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The Evolution of the Long-Necked Giraffe (*Giraffa camelopardalis* L.) – What Do We Really Know?

(Part 1)

Giraffe, maximum values: life expectancy 34 years, height 5.80m [5.82], weight 1200 kg, speed 52 km/hr, [and general data:] ruminant, dental formula 0033/3133 (like the chamois), 66 heartbeats/minute, blood pressure in mm Hg: **systole 340, diastole 230** (average), age of sexual maturity: 6-7 years, gestation period 431-465 days (data so far according to Rainer Flindt 2000), 8 neck vertebrae (!), not 7 as reported in almost all textbooks (Nikos Solounias 1999, 2000), chromosome number 2n=30 (okapi 2n=44, 45 46).

"No data from giraffes then [in Darwin's time] existed
to support one theory of causes over another, and none exist now."
"…ancestral species are relatively short necked, and the spotty evidence
gives no insight into how the long-necked modern species arose."
"The standard story, in fact, is both fatuous and unsupported."

Stephen Jay Gould

Summary: In the following article the assertions of three supporters of the synthetic theory regarding the evolution of the long-necked giraffe will be discussed: the statements of Ulrich Kutschera, Richard Dawkins and Kathleen Hunt.

1. Ulrich Kutschera made the following statement regarding the origin of the giraffe, on November 29, 2005 in 3SAT [a German TV channel]: "...the evolution of the long-necked giraffe can be reconstructed through fossils." According to today's best giraffe researchers, *all fossil links that could show us the gradual evolution of the long-necked giraffe from the short-necked giraffe are missing*, apart from the insufficiently answered question of causes. Some paleontologists postulate a "neck elongation macromutation" to explain the origin of the long-necked giraffe.

2. Richard Dawkins likewise considers – in a striking exception to his usual theoretical framework – the origin of the long-necked giraffe through a macromutation. *This exception would naturally be fully unnecessary, if the gradual evolution of the long-necked giraffe could really be reconstructed through fossils*, especially since he much prefers the gradualist view. Dawkins draws the okapi, in relation to the *Giraffa*, nearly twice as large as it really is. In this way, the problem of its evolution (the gap between the two forms) appears only half as large. One may well ask if this technique is useful in the search for truth.

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3. Kathleen Hunt however, in her often-cited work *Transitional Vertebrate Fossils FAQ,* leaves no doubt that the origin of the giraffe is clearly and completely solved by the synthetic theory (gradual evolution through mutations, recombination and selection). When one looks at her reasoning more closely, however, one encounters numerous holes and problems and *the fossil evidence for the gradual evolution of the long-necked giraffe is — as expected — completely lacking.* A detailed analysis of her work shows, therefore, that the strong impression that one receives on a first reading concerning the continuous evolution of the giraffe stands in stark contrast to the current paleological facts.

The data so far obtained show that there are many suggestive but untestable hypotheses and that we really know nothing about the evolution of the long-necked giraffes. Moreover, a close examination of the evidence reveals several deep problems for any of the current hypotheses explaining the origin of theses species exclusively by mutations and selection.

1a. Ulrich Kutschera on the Evolution of the Giraffe

On the evolution of the giraffe, Ulrich Kutschera asserted in the TV-3SAT-science programme *Nano* Nov 19, 2005[(1)], reacting to a clip from the film by Fritz Poppenberg *Is the Bible right after all?* – in which the origin of the long-necked giraffe is presented as a problem for the synthetic theory of evolution – the following points (my emphasis according to the oral TV-statement):

> "We know 20-million-year-old fossils, fossil giraffes, short-necked forms, from which the long-necked giraffes inhabiting the savannah, as well as the short-necked giraffes which inhabit the forest, have evolved. That is, *the evolution of the long-necked giraffe can be reconstructed from fossils.* We are dealing with a false statement in this film."

Before and after the "false statement", Kutschera made a short pause for stronger emphasis (a clarification on the question of the origin of synorganization (co-adaptation) and why the bull giraffes are generally more than 1 m taller than the cows, however, was not offered.)

Let us look more closely at the currently known facts, and let the reader decide, based on these facts, who has – according to the current state of knowledge – actually made unproven assertions in this matter. Regarding the fully inappropriate concept of the "false statement" ("consciously false statement (punishable)“ – Wahrig) – see the detailed footnote[(1a)]. (The first part of this text is in several points taken from the document http://www.weloennig.de/Giraffe.html, though expanded and modified).

In comparison to the long-necked giraffe, Petzsch remarked about the okapi (Urania/Rowohlt: Säugetiere Bd. 3, 1974, p. 412): "Completely different, the appearence of the short-necked, or forest giraffe, is more similar to the horse, cow or antilope." The okapi has a height of 150-170 cm, the Giraffe 390-450 cm (cow) and 450-580 cm (bull).

According to the theory of additive typogenesis (G. Heberer) through many small steps of adaptive character and, as Mayr says, through mutations with "*slight or even invisible effects on the phenotype",* numerous intermediate forms must be postulated just *for the height difference* between *Okapia* (or rather, a postulated *Okapia*-like

ancestor) and *giraffa*. "Macroevolution (evolution between species) is composed of **numerous small microevolutionary steps** (**additive typogenesis**)" – Kutschera 2001, p. 250. Or: "**Uncountable successive small microevolutionary steps** have led to large changes in the body forms of organisms in the course of millions of years **(macroevolution, concept of additive typogenesis)**" – Kutschera 2006, p. 204 (my boldface).

Darwin had already postulated "infinitesimally small variations", "steps not greater than those separating fine varieties" and "insensibly fine steps" for evolution, "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".

Ulrich Kutschera speaks of (2006, pp. 34/35) "the phylogenetic development of the body form of the African long-necked giraffe according to the principle of Darwin/Wallace of natural selection" as follows:

> "Starting from the short-necked giraffe, which is found in the fossil record (for example, okapi-like forms such as *Palaeaotragus*, about 20 million years old), Darwin (and Wallace) proposed the following scenario: The original short-necked forms comprised large, variable populations. Under the selection pressure of droughts and leaf shortages, those variations with longer necks and forelegs survived and reproduced preferentially. In this way, over the course of generations, these large mammals adapted to their special environment have arisen. (DARWIN 1859/1872 and 1871). More recent research has shown that sexual selection has also played a role: male giraffes with especially long necks are dominant and mate with more fertile females than their shorter-necked competitors. In accordance with this naturalistic model, the long-necked varieties have gradually established themselves over thousands of generations throughout the African giraffe population."

Since Kutschera himself offers no naturalistic alternative to this example, but only adds the hypothesis of sexual selection[(1b)] to the gradual evolution over thousands of generations, and as he refers approvingly to the thesis of additive typogenesis in various places in his work (see for example the citations above), one is not unjustified in assuming that he favors this explanation, in agreement with his TV-3SAT-statement[(1c)].

The question of selection pressure and sexual selection, discussed in the above citation, will be more closely considered in the second part of this paper, as well as the question of to what extent Darwin himself was prone to a Lamarkian interpretation in his considerations.

How many intermediate forms should a hypothesis of gradual evolution lead us to expect?

If we estimate *only one intermediate form for each centimeter* and if we take into account the variations within each species, we conclude that there were, say, about **200 missing intermediate forms** (assuming only 2 m difference between "small giraffes" and large okapis). Since G. G. Simpson, a proponent of the synthetic theory of evolution, estimates a growth rate in horse teeth of about one millimeter per million years, and assumes that even this millimeter is gradually bridged through numerious intermediate forms (cf. Artbegriff 1993, p. 448), one can ask, to what extent this estimate could be applied to the growth rate of the length of neck vertebrae and other bones. Using such calculations, there are even more intermediate forms

required: *According to the theory of gradual evolution* **at least 1000 links are missing between the okapioid ancestor and *Giraffa,* conservatively estimated!**

If one applies Simpson's considerations to the growth rate of the 7 neck vertebrae, etc. – more literally, i.e. with numerous links per millimeter – on can even postulate 10,000 or more links.

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 characteristics) 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 (genes, hormones, skeletons, muscles, nerves, etc.) must be so fine-tuned with each other and preserved, 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 the adaptation, must 'fit' the existing framework, that is, be able to be fully integrated into the existing synorganized structure. We are expected to assume that, in this manner, through 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 through chance mutations (non-directional by definition), independently of each other and at numerous different genetic loci! I have discussed in detail the improbability of such a process in my work on the eye (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 1995/2003: http://www.weloennig.de/Gesetz_Rekurrente_Variation.html). ***The result of these investigations is that the theory of additive typogenesis is neither mathematically nor experimentally functional.***

Incidentally, the okapi already shows nicely the phenomenon of co-adaptation. In the okapi not only the neck is somewhat lengthened, but also the legs, and the anatomical features are fine-tuned to work together.

When we now move to the paleontology of the giraffe, and investigate Kutschera's above-cited claims, as well as his thesis of additive typogenesis, let me state that for this discussion I accept all time stipulations as "given" and investigate the weak points and contradictions of the synthetic theory, essentially depending on mutations, recombination and selection, on this assumption. A critical scientific treatment of the time-question lies beyond the scope of the present work.

1b. On the Paleontology of the Giraffe

"Several distinct forms have been preserved as fossils, though most are still not very similar to the two modern representatives of the family" (Cox et al. 1989, p. 280). Long-necked giraffes, according to Carroll, first appear in the middle Miocene era (Carroll 1993, p. 629; see also the discussion below on K. Hunt).

There are, however, many evolutionary statements that leave the impression that we already know the whole story: "The family of Giraffidae, which today is represented

by only 2 genera (1 species each) in sub-Saharan Africa, arose from primitive, antlerless deer in the Miocene era" (Siewing 1985, p 553/554); Storch and Welsch claim 1991, p. 673 likewise, that giraffes “derive from primitive deer“ (see also their edition of 2003). In Herder/Spektrum Biologielexikon (1994, Vol. 4, p. 67, also 2001) the giraffe is perhaps more cautiously spoken of as an even-toed ungulate "which presumably developed in the early Miocene from deer-like hoofed animals (Palaeomerycidae)" or more clearly with the words of a Spanish researcher "***Probably*** the giraffe family evolved from the *Climacoceras*;...". Similarly, Mitchell and Skinner (2003) write, “These ancestors [of the modern giraffes] ***appear*** to have arisen from the gelocid ancestral assemblage of 20-25 Mya via the family Palaeomerycidae“ (my boldface, in the following quotation as well). After the introductory remark **”The origin, phylogeny, and evolution of modern giraffes (*Giraffa camelopardalis*) is obscure”**, they present, however, questionable evolutionary theses, which I will return to examine in the second part of this work.

The fact is, in any case, that *no continuous series of fossil links leads to the Giraffa or Okapia*. "The giraffe and the okapi of the Congo rain forest are considered as sister groups**, *the origins of which are still not known***" (Devillers and Chaline 1993, p. 247). Similarly Starck 1995, p. 999 remarks: **“The ancestry of Giraffidae is disputed.”**

Wesson (1991, pp. 238/239) agrees with these statements about giraffe fossils, as follows (as ever, my boldface):

> "The evolving giraffe line left no middling branches on the way, and **there is nothing, living or fossil, between the moderate neck of the okapi and the greatly elongated giraffe**. The several varieties of giraffe are all about the same height. There are a number of fossil giraffids with more or less the shape of the okapi; it would seem that one of them rather suddenly took off and grew to the practical limits of a giraffe."

But what scientific evidence is there for the claim that one of these rather suddenly – or according to synthetic evolutionary theory, very gradually – took a new path that led to the to lofty giraffe height? I will come back to this below and in Part 2.

I have written a number of paleontologists who are most familiar with mammal paleontology asking them the following question: “Is there a series of intermediate fossil forms between the short-necked (like *Okapia*) and long-necked giraffes (*Giraffa*)?“ None of these evolutionary biologists was able to answer 'yes', although no doubt they would gladly have done so, if such links existed – not to mention that, in this case, the intermediate fossil forms would be published in every evolutionary textbook.

Dr. X, a paleontologist and evolutionary biologist, who, according to his own statement has carefully studied and documented the fossil neck vertebrae of the Giraffidae, but would like to remain anonymous (“I am sure you understand how delicate this point is”), answered this question in an e-mail to me on March 3, 2006, as follows:

> **“They [the fossil cervical vertebrae] are all short except of those of *Bohlinia attica* from Pikermi (Miocene of Greece) and *Giraffa*. *Bohlinia* is just as long as *Giraffa* and certainly not an intermediate.** There are differences in the short vertebrae of the various species. These

> vertebrae are a few and not connecting any of the fossil taxa to *Giraffa*. The okapi is not related in any way to any of the fossils and there are no fossil okapis."

And a couple of hours later: "The variation in the short-necked extinct forms is interesting **but not leading to long necks**."

Dr. X is thus in agreement with Wesson, Devillers, Chaline, Starck and in general with those evolutionary biologists who have to date commented on this matter, but who have refrainded from making firm, but completely unproven statements about fossil links. (See also Dr. Y and Dr. Z, p. 18 of this article, last paragraph, and the supplement from April 23, and May 1, 2006, footnote 1d and 3.)

The assertion of Charles Devillers (1914-1999) and Jean Chaline (1937-), however, that the oldest giraffes were the largest, is contested by Dr. X ("incorrect"). I have so far not been able to check the evidence on which Devillers and Chaline have based their following statement: "The oldest fossils attributed to the genus *Giraffa* date from the end of the upper Miocene in east Africa, some 10 million years ago. They are assigned to the species *Giraffa jumae*, which was larger than the largest present giraffe (*G. (c)amelopardalis*)". "...the palaeontological record shows that in the oldest deposits, the giraffe was represented by specimens which exceeded in size even the largest current giraffes. This is in contradiction to what we might expect from theoretical considerations on evolutionary trends, such as an apparent general increase in size. The evolution of the giraffe therefore appears to represent a particular case" (Devillers and Chaline 1993, p. 247 and p. 207).

Under the assumption that these authors, both respected biologists with numerous publications - Devillers for example has co-authored with Grassé (Grassé, Pierre-P, and Charles Devillers, 1965, Zoologie. Vol. 2: Vertébrés, 1129 pp., Masson et Cie, Paris 1965; or Charles Devillers and P. Clairambault: Précis de zoologie: vertébrés, tome I: Anatomie comparée, Masson 1976, 2. Auflage) and Chaline is one of the more important vertebrate paleontologists of our time (http://fr.wikipedia.org/wiki/Jean_Chaline), - have not simply invented this claim, I will let this contradictory statement stand, and examine it later.

Supporters of the synthetic theory of evolution will probably object that the fossil material here is still much too fragmentary. *The sudden appearence of new forms is however also confirmed in the best-preserved animal groups*. The paleontologist Oskar Kuhn from the University of Munich remarked on this question already in 1965, p. 5 (similarly 1981 pp. 53/54; further documentation of mine 1993/2003, pp. 314 -324, and 1998/2003, italics and spacing by Kuhn):

> "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*".

Also, it should be remarked that the paleological material in the case of the giraffe is likewise by no means as incomplete as is generally assumed. In fact, Mikael Fortelius, Professor of Evolutionary Palaeontology in Helsinki, provided a fossil list for the Giraffidae of some 62 pages, with more than 500 findings in hundreds of locations (partly from http://www.helsinki.fi/science/now/) and this list is still by no means complete. It is also noteworthy that numerous genera and species of this family are only known through fossils (see discussion on Hunt below).

The interested reader can find a couple of other interesting points about the giraffe, from the year 2005, at http://en.wikipedia.org/wiki/Giraffa_camelopardalis

2. Richard Dawkins on the Evolution of the Giraffe

Dawkin's book CLIMBING MOUNT IMPROBABLE, original drawings by Lalla Ward, Viking, Published by the Penguin Group (1996), contains a discussion on the origins of the giraffe (pp. 91-93) which includes the following illustration (strongly reduced, p. 92):

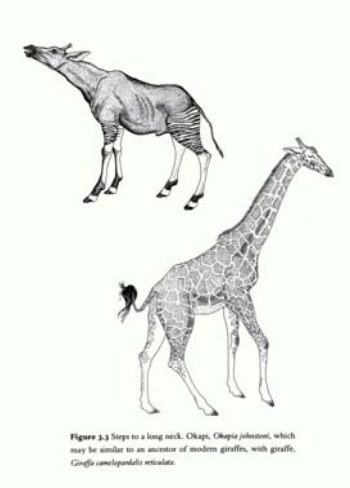
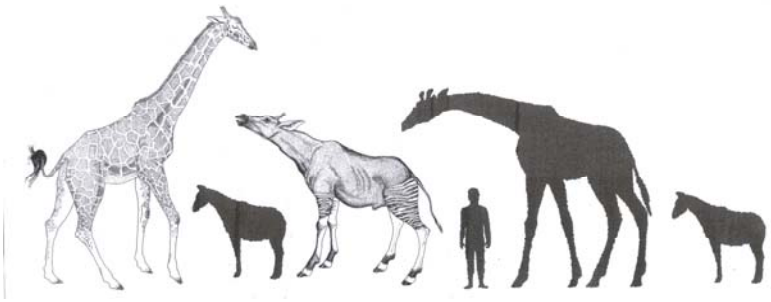


Figure 3.3 Steps to a long neck. Okapi, *Okapia johnstoni*, which may be similar to an ancestor of modern giraffes, with giraffe, *Giraffa camelopardalis reticulata*.

In the book ANIMALS OF OUR WORLD (1988), Bertelsmann Lexikothek, however, the true relative sizes are shown as follows (p. 512, the **silhouettes** on the right side, of man, giraffe and okapi):



On the left side I have placed Dawkin's illustration for comparison, but with the okapi placed on the same level as the giraffe (cf. Dawkins illustration above). In between, I have repeated the drawing of the okapi with its real relative size shown (silhouette).

From Dawkin's portrayal one naturally gets the impression that the step from okapi to long-necked giraffe is slight, and the text reinforces this impression. The placement of the okapi in Dawkin's book above the giraffe also makes it appear larger than if it were placed on the same level as the long-necked giraffe.

If an intelligent design proponent used such methods – what objections would be raised for example by the “AG Evolutionsbiologie”, a group of German evolutionary biologists? [German: AG= Arbeitsgemeinschaft: team, study group.]

Here are some excerpts from Dawkin's text (p. 91) on the evolution of the giraffe, with comments from me:

> "Giraffes have evolved from an ancestor rather like a modern okapi (Figure 3.3)."

Here Dawkins offers as fact a hypothesis which still needs to be scientifically investigated. This is not scientifically admissible, otherwise one could interchange all possible hypotheses with facts (current example: "It could be a case of bird flu", or "It is a case of bird flu" – an important difference![2]). Even if "conceivable", there is still a categorical difference between a hypothesis and a scientifically proven fact. For example, it is also conceivable (though not in accord with the intentions of Dawkins), that the okapi arose "from an ancestor like a modern giraffe”.

As mentioned above, Figure 3.3 presents the relative sizes unrealistically: The real okapi is substantially smaller in comparison to the giraffe than that presented by Dawkins to support its evolutionary derivation. Dawkins continues:

> "The most conspicuous change is the elongation of the neck. Could this have come about in a single, large mutation? I hasten to say that I am sure it didn't."

Thus Dawkins believes also in this case in his idea of gradual evolution! In the next sentence, however, he qualifies this:

> "But that is another matter from saying that it couldn't."

OK! In the following sentences, Dawkins develops a sort of macromutation theory on the origins of the giraffe, although he is sure that this theory is not correct (did the elongation of the neck come about by a single large mutation? "...I am sure it didn't"). He simplifies the biological problems to a degree that is tolerable for evolutionary theory, but not realistic with regard to the biological facts (italics by Dawkins):

> "A Boeing 747 mutation like a brand-new complex eye - complete with iris diaphragm and refocusable lens, springing from nothing, like Pallas Athene from the brow of Zeus — that can *never* happen, not in a billion billion years. But, like the stretching of the DC8, the giraffe's neck could have sprung out in a single mutational step (though I bet it didn't). What is the difference? It isn't that the neck is noticeably less complicated than the eye. For all I know it may be more complicated. No, what matters is the complexity of the *difference* between the earlier neck and the later one. This difference is slight, at least when compared with the difference between no eye and a modern eye. The giraffe's neck has the same complicated arrangement of parts as the okapi (and presumably as the giraffe's own short-necked ancestor). There is the same sequence of seven [eight in *Giraffa* — note by W.-E. L.] vertebrae, each with its associated blood vessels, nerves, ligaments and blocks of muscle. The difference is that each vertebra is a lot longer, and all its associated parts are stretched or spaced out in proportion."

Only in the fantasy world of evolutionary theory are things as simple as that. In the world of biological realities, on the other hand, things are different:

"For rumination, semi-solid food [pulp, mash] must be forced over 3 m high from the reticulum stomach to the mouth!" (Bertelsmann Lexikon der Tiere 1992, p. 259.) For this, the giraffe is equipped with a *special muscular esophagus*. "The uniform circulation of blood to the different body parts makes several adaptations of the heart, arterial and venous systems necessary" (Grosse Encyclopedie der Tierwelt 1988, p. 303). To avoid cerebral hypoxaemia (blood shortage) by the movement of the head from drinking water at ground level, to – seconds later – 5 m height, this animal is equipped with appropriate *muscular arteries*. Furthermore, it has a *complicated system of valves in the veins*, as well as a "*wundernetz"*, a *rete mirabile, of blood-storing arteries at the brain base*. Also, the lengths, powers/strengths and functions of the skeletal, muscle and nervous systems, etc. must be precisely in tune with each other, if the animal is to be capable of survival. Davis and Kenyon summarize the main points as follows (1993, p. 13):

> "When standing upright, its blood pressure must be extremely high to force blood up its long neck; this in turn requires a very strong heart. But 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. Pressure sensors along the neck's arteries monitor the blood pressure and activate contraction of the artery walls (along with other mechanisms) to counter the increase in pressure."

McGowan lists additional details (1991, pp.101/103):

> "The blood leaving the giraffe's heart has to do more than just reach the level of the head, it has to be at a high enough pressure to pass through all the fine vessels, the capillaries, that supply the brain and other organs. To achieve this the blood leaves the heart at a pressure of 200-300 mm Hg [260-350 mm Hg, Starck 1995, p. 206[(2a)]], which is probably the highest blood pressure of any living animal (Warren, 1974; Hargens et al., 1987). A giraffe's blood pressure is so high that it would probably rupture the blood vessels of any other animal, but two mechanisms appear to prevent this. First, the arterial walls are much thicker than in other animals. Second, 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.
>
> ...Another problem posed by the possession of a long neck is the large volume of air in the trachea, the tube that connects the back of the throat with the lungs. This air is unavailable for respiration and the space it occupies is consequently referred to as the dead space. The dead space has a volume of about five pints (2,5 l) in the giraffe. Since this air has to be moved each time the animal breathes, the rate of ventilation has to be increased to compensate for the reduced air flow. A resting giraffe takes about twenty breaths per minute, compared with our twelve and an elephant's ten; this is a very high respiration rate for such a large animal."

Correspondingly efficient and "big lungs" have the task of balancing respiration "through a 10 feet long tube; many muscles, tendons, and bones had to be modified harmoniuosly" (Wesson 1991, p. 226) (for full quotation see footnote 2b).

Davis and Kenyon summarize the problems of the giraffe for the synthetic evolutionary theory as follows (1993, p. 13, my italics):

> "In short, the giraffe represents *not a mere collection of individual traits but a package of interrelated adaptations.* It is put together according to an overall design that integrates all parts into a single pattern. Where did such an adaptational package come from?
>
> According to Darwinian theory, the giraffe evolved to its present form by the accumulation of individual, random changes preserved by natural selection. *But it is difficult to explain how a random process could offer to natural selection an integrated package of adaptations, even over time.* Random mutations might adequately explain change in a relatively isolated trait, such as color. But major changes, like the macroevolution of the giraffe from some other animal, would require an extensive suite of coordinated adaptations."

All of these questions are completely ignored by Dawkins, and he continues:

> "The point is that you may only have to change one thing in the developing embryo in order to quadruple the length of the neck. **Say you just have to change the rate at which the vertebral primordia grow, and everything else follows.**"

"... and everything else follows": Can one, in view of the above details, describe this conclusion perhaps as purely wishful thinking? And such and/or further wishful thinking on evolution passes today as science that must scarely be questioned, or not at all. – Richard Dawkins continues:

> "But in order to make an eye develop from bare skin you have to change, not one rate but hundreds (see Chapter 5). If an okapi mutated to produce a giraffe's neck it would be a Stretched DC8 macro-mutation, not a 747 macro-mutation. It is therefore a possibility which need not be totally ruled out. Nothing new is added, in the way of complication. The fuselage is elongated, with all that entails, but it is a stretching of existing complexity, not an introduction of new complexity."

"Nothing new is added, in the way of complication" – this claim is simply false (see details above). The subsequent comparison with the different numbers of vertebrae in snakes seems inappropriate, since the unique problems of the giraffe, cited above in some detail, cannot applied here (however, possibly others could be found in snakes).

3a. Kathleen Hunt on the Evolution of the Giraffe

When one examines the assertions of the zoologist Kathleen Hunt in one of the most-cited internet page on the subject, *Transitional Vertebrate Fossils FAQ*, one immediately gets the impression that all questions and problems on the origin of the giraffe are completely resolved within the context of the synthetic theory of evolution – as above with the statements of Kutschera. It should be observed that this site, because of its seemingly high scientific level and the stringent-appearing reasoning, has perhaps convinced more readers of the correctness of the theory of evolution than many other internet sites. On the giraffe, Hunt writes (1999):

> "Giraffes: Branched off from the deer just after *Eumeryx*. The first giraffids were *Climacoceras* (very earliest Miocene) and then *Canthumeryx* (also very early Miocene), then *Paleomeryx* (early Miocene), then *Palaeotragus* (early Miocene) a short-necked

> giraffid complete with short skin-covered horns. From here the giraffe lineage goes through *Samotherium* (late Miocene), another short-necked giraffe, and then split into *Okapia* (one species is still alive, the okapi, essentially a living Miocene short-necked giraffe), and *Giraffa* (Pliocene), the modern long-necked giraffe." (http://www.talkorigins.org/faqs/faq-transitional/part2c.html).

When we now look more closely at her exposition and examine the reasoning behind individual statements, we should be aware of the following problem: we have to start from the current state of knowledge, which it cannot be considered settled, since we do not know if and which further developments and findings may lead to revisions in certain questions.

But we obviously cannot start from fossil finds that perhaps someday will be discovered and described, using to the motto: "Faith is the substance of fossils hoped for, the evidence of links unseen" (according to A. Lunn[2c]). Besides, it is possible that further fossil finds may even deepen the mystery of the giraffe ancestry – a possibility that most evolutionary theorists deem highly unlikely (unjustifiedly, as many examples show).

> "Giraffes: Branched off from the deer just after *Eumeryx*."

This statement is not supported by any fossil finds. Thus we might ask, if and from where K. Hunt and many other authors, who make similar and often even stronger assertions and apparently completely certain deductions, can know these things so definitively? We should further ask in this connection, what these first deer looked like and when they appeared? "The first deer emerged more than 30 million years ago in the Oligocene era, in Asia. The early deer *Eumeryx* had as yet no antlers on his long and primitive skull. The male animals had dagger-like eye teeth in the upper jaw, like today's water chevrotain" - Ernst Probst in: http://www.fortunecity.de/lindenpark/wittgenstein/30/RekordederUrzeit.html

In view of the complete lack of fossil evidence for the derivation of the giraffe from *Eumeryx*-relatives, one can justifiably ask if such antlerless deer, with daggerlike eye-teeth, really have evolved through mutation, recombination and selection into giraffes? As for deer themselves, one may further ask: was does "emerge" mean? Where do these deer come from? Further, a transitional series leading to the *Prodremotherium* from the late Eocene is also lacking. Evolutionary claims are not supported, neither for the ancestry of the deer nor for the giraffe, by “very fine-grained sequences documenting the actual speciation events” (in accordance with Hunt's Introduction). Of such transitions, she further says:

> “These species-to-species transitions are unmistakable when they are found. Throughout successive strata you see the population averages of teeth, feet, vertebrae, etc., changing from what is typical of the first species to what is typical of the next species.”

In accord with this statement the English zoologist Douglas Dewar wrote already decades ago (1957, p. 35):

> “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. “

And precisely these criteria are here not fulfilled. Otherwise we could follow the evolution of the long-necked giraffe, and the giraffes in general, back to their origins. Whether at least her description of the "general lineage" can be applied on the giraffes, will be discussed later.

Let us first look for descriptions of unmistakable “species-to-species transitions“ in the giraffe's derivation, which she maintains appear especially frequently in Part 2 of her work:

> "The first giraffids were *Climacoceras* (very earliest Miocene)..."

The New Shorter Oxford Dictionary defines “giraffids” as follows: “...of or pertaining to, any animal of, the artiodactyl family Giraffidae, comprising the giraffe, okapi, and related extinct forms. *Webster* says about *Giraffa*: “...comprising the giraffes which together with the okapis and extinct related forms constitute a family and sometimes a superfamily of the Artiodactyla.”

I would only like to remark here that *Climacoceras* does <u>not</u> belong to the Giraffidae family. This genus should rather be placed in its own family, Climacoceratidae (Hamilton 1978). Both families, however, belong to the superfamily Giraffoidea.

In Benton's *The Fossil Record 2* (1993, pp. 756,758/759) *Climacoceras* is likewise not placed in the giraffe family (also not by McKenna and Bell 1997/2000). Carroll 1988/1993 even places this genus in the deer family Palaeomerycidae – that is, a good bit further away, i.e., outside the Giraffoidea (see also Thenius 1970/2000). In none of the newer sources known to me is the genus placed in the Giraffidae family.

If Hunt, by "giraffids", refers to the superfamily (which by the way would seem to be an unusual use of the term in English), then one may include *Climacoceras*. However, this choice of wording leaves the less-informed reader with the impression of a closer kinship to the giraffe family than in reality exists.

A horizontal evolution of special features from one family to another seems difficult to accept because of the the problem of *heterobathmia*. In addition there are some serious time problems, that we will address in detail later.

Climacoceras (about 100 kg and 1,50 m tall) according to:
http://images.google.de/imgres?imgurl=http://www.planetarios.com/cenozoico/37.jpg&imgrefurl=http://www.planetarios.com/spanishcenozoico.htm&h=554&w=355&sz=122&tbnid=cTMNy9m9fsvYjM:&tbnh=130&tbnw=83&hl=de&start=1&prev=/images%3Fq%3DClimacoceras%26svnum%3D10%26hl%3Dde%26lr%3D%26ie%3DUTF-8%26sa%3DN

Climacoceras according to:
http://images.google.de/imgres?imgurl=http://www.dinosaur.hpg.ig.com.br/GIFS/Casco/Climacoceras.gif&imgrefurl=http://www.dinosaur.hpg.ig.com.br/girafas.htm&h=497&w=312&sz=8&tbnid=jx6gY_0CXI6d0M:&tbnh=127&tbnw=79&hl=de&start=2&prev=/images%3Fq%3DClimacoceras%26svnum%3D10%26hl%3Dde%26lr%3D%26ie%3DUTF-8%26sa%3DN

Furthermore, according to Stucky and McKenna (see Benton) the assignment of *Climacoceras* to the “very earliest Miocene” is false and correct is ***Middle Miocene*** (see also McKenna and Bell 1997/2000, p. 432). Carroll, on the other hand, only stipulates “Miocene”.

In the original work by Hamilton (1978), the species *C. africanus and C. gentryi* were dated approximately 14 (13.8) million years back, that is the middle Miocene (Miocene: begins 23.03 million years ago, ends 5.33 million years ago; Middle Miocene: 16.3 to 10.4 million years ago).

If the date of 13.8 million years is correct, the closest short-necked giraffe, *Canthumeryx*, dated by Hunt in the early Miocene, is older than the Climacoceratidae, from which these giraffes supposedly developed. The children would in this case have existed before the parents. Carroll (1988/1993, p. 629) puts the first fossil evidence for the genus *Giraffa* into the middle Miocene. Even if this is questionable (I have so far not found any confirmation for this dating from other authors), this still seems to be correct for another long-necked giraffe genus, namely *Bohlinia*, which has a thus-far maximum calculated age of 11.2 million years (see

below). In this case, *Climacoceras* and the long-necked giraffe would geologically appear much closer together, leaving hardly enough time for a gradual evolution through thousands of intermediate stages.

Thenius remarks in Grzimeks Tierleben (1970/2000, p. 255):

> "...the giraffes were once a many-form, wide ranging family of even-toed ungulates. They evolved relatively late – presumably scarcely 25 million years ago in the early Miocene – from a group of deer-like (with respect to teeth) hoofed animals, to which the European genera *Lagomeryx, Procervulus* and *Climacoceras,* among others, belong. The Lagomerycides (Lagomerycidae family) had forked, branched, or branched palms on stalks, bony skull protrusions, reminiscent of deer antlers, but which no doubt were permanently covered with skin, and could not be regenerated [exchanged]."

Note that Thenius also assigns *Climacoceras* to the Lagomerycidae. Yet the assumption that *Climacoceras* belongs to the early Miocene is clearly incorrect. Apart from the unproven claims regarding evolutionary derivations, most authors are however in agreement that the short-necked giraffes appeared in the early Miocene. "An older form, † *Zarafa* (= † *Canthumeryx*) belongs to the early Miocene in North Africa. In the late Miocene, Giraffidae († *Palaeotragus*, † *Giraffokeryx*) appear in Eurasia. Along with these short-necked forms, the long-necked giraffes appear more or less at the same time, as Savanna dwellers. († *Honianotherium* in Africa, Eurasia). In the late Tertiary another family line of Giraffidae appears in Eurasia and Africa, the Sivatheriidae with † *Helladotherium*, and † *Sivatherium* among others. These were animals with heavy, cow-like body forms, and with branched, antler-like ossicones, which survived into the Pleistocene" (Starck 1995, p. 999). We have already noted above that the same author points out that "the ancestry of the Giraffidae is disputed". The reasons for this should now have become clearer. He is thus in agreement with all other critical researchers in this area, at least in principle.

To summarize: with respect to *Climacoceras* it should be stressed that a series of transitional forms from early antlerless deer (such as *Eumeryx*) to *Climacoceras* with its bony skull protrusions ("branched, antler-like ossicones") is completely lacking, and that according to current dating *Climacoceras* arose a few million years too late to be considered a possible ancestor of *Canthumeryx* (the earliest genus unanimously assigned to the Giraffidae). But even if the assignment of *Climacoceras* to the "very earliest Miocene" were correct, this genus would still not be older than *Canthumeryx* and thus could hardly be its ancestor: even in this case the time would still not be sufficient for a gradual series of transitional forms from one genus to the other in a continuous evolution over millions of years.

Neither the claim, put forth as fact, that *Climacoceras* arose from early antlerless deer, nor the idea, likewise represented as fact, that this genus is the starting point for further giraffe evolution, can in any way be firmly established.

> "...and then *Canthumeryx* (also very early Miocene),..."

The oldest dating of a find of *Canthumeryx sirtensis* lies between 18 and 22.8 million years ago (according to the dating of Mikael Fortelius). If one fixes the beginning of the Miocene at 23.03 million years, K. Hunt's assignment of *Canthumeryx* to the

"very early Miocene" is correct, but then this genus would be at least 8 million years older than the "forerunner" genus *Climacoceras.* (If one wants to be very critical, one could argue that the average estimate of 20.4 million years would be in the Miocene, but not "very early" Miocene.)

So far I did not find good illustrations of *Canthumeryx.*

> "....then *Paleomeryx* (early Miocene),..." [more accurately, *Palaeomeryx*]

In the newer technical literature, the deer *Palaeomeryx* is unanimously placed in Palaeomerycidae, a group which – as already mentioned above – lies outside Giraffoidea, and in which Carroll and Thenius have also placed *Climacoceras*. These "oldest relatives of the giraffe" (as claimed by the following Internet source, in agreement with Hunt), dated 15 million years ago, cannot fill the role claimed for them, for time and morphological reasons, though the rest of the exposition may be correct:

> "These animals, called *Palaeomeryx* had somewhat the same size as today's red deer. It is evident from skeleton remnants from China, that male specimens of *Palaeomeryx* had bony protrusions on the skull. *Palaeomeryx* inhabited the forest, and ate leaves" (http://fossilien-news.blog.de/?tag=Palaeomeryx).

Besides, according to the best sources known to me, *Palaeomeryx* first arose in the middle Miocene (and not "early Miocene"), thus later than *Canthumeryx* and would in this respect fit time-wise, – except only that they do not belong to this family and superfamily at all. But even if *Palaeomeryx* could be fit in with the giraffes, this genus, 15 million years old, is still some 1.2 million years older than *Climacoceras* (13.8 million years), which leads us again to the above-mentioned time problem concerning evolutionary derivations.

Recent deer, similar to the *Palaeomeryx*, according to http://eo.wikipedia.org/wiki/Cervedoj

It hardly needs to be mentioned, that the "species-to-species transitions" again completely fail, otherwise we would certainly not have the above mentioned difficulties in placement; remember please Hunt's words:

> “These species-to-species transitions are unmistakable when they are found. Throughout successive strata you see the population averages of teeth, feet, vertebrae, etc., changing from what is typical of the first species to what is typical of the next species.”

Hunt calculates something less than 1 million years for “species-to-species transitions“; transitional series between genera would cost, correspondingly, several times as many years.

In the place of *Palaeomeryx*, in the newer literature a genus called *Propalaeomeryx* is frequently mentioned, which unlike *Palaeomeryx* is placed in Giraffidae. However, this “Pro“ has nothing to do with an evolutionary first step to *Palaeomeryx*, since the latter belongs to the Palaeomerycidae and the former to Giraffidae. Regarding *Propalaeomeryx* McKenna and Bell remark (1997/2000, p. 432): “Proposed as a provisional name” by Lydekker 1883, pp. 173-174. Further hints: “[Including † *Progiraffa* Pilgrim, 1908: 148,155.]“. This “Pro” in *Progiraffa* has likewise nothing to do with a link to *Giraffa*, since *Progiraffa* is "an uncertain large cervoid" [thus, a deer] (Berry et al. 2005), maximum age 18 million years.

> "...then *Palaeotragus* (early Miocene) a short-necked giraffid complete with short skin-covered horns."

Palaeotragus is, to be sure, dated to be maximally 18 million years old (occurring in the early Miocene), but again there is no known series of links to any forerunners, and this genus is, according to the current finds, also several million years older than the presumed ancestor *Climacoceras,* which is incorrectly arranged by Hunt as to the time of first its appearance as well as morphology and evolution.

Palaeotragus, according to http://critters.pixel-shack.com/WebImages/crittersgallery/Palaeotragus.jpg

A similar illustration can be found in Metcalf 2004, p. 37.

Further, Metcalf conveys the idea by his the text and illustrations, that *Helladotherium* was a forerunner of *Palaeotragus*. The former, however, first appears in the late Miocene, and thus from time considerations alone cannot be considered an ancestor of the latter. In addition, *Helladotherium* belongs to the Sivatheriinae, the above-mentioned animals with "heavy, cow-like body forms and with branched, antler-like skull ossicones, that survived into the Pleistocene“.

The reconstruction of *Palaeotragus* looks somehow disproportionate as to its anatomy and is possibly built in part on evolutionary assumptions (yet the neck is in any case as short as it should be according to the fossils found).

Further, Kathleen Hunt writes about the next short-necked giraffe:

> "...From here the giraffe lineage goes through *Samotherium* (late Miocene), another short-necked giraffe,..."

Samotherium according to:
http://images.google.de/imgres?imgurl=http://www.dinosaur.net.cn/_HeZhang/2003pic09.jpg&imgrefurl=http://www.dinosaur.net.cn/_HeZhang/page02.htm&h=480&w=640&sz=79&tbnid=BseLcdOyzayQqM:&tbnh=101&tbnw=135&hl=de&start=2&prev=/images%3Fq%3DSamotherium%26svnum%3D10%26hl%3Dde%26lr%3D%26ie%3DUTF-8%26sa%3DG

None of the other authors so far known to me places *Samotherium* into the "late Miocene", but rather into the ***Middle Miocene*** (maximum 14.8 million years for this genus). The time between *Palaeotragus* and *Samotherium* is then some 3.2 million years, again relatively short for a gradual evolution in the sense of Darwin and the synthetic theory of evolution. Once again a transitional series is missing, and in addition, up to now we have ***nothing but short-necked giraffes***.

The wording: "From here the giraffe lineage goes through *Samotherium*..." implies - even according to cladistic evolutionary assumptions - the unrealistic idea that the above-mentioned genera represent the "giraffe lineage". Already in 1978, Hamilton pointed out that in all these cases we are dealing only with "sister-groups": "The giraffines are identified as the sister-group of the *Palaeotragus* group using lengthening of the limbs and neck as a synapomorphy" (p. 220), and previously we read some similar arguments for the evolutionary relationships of these forms: "...*Canthumeryx* is identified as the sister-group of the giraffids and *Climacoceras* is the sister-group of *Canthumeryx* plus the giraffids" (p. 219).

What are "sister-groups"? According to evolutionary assumptions, they are defined as follows: "...sister groups are the two monophyletic groups produced by a single dichotomy; each is the other's nearest relative; sister species-groups" (Lincoln et al.: A Dictionary of Ecology, Evolution and Systematics). As already repeatedly mentioned, **the line itself with its numerously assumed *speciation events* has not been documented. Rather, according to Hamilton and many other authors, we know more or less only the twigs of the assumed tree in the form of *sister-groups*.**

The giraffe lineage therefore does not go "through *Samotherium*", but rather, even according to evolutionary presumptions, **past *Samotherium*** .

> "...and then split into *Okapia* (one species is still alive, the okapi, essentially a living Miocene short-necked giraffe),..."

The above sources place *Okapia* in the early Pleistocene. *Samotherium* however, according to current dating, lived 14.8 to 3.4 million years ago. The transitional series is missing, as in the afore-mentioned cases. And the okapi, “essentially a living Miocene short-necked giraffe“ can – according to this assertion – be classified almost as a living fossil (basic form essentially unchanged for some 15 million years; on the topic of living fossils, cf. http://www.weloennig.de/mendel20.htm; see also Janis 1984).

> "...split into *Okapia* ...and *Giraffa* (Pliocene), the modern long-necked giraffe."

The long-necked giraffes first appear ***not*** in the Pliocene, but rather with *Giraffa attica* (maximum 9 million years ago) and *Bohlinia attica* (maximum 11.2 million years ago) already in the late Miocene. The end of the middle Miocene is dated at 10.4 million years ago, so the oldest estimate for *Bohlinia* even reaches back into the middle Miocene. So far *both genera appear in the fossil record without transitional stages with their very impressive heights of almost 6 meters.* Since the genus *Giraffa*, with a maximum age of 9 million years, is placed into the late Miocene, it can in any case be considered a living fossil.

Now at this point, where the most thrilling part for our basic question begins, i.e. at the point, where the gradual evolution of the long-necked giraffe is asserted to have been documented by intermediate fossil forms (“...the evolution of the long-necked giraffe can be reconstructed through fossils“ – see Kutschera above), ***we no longer hear anything about the fossil evidence*****,** but only the assertion that this evolution has taken place ("...split into *Okapia* ...and *Giraffa*"). If, however, Kathleen Hunt could produce the fossil evidence for a gradual evolution, then, given her desire to show the public that all fundamental questions and problems on the origins of the giraffes have been completely solved in accord with the synthetic theory of evolution, so that only the ignoramus and/or religious fanatics could doubt this fact, then surely she would have laid it out in detail. However, she does not present the evidence, because such a transitional series does not exist.

Recently this last point was confirmed by a fervent defender of evolutionary theory, we will call him Dr. Y, by answering my question “Is there a series of intermediate fossil forms between *Samotherium africanum* and *Bohlinia*?“[(3)] clearly in the negative (“There is not an intermediate that I am aware of“). Another biologist – likewise a giraffe expert (Dr. Z) – said, to be sure, that the skull and teeth of *Bohlinia* are more primitive than those of *Giraffa* (when the term “primitive” is used, in my experience caution and further investigations are advisable), but he added: “...but it is true that the post-cranials are about as long as those of the living giraffe.” This author questioned the derivation from *S. africanum* and from his following statement “The ancestors of *B. attica* should rather be sought in Eurasia...” it is easy to conclude that the the assumed series of evolutionary ancestors and transitional forms are unknown (because clearly: if we had them, we no longer need to search for them – neither in Africa nor in Eurasia).

The majority of the corrections to Hunt's statements are based on data that were already known at the beginning of the 90s of the previous century – thus she (like Kutschera) has not done careful and critical research, but rather made statements designed to provide impressive support for the synthetic theory of evolution, yet incorrect in the essential points.

Thus the circle is closed back to the first part of our exposition: The assertion, made before an audience of altogether some 1 million viewers by Ulrich Kutschera, that the difficulties for the synthetic theory of evolution presented in Fritz Poppenberg's film were "false statements" (see Kutschera above), is shown to be itself incorrect by the above data.

3b. General lineages

If the evidence for "species-to-species-transitions" for the giraffe is so completely lacking (although such cases should, according to her words, appear especially frequently in Part 2 of her work, in which the giraffe is also treated) – could not at least her second main assertion be correct, that evidence exists for a "general lineage", confirming the evolution of the Giraffidae indirectly? Let us look more closely at her assertion on the matter of the "general lineage":

> "This is a *sequence of similar genera or families*, linking an older group to a very different younger group."

However, this could just mean a purely morphological derivation, which cannot necessarily be identified with a series of evolutionary stages (Dacqué, Kuhn, Troll). She continues:

> "Each step in the sequence consists of some fossils that represent a certain genus or family, and the whole sequence often covers a span of tens of millions of years."

Since the fossil evidence for Giraffidae stretches back some 23 million years, this assertion could be correct in principle. Interpreting the existing fossil genera as "steps" in a genetic-evolutionary sequence, however, runs into the above-discussed time and anatomical difficulties (see further points below). Hunt further defines:

> "A lineage like this shows obvious morphological intermediates for every major structural change, and the fossils occur roughly (but often not exactly) in the expected order."

The evidence of "obvious morphological intermediates for ***every major structural change***" is for Giraffidae evidently not existing, neither within the short-necked giraffes nor for the decisive step to the long-necked giraffes, nor within the long-necked giraffes. And one must be unrealistically benevolent if one wants to claim that, in the sense of evolutionary connections, the fossils in this family appear "roughly (but often not exactly) in the expected order".

> "Usually there are still gaps between each of the groups -- few or none of the speciation events are preserved."

Gaps exist between all the genera of the Giraffidae, and not a single one of the numerous postulated “speciation events“ has been preserved (granted that they ever occurred).

> “Sometimes the individual specimens are not thought to be *directly* ancestral to the next-youngest fossils (i.e., they may be "cousins" or "uncles" rather than "parents").”

This can be said of all fossil and living Giraffidae genera and species.

> “However, they are assumed to be closely related to the actual ancestor, since they have intermediate morphology compared to the next-oldest and next-youngest "links".”

As a rule, not even the expected “intermediate morphology” is present. “...they are *assumed* to be closely related to the *actual ancestor*...”: In both cases we are dealing with *assumptions,* for the “actual ancestor” as well as for the evolutionary “cousins or uncles“.

> “The major point of these general lineages is that animals with intermediate morphology existed at the appropriate times,...”

Both the “intermediate morphology“ as well as evidence of links “at the appropriate times” are missing.

> “...and thus that the transitions from the proposed ancestors are fully plausible.”

This would not be the case, even if all the criteria were fulfilled, cf. http://www.weloennig.de/mendel13.htm and the following chapter, as well as: http://www.weloennig.de/mendel14.htm and also http://www.weloennig.de/AesWesen.html and the following chapter.

In this connection, we should remember Kuhn's basic statement concerning the relationship between morphology and evolution:

> “The similarity of forms is explained by evolution, and evolution is in turn is proven through the grades of similarities. That here one has fallen victim to circular reasoning is hardly noticed; what one wants to prove, namely that similarity is based on evolution, is simply assumed, and then the different degrees in the gradation of the (typical) similarities, are used as evidence for the truth of the idea of evolution. Albert Fleischmann has repeatedly pointed out the lack of logic in the above thought process. The same idea, according to him, is used interchangibly as assertion and as evidence.
>
> Similarity can also be the result of a plan, and ...morphologists such as Louis Agassiz, one of the greatest morphologists of all time, attributed the similarity of forms of organisms to a creations plan, not to evolution."

It would perhaps be “fully plausible“ only if there were no alternative to the evolutionary interpretation through mutation, recombination and selection. That is however, not the case (see in Part 2 the exposition on ID).

Kathleen Hunt continues:

> “General lineages are known for almost all modern groups of vertebrates, and make up the bulk of this FAQ.”

In this case, the Giraffidae family would be an exception to this rule of “general lineages“. According to my knowledge, however, the giraffes conform to a rule, which has first been established for the classification of the higher categories, and which according to current knowledge also holds true for the origin of the genera of the giraffes (cf. http://www.weloennig.de/AesIV5.SysDis.html, the statement by Steinmann about the more or less closed series of evolutionary sequences should likewise be examined, from case to case).

If, however, the general lineages for almost all modern groups of vertebrates are as uncertain as the case of the giraffes, then we are dealing only with suggestive evolutionary interpretations in other groups as well, yet without solid proof.

Notes

(1) The program was, according to the statement of an MPG employee, replayed several times the following morning. Upon my question, the TV management informed me that the science program *Nano* has an average of a half million viewers, and similarly for the reruns.

(1a) Upon further reflection I have come to the conviction that the term “Falschaussage” (false statement) used by U. Kutschera is completely out-of-place here. According to all dictionaries and encyclopaedias available to me, this is a precise *legal* term, which is defined as follows (Brockhaus, Band 7, 1988, p. 86, further points there): “**Falschaussage, uneidliche [not under oath] Falschaussage, falsche uneidliche Aussage**, the intentional false statement of a witness or expert, not under oath, in a courtroom or other place where examinations of witnesses or experts take place (for example, parlimentary investigation committees). “Falschaussage” will be punished by three months to five years imprisonment (§ 153 StGB).” What Kutschera apparently here intends is the criminalization of opinions deviating from his view of things, as evidenced by the following citations and commentaries made by him:

On page 159 of his book STREITFALL EVOLUTION ("Controversies of Evolution") Kutschera cites an article by professor Werner Gitt, agreeing with the comments of the Jenaer biologist W. Bergmann as follows (boldface again from me):

> “It should be further mentioned that the exposition of this author on the topic of "Animal and Plant Life" is factually incorrect and conveys a completely out-dated picture of the physiology of organisms: The concept of "metabolic energy" seems to be fully unknown to the author. The biologist Prof. W. Bergmann (Jena) sent me this journal with the following comments on the article by engineer W. Gitt: 'Such journals with pseudo-scientific assertions were distributed at the Bible exhibition in Jena. This is irresponsible "dumming down" of the public, which must be **penalized and forbidden**. One can only say, adapting a quote by Prof. H. Küng about Pope John Paul II, that with such writings, Christianity remains a middle-age gally of minors.” **There is nothing to add to these appropriate comments**.“

If -- as U. Kutschera says – “there is nothing to add to these appropriate comments“, that means the article should be penalized and forbidden – rather than discussed and factually refuted. For a work to be penalized and forbidden, it must first be criminalized, and this he attempts to do with regard to the topic of giraffe evolution, with the legal idea of the “Falschaussage”, – it only remains to be asked, who should be the judge in this trial, though one can well imagine.

I cannot tell whether Kutschera's judgement on the article by Gitt is justified or not, since I have not as yet seen Gitt's comments. Anyhow, Kutschera himself has not offered any factual refutation. If Kutschera's claims about Gitt's article are as unfounded as his statements on giraffe evolution, then extra skepticism is appropriate. In any case, according to my understanding, anyone who – instead of arguing publicly, factually and scientifically – wants to **penalize and forbid**, **has ventured outside the framework of the Constitution**.

(1b) The suggestion by R.E.Simmons and L.Scheepers of sexual selection was however not offered as a supplement to Darwin's explanation (feeding competition), but rather as an *alternative*. In the abstract of their article "Winning by a neck: Sexual selection in the evolution of giraffe" (American Naturalist 148 : 771-786, 1996) they say, among other things:

> "A classic example of extreme morphological adaptation to the environment is the neck of the giraffe (Giraffa camelopardalis), a trait that most biologists since Darwin have attributed to competition with other mammalian browsers. However, in searching for present-day evidence for the maintenance of the long neck, **we find that during the dry season (when feeding competition should be most intense) giraffes generally feed from low shrubs, not tall trees**; females spend over 50% of their time feeding with their necks horizontal; both sexes feed faster and most often with their necks bent; and other sympatric browsers show little foraging height partitioning. **Each result suggests that long necks did not evolve specifically for feeding at higher levels**. Isometric scaling of neck-to-leg ratios from the okapi Okapia johnstoni indicates that giraffe neck length has increased proportionately more than leg length – an unexpected and physiologically costly method of gaining height. **We thus find little critical support for the Darwinian feeding competition idea**. [Here follow their arguments for sexual selection, which I do not want to address until the second part.]
> ...We conclude that sexual selection has been overlooked as a possible explanation for the giraffe's long neck, and on present evidence it provides **a better explanation** than one of natural selection via feeding competition" (my boldface).

(1c) The TV-3SAT-remark should also be understood in connection with the presentation of giraffe evolution by Dr. Ragnar Kühne (Berlin Zoo) in Fritz Poppenberg's Film. There Kühne defends the gradual evolution in connection with the selection theory. Poppenberg follows with a technical criticism, and Kutschera is now more or less defending Kühne.

(1d) Supplement from April 23, 2006 and May 1, 2006: Since I want to keep my readers as correct and up-to-date as possible, I feel obliged to add the following points to the discussion on the origin of the long-necked giraffes: On April 21, 2006, Dr. X partially retracted his statement. However, the facts – if there are any – on which this retraction was based, and which would support a view partially in opposition to his clear and unequivocal previous statements as well as those of the other giraffe specialists quoted above, are not known to me. (Such fully new facts must therefore have been discovered in the last couple of weeks, yet I have heard nothing of this. His *hypothesis* is, that the neck vertebrae were first lengthened stepwise, and then a quantum mutation produced the duplication of a cervical vertebra.) Therefore I sent him the following questions (22 April 2006) concerning his statement "I have intermediates with partially elongated necks but they are unpublished":

> "If you really have intermediates (How many? Really a continuous series leading to the long-necked giraffes? What does "partially elongated" exactly mean? Are the intermediates really "intermediate" in the strict sense of the term?), which are relevant for the origin of the long-necked giraffes and which are occurring in the expected, i.e. "correct" geological formations (taking also into account the sexual dimorphism of the species and excluding juvenile stages and the later pygmy giraffes etc.), bridging in a gradual/continuous fashion of small steps in Darwin's sense the enormous gap between the short-necked and lond-necked giraffes, I can only advise you to publish these results as a *Nature* or *Science* paper as soon as possible. And if you have, in fact, unequivocal proofs, I can only add that I, for my part, will follow the evidence wherever it leads. So drop all secondary things and publish it as rapidly as you can."

He replied, but did not answer these questions, neither does he intend to publish his findings this year. So at present I have no reasons to doubt that his original clear statements as quoted in the main text of the article were essentially correct and that Gould's verdict quoted on page 1 of the present article in accord with the answers of the other giraffe specialists, is still up-to-date.

But let's assume for a moment that there once existed say 2 or 3 further mosaic forms with some intemediary features: Would that prove the synthetic theory to be the correct answer to the question of the origin of the long-necked giraffes? As the quotation of Kuhn shows (see p. 20 above) that would be circular reasoning as long as the problem of the causes of such similaries and differences have not been scientifically clarified (just *assuming* mutations and selection is not enough). In 1990 and 1991, I wrote:

> Since roughly half of the extant genera of mammals have also been detected as fossils (details see http://www.weloennig.de/NeoB.Ana4.html), one might – as a realistic starting point to solve the question of how many genera have existed at all – double the number of the fossil forms found. Thus, there does not seem to exist a larger arithmetical problem to come to the conclusion that by also doubling the intermediate fossil genera so far found (which represent in reality most often mosaics) one cannot bridge the huge gaps between the extant and fossil plant and animal taxa.

However, from this calculation is seems also clear that in many plant and animal groups further mosaic forms (but not genuine intermediates) will most probably be found, which will nevertheless – on evolutionary presuppositions – be interpreted as connecting links. Since the quality of the fossil record is often different for different groups (practically perfect concerning the genera in many of the cases mentioned by Kuhn above, but in other groups imperfect), it is not easy to make definite extrapolations for the giraffes. My impression is, however, that with about 30 fossil genera already found (only *Giraffa* and *Okapia* still extant), the number still to be discovered might be rather low (generously calculated perhaps a dozen further genera may be detected by future research). As to the origin of the long-necked giraffes one may dare to make the following predictions on the basis that at least about half of the giraffe genera have been detected so far:

> (a) **A gradual series of intermediates** in Darwin's sense (as quoted above on page 3) **has never existed and hence will never be found**.
>
> (b) Considering *Samotherium* and *Palaeotragus*, which belong to those genera which appear to display (to use the words of Dr. X) "some differences in the short vertebrae", a few further such mosaics might be discovered. As mosaics they will **not** unequivocally be "connecting any of the fossil taxa [so far known] to *Giraffa*". Nevertheless gradualists would as triumphantly as ever proclaim them to be new proofs of their assumptions (thus indicating that hardly any had been detected before).
>
> c) The duplication of a cervical vertebra excludes by defintion a gradual evolution of this step – by whatever method the giraffes were created.

(2) "However, bird flu actually exists. With evolution, on the other hand, one is looking for a black cat in a dark room, where there is no cat, yet one continually yells: I have found it." – Remarks of Dr. Werner Gieffers.

(2a) Dietrich Starck 1995, p. 206: "...in giraffes the blood pressure in arteries near the heart is very high (systolic 260-350 mm Hg), in the brain arteries however it is more or less the same level as in short-necked hoofed animals (130 mm Hg). The high pressure in the cartoid (heart) arteries is necessary in order to overcome the large hydrostatic differences in the standing animal (3 m neck length). The drop of pressure in the brain blood vessels is achieved by the *rete mirabile* in the cartoid arteries, which serves as a protection mechanism for the brain."

(2b) Wesson 1991, p. 226: "...an important part of the adaptation of the giraffe would have been protogiraffes' copying one another in stretching toward higher leaves, and this would promote the selective process favoring longer-necked mutants. This still leaves a lot for natural selection to explain. The protogiraffe had not only to lengthen neck vertebrae (fixed at seven in mammals [but

with some exceptions, including the giraffe with its 8 neck vertibrae; my note]) but to make many concurrent modifications: the head, difficult to sustain atop the long neck, became relatively smaller; the circulatory system had to develop pressure to send blood higher; valves were needed to prevent overpressure when the animal lowered its head to drink; big lungs were necessary to compensate for breathing through a tube 10 feet long; many muscles, tendons, and bones had to be modified harmoniously; the forelegs were lengthened with corresponding restructuring of the frame; and many reflexes had to be reshaped. All these things had to be accomplished in step, and they must have been done rapidly because no record has been found of most of the transition. That it could all have come about by synchronized random mutations strains the definition of random. The most critical question, however, is how the original impetus to giraffeness – and a million other adaptations – got started and acquired sufficient utility to have selective value (John and Miklos 1988, 236)."

For further examples clarifying Wessons "most critical question" see Markus Rammerstorfer http://members.aon.at/evolution/gererk.html

As to further remarkable features of the long-necked giraffe, R. Peachey quotes Lynn Hofland as follows:

> "Equally marvellous is the fact the blood does not pool in the legs, and a giraffe does not bleed profusely if cut on the leg. The secret lies in an extremely tough skin and an inner fascia [fibrous connective tissue] that prevents blood pooling. This skin combination has been studied extensively by NASA scientists in their development of gravity-suits for astronauts. Equally helpful to prevent profuse bleeding is that 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. It quickly becomes apparent that these unique facets of the giraffe are all interactive and interdependent with its long neck. But there's more. The smaller red blood cells allow for more surface area and a higher and faster absorption of oxygen into the blood. This helps to retain adequate oxygen to all extremities, including the head."

(2c) The Bible: according to Hebrews 11:1, modified by Lunn. The King James Version of 1611 translates: "Now faith is the substance of things hoped for, the evidence of things unseen." Modern translations give the original text more accurately, for example: "Faith is the assured expectation of things hoped for, the evident demonstration of realities though not beheld" (NW).

(3) Regarding *Bohlinia*, see the citation on page 5 of the present article (2006) as well as Hamilton (1978, p. 212): "...Post-cranial material of *B. attica* is figured by Gaudry (1862-7) and the synonymy between Gaudry's species *Camelopardalis attica* and *B. attica* is indicated by Bohlin (1926, p. 123). This species has limb bones that are as long and slender as those of *Giraffa*. *Bohlinia* is more advanced than *Honanotherium* in features of the ossicones and is therefore identified as the sister-genus of *Giraffa*." Denis Geraads writes (1986, p. 474): "*Giraffa* (y compris les espèces fossiles) et *Bohlinia* possèdent quelques caractères crâniens communs (Bohlin 1926); l'allongement et les proportions des membres sont très semblable (Geraads 1979). Les deux genre sont manifestement très voisins et leur appendices crâniens selon toute vraisemblance homologues (ossicônes)."

The following topics and questions should be addressed in Part 2. Due to many other time-consuming tasks, however, I will probably come back to this topic only in a few months:

1) Many Giraffidae species and genera appear in the fossil record practically simultaneously and the assumed ancestors co-exist millions of years with their "more evolved" offspring (illustration)

The German article was translated into English mainly by Granville Sewell, Professor of Mathematics, the University of Texas at El Paso, yet the responsibility for any mistakes in words and grammar and especially of the contents of the text rests entirely with W.-E.L..