laskos, Dimitris S. Kostopoulos (2024): https://www.sciencedirect.com/science/article/abs/pii/S0016699524000202 ("…phylogenetically linked to the sivatherine lineage,…"
[48] https://en.wikipedia.org/wiki/Palaeogiraffa (Retrieved 29 and 30 September 2025)
[49] https://en.wikipedia.org/wiki/Giraffokeryx (Retrieved 1 October 2025), See also Aftab et al. 2015 in: Pakistan J. Zool., vol. 47, pp. 1393-1403.
[50] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42696&is_real_user=1 (Retrieved 1 October 2025 and 7 October 2025)
[51] https://en.wikipedia.org/wiki/Honanotherium (Retrieved 1 October 2025) Reconstr.skeleton in Henan Geol. Museum, *cf.* https://commons.wikimedia.org/wiki/File:Honanotherium_2.jpg
[52] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42704&is_real_user=1 (Retrieved 29 September 2025)
[53] https://www.researchgate.net/publication/291854501_A_new_Giraffidae_from_the_Lower_Miocene_of_Kazakhstan
[54] https://en.wikipedia.org/wiki/Early_Miocene (Retrieved 30 Sept. 2025): However, info for Aktau-Formation: AI: retrieved 1 October 2025
Elena G. Kordikova & Alexander V. Mavrin (1996): Stratigraphy and Oligocene-Miocene Mammalian Biochronology of the Aktau Mountains, Dzhungarian Alatau Range, Kazakhstan, p.161. Also, *Palaeotragus* is mentioned for the "Middle Member" of "The Aktau Mountains middle Chul'adyr fauna…" Age later (2000) corrected: https://link.springer.com/article/10.1007/BF02987961, p.195: "Subsequently the age assignment has been refined to MN 4-5 based on comparisons of the cricetid and insectivore faunas to Turkish micro-mammalian faunas of MN 6 (Paalar, Gandir) (KORDIKOVA, unpublished data)."
[56] https://en.wikipedia.org/wiki/Samotherium (Retrieved 29 September 2025)
[57] https://paleobiodb.org/classic/basicTaxonInfo?taxon_no=100507 (Retrieved 29 September 2025)
[58] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42691&is_real_user=1 (Retrieved 30 September 2025)
[59] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42693&is_real_user=1 (Retrieved 30 September 2025)
[60] "A juvenile D. rex specimen from Spain suggests that the ontogenetic development of ossicones in the species was similar to that of the modern giraffe.[3]"
https://en.wikipedia.org/wiki/Decennatherium Ríos et al (2024): https://www.tandfonline.com/doi/full/10.1080/08912963.2024.2376359 (Retrieved 30 Sept. 2025)
[61] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42697&is_real_user=1 (Retrieved 30 Sept. 2025)
[62] "…base of the Messinian to the top of the Calabrian or 7.24600 to 0.77400 Ma" https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42709&is_real_user=1 (Retrieved 30 Sept. 2025)
[63] https://en.wikipedia.org/wiki/Vishnutherium
[64] "No collection or age range data are available" but for *Giraffa Priscilla*: Middle Miocene or 15.98000 to 11.63000 Ma

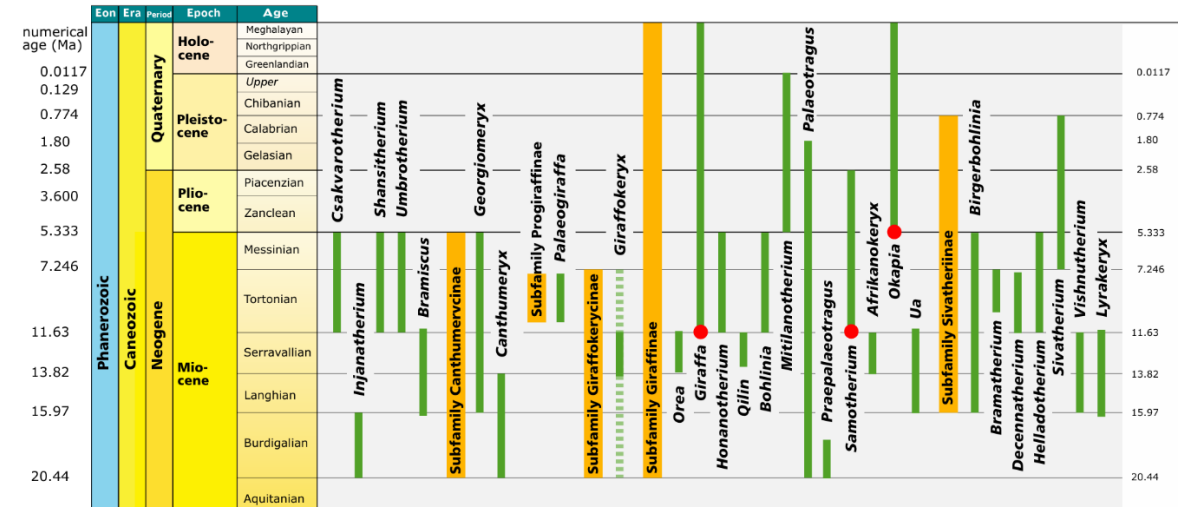

Figure above by Roland Slowik (Dietzenbach near Frankfurt/Main) for the present article.
Left: The fossil record of the 26[65] plus 3 (recently described) genera of the family Giraffidae as listed above.
"The gaps between the types and subtypes *must be viewed as real*" (paleontologist Professor Kuhn, State University of Munic)
"…the great majority of species [and genera] appear with **geological abruptness in the fossil record and then persist in stasis until their extinction**. Anatomy may fluctuate through time, but the last remnants of a species look pretty much like the first representatives" (Gould)
See the strong contrast to the evolutionary hypothesis according to Solounias & Danowitz presented in many public articles[66]

So, this is what the fossil record really reveals us not only on the origin of the giraffes but virtually for also all the other groups of animals[67] – not to speak of plants[68].

The contrast to what the theory of evolutionary gradualism has predicted (still to this very day) is really mind boggling. Unsurpassed, unmatched and unrivalled are the basic inferences on this matter by zoologist Douglas Dewar after **115 years** of Darwin's *Essays* (1842 and 1844)[69] and **98 years** after Darwin's *Origin of Species* (1859) – to repeat these essential points which are all the more fully up-to-date in 2025 against the ensuing expectations of gradualism for well-preserved forms of life (so, considerations that hold as much today as in 1957):

"If the evolution theory be true, the record should exhibit the following features:

I. Every class, order, family or genus would make its appearance in the form of a single species and exhibit no diversity until it has been in existence for a long time.

II. The flora and fauna at any given geological horizon would differ but slightly from those immediately above and below except on the rare occasions when the local climate suddenly changed if the sea flowed over the land, or the sea had retreated.

III. It should be possible to arrange chronological series of fossils showing, step by step, the origin of many of the classes and smaller groups of animals and plants. By means of these fossil series it should be possible to draw up a pedigree accurately tracing the descent of most of the species now living from groups shown by the fossils to have been living in the Cambrian period.

IV. The earliest fossils of each new group would be difficult to distinguish from those of the group from which it evolved, and the distinguishing features of the new group would be poorly developed, e.g. the wings of birds or bats."[70]

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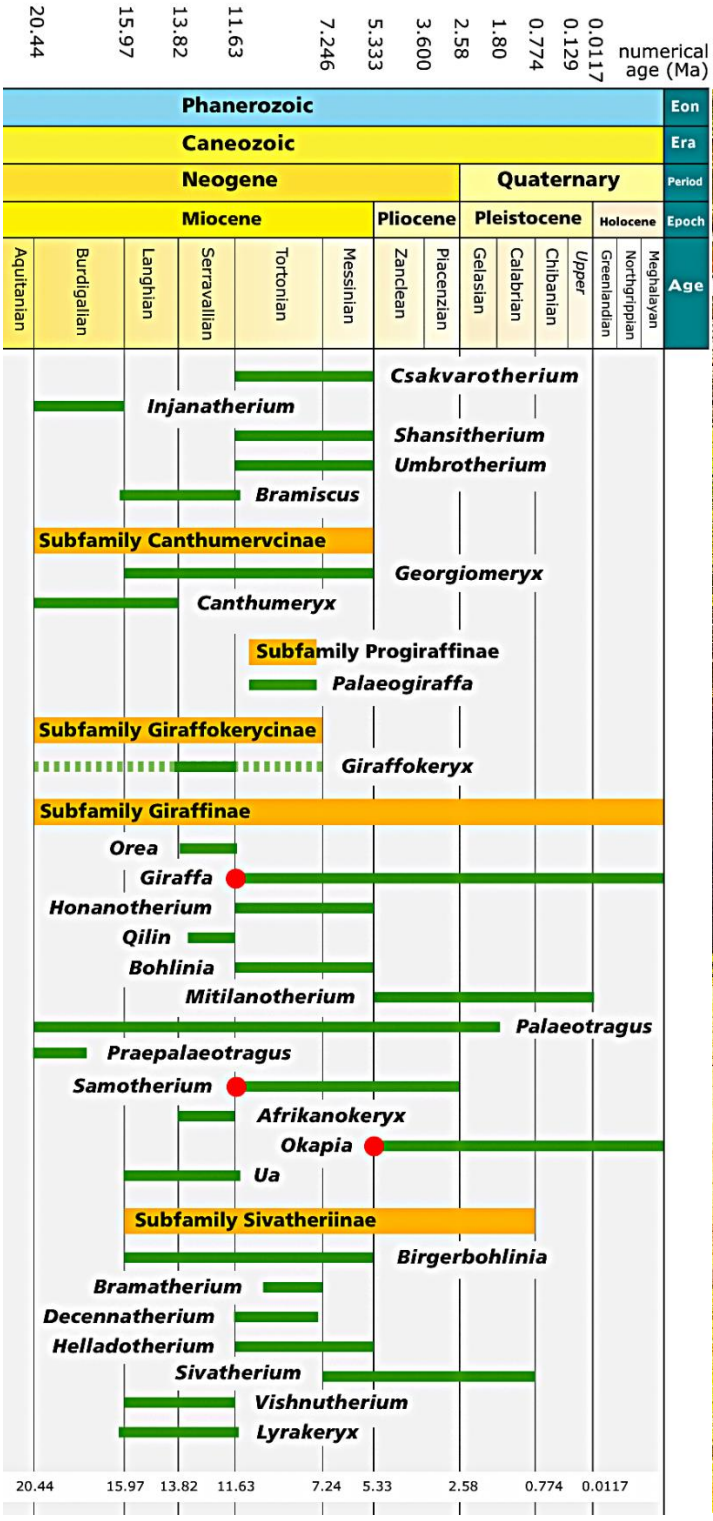
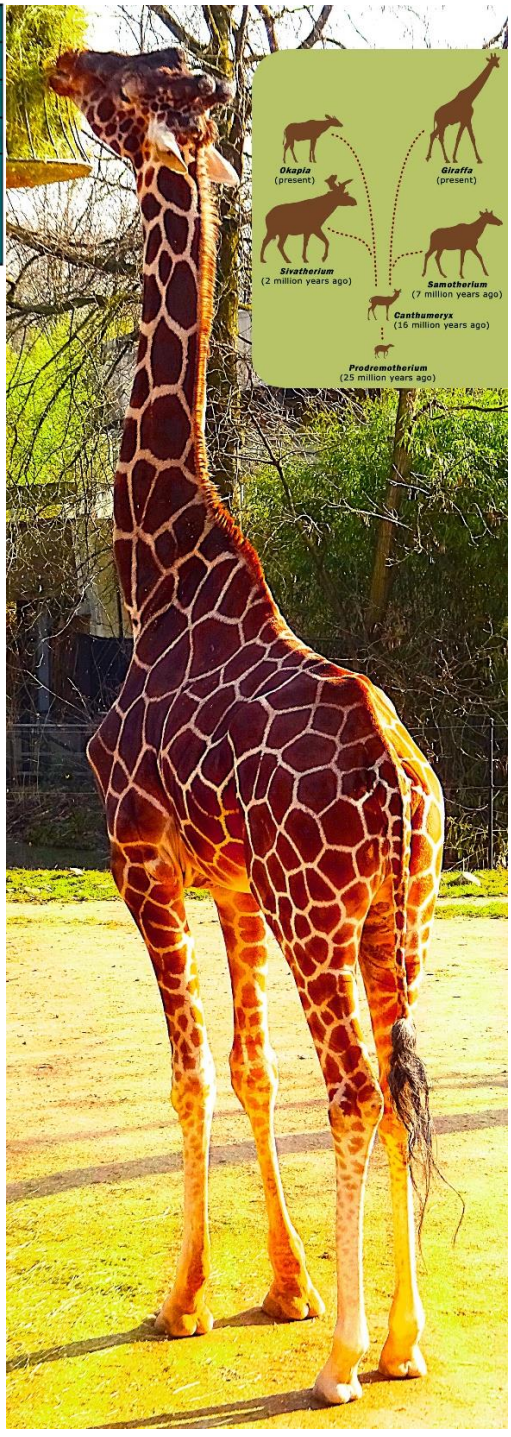
[65] Minus 1 "no age range available".
[66] https://phys.org/news/2015-10-clues-giraffe-neck-evolved.html, https://www.sci.news/paleontology/science-giraffe-neck-evolution-03321.html, https://www.livescience.com/52903-transitional-giraffe-fossils.html, https://www.spektrum.de/news/warum-die-giraffe-einen-langen-hals-hat/1378854
[67] See *The Fossil Record 2* (Edited by M. J. Benton), Chapman and Hall, London 1993. Principally the same has endlessly been corroborated during the following decades: *Cf.* just the **examples documented at my homepage**: https://www.weloennig.de/KoalaPart2.pdf (2025), https://www.weloennig.de/PANDA.Part1.pdf (2024), https://www.weloennig.de/Hummingbirds.pdf (2024), https://www.weloennig.de/Hippo.pdf (2023), https://www.weloennig.de/SauropodDinosaur.pdf (2023), https://www.weloennig.de/Feduccia2020.pdf (2021, pp. 22/23), https://www.weloennig.de/HumanEvolution.pdf (2019), https://www.weloennig.de/ElephantEvolution.pdf (2019), https://www.weloennig.de/ExplosiveOrigins.pdf (2018), https://www.weloennig.de/Hunderassen.Bilder.Word971a.pdf (2012/2014, p. 308), https://ad-multimedia.de/evo/long-necked-**giraffe**_mU.pdf (2011, pp. 45-48), https://www.weloennig.de/Utricularia2010Diskussion.pdf pp. 2, 69-71, 126/127 (even if Li had erred (see pp. 67/68 – as Wong et al. have argued in detail 2015: https://www.researchgate.net/publication/276291808_Early_Cretaceous_Archaeamphora_is_not_a_carnivorous_angiosperm and Wong et al are correct ("insect induced **leaf galls**"), *it would now demonstrate the abrupt appearance as well as* ***the enormous age and constancy*** (found moreover in "abundant 230 million-year-old amber from the **Late Triassic** (Carnian)") **of leaf galls and their insect inducers**: "https://www.weloennig.de/PlantGalls.pdf (2017, pp. 59-62) – **not to speak of all the papers and authors mentioned above including the documentation by Nelson**.
[68] https://www.weloennig.de/AngiospermsLivingFossils.pdf
[69] Darwin, F., editor. 1909. The foundations of the origin of species. **Two essays written in 1842 and 1844**. Cambridge: Cambridge University Press. Cited according to by Richard William Nelson (2009, p. 321): Darwin, Then and Now. iUniverse, Inc. New York Bloomington. https://darwinthenandnow.com/wp-content/uploads/2024/10/Darwin-Then-and-Now_TEXT.pdf
[70] https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf (quotation from Douglas Dewar (1957): The Transformist Illusion. Murfreesboro, TN: DeHoff Publications, 1957. Republished 2005 by Sophia Perennis et Universalis, Hillsdale, NY.

Left: See in contrast again the *Giraffe Fossil Record* (Fig. by Roland Slowik, Oct. 2025) now enlarged for easier reading and study. Right: *Giraffa camelopardalis* ssp. *reticulata*[71] (Photo W.-E. L. Zoo Duisburg 17 Febr. 2019).





Right above: Picture within the picture: Giraffid evolution according to Nikos Solounias and Melinda Danowitz (see the links on the previous page: footnote), ***redrawn and modified by Roland Slowik***. The genera arise geologically abruptly followed by an enormous stasis/constancy. This is in utter contrast to the predictions of gradualism (Neo-Darwinism/Modern Synthesis). "The tree is a bush" [72]. I would add that it is not even a bush: the main types and subtypes appear independently of each other.[73] In consonance with the ID-theory their homologous similarities are due to common design not to common descend. This is true also for the "Tall Blonde" above.

[71] For reasons given at https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, pp. 92/93 (All the "species" of the extant genus Giraffa can crossbreed. Gray, in her work Mammalian Hybrids (1971, pp. 148/149) lists the following examples" *cf.* the list there.) The German text of the book was kindly translated into English by Prof. Granville Sewell *cf.* https://scienceandculture.com/author/gsewell/ See for example also his video: https://www.youtube.com/watch?v=ph9AwtbcbdA

[72] According to a highly qualified giraffe expert in mail of 9 October 2025 to W.-E. L.

[73] As for intermediate forms see https://www.weloennig.de/GIRAFFA.Samotherium.pdf

In this context I would also like to emphasize again the ***phenomenon of stasis, the constancy of life forms*** equally unexpected from evolutionary gradualism[74]:

Ernst Mayr (2001, p. 195): "The complete standstill or stasis of an evolutionary lineage for scores, if not hundreds, of millions of years **is very puzzling**."

Donald R. Prothero (2007, p. 81): Evolution: what the fossils say and why it matters. "Some biologists tried to explain away stasis with mechanisms such as stabilizing selection (selection against the extremes of a population, reinforcing the mean tendency), **but this does not explain how some fossil populations persist unchanged through millions of years of well-documented climatic change (surely a strong selection pressure)**, as documented by Prothero and Heaton (1996) and Prothero (1999). As Gould (1980a, 2002) pointed out, ***the persistance of fossil species through millions of years of intense selection pressure suggests that they are not infinitely malleable by selection, but instead have an integrety of some sort of internal homeostatic mechanism that resist most external selection***." Prothero betont weiter, dass diese These "still hotly controversial" ist und dass sie von Seiten der Vertreter der Synthetischen Evolutionstheorie zumeist nicht akzeptiert wird ("…many biologists are unconvinced that the fossil record can't be explained by some Neo-Darwinian mechanism (see chapter 4))."

Steven M. Stanley (1981, p. XV): "The record now reveals that **species typically survive for a hundred thousand generations, or even a million or more, without evolving very much**. … After their origins, most species undergo little evolution before becoming extinct."

Stephen Jay Gould (2002, p. 749) "[T]he tale [of the correspondence between Darwin and Falconer] itself illustrates the central fact of the fossil record so well – **geologically abrupt origin and subsequent extended stasis of most species**. …Most importantly, this tale exemplifies what may be called the **cardinal and dominant fact of the fossil record**…: the great majority of species appear with **geological abruptness in the fossil record and then persist in stasis until their extinction**. Anatomy may fluctuate through time, but the last remnants of a species look pretty much like the first representatives. In proposing punctuated equilibrium, Eldredge and I did not discover, or even rediscover, this fundamental fact of the fossil record. Paleontologists have always recognized the longterm stability of most species, but we had become more than a bit ashamed by this strong and literal signal, ***for the dominant theory of our scientific culture told us to look for the opposite result of gradualism as the primary empirical expression of every biologist's favorite subject*** – evolution itself." (P. 755:) "[...] George Gaylord Simpson, the greatest and most biologically astute paleontologist of the 20th century (and a strong opponent of punctuated equilibrium) **acknowledged the literal appearance of stasis and geologically abrupt origin as the outstanding general fact of the fossil record** and as a pattern which would "pose one of the most important theoretical problems in the whole history of life" if Darwin's argument for artifactual status failed." "...stasis is data... Say it ten times before breakfast every day for a week, and the argument will surely seep in by osmosis: "stasis is data; stasis is data"..." (p. 759.)

> This is what **Simpson** stated in 1960: "It is a feature of the known fossil record that ***most taxa appear abruptly***. They are not, as a rule, led up to by a sequence of almost imperceptibly changing forerunners such as Darwin believed should be usual in evolution. … These peculiarities of the fossil record pose ***one of the most important theoretical problems in the whole history of life***." Simpson GG 1960. The History of Life. pp. 117–180 in: Sol Tax (ed.). Evolution after Darwin. Vol. 1. The Evolution of Life: Its Origin, History, and Future. University of Chicago Press: Chicago (IL), 629 pp. Cited according to paleontologist Günter Bechly (2024): https://scienceandculture.com/2024/05/fossil-friday-discontinuities-in-the-fossil-record-a-problem-for-neo-darwinism/

Niles Eldredge (1998, p. 157): "**It is a simple ineluctable truth that virtually all members of a biota remain basically stable, with minor fluctuations, throughout their duration**.. (Remember that by "biota" we mean the commonly preserved plants and animals of a particular geological interval…)"

Once again: **Donald R. Prothero** (1992, p. 41): "Eldredge and Gould not only showed that paleontologists had been out-of-step with biologists for decades, but also that **they had unconsciously trying to force the fossil record into the gradualistic mode**. The few supposed examples of gradual evolution were featured in the journals and textbooks, but paleontologists had long been silent about their "dirty little trade secret": **most species appear suddenly in the fossil record and show no appreciable change for millions of years until their extinction**. http://chaos.swarthmore.edu/courses/SOC26/PunctEquil.pdf

Tom S. Kemp (1985, pp. 66-67): "As is now well known, most fossil species appear instantaneously in the record, persist for some millions of years virtually unchanged, only to disappear abruptly - the 'punctuated equilibrium' pattern of Eldredge and Gould."

For 2025: See a range of further corroborating statements by evolutionary biologists and others as gathered by Richard William Nelson *Fossil Record by Decade* **up to 2014** and the links above **up to 2025**. See also several revealing points in https://scienceandculture.com/?s=stasis&site-current-site=1 (up to **2024**) and https://scienceandculture.com/?s=constancy&from=1991&to=2025&author=&orderby=relevance&site-current-site=1 (up to **2025**) as well as https://scienceandculture.com/?s=Fossil+record (**also up to 2025**).

AI correctly notes: "Stasis in the fossil record refers to extended periods where a species or lineage shows little to no morphological change. ***This pattern is common in the fossil record and contrasts with gradualism***;" … "**Contrast with Gradualism**: It stands in contrast to gradualism, which suggests that evolutionary change is slow and continuous over time." (retrieved 5 October **2025**)[75]

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[74] https://www.weloennig.de/AngiospermsLivingFossils.pdf

[75] See also perhaps some revealing points in the *Evolution Encyclopedia* on The Horse Series: https://evolutionfacts.com/Appendix/a23.htm
Gould: "Paleontologists have documented virtually no cases of slow and steady transformation, foot by foot up the strata of a hillslope—not for horses, not for humans."

The pattern cited above is also true for the genus *Prodremotherium*, which is usually asserted to be "one of the most ancient ancestors of the giraffe and the okapi"[76]: "Age range: base of the Early/Lower Oligocene to the top of the Late/Upper Oligocene or 33.90000 to 23.04000 Ma[77] – thus the enormous stasis/constancy of that genus of about 10 Ma.

A series of transitional links in Darwin's and the Neo-Darwinians' sense from the genus *Prodremotherium* (Family Gelocidae) to any of the genera of the Family Giraffidae is totally missing so far[78] (although according to my prediction based on the fossil record to date – '2 or 3 further mosaic forms with some intermediary features' in the 'right' geological strata – may still be detected, but no continuous series in Darwin's sense. Also, if these mosaics ever existed and would be found 'as mosaics they will not unequivocally be "connecting any of the fossil taxa to Giraffa"'[79].

Let's keep in mind that **an absolutely ingenious and prolific mind** having generated and sustaining the laws of physics ***has the potential to create as many mosaic forms with some intermediary characters as are imaginable within functional limits***.

The Significance of Similarities and Differences in the World of Organisms

Just a Few More Reminiscences and Reminders[80]

"The similarity of forms was explained by evolution, and evolution in turn was proven by the various grades of similarities. It was hardly noticed that here one has fallen victim to circular reasoning; the very point that one set out to prove, namely that similarity was based on evolution, was simply assumed, and then the different degrees in the gradation of the (typical) similarities, were used as evidence for the truth of the idea of evolution. Albert Fleischmann[81] has repeatedly pointed out the lack of logic in the above thought process. The same idea, according to him, was used interchangeably as assertion and as evidence.

However, **similarity can also be the result of a plan**, and ...morphologists such as **Louis Agassiz**[82], **one of the greatest morphologists that ever lived, attributed the similarity of forms of organisms to a creation plan, not to evolution**."

Paleontologist Oskar Kuhn[83]

Kuhn also stated that "evolution is ... only indirectly accessible more or less as an appendix to systematic morphology", quoting approvingly the Swiss zoologist and paleontologist Adolf Naef who had "argued that the basic concepts of ancient pre-evolutionary morphology were later simply "translated" into the language of evolution.

Thus (the following "translations" were made):

relationship of form was translated...into evolutionary relationship
systematics……into phylogeny/evolution
metamorphosis……..….into evolutionary transformation
systematic grades of similarities…...into evolutionary grades of ancestries
type ……...into stem form/original form
typical states……..into original evolutionary states
atypical …….into evolutionary derived

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[76] Cited to be so even in https://simple.wikipedia.org/wiki/Prodremotherium (Retrieved 27 October 2025). Other sources are more cautious: "*Prodremotherium* is considered to be **a potential ancestor** of Giraffidae based on fused and elongated metapodials, small canines and reduced cingulum on upper molars" https://pmc.ncbi.nlm.nih.gov/articles/PMC4632521/ Original description by Filhol 1877: https://www.gbif.org/species/4835233
AI (27 October 2025, translated from German) has stated the evolutionary view correctly as follows: *Prodremotherium* was a mammal considered a **possible** ancestor of giraffes, as it **likely** exhibited a primitive form of neck elongation. The genus is thought to have lived in France around 25 million years ago and represents one of the earliest forms of the giraffe system, ***although its ancestry is ambiguous and may also indicate convergent evolution***." German: "*Prodremotherium* war ein Säugetier, das als möglicher Vorfahre der Giraffen gilt, da es wahrscheinlich eine primitive Form der Halsverlängerung aufwies. Es wird angenommen, dass die Gattung etwa vor 25 Millionen Jahren in Frankreich lebte und eine der frühesten Formen des Giraffensystems darstellt, obwohl seine Abstammung nicht eindeutig ist und auch auf konvergente Evolution hinweisen könnte."

[77] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=42610&is_real_user=1 (Retrieved 8 October 2025)

[78] "… at the present, the ancestor of the Giraffidae is **somewhere between** Gelocidae, *Palaeomeryx* and *Lagomeryx*." Solounias 2024, p. 15 in: Anatomy and Evolution of the Giraffe – Parts Unknown. Cambridge Scholars Publishing. Newcastle upon Tyne, England. (194 pp.)

[79] See for example pp. 9 and 10 of https://www.weloennig.de/GIRAFFA.Samotherium.pdf

[80] See https://www.weloennig.de/HumanEvolution.Critique.pdf pp. 33/34

[81] Zoologist and Textbook author. Details about Fleischmann see: https://www.zobodat.at/biografien/Fleischmann_Albert_Sitzber-physik-med-Soc-Erlangen_75_XX-XXXV.pdf https://www.deutsche-digitale-bibliothek.de/person/gnd/116602511 https://en.wikipedia.org/wiki/Albert_Fleischmann (Retrieved 10 October 2025)

[82] Excellent series of articles: https://scienceandculture.com/?s=Agassiz, https://de.wikipedia.org/wiki/Louis_Agassiz, and a podcast: https://scienceandculture.com/2017/02/darwin_v_agassi/ (Retrieved 10 October 2025), https://scienceandculture.com/2017/02/darwin_v_agassi/

[83] See also https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf p. 19.

lower animals……....into primitive
atypical similarities……...into convergence
morphological derivation..……..…..into evolutionary derivation”

It is the [homologous[84]] similarities on all biological levels (including anatomy, physiology and genetics etc.), which are the undeniable facts being ***often subconsciously translated into (and treated as equivalent with) macro-evolutionary relationships*** (as to the limits to extrapolate from microevolution to macroevolution, see, please, http://www.weloennig.de/KutscheraPortner.pdf pp. 12-14, 41, 52, 61). So, let’s substitute “morphological similarity” [more precisely but too cumbersome: **homologous** morphological similarity] for “evolution” in the citations given in https://www.weloennig.de/KoalaPart2.pdf, pp. 1 and 7, keeping in mind that the expression stands also for all the other homologous similarities (which could likewise be inserted here) – see next page after the follwing inserts:

Richard Dawkins (and in principal agreement with him most Neo-Darwinians and all evolutionary biologists) stated[85]:

“Evolution is a fact. Beyond reasonable doubt, beyond serious doubt, beyond sane, informed, intelligent doubt, beyond doubt evolution is a fact. The evidence for evolution is at least as strong as the evidence for the Holocaust, even allowing for eye witnesses to the Holocaust.”

“The number of clues, the sheer weight of evidence, totally and utterly, sledgehammeringly, overwhelmingly strongly supports the conclusion that evolution is true - unless you are prepared to believe the Almighty deliberately faked the evidence in order to make it look as though evolution is true.”

My answer was this:

The “evolution is a fact” suggestion (“*Suggestion*” in the German sense of the word as especially applied in psychology) is echoed almost everywhere (articles, textbooks, radio- and TV-shows – I have been systematically observing such assertions). Jay Mathers Savage (97[42]), emeritus professor at the University of Miami and adjunct professor at San Diego State University, once noted, for example, that "No serious biologist today doubts the fact of evolution,…" – a statement endlessly repeated already a hundred years ago and perhaps even more often and emphatically during the more than sixty years after that assertion. Savage continued: “The fact of evolution is amply clear.” Also: “The fact of evolution is demonstrated on every side in all fields of biology.” And “***We do not need a listing of evidences to demonstrate the fact of evolution any more than we need to demonstrate the existence of mountain ranges***.”[43]

Well, positing (macro-)evolution on the same level of reality/actuality with the existence of mountain ranges – other Darwinians have put it on par with the fact that the **sun is hot**, the **earth is a sphere**, with **gravity** and other testable phenomena – **could lead to some perhaps humorous and captivating reflections by just swapping, for example, the mountain ranges for evolution**:

"***No serious geologist today doubts the fact of mountain ranges***, ... The fact of mountain ranges is amply clear. …The fact of mountain ranges is demonstrated on every side in all fields of geology … ***We do not need a listing of evidences to demonstrate the fact of mountain ranges any more than we need to demonstrate the existence of evolution***." May one not raise the question, for instance, which rational researcher would ever say such curious things defending the existence of mountain ranges, as if there was anything to defend? Or "***No serious astronomer today doubts the fact that the sun is hot, ... We do not need a listing of evidences to demonstrate the fact that the sun is hot any more than we need to demonstrate the existence of evolution***." And so on.

Or: “***Mountain ranges are a fact. Beyond reasonable doubt, beyond serious doubt, beyond sane, informed, intelligent doubt, beyond doubt mountain ranges are a fact***.”

“***The number of clues, the sheer weight of evidence, totally and utterly, sledgehammeringly, overwhelmingly strongly supports the conclusion that mountain ranges truly exist.***”

So, what is the basic difference between mountain ranges, that the sun is hot, the earth is a sphere, gravity etc. and evolution, so that no rational mind would ever try to compose such statements to defend the existence of the former phenomena (if ever doubted at all during the last 150 years) by comparing them to (macro-)evolution? Answer: All the various examples given to inculcate “the fact of evolution” into the mind of the reader/listener are – as already hinted at above – testable and demonstrable (scientifically and mostly also by personal experience, at least potentially) whereas evolution is definitely not: “These evolutionary happenings are unique, unrepeatable, and irreversible. It is as impossible to turn a land vertebrate into a fish as it is to effect the reverse transformation. The applicability of the experimental method to the study of such unique historical processes is severely restricted before all else by the time intervals involved, which far exceed the lifetime of any human experimenter” – Theodosius Dobzhansky.

Thus, evolution – including man as a descendant of extinct apes and hence a genetic cousin of the chimpanzee – cannot honestly be spoken of as a fact like mountain ranges, that the sun is hot, like gravity etc. It is definitely not “beyond reasonable doubt”, neither “beyond serious doubt”, nor “beyond sane, informed, intelligent doubt”.

[84] “**Richard Owen** coined the term "homology" in 1843 to describe structures that are the "same organ in different animals under every variety of form and function". For Owen, homology pointed to a shared underlying **archetype or divine plan**, rather than a shared ancestor and he used examples like the human hand and bat wing. In contrast to Owen's view, modern biology, heavily influenced by Darwin, defines homology as a similarity due to descent from a common ancestor, with analogous structures performing similar functions but not sharing a recent common origin.” Correect! AI 29 Oct. 2025. I’m using it in Owen’s sense.
[85] See literature references in the article just mentioned, to repeat: https://www.weloennig.de/KoalaPart2.pdf

So, would Dawkins have been right, if he had said: *"...history deniers who doubt the fact of morphological similarity are ignorant of biology*"? Yes, that's true. "*Morphological similarity is a fact. Beyond reasonable doubt, beyond serious doubt, beyond sane, informed, intelligent doubt, beyond doubt morphological similarity is a fact. The evidence for morphological similarity is at least as strong as the evidence for the Holocaust, even allowing for eye witnesses of the Holocaust*." Correct. Or: "*The number of clues, the sheer weight of evidence, totally and utterly, sledgehammeringly, overwhelmingly strongly supports the conclusion that morphological similarity is true*." Or Jay Mathers Savage: "*No serious biologist today doubts the fact of morphological similarity*." Also "*The fact of morphological similarity is amply clear*." And "*The fact of morphological similarity is demonstrated on every side in all fields of biology*." And "*We do not need a listing of evidences to demonstrate the fact of morphological similarity any more than we need to demonstrate the existence of mountain ranges*."

Okay. However, the problem with such statements would be, of course, that they are altogether unsurpassably simplistic truisms, which could be set on par with such stupendously information rich assertions like "no serious geologist today doubts the fact of mountain ranges."

My hypothesis for the (usually scientifically baseless) ***leap from morphological and further similarities to macro-evolution is this***: Materialist metaphysics and its *re-ligio* (*being bound to a postulate*) **translate these biological similarities directly into evolution thus generating a shortcut to the naturalistic world view *in the absence of real/testable proofs*** by, among other points, the incessant repetition of the slogan that "evolution is a fact", "beyond reasonabledoubt, beyond serious doubt" etc.

For more of the background see please again: https://www.weloennig.de/KoalaPart2.pdf

Convergence

In the context of the origin of Giraffa and convergence, Solounias and Ring (2007, p. 6) after stating that "*Palaeotragus* and *Samotherium* had medium in length necks like a modern gerenuk. Their limbs were short in comparison to the limbs of modern giraffe." And also that "There were two sivathere species of giraffes which were even larger than *Samotherium* and they had short necks and stalky limbs. ***None of these giraffids were ancestral to modern giraffe***", they continue to point out that:

> "In addition there was a species (***Bohlinia***) which resembled the modern giraffe in that it had long limbs and a long neck. **This species may not actually be related to modern giraffe and *in that case the long neck would be due to parallel evolution***. If that was the case, then there would be no ancestor of the modern giraffe found on Samos. *Schansitherium* is a species similar to *Palaeotragus*. *Birgerbohlinia* was like a sivathere but it was different in the limb."[86]

Concerning the anatomical peculiarities clearly differentiating *Bohlinia* from *Giraffa* Solounias has mentioned the following points (2024, p. 123[87] and 2025[88], p. 91):

> "*Bohlinia* has a long neck but **C7 is not specialized** (unpublished material). It is a long C7 but without ventral tubercles (where **the giraffe is specialized with a C7** that is exceptional in having ventral tubercles). In other words, the **C7 of *Bohlinia* is rather normal**. *What is untypical is the lack of a large a medial epicondyle on the femur*. In this respect, *Bohlinia* is unlike other giraffids. The femur resembles more that of a dromedary. Thus, ***Bohlinia* resembles a camel in limb posture and is rather different from the majority of the Giraffidae**. *Honanotherium* is now known by complete skulls from Gansu. They are very similar to *Bohlinia*. The metapodials were thicker and shorter than in *Bohlinia*…[89] The metapodials are **either medium or long in this subfamily**.

Solounias (2024, p. 94):

> "Presently I would suggest that *Bohlinia* was functionally more similar to a camel in the morphology of the foot. The medial epicondyle of the femur is also small in *Bohlinia*. These of course are **convergent**

[86] https://virtualexplorer.com.au/system/files/papers/00179/assets/the-samos-fossils.pdf
[87] Solounias, N. (2024): Anatomy and Evolution of the Giraffe – Parts Unknown. Cambridge Scholars Publishing. Newcastle upon Tyne, England. (194 pp.)
[88] Solounias, N. (2025): Putting Samotherium in its Place: The Morphology of Giraffids and the Geology of Samos. Cambridge Scholars Publishing. Newcastle upon Tyne, England. (269 pp)
[89] The author continuous to state: "*Giraffa* evolved in the Siwaliks of Pakistan. It migrated into Africa rather recently. *Bohlinia* evolved in the Pikermian Biome [Greece], and *Honanotherium* in the Beotian Biome [central Greece}." The author appears to imply that the differences between the genera are due to, or at least have something to do with, different environmental factors (geography and biocenosis). According to the fossil record so far known all three genera appear almost simultaneously and the problems involved in the phenomenon of convergence (see below) tell us that such an explanation would be insufficient without ID.

> with some similarity in function. This is important as the literature treats *Bohlinia* as the direct ancestor of Giraffa based on the long metapodials. In my opinion, ***Bohlinia* has a long neck and metapodials parallel to Giraffa**. ***Thus, we have two independent lineages reaching the elongated morphology***."

Moreover, in long-necked dinosaurs there are up to **40 independent lineages** reaching the elongated [neck] morphology.[90]

Above I have already emphasized that "Convergence is a deeply intriguing mystery, given how complex some of the structures are. Some scientists are skeptical that an ***undirected process like natural selection and mutation would have stumbled upon the same complex structure many different times***." (Meyer, Minnich, Moneymaker, Nelson, Seelke) and:

> "Now it is precisely the phenomenon of convergence that poses further major problems for neo-Darwinism. For if the one-time emergence of completely "adapted" organs or characteristics through selection of random mutations can hardly be explained, the multiple formation of similar organs elutes the Neo-Darwinian interpretation even further" (Henning Kahle).

See in the following reminder several additional improbabilities involved in convergence due to selection of accidental/haphazard/random DNA mutations:[91]

> Change Laura Tan: "Convergent evolution is unlikely to happen because it requires the simultaneous generation of multiple new genes – hundreds in the case of the echolocation in bats and whales (Parker et al. 2013), but gene generation via mutation and natural selection is improbable (Tan 2015). In addition, some of the genes functioning in the processes that are mosaic are taxonomically restricted essential genes whose function is indispensable for the survival of its carrier organism (Tan 2015, and references therein)."
>
> Lee Spetner: "The lack of uniqueness of the phylogenetic tree is usually explained away by what is called "convergent evolution." Convergent evolution is the appearance of the same trait or character in independent lineages. It is, however, an invention. It was invented solely to avoid addressing the failure of phylogenetic trees to support Common Descent. There is no theoretical support for convergence, and whatever evidence has been given for it is the product of a circular argument. Richard Dawkins (2010) seems to revel in describing numerous examples of convergent evolution without realizing that any of those examples destroy his case for evolution."
>
> Casey Luskin: "Biological similarity implies common ancestry, *except when it doesn't*."
>
> Stephen Dilley, Casey Luskin, Brian Miller and: "In Kojonen's view, convergence … "***refers to the independent evolution of the same biological outcome in two or more different lineages, beginning from different starting points*** (Kojonen 2021, p. 125)".
> … Kojonen clearly regards convergence as important. Recall that he believes "[e]xamples of convergence are ubiquitous in biology" (Kojonen 2021, p. 125). The reason that these examples are said to be 'convergent' is because, in general, multiple lines of evidence – typically from genetics, paleontology, biochemistry, systematics, and the like – indicate that ***it is difficult to form a coherent phylogenetic account of their origin from a given common ancestor.*** **These data count as anomalies under common ancestry.** ***That is why evolutionary biologists regard them as the result of convergent evolution***."
>
> Emily Reeves: "The first problem is that convergence needs not only to evolve certain complex proteins, traits, and systems but also to evolve these things on their own more than once. ***If proteins are rare and isolated (as our review establishes) and the chances of even a single short protein evolving once in the whole history of the earth are too low, then, all other things being equal, the chances of similar proteins evolving more than once are even lower.*** **This is amplified when scaled up to protein complexes, cell types, tissues, and organs, again demonstrating why the strength of the scientific evidence is crucial**."

[90] https://www.weloennig.de/SauropodDinosaur.pdf: A Brief Note on the Multiple Independent Origins of the Long Necks in Sauropod Dinosaurs: Neo-Darwinism or Intelligent Design?
[91] https://www.weloennig.de/KoalaPart2.pdf, pp. 8-10 and 11-12

On **convergence** you may also check the more than 300 scientifically critical articles up to the present at https://scienceandculture.com/?s=Convergence&site-current-site=1

Concerning **similarities and differences** see:

https://scienceandculture.com/?s=**similarities**
https://scienceandculture.com/?s=**differences**

Does Functional Synorganization in the Giraffe Speak for ID?

The following list is *just a modest beginning* of many more coadapted/synorganized features.

1. Hight up to almost 6 m: blood pressure must be extremely high to force blood up its long neck: Different values have been given for the level of blood pressure, even values up to: systole 340, diastole 230[92], systole even up to 350 according to evolutionary anatomist D. Starck (but see correction in the footnote[93]).

2. Requires a very strong heart displaying special features. Weight ca. 11 kg. Walls: diameter about 8 cm.

3. "...when the giraffe lowers its head to eat or drink, the blood rushes down and could produce such high pressure in the head that the blood vessels would burst. To counter this effect, the giraffe is equipped with a coordinated system of blood pressure controls" (Davis & Canyon).

4. Arterial walls much thicker than normal, specialized *rete mirabile* with extraordinarily elastic vessels.

5. "...the fluid that bathes the cells of the body is maintained at a high pressure; this is largely achieved by the thick skin, which is tightly stretched over the body and which functions like the **anti-gravity suit** worn by pilots of fast aircraft." (McGowan)

6. Large volume of air in the trachea. This air is unavailable for respiration and the space it occupies is the dead space. The dead space has a volume of about 2,5 l, the rate of ventilation has to be increased. A resting giraffe takes about 20 breaths per minute, man 12, elefant 10. (McGowan)

7. Many muscles, tendons, and bones had to be modified accordingly (could be a topic for a Ph.D.)

8. "...to prevent profuse bleeding... all arteries and veins in the giraffe's legs are very internal. The capillaries that reach the surface are extremely small, and the red blood cells are about one-third the size of their human counterparts, making capillary passage possible" (Hofland).

9. Ontogeny and birth modified (see an important point by Natterson-Horowitz in the footnote below).

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[92] R. Flindt 2000, p. 68 (in https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, p. 1, reference p. 122. In that book also most of the following citations).

[93] D. Starck 1995, p. 206: "...in giraffes the blood pressure in arteries near the heart is very high (systolic 260-350 mm Hg),
However, nowadays most often values about **280/180** are mentioned. More topics: Bob Holmes: https://www.smithsonianmag.com/science-nature/cardiovascular-secrets-giraffes-180977785/ (discussion of many additional details of synorganizations). See also the summary points in: Christian Aalkjær and Tobias Wang (2021): The Remarkable Cardiovascular System of Giraffes: https://www.annualreviews.org/content/journals/10.1146/annurev-physiol-031620-094629 For example on the legs: "**The legs** of the giraffe experience high arterial and venous pressures that may reach approximately **300 mm Hg and 130 mm Hg**, respectively, close to the hooves. (b) Cross sections (2 cm between sections) of hindlimb arteries. The conduit arteries in the hind legs of giraffes exhibit an abrupt narrowing around the position of the knee where the lumen becomes very small within a few centimeters. The site of this narrowing is surrounded by smooth muscle and appears to function as a sphincter that provides viscous resistance to blood flow and establishes a pressure gradient. (c) The sphincter appears densely innervated by sympathetic nerves (stained with S100), and we propose that the pressure reduction in the large conduit arteries is regulated by the sympathetic nervous system." … "Large Veins The femoral/tibial veins have bicuspid valves approximately every 3 cm (18) (this may also be the case in the brachial/median veins, but this has not been quantified) that must protect the capillaries during walking or running. This is emphasized by the dramatic finding that **venous pressure in the giraffe leg varies between −250 mm Hg and 240 mm Hg during walking**."

BBC (Bob Holmes 2021): "The giraffe has another trick to avoid heart failure: the **electrical rhythm of its heart differs from that of other mammals**." … "**Natterson-Horowitz** is now turning her attention to another problem that giraffes seem to have solved: high blood pressure during pregnancy, a condition known as preeclampsia. In people, this can lead to severe complications that include liver damage, kidney failure and detachment of the placenta."
https://www.bbc.com/future/article/20210803-how-giraffes-deal-with-sky-high-blood-pressure

Graham Mitchell (2021): The Blood Pressure of Giraffes. "As discussed in this chapter, giraffes have, compared with any other mammal, a **very high mean blood pressure of ~250 mmHg. Human blood pressure is ~90 mmHg**.
https://academic.oup.com/book/41222/chapter-abstract/350698950?redirectedFrom=fulltext&login=false

AI: "A giraffe's blood pressure is **approximately (280/180\) mmHg, which is about double that of a human's**. This high pressure is necessary to pump blood up its long neck to the brain, overcoming gravity. To manage this, giraffes have several adaptations, including a powerful heart, a unique heart rhythm, and physical features like tight skin on their legs that prevents blood pooling" **Legs**: The **tight skin on a giraffe's legs acts like built-in compression socks** to stop blood from pooling at the bottom and to assist the blood flow back up to the heart. (Retrieved 1 November 2025)

Jennifer Geer (2023): "A normal systolic blood pressure is 120 millimeters of mercury (mm Hg) or lower for humans. On the other hand, a **giraffe's blood pressure can range from 180 to 300 mm Hg.** https://a-z-animals.com/articles/discover-the-top-animals-with-highest-blood-pressure/

Solounias (2024, p. 32): "A common misunderstanding is that the carotid arteries of the giraffe have evolved valves. This is not true". However, the ***giraffe's jugular veins appear to display special features***. Aalkjaer et al (2025): Hemodynamics and Drinking in the Giraffe ("…the elastin/collagen ratio increased markedly from proximal to distal locations and paralleled the increase in compliance along the jugular vein.") https://onlinelibrary.wiley.com/doi/full/10.1111/apha.70046
https://sqonline.ucsd.edu/2024/10/from-savannah-to-science-what-giraffes-can-teach-us-about-treating-high-blood-pressure/ (2024/2025):"When compared to other mammals, the **FGFRL1 protein sequence of the giraffe appeared highly different and contained seven amino substitutions in areas that are crucial for FGF binding**."

10. For more: Check please "synorgan" (for synorganization and synorganized) in: *The Evolution of the Long-Necked Giraffe – What Do We really Know? Testing the Theories of Gradualism, Macromutation and Intelligent Design*[94]: https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf (there also the references).

11. "If a living being is to change for the better, absolutely everything about it must change" (B. Müller).[95]

12. A quantum mutation resulting in the duplication of a cervical vertebra (Solounias), is by definition, outside the scope of Darwinian and Neo-Darwinian gradualism ("insensibly fine steps" and "insensibly fine gradations" etc. – see above).

13. Unthinkable question: Do evolutionary biologists believe in miracles? "A miracle is an event that should appear impossible to a Darwinian in view of its ultra-cosmological improbability within the framework of his own theory. Now speaking of macromutations, let me observe that to generate a proper elephant [or giraffe], it will not suffice suddenly to endow it with a full-grown trunk [or neck respectively]. As the trunk [neck] is being organized, a different but complementary system – the cerebellum – must be modified in order to establish a place for the ensemble of wiring that the elephant [giraffe] will require to use his trunk [or neck]. These macromutations must be coordinated by a system of genes in embryogenesis" Paul M. Schützenberger.

14. For gradualism *cf.* p. 4 of *The Evolution of the Long-Necked Giraffe*:

> According to the theory of gradual evolution at least 1000 intermediate links are missing between the okapioid ancestor and Giraffa, conservatively estimated!
>
> Yet, if one applies Simpson's considerations to the growth rate of the 7 (8) neck vertebrae, etc. – more literally, i.e. with numerous links per millimeter – on can even postulate 10,000 or more transitional links (similarly Badlangana et al. 2009, see the details on p. 129 [of the book]).
>
> However, this still does not take into consideration the many other anatomical, physiological and ethological differences between *Giraffa* and *Okapia*, so that according to the theory of additive typogenesis numerous further links in other characters must be postulated between an okapi-like ancestor and the giraffe. For every one of these links, on the one hand, literally thousands of components (in rough numbers some 25,000 protein-coding genes and due to alternative splicing 90,000 proteins, 200 joints, 300 bones associated with 1,000 ligaments and 4,000 tendons, 700 muscles, 100 billion neurons constituting the nervous system, 100,000 km of blood vessels etc.) ***must remain so fine-tuned with each other that a functional and survivable organism is always guaranteed***. On the other hand, every one of these almost unnoticable steps that is supposed to improve adaptation, must 'fit' into the existing framework, that is, be able to be fully integrated into the existing synorganized structures. We are expected to assume that, in this manner, by the addition of thousands upon thousands of small steps, new species, genera, families, etc., even new body plans could arise. And all of this, it is believed, happened by random mutations (non-directional by definition), independently of each other and at numerous different genetic loci! I have discussed the improbability of such a process in detail in my work on the eye[96].

So, does functional synorganization (including irreducible and specified complexity) in the giraffe speak for ID? You, the reader, are invited to answer that question on the basis of the biological facts.

Question: So, why is a true evolutionary story not available?

Answer: Apart from the basic problems of historical investigation into the deep past, the answer is: Because in the Darwinian and Neo-Darwinian sense – i.e. continuous, gradual evolution by natural selection of random mutations over hundreds of millions of years without any intelligent direction – is so utterly improbable that many renowned biologists have come to the conclusion that it never happened at all. The giraffe's biology and fossil record corroborate this view.

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[94] Translated from German into English by Prof. Granville Sewell (see footnote above).

[95] See context in https://ad-multimedia.de/evo/long-necked-giraffe_mU.pdf, p. 57

[96] 2nd edition 1989 – internet-edition 2003: http://www.weloennig.de/AuIn.html; see also Wittlich 1991/2002: http://www.weloennig.de/NeoD.html as well as my contribution of 2006: http://www.weloennig.de/ShortVersionofMutationsLawof_2006.pdf, and Lönnig 2007, 2010). The result of these investigations is that the theory of additive typogenesis does not function, neither mathematically nor experimentally.

Further Questions and Anwers

1. Why does *Giraffa* appear in the Tortonian (11.63 Ma) in your figure above on the *Giraffe Fossil Record* although most authors assume that the decisive second step of elongation to *Giraffa camelopardalis* occurred "only" about 1 Ma ago?[97]

   First, I would point out that here I have followed the PBDB (Paleobiology Database) for *Giraffa*: "Maximum range based only on fossils: base of the Sarmatian to the top of the Holocene or 12.80000 to 0.00000 Ma, Minimum age of oldest fossil (stem group age): 11.63 Ma"[98] (includes, *Giraffa gracilis*, *G. priscilla*, *G. jumae*, *Camelopardalis sivalensis* and several others with comparable time specifications or even older).

   Second, even for the species *Giraffa camelopardalis* PBDB age information is up to 5.3 Ma is given (at least 3.6 Ma).[99]

   Third, giraffids with long necks astonishingly similar to *G. camelopardalis* appeared in strata dated to be even earlier/older than 11.63 Ma: Solounias and Ríos report on *Orea leptia* (2025, p. 1 and p. 13):

   > (P. 1) "We report a sample of postcranial material (13.6 to 11.4 Ma) from the Chinji Formation that merits the designation of a new genus and species: *Orea leptia* gen. nov. sp. nov. … The elongated metapodials and the morphology of the atlas suggest that **it is another long-necked giraffid**. The slender and elongated metapodials are characteristic of the Giraffinae subfamily. Our comparative analysis with several taxa, including specimens from the Chinji Formation and other Giraffidae, indicates that the morphology of Orea leptia gen. nov. sp. nov. is most similar to that of the Giraffinae."

   P. 13 on the atlas:

   > "The atlas of *Orea* is similar in proportions to that of *Giraffa camelopardalis* and is nearly identical in length (Fig. 5). Short necks possess an atlas which is wider than long. The *Okapia* neck represents this type of short neck morphology. In *Palaeotragus* and *Samotherium*, where the necks are slightly elongated, the atlas is not as long as the one in question (Danowitz, Domalski, et al., 2015). **Using these data, the neck was inferred to be long**. ***Long necks would be expected with the very long metapodials. When the metapodials are this long, the animal would be unable to reach water sources unless the neck was proportionally elongated as well*** (Danowitz & Solounias, 2015). This data again suggest that this species was similar in form to the Giraffa, although smaller. Long necks imply long metapodials."

   Also, pp. 5 and 13. Just a few more keywords for additional similar anatomical structures:

   > "The calcaneus shows a long tuber calcis, and the fibula is **notably similar to that of *Giraffa***." … "The tuber calcis of the calcaneus is long and the fibula is **remarkably similar to *Giraffa***." … "The fibula or malleolar is **remarkably similar to that of *Giraffa***." "The foramen for the vertebral artery is oval in this species, **similar to the vertebral artery foramen found in Giraffa**. **The atlas is long as in Giraffa** (Fig. 5B)". P. 13: … "The similar lengths of the radius and tibia in *Orea* suggests the **sloping back outline of the body as in Giraffa**, though slightly less pronounced." … P. 15: "The ratios of distal width to minimal width of the metatarsal were found to be similar in *Giraffa* and *Orea*, at 1.89 and 1.86 respectively."

   And many more similarities. There are of course also several differences. For all the anatomical similarities and differences check please the original paper.

   Now, if one does not want to put *Orea* into the category of convergently arisen long-necked giraffids, it really was a ***Giraffa***. By the way, I think it's not without risk to infer from these relatively few fossils a completely new genus and species of the subfamily Giraffinae. Question on variation: Perhaps the few specimens at the Peabody Museum of Harvard belong to just a very small group, just a few individuals, of most likely many Mendelian recombinants displaying the "slenderest metatarsal among ruminants

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[97] *Cf.* https://www.weloennig.de/GIRAFFA.Samotherium.pdf
[98] https://paleobiodb.org/classic/checkTaxonInfo?taxon_no=133600&is_real_user=1
[99] "When: Chiwondo Formation, Pliocene to Pliocene (5.3 - 0.0 Ma)": https://paleobiodb.org/classic/basicCollectionSearch?collection_no=22323&is_real_user=1 "ETE dating method: time unit, ETE age comment: Max age = 8.6;Min age=3.76-2.0 Ma for Unit 3A" (Retrieved 3 November 2025)

(Giraffidae, Mammalia)"? Also, modifications due to environmental factors could play a role. In this context, let's think of ***the enormous variation in many animals and in humans*** (and how many genera and species Haeckel had once "identified" in the latter)[100].

Presupposing the Neo-Darwinian evolutionary theory, Solounias and Ríos interestingly state in their conclusions (p. 17) that "Our analysis, focused on postcranial material, ***confirms Orea leptia as a longnecked giraffid***, with elongated metapodials characteristic of the Giraffinae subfamily. Phylogenetic assessment further supports this classification, positioning *Orea leptia* within the Giraffinae clade, suggesting its close proximity to the ancestor of all Giraffinae species."

Incidentally, this would rule out *Samotherium major* from being an '*Intermediate-Necked "Real Missing Link*"' – not only for all the reasons given at https://www.weloennig.de/GIRAFFA.Samotherium.pdf – but now also from the geologically temporal perspective.

2. Besides the ingeniously designed *Okapia* and *Samotherium*, are there any other geraffids with slightly elongated cervical vertebrae? Answer: *Palaeotragus*[101], *Shansitherium*[102], *Helladotherium*[103], *Honanotherium*[104]. None of them belongs to the evolutionarily postulated lineage of *G. camelopardasis*. Also, **Correlation** with overall size appears to be an important part of the answer. See, for example ***the strong length differences in the cervical vertebrae in dogs***: https://www.weloennig.de/Hunderassen.Bilder.Word97.pdf, skeletons p. 43. The same is certainly true in humans: https://www.weloennig.de/Hippo.pdf *cf*. p. 22.

3. Is the *Geological Time Scale* really so absolutely sure as usually asserted? Although I noted a few cases of contradictory time information above for the *Giraffe Fossil Record*, at present I'm going to let that question open. Nevertheless, in the footnote you'll find some links on interesting but controversial points.[105]

4. Why have so many life forms become extinct?

   As for the giraffids: See the photos of bone beds by Nikos Solounias 2025, pp. 93-99 ("The age, geology and stratigraphy of the Samos bone beds"), 122-125 ("a 40 m bone bed" and others displayed at the Hezheng Museum). There are strong reasons to infer that catastrophic events were involved in these phenomena.[106]

   In general: Immanuel Velikovski (1955): Earth in Upheaval. Doubleday Edition. Pocket Book Edition 1977. New York. Archive see Footnote.[107] Check in the book, for instance, "Siwalik".

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[100] See, for example: https://www.weloennig.de/Hippo.pdf pp. 19-21ff. See perhaps also: https://www.stern.de/neon/wilde-welt/aegypten--wenn-der-groesste-mann-auf-die-kleinste-frau-der-welt-trifft-7839976.html, https://www.spiegel.de/fotostrecke/guinness-buch-der-rekorde-groesster-und-kleinster-mann-treffen-sich-fotostrecke-121068.html
Cf. also the discussion on Species Concepts and the Origin of Species here: https://www.weloennig.de/Artbegriff.html

[101] https://en.wikipedia.org/wiki/Palaeotragus (with photo of reconstruction of the skeleton)

[102] https://artsandculture.google.com/asset/shansitherium/EAFesdhpgE6oaA?hl=en

[103] https://okapia.wordpress.com/category/okapi/ (see Fig. 114)

[104] https://en.wikipedia.org/wiki/Honanotherium
For a comparison with the skeleton of the Okapi see https://www.flickr.com/photos/39379354@N03/38232768214 (Retrieved 4 November 2025) and https://www.zobodat.at/pdf/abh-berichte-mus-nat-heimatk-magdeburg_II_0433-0441.pdf (Tafel XV)

[105] https://www.weloennig.de/HumanEvolution.pdf, pp. 27-32; https://www.weloennig.de/Dr.med.X.pdf, pp. 9-12,14; and from the present geological and evolutionary point of view probably one of the most astounding anomalies ever found: https://newgeology.us/presentation48.html

[106] Solounias, N. (2025): Putting Samotherium in its Place: The Morphology of Giraffids and the Geology of Samos. Cambridge Scholars Publishing. Newcastle upon Tyne, England. (269 pp). Explanations by Solounias 2007, p.11 (Not fully satisfying): "It is frequent that rains follow droughts and bones can be transported by water in small rivers. In torrential rains sheets of water can traverse the land outside river banks sweeping bones. These are termed flash or sheet floods. Subsequently, some of the bones can be washed into a low spot by floods. Bones would accumulate due to periodic droughts. Another explanation is that bones accumulating in a region where numerous animals live or pass by. Depressions in areas where animals live would enhance burial. Many of the Samos fossils are well preserved and often are skulls which are fragile. This implies rapid burial after death."
https://www.researchgate.net/publication/250275770_Samos_Island_Part_II_Ancient_history_of_the_Samos_fossils_and_the_record_of_earthquake

[107] Entire book: https://archive.org/details/vlkvsky/Earth%20in%20Upheaval%20by%20Immanuel%20Velikovsky%20%281955%29/page/n5/mode/2up

See perhaps also several captivating points by the evolutionary paleontologist David M. Raup (1991): *Extinction. Bad Genes or Bad Luck*? Introduction by Stephen Jay Gould. W.W. Norton & Company, New York.

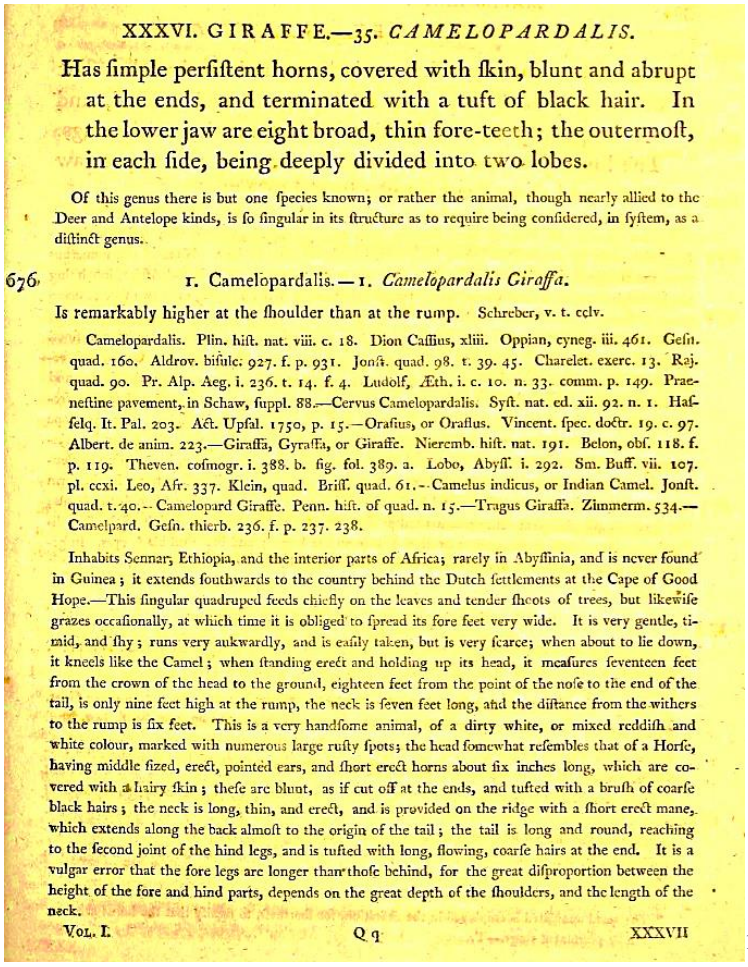
AI: “Earth's timeline of mass extinction events includes the Late Ordovician (~444 mya), Late Devonian (~364 mya), End Permian (~252 mya), End Triassic (~201 mya), and End Cretaceous (~66 mya) events, with the Holocene extinction currently underway and caused by human activity. Each major event had a distinct cause, from volcanic activity and climate change to asteroid impacts.” (Retrieved 4 November 2025)

See also: https://en.wikipedia.org/wiki/List_of_extinction_events

Cf. for some further aspects perhaps also https://www.weloennig.de/NeoB.Ana2.html (2002); https://www.weloennig.de/DynamicGenomes.pdf, p. 115 (2004) as well as the several of the **more than 300 articles** up to the present (2025): https://scienceandculture.com/?s=Extinction

Moreover, it is no secret that many people accepting the *Bible as History* are convinced that the *Genesis Flood* was especially involved here (see, for example The Mammoth and the Flood: 17 volumes in: http://www.hanskrause.de/indexEnglish.htm).

Robert Kerr (1792):



XXXVI. GIRAFFE.—35. *CAMELOPARDALIS.*

Has ſimple perſiſtent horns, covered with ſkin, blunt and abrupt at the ends, and terminated with a tuft of black hair. In the lower jaw are eight broad, thin fore-teeth; the outermoſt, in each ſide, being deeply divided into two lobes.

Of this genus there is but one ſpecies known; or rather the animal, though nearly allied to the Deer and Antelope kinds, is ſo ſingular in its ſtructure as to require being conſidered, in ſyſtem, as a diſtinct genus.

676 1. Camelopardalis.—1. *Camelopardalis Giraffa.*

Is remarkably higher at the ſhoulder than at the rump. Schreber, v. t. cclv.

Camelopardalis. Plin. hiſt. nat. viii. c. 18. Dion Caſſius, xliii. Oppian, cyneg. iii. 461. Geſn. quad. 160. Aldrov. biſulc. 927. f. p. 931. Jonſt. quad. 98. t. 39. 45. Charelet. exerc. 13. Raj. quad. 90. Pr. Alp. Aeg. i. 236. t. 14. f. 4. Ludolf, Æth. i. c. 10. n. 33. comm. p. 149. Praeneſtine pavement, in Schaw, ſuppl. 88.—Cervus Camelopardalis. Syſt. nat. ed. xii. 92. n. 1. Haſſelq. It. Pal. 203. Act. Upſal. 1750, p. 15.—Oraſius, or Oraſius. Vincent. ſpec. doctr. 19. c. 97. Albert. de anim. 223.—Giraffa, Gyraffa, or Giraffe. Nieremb. hiſt. nat. 191. Belon, obſ. 118. f. p. 119. Theven. coſmogr. i. 388. b. fig. fol. 389. a. Lobo, Abyſſ. i. 292. Sm. Buff. vii. 107. pl. ccxi. Leo, Afr. 337. Klein, quad. Briſſ. quad. 61.—Camelus indicus, or Indian Camel. Jonſt. quad. t. 40.—Camelopard Giraffe. Penn. hiſt. of quad. n. 15.—Tragus Giraffa. Zimmerm. 534.—Camelpard. Geſn. thierb. 236. f. p. 237. 238.

Inhabits Sennar, Ethiopia, and the interior parts of Africa; rarely in Abyſſinia, and is never found in Guinea; it extends ſouthwards to the country behind the Dutch ſettlements at the Cape of Good Hope.—This ſingular quadruped feeds chiefly on the leaves and tender ſhoots of trees, but likewiſe grazes occaſionally, at which time it is obliged to ſpread its fore feet very wide. It is very gentle, timid, and ſhy; runs very aukwardly, and is eaſily taken, but is very ſcarce; when about to lie down, it kneels like the Camel; when ſtanding erect and holding up its head, it meaſures ſeventeen feet from the crown of the head to the ground, eighteen feet from the point of the noſe to the end of the tail, is only nine feet high at the rump, the neck is ſeven feet long, and the diſtance from the withers to the rump is ſix feet. This is a very handſome animal, of a dirty white, or mixed reddiſh and white colour, marked with numerous large ruſty ſpots; the head ſomewhat reſembles that of a Horſe, having middle ſized, erect, pointed ears, and ſhort erect horns about ſix inches long, which are covered with a hairy ſkin; theſe are blunt, as if cut off at the ends, and tufted with a bruſh of coarſe black hairs; the neck is long, thin, and erect, and is provided on the ridge with a ſhort erect mane, which extends along the back almoſt to the origin of the tail; the tail is long and round, reaching to the ſecond joint of the hind legs, and is tufted with long, flowing, coarſe hairs at the end. It is a vulgar error that the fore legs are longer than thoſe behind, for the great diſproportion between the height of the fore and hind parts, depends on the great depth of the ſhoulders, and the length of the neck.

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[108]

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[108]Robert Kerr (1792): The animal kingdom, or zoological system, of the celebrated Sir Charles Linnæus. containing a complete systematic description, arrangement, and nomenclature, of all the known species and varieties of the mammalia, or animals which give suck to their young https://archive.org/details/animalkingdomorz00linn/page/304/mode/2up