

The Origin of Mammals: A Study of Some Important Fossils

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ABSTRACT

For many years evolutionists have pointed to the alleged transition of reptiles to mammals as being the best example of the natural origin of a major taxon. At first sight such claims appear to have considerable justification, but when the fossil evidence is closely examined it can be shown that there are some grave deficiencies, and the claim is not only factually unproved but also contains a number of dubious assumptions. It is therefore proposed to subject certain of the key fossils to more scrutiny.

INTRODUCTION AND BRIEF OVERVIEW

In 1966 Olson wrote,

'The reptilian-mammalian transition has by far the finest record of showing the origin of a new class.' (Emphasis added.)¹

Kemp in 1982 had the same view.² If it can be shown that such a claim is not as strong as Olson and Kemp believe, then by implication, the evolutionary origin of **all other** classes in the animal and plant kingdoms must be even more doubtful.

Except for birds, mammals are claimed to have been the latest in a line of progressive vertebrate evolution, beginning with the Class Amphibia in the Carboniferous system of the Upper Palaeozoic, allegedly some 300 mya (million years ago). (See Table 1.)

Most authorities believe that certain fishes of the order Crossopterygia came ashore, changed their fins into feet and legs, and gradually evolved into primitive amphibians. Not long after (in evolutionary time), the first reptiles arose from some group of amphibians.³

One particular group of these early reptiles differed from the others right from the first appearance of the Class — the Synapsids, the so-called mammal-like reptiles, which were characterised by the presence of a single temporal fenestra or opening in each side of the skull, posterior to the orbits. One or more of this line of slightly different reptiles is then believed to have eventually become so transformed in its morphology over the next 100 million years or so, that it gradually developed into the first primitive mammals of the Late Triassic of the Mesozoic (see Figure 1).

Subclass Synapsida contains two orders of now-extinct mammal-like reptiles — the earlier pelycosaurs and the

therapsids of later Permian and Triassic 'times'. It is supposedly within the order Therapsida (suborder Theriodontia), that we find the subgroups to which the immediate ancestors of mammals are assigned (see Table 2⁴).

Almost all authorities are convinced that the immediate reptilian ancestors of the early mammals are to be found in the infraorders Cynodontia, Tritylodontia and Ictidosauria, although all six theriodont subgroups contain fossils which appear to bear at least some mammalian-like features. Most are found in the tritylodonts and ictiosaurs of the Triassic, but a great deal of blurring of these groups is evident from the literature and it is safe and convenient to refer to them mostly all under the one heading, cynodonts.⁵

Within this group are some families which are of special interest, as they contain the genera which seem to most clearly approach the mammalian condition (see Tables 3⁶ and 4^{7,8}). Within these various genera is to be found the main evolutionist case for the transition. According to the transformist paradigm, one (or more) of these types evolved into the primitive first mammals such as *Morganucodon*, *Eozostrodon* and *Kuehneotherium* from around the Triassic/Jurassic boundary. (I must point out here that I do not accept the uniformitarian timescales and only use the terms for the sake of the argument in the context of this paper.)

At this stage it must be said that because the whole subject is so vast and space so limited, the intention is to restrict the discussion to the creatures mentioned in Tables 3 and 4, plus the alleged mammals referred to previously.

Only a brief comment is here made on the earlier alleged transformations such as fish to amphibian, amphibian to reptile and pelycosaur to therapsid. The hard

Stratigraphic Sequence	Fossil Sequence
TERTIARY	(TIME OF MODERN MAMMALS)
CRETACEOUS	(TIME OF ANCESTORS OF TERTIARY MAMMALS)
JURASSIC	'ADVANCED' MAMMALIAN ORDERS <i>Multituberculata, Pantotheria</i>
	OTHER MAMMALIAN ORDERS — <i>Symmetrodonta, Triconodonta, Docodonta</i>
	EARLY MAMMALIAN GENERA — <i>Kuehneotherium, Eozostrodon, Morganucodon</i>
TRIASSIC	'ADVANCED' CYNODONT TYPES (Order Therapsida) <i>Probainognathus, Probelesodon, Diarthrognathus</i>
	'LESS-ADVANCED' CYNODONTS <i>Cynognathus, Thrinaxodon</i>
PERMIAN	EARLY MAMMAL-LIKE REPTILES (Order Pelycosauria)
CARBONIFEROUS	(TIME OF STEM REPTILES)

Table 1. The time-span from the Carboniferous to the Tertiary, during which the transition from early stem reptiles to true mammals supposedly took place. Large morphological gaps separate these groups and nobody knows the alleged ancestors of the 'advanced' mammals such as the pantotheres and multituberculates.

evidence for these transitions is not strong and there are many very big gaps in these supposed lineages. Various creationists have pointed to the very circumstantial nature of the evolutionist case, especially the lack of sound fossil evidence.^{9,10,11,12}

THE EVIDENCE PROPOSED BY EVOLUTIONISTS AND A CREATIONIST'S RESPONSE

Before beginning this section it would be useful to explain some of the terms to which I shall be referring in respect of the theriodonts and mammals which are of significance. As full theriodont and mammalian fossil skeletons are extremely rare from the Triassic and Jurassic,

<u>ORDER Therapsida</u>	
<u>Suborder Therodontia</u>	
Infraorders —	Gorgonopsia Therocephalia Bauriamorpha Cynodontia Tritylodontia Ictidosauria

Table 2. The six infraorders of theriodonts amongst which are to be found a number of mammal-like characteristics. Most authorities now lump the cynodonts, the tritylodonts and ictidosaurians into one descriptive term — cynodonts.

ERAS	PERIODS AND EPOCHS	BEGAN — (YEARS)	APPEARANCE OF LIFEFORMS	
CENOZOIC	RECENT	10,000	—	
	PLEISTOCENE	2 million	<i>Homo</i> (man)	
	PLIOCENE MIOCENE OLIGOCENE EOCENE PALAEOCENE	65 million	hominids pongids (apes) monkeys horse types primates	
MESOZOIC	CRETACEOUS	135 million	whales marsupials monotremes flowering plants	
	JURASSIC	205 million	birds mammals	
	TRIASSIC	250 million	dinosaurs conifers	
PALAEOZOIC	PERMIAN	290 million	cycads (true pines?) mammal-like reptiles	
	CARBON- IFEROUS	PENNSYLVANIAN	310 million	coal-producing forests primitive reptiles
		MISSISSIPPIAN	355 million	amphibians
	DEVONIAN	410 million	sharks jawed fish ferns vascular land plants	
	SILURIAN	438 million	insects mosses	
	ORDOVICIAN	510 million	jawless fish cephalopods graptolites, crinoids	
	CAMBRIAN	570 million	annelid worms sponges mollusks trilobites starfish	
PROTEROZOIC	(PRECAMBRIAN)	2.5 billion	jellyfish	
ARCHAEAN		3.5 billion	bacteria algae	
		4.5 billion		

Figure 1. The standard Geologic Column commonly depicted in various textbooks.

Infraorder Cynodontia	
FAMILIES	GENERA
Chiniquodontidae	<i>Belesodon</i> <i>Chiniquodon</i> <i>Probainognathus</i> <i>Probelesodon</i>
Traversodontidae	<i>Massetognathus</i> <i>Trirachodon</i> <i>Scalenodon</i>
Galesauridae	<i>Thrinaxodon</i> <i>Cynognathus</i> <i>Diademodon</i>
Infraorder Tritylodontia	
	<i>Tritylodon</i> <i>Bieneotherium</i> <i>Oligokyphus</i>
Infraorder Ictidosauria	
	<i>Diarthrognathus</i>

Table 3. The three infraorders of theriodont mammal-like reptiles in which the most advanced specimens are to be found. Most authorities now lump all the above families and genera into the general term of Cynodonts. The above specimens do not form a known lineage leading to mammals. 'Advanced' features in one genus are often missing in others, that is, *Probainognathus* and *Diarthrognathus* possess what may be a squamosal-dentary contact, but this is not firmly established.

this analysis will be limited chiefly to the most commonly found osteological remains, such as crania, jawbones and teeth.

(a) Brief Glossary

Buccal cavity . . . The mouth by which food is taken and swallowed.

Diphyodont dentition (diphyodontia) . . . Mammals have only one kind of tooth replacement, by which teeth are replaced once only from directly beneath the first set of teeth (the 'milk' and permanent teeth). Also, the upper and lower molars are added sequentially from front to back as the jaws increase in size (see polyphyodont dentition for cynodont and reptilian conditions).

Occipital condyle(s) ... A rounded prominence on the posterior of the skull of mammal-like reptiles and mammals. In some 'advanced' cynodonts, and in mammals, the condyle is divided and articulates with the vertebra of the neck, which allows up and down

movement of the head.

Polyphyodont dentition (polyphyodontia) ... the 'reptilian' type of alternate tooth replacement of all mammal-like reptiles whereby teeth are replaced continuously throughout life from between existing teeth. Molars are added from the posterior end of the tooth row.

Postdentary bones . . . The jawbones of reptiles apart from the dentary, such as the articular, the surangular, the prearticular, etc. Mammals have only a single jawbone — the dentary.

Postorbital bar . . . The bony ridge above the orbits (eye sockets) in reptiles. This ridge is absent in 'advanced' mammal-like reptiles.

Quadrate-articular joint . . . The articulation or jaw suspension with the skull in all mammal-like reptiles is formed between these two bones (see squamosal-dentary joint for mammalian condition).

Secondary palate . . . The roof of the mouth which partitions the nasal passages from the buccal cavity, enabling feeding and breathing to be carried on simultaneously. This type of palate is found in all mammals and in some 'advanced' cynodonts, and also in some fossil and extant crocodiles.

Squamosal-dentary joint . . . The bones which form the jaw/skull joint of mammals; the point where the

SUBORDER CYNODONTIA	
FAMILIES	GENERA
Procynosuchidae	<i>Procynosuchus</i> and others
Dviniidae	<i>Dvinia</i> and others
Galesauridae	<i>Cromptodon</i> and others <i>Thrinaxodon</i> and others
Cynognathidae	<i>Cynognathus</i> and others
Diademodontidae	<i>Diademodon</i> and others
Traversodontidae	<i>Andescynodon</i> and others
Chiniquodontidae	<i>Belesodon</i> <i>Chiniquodon</i> <i>Probainognathus</i> <i>Probelesodon</i> and others
Tritylodontidae	<i>Bienotherium</i> and others
Trithelodontidae	<i>Diarthrognathus</i> <i>Trithelodon</i> and others

Table 4. Another view of cynodont classification.

dentary of the lower jaw articulates with the squamosal of the skull.

Tooth differentiation ... In some 'advanced' mammal-like reptiles and in most mammals, the teeth are clearly divided into incisors, canines and cheek teeth. In most reptiles the teeth are all more or less the same, that is, undifferentiated.

(b) The Origin of Cynodonts and Other 'Advanced' Mammal-like Reptiles

Between the order of pelycosaur and the later therapsid order exists a considerable morphological gap, although there are also some similarities. Romer believes that a subgroup of the pelycosaur known as sphenacodonts may have given rise to a primitive therapsid group, the phthinosuchia of the Permian, because of some diagnostic characters common to both, but this is by no means an established fact.^{13,14,15} Although the fossils are very extensive in number, good lineages are rare or non-existent. In fact, the lineage in which we are interested is a matter of mostly quantum leaps. Regarding these, Romer says,

'So varied are these types that they are often considered to constitute a number of distinct orders.' (Emphasis added.)¹⁶

As we shall see, the fossil gaps are not restricted to orders, but exist all the way from genera to families and suborders.

Nor is there any guarantee that other therapsids evolved from phthinosuchia, as there are also mostly gaps in the alleged transitions. There is little resemblance between the earlier and the later members of the various supposed lineages.¹⁷ There are certainly one or two inferences, but inferences are not necessarily facts. In this context it is worth remembering the words of leading English zoologist Kemp, *'... the therapsids ... evolved from an unknown lineage of the sphenacodonts.'* (Emphasis added.)¹⁸ On the same page Kemp admits that, *'Even at their first appearance, the therapsids had already diverged into several groups...'*

To emphasize the reality of such doubts, Kemp also said:

*'The main groups ... are more or less fully evolved when they first appear in the fossil record ...'*¹⁹

And again he concedes an important point:

'Each species of mammal-like reptile ... appears suddenly in the fossil record and is not preceded by the species that is directly ancestral to it. It disappears some time later, equally abruptly, without leaving a directly descended species ...'

Also:

'The fossil record shows ... the sudden replacement of one species by another, within a lineage, rather than the gradual change of one species into another.' (Emphasis added throughout.)²⁰

When we study Kemp's mammal-like reptile phylogeny,²¹ we can see why he is cautious. The morphological gaps between the pelycosaur and the therapsids,

and between the alleged ancestors of the cynodonts, are striking; we can agree with him and therefore justifiably have little confidence in the historical reality of these alleged transitions. Of course, Kemp has not included all the known fossils in his diagram, but even when they are all considered the result is the same.

In another of Kemp's works he again concedes the following:

'Gaps at a lower taxonomic level, species and genera, are practically universal in the fossil record of the mammal-like reptiles. In no single adequately documented case is it possible to trace a transition. . . from one genus to another.' (Emphasis added.)²²

As for the major taxa such as families and orders, Kemp mentions the *'... sudden appearance of new higher taxa, families and orders'*. (Emphasis added.)²³ It is therefore self-evident that if not a single record exists of a transition between genera, then the same automatically applies to families, superfamilies, suborders and orders.

We see now the extent of the inferences involved rather than hard evidence, and we suspect the possibility of preconception. With the expected transitional forms and good lineages missing, creationists are free to consider other possibilities which will be examined later. These gaps and missing lineages are virtually universal in the fossils, not only in mammal-like reptiles but also in every other field, as admitted by Kitts,^{24,25} Goldschmidt,²⁶ and Simpson.²⁷ Even Darwin himself could not fail to perceive the problem.²⁸

Noted Australian zoologist T. J. Dawson conceded that:

'The time of the reptile-mammal transition was the Late Triassic period about 190 million years ago . . . Good transitional stages are not known.' (Emphasis added.)²⁹

The evolutionist case is undeniably based very heavily on fossils, unsatisfactory as they may be, and without them it is difficult to see how the theory could exist. In the 134 years since Darwin nobody has come up with a reasonable and satisfying answer for so many missing links, except creationists who say the obvious solution must be that major groups such as families, orders and classes, etc. were created that way with built-in variability allowing speciation only within their respective kinds. No intermediate forms ever existed.

Dr Mark Ridley was a noted zoologist and avowed evolutionist at the Oxford University Museum when he authored a paper in 1981. Confronted by the **fact** of the missing transitionals, his response was to **abandon** fossils as being relevant to evolution! He substituted instead geographic distribution and 'observed' evolution. The header to his article states, *'The evidence for evolution simply does not depend upon the fossil record.'* He went on to say that it was *'... (a) false idea that the fossil record provides an important part of the evidence that evolution took place ...'*, and, *'... the fossil record is useless for*

testing between evolution and special creation'. Ridley also conceded that there are '*. . . no gradual intermediate forms*'. He then states, '*. . . no real evolutionist . . . uses the fossil record in favor of . . . evolution as opposed to special creation*'. (Emphasis added throughout.)³⁰ One is entitled to ask what does this do to the reptile to mammal case?

Two years later Ridley contradicted his own words by returning to the fossils as evidence for evolution, but only in the same broad sense I have already mentioned — that is, fish fossils are earlier than amphibians which in turn appear before reptiles and so on. However, he still acknowledges the '*very poor*' fossil record of single lineages and therefore its uselessness as a powerful argument for evolution.³¹ The key is fossil separation and differentiation, which has also been explained by Woodmorappe,³² whose Tectonically Associated Biological Provinces Flood Model accounts for this separation and shows that uniformitarian geology is not necessarily the only way to interpret the stratigraphic column.

British geologist Kerkut wrote in 1960 that the current account of mammal origins contains a serious flaw — geology shows us '*. . . not the time of origin of the different classes of vertebrates, but instead the time of dominance of that class*'. (Emphasis in original.)³³ Kerkut was also critical of subjective methods of orthodox stratigraphy when correlating fossils on a global basis.³⁴ From the above we can say that while the mammal-like reptile fossils can be considered as being **broadly** compatible with evolutionary theory, the persistent lack of detail also allows us to consider other alternatives, as we shall see later. As previously pointed out, the gaps between the various genera and families of these curious animals are consistent, persistent and systematic; that is, there are **fewer** transitional species between the major taxa than between the lower categories. This is consistent with creation of kinds or types, but is generally inconsistent with mechanistic evolution.

Not only are the fossils themselves the cause of difficulty, but the stratigraphic record also poses some problems. Carroll acknowledges

' . . . the difficulty of relying exclusively on the fossil record to determine the sequence of anatomical changes . . . and cladists have been suspicious of the fossil record and minimize its importance in establishing polarity.'

He continues:

'Despite the difficulties of interpreting the fossil record, it is the final arbitrator in establishing the antiquity of groups and the distribution of character states . . . determining the direction of polarity from the fossil record requires some degree of prior knowledge of the relationships of the groups being investigated.' (Emphasis added throughout.)³⁵

This suggests to me at least some degree of circular or preconceived reasoning.

(c) The 'Protomammals'

We return now to the 'advanced' mammal-like reptiles. Various 'advanced' cynodont groups share some similarities with each other, with reptiles, and with mammals. Because of these similarities the 'advanced' cynodonts have been classified together, and some have been sometimes classified with mammals and with reptiles. Actually, every 'advanced' cynodont displays a curious mosaic of characters, involving one or a few distinctively 'mammalian' characters. The question we must ask is whether this character mosaic is the result of mechanistic evolution or of created groups which share these few features.

Most authorities usually refer to the synapsids/therapsids as 'reptiles' or as 'reptilian' when describing their various non-mammalian characters, but occasionally one hears claims that some of the more 'advanced' specimens should be classified as mammals.^{36,37}

Grasse points out that all theriodont subgroups feature at least some characteristics which normally we associate with mammals.³⁸ Some, like the gorgonopsians cannot for technical reasons be in any line of descent to mammals,³⁹ nor can most cynodonts nor the bauriamorphs.⁴⁰ Carroll rules out the tritylodonts because of specialization in dentition.⁴¹

Creationists can accept without any problem that some of the 'advanced' mammal-like reptiles share a mosaic of what for the moment I will describe as 'reptilian' features and 'mammalian' characters as Grasse sets forth.⁴² The greatest number of 'mammalian' -type features are found in 'advanced' cynodonts,⁴³ but they are still relatively few. **No** single theriodont group shows all the characters.

Grasse lists an additional number of mammalian features which are not found in any mammal-like reptile and which, as he stresses, is demonstrative of the '*sharp break*' which still separates the most mammal-like reptiles from mammals.⁴⁴ He also goes on to say that one feature is most significant in distinguishing between reptiles and mammals — the matter of successive visible dentition; that is, the type of tooth replacement.⁴⁵ **All** members of suborder Therodontia have the reptilian type replacement — they are all polyphyodont, but we shall return to this later. The most diagnostic 'mammalian' characters will now be evaluated.

(d) A 'Double' Jaw Suspension?

Among the theriodonts are a couple of specimens which appear to have (possibly) possessed a double jaw/skull articulation — the squamosal-dentary of mammals, and the quadrate-articular of reptiles. The chiniquodont *Probainognathus* and the ictidosaurian *Diarthrognathus* are of special interest because there is indeed some doubt as to whether they did actually possess the mammalian-type system at all. On the other hand, both undoubtedly had a **powerful and functional** reptilian quadrate-articular suspension.

Gish⁴⁶ cites documentary evidence which throws considerable doubt on evolutionist claims that these two speci-

mens possessed the mammalian articulation. He quotes Kemp when he refers to these two bones of the skull and jaw of *Probainognathus*, 'In fact there is some doubt whether there is actual contact between these bones . . . (Crompton and Parker, 1979)' (the squamosal and the dentary).⁴⁷

As for *Diarthrognathus*, Gow also had doubts based on Crompton's work. Gow states in regard to the presumed squamosal-dentary articulation:

' . . . *Diarthrognathus* is thought to have both reptilian and mammalian jaw joints. However, several of Crompton's interpretations of the morphology (of the jaw) and its articulation with the skull were wrong; some but not all of these he has conceded in print. (Crompton 1972)'.⁴⁸

The problem is mainly caused by the extremely fragmentary and disarticulated fossil material which requires reconstruction by the palaeontologist, and such reconstructions and the consequent question of functionality are very much subject to the interpretation of the material. Every evolutionist palaeontologist would 'expect' that at some stage the reptilian quadrate-articular would give way to the mammalian condition. When performing the reconstruction, this entirely natural expectation could lead the palaeontologist to come to different conclusions than would a creationist palaeontologist using exactly the same fragmentary material. For example, the Canadian, McGowan, discussing the alleged mammalian jaw/skull contact of *Probainognathus*, claims that it is an 'intermediate' feature. He writes:

'(The) jawjoint (is) formed between a **hollow** in the **lower jaw** and a **flat** surface in the **skull**.' (Emphasis added).⁴⁹

Now the mammalian squamosal-dentary suspension is between a deep **hollow** in the **skull** (the glenoid in the squamosal) and a spur or knob on the posterior end of the dentary, as he says.⁵⁰ This spur fits into the hollow thus forming the actual joint, which does **not** occur in *Probainognathus*. How McGowan can say that the **hollow** in the jaw and a **flat** surface on the skull is intermediate is therefore puzzling, because on page 139 he correctly says that the 'hollow' is a groove on the **skull** into which the lower jaw fits. It appears that either McGowan is confused or he is 'seeing' the intermediate condition which is not really there. Archer's drawing of the skull of *Probainognathus* shows a slight hollow also as being on the lower jaw (the dentary) and a slight protuberance on the skull (the squamosal). Figure 2 indicates the arrangement of a crocodile,⁵¹ a mammal, and the situation with *Probainognathus*.⁵²

We can note here that *Probainognathus* still possessed its reptilian complement of post-dentary bones, although much reduced. When we later pass on to an examination of the alleged primitive mammal *Morganucodon*, we shall be better placed to recognise the significance of these doubts about the above two specimens of mammal-like reptiles.

So far we have found that some 'advanced' cynodonts

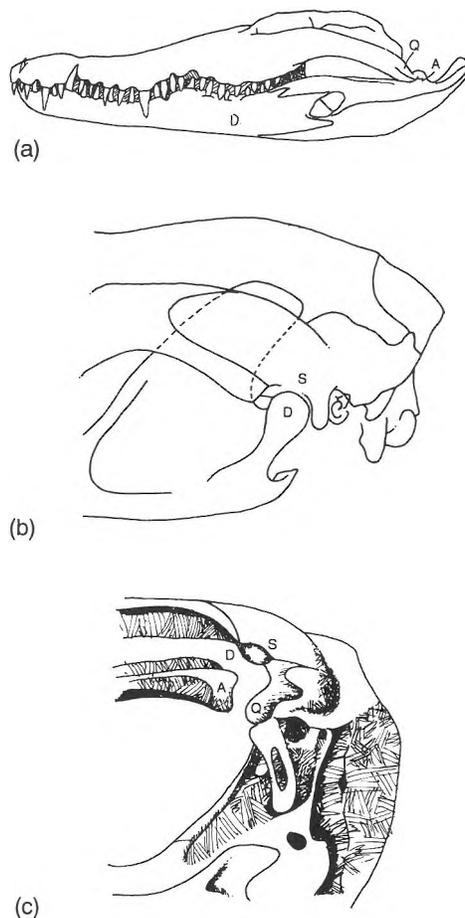


Figure 2. Skull and jaws of (a) crocodile, (b) modern mammals (opossum), (c) *Probainognathus*, an 'advanced' mammal-like reptile. Note the reptilian Q-A suspension in the crocodile and *Probainognathus*; and the squamosal-dentary joint of the opossum, where the spur of the dentary (D) neatly fits into the deep hollow in the skull (S). In *Probainognathus* there is an area of possible contact where the skull (s) meets the dentary (d). This possible contact is far from being a functional joint.

possessed a number of mammal-type characters, such as clearly differentiated teeth, molars with fairly complex cusps, divided (double) occipital condyles, a full secondary palate, and a large dentary with an ascending ramus.

(e) Dentition in Some Advanced Specimens

Archer makes the puzzling claim that the chiniquodont *Probainognathus* had ' . . . just two generations of teeth'.⁵³ As this is most certainly a 'mammalian' feature not found in any theriodont,⁵⁴ I must only assume that he is in error, as not one of my other authorities mentions such a significant point. In fact, Crompton and Parker contradict Archer:—

'In reptiles **and** mammal-like reptiles, . . . new teeth tend to erupt **between** older teeth and replacement usually continues throughout the life of the indi-

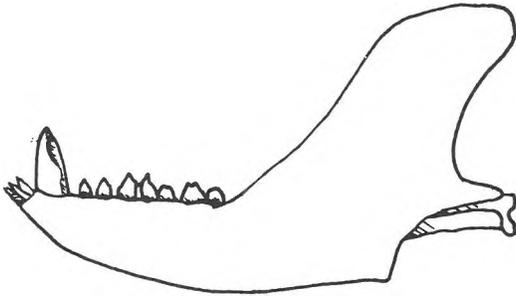


Figure 3. Lower jaw and teeth of *Probainognathus*. This ‘advanced’ cynodont from the Triassic displays remarkable similarities to the ‘mammal’ *Morganucodon* (Figure 5). Of special interest are the cheek teeth. Immediate post-canine teeth may be premolars, but this is not certain and depends on interpretation and inference.

vidual.’ (Emphasis added.)⁵⁵

In addition, Carroll states that all cheek teeth of *Probainognathus* were replaced in the usual reptilian manner.⁵⁶ *Probainognathus* thus had the same polyphyodont dentition as did all other cynodonts.

Mammals often possess what are called shearing teeth, with several cusps forming the crown, and which are used for cutting and slicing food into smaller pieces. Some advanced mammal-like reptiles also **possibly** possessed such teeth, amongst them some of the tritylodonts, *Diarthrognathus* and *Probainognathus*.^{57,58,59,60} (See Figure 3.⁶¹)

The claim that *Probainognathus* had just two generations of teeth is, I strongly suspect, an inference based on two factors. This specimen has what appear to be **possible** premolars. As already stated, it may have possessed matching shearing/slicing cheek teeth as claimed by Kermack *et al.*⁶² If these ‘premolars’ and ‘shearing teeth’ were in fact just that, then Archer’s claim would be justified. However, he does not tell us the full story. In the Kermack *et al.* paper, the authors admit that some authorities at least have doubts on this point, and they cite the view of Mills:

‘. . . (the) action and the mode of wear of the molars in *Morganucodon* (an alleged mammal), **differs** from that usual in the *Theria* . . . the chewing action consists of comparatively blunt cusps moving down grooves. Wear of the teeth is more rapid . . . the wear tending to blunt the cusps.’ (Emphasis added.)

‘Mills (1971) considers that the teeth in *Morganucodon* “mill” the food, apparently meaning by this some form of grinding.’⁶³

Although Kermack *et al.* do not agree with this, it appears that the cheek teeth may **not** have sheared past each other vertically.

If Mills is right, then the ‘mammal’ *Morganucodon* did not have true shearing teeth, and by implication neither did

Probainognathus which lived ‘earlier’ in time. Because the action of true shearing teeth **requires** a strong and functional squamosal-dentary mammalian-type jaw-joint, which neither *Morganucodon* the ‘mammal’ nor *Probainognathus* the cynodont had, neither could have been mammals as currently defined. In both cases, the ‘power’ of the jaw suspension lies with the **reptilian-type** quadrate-articular arrangement. Further, full occlusion of the cheek teeth is **always** associated with a fully functional, mammal-type joint, which *Probainognathus* did not have, and neither did *Morganucodon*.

Thus the use of ‘premolars’ is a term of hopeful description and they are not proved to have been so, because they only occur in what are defined as true mammals. I shall be returning to this subject in the latter part of this paper.

(f) Auditory Apparatus in Cynodonts

Evolutionists are unanimous about the type of hearing possessed by even the most ‘advanced’ theriodonts. All had the single-bone middle-ear system common to reptiles and also to birds — the stapes. **All** mammals, living or fossil, have a much more complex and finely engineered three ossicle apparatus. This chain of small bones, the malleus, the incus and the stapes transmits vibrations from the mammalian eardrum to a receptor organ inside the skull. **No** fossil transitions are known.

However, McGowan and Archer have pointed out that in the embryonic development of mammals such as young bandicoots, it is observed that when born they have a functional quadrate-articular jaw-joint, but as the youngster develops, the embryonic articular bone of the jaw and the quadrate of the skull become the malleus and the incus of the middle-ear by adulthood. At about 60 days old, the bandicoot has a normal mammalian squamosal-dentary jaw suspension and four ‘free’ bones in the middle ear.^{64,65} The original articular has become the malleus and the original quadrate of the embryonic skull has moved between the malleus and the stapes, while the original angular of the jaw matures between the articular and the dentary to become the ectotympanic for support of the developing tympanic membrane of the bandicoot.

Now while all this is suggestive (and no more than that) for the evolutionist, it is surely a marvellous piece of biological engineering and is a **present-day fully functional system** with two ‘purposes’ — the first (the quadrate-articular joint) is absolutely necessary to allow the tiny embryo to open its mouth wide enough to properly grasp the teat and feed; once it is big enough, the second process (middle-ear development) brings about the true mammalian auditory system. Archer believes this all came about by a trial and error evolutionary mechanism which **simultaneously** changed one complex jaw and hearing structure into an even more complex mammalian-type system. The study to which Archer refers was carried out by Palmer in 1913, but I have not been able to locate a copy of his work for investigation. We should note here that during those

first 60 days of the bandicoot embryo's life in the pouch, it does not need to hear and therefore the movement of the articular and the quadrate bones into the middle ear is of no consequence to its survival. But this same movement gradually over millions of years, from the reptilian into the mammalian stage, would be a very great handicap to the creatures involved, as they would literally have had to incessantly stop chewing in order to listen for danger signals because those bones allegedly were needed for jaw/skull articulation and for sound detection simultaneously. Whether the example of the mammalian embryo is due to evolution or was brought about by a Creator/Designer cannot be scientifically proved one way or the other, but there is a possible clue when we come to examine early mammal fossils. Evidence from embryology can be misleading,^{66,67} and Archer must be well aware of this because he goes on in the same page to comment that it is

‘. . . **inappropriate to interpret** ancestral adult conditions from the embryological conditions of **descendants** . . .’ (Emphasis added.)⁶⁸

Yet he seems to be doing just that — since he already ‘knows’ that mammals are descended from reptiles, he has allowed his preconceptions to influence his argument.

(g) The First Primitive Mammals

Finally we come to the question of the alleged early mammals in the Late Triassic and the Jurassic. By the time of the Triassic/Jurassic boundary almost all of the mammal-like reptiles had become extinct. The reasons for this extinction are unknown, but it was certainly not due to the arrival of the mammals. These new warm-blooded creatures were very small and certainly were not in competition with any of the synapsids. In fact, there was supposedly a period of about 80 million years during which hardly anything happened in mammal development, and about which we are almost totally ignorant.

The Morganucodontidae

According to Romer these very primitive mammals possessed essentially therapsid-like skeletons, ‘Morganucodon . . . appears to lie close to the reptilian-mammalian boundary’.⁶⁹ Other early forms are *Kuehneotherium* from Lower Jurassic deposits and the triconodonts also from the Jurassic. A little later the symmetrodonts appear, and also the pantotheres and multituberculates, specimens of which persisted into the Tertiary. The relationships between all these groups are highly speculative, so I will concentrate on the ‘first’ early specimens of mammals.

Some interesting genera of the family Morganucodontidae are *Eozostrodon*, *Megazostrodon* and *Morganucodon*, and there is considerable published material on these specimens. (From this point on, I will be using the word ‘reptilian’ in place of the inconvenient term ‘mammal-like reptilian’ in respect of various features.)

It is interesting to note that Norman expresses the view

that, ‘. . . *the first true mammals are recognized* . . . almost **by weight of opinion**, rather than anything more scientific’. (Emphasis added.)⁷⁰ The reason for such an extraordinarily frank concession is their very reptilian features. We shall later see further evidence which supports Norman's admission.

Dealing with the ‘primitive’ features first, we learn from Grassé,⁷¹ Crompton *et al.*,⁷² Kermack⁷³ and Carroll,⁷⁴ that these early ‘mammals’ possessed a great number of reptilian characters as well as some of mammalian type just as did the advanced therapsids.

For instance, Kermack says,

‘. . . *the hearing of this primitive mammal (Morganucodon) was much closer to that of birds and reptiles than to that of modern mammals*’;

and

‘(Although *Morganucodon* had a squamosal-dentary jaw-joint, it) *retained the older articulation between the quadrate and the articular* . . .’.

He further says,

‘. . . *the inner ear of Morganucodon was also much more like that of a reptile or a bird than a modern mammal*’.⁷⁵

That this is true is amply confirmed by Crompton *et al.*⁷⁶ who point out that

‘Morganucodon's *inner ear was non-mammalian in three aspects*’ . . . (the shape, the length and the lack of bony laminae within the cochlear cavity) (all reptilian features).

From these authorities we find a great number of other significant features in *Morganucodon*, as well as a few of mammalian type. Some major ones are:—

[KEY: *m* = mammalian
c = cynodont-type
r = reptilian
* = cases where this feature is found in at least some reptiles other than cynodonts]

- (1) The ear structure was single-boned (*c,r*).
- (2) It had a **possible** (but not fully functional) squamosal-dentary contact (*m,c*).
- (3) It had a **strong** and **functional** quadrate-articular jaw-joint (*c,r*).
- (4) The known specimens vary in the number of teeth from 48-54 (*c,r*).
- (5) The teeth were well differentiated (*m,c*).
- (6) It **may** have had an ‘improved’ dentary occlusion (*m*).
- (7) Tooth replacement was of the polyphyodont type (*c,r*).
- (8) An early appearance of posterior molars (*c*).
- (9) A relatively larger braincase than mammal-like reptiles (*m*).
- (10) Multiple lower jaw-bones, all but the dentary reduced (*c*).
- (11) A full secondary palate (*m,c,r**).

- (12) The skull as a whole is more mammalian (*m*).
 (13) **Possible** possession of shearing/slicing cheek teeth (*m,c,r**).
 (14) Possession of complex, multi-cusped cheek teeth. (*m,c,r**).

From the point of view of the evolutionist, much of this ‘baggage’ of reptilian characters would be expected. Archer says, ‘Clearly, the first mammals . . . are only **marginally distinct from the structurally more primitive synapsids**’ (Emphasis added.)⁷⁷ Yet on the same page he makes the claim that these first mammals had lost the reptilian-type tooth replacement of the post-canine teeth. He has obviously based this on the presence of possible ‘premolars’ in *Morganucodon*. As only mammals feature true premolars, it is almost certain that the teeth in question are simply undifferentiated cheek teeth — a feature shared by several species of mammal-like reptiles, including *Probainognathus* (see Figure 4).

Discussion

- (1) See previous discussion.
 (2, 3) Like *Probainognathus* and a few other cynodonts, *Morganucodon* **may** have had a contact between the squamosal and the dentary, but this is not at all certain. Gish points out that this ‘contact’ is a belief which rests on inference only,

‘. . . because the evidence is extremely fragmentary and no fossils are available showing the dentary in actual contact with the squamosal of the skull.’ (Emphasis added.)⁷⁸

In any case there arises a peculiarity; Kermack, Mussett and Rigney found that,

‘The lower jaw of *Morganucodon* resembles **closely** that of an advanced cynodont except for the presence of a squamosal-dentary joint in the former. There was no reduction in the **functional** importance of the reptilian (*q-a*) jaw-joint in passing from the cynodont condition to that of *Morganucodon*.’ (Emphasis added.)⁷⁹

On the next page they went on to say,

‘The most **striking** characteristic of the accessory jawbones of *Morganucodon* is their **cynodont** character . . . (they) show **no** reduction either in size or

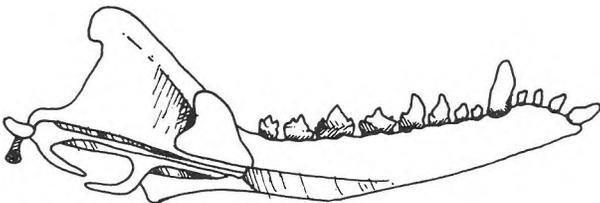


Figure 4. Lower jaw and teeth of *Eozostrodon*, a *morganucodontid*, the putative earliest mammal. Strong affinities with advanced mammal-like reptiles indicate it may be a cynodont closely related to *Probainognathus* and others.

*complexity of structure. In particular, the actual reptilian jaw-joint itself was relatively as powerful in the mammal *Morganucodon* as it was in the reptile, *Cynognathus*. This was quite **unexpected**.’ (Emphasis added.)⁸⁰*

Now this is highly significant, because there should have been a **progressive weakening** of this reptilian-type jaw-joint as the cynodonts ‘progressed’ to the mammalian stage, that is, the quadrate-articular of *Morganucodon* should have been much weaker than that of *Cynognathus*, and this did **not** occur. Neither did this happen **within** the cynodont group. *Cynognathus*’ jaw-joint was extremely powerful, and Kermack *et al.* say that the quadrate-articular of that animal was adequate suspension, so why was a squamosal-dentary needed at all in *Morganucodon*?⁸¹ They believe it is explainable within the context of feeding habits, but while this is interesting, it remains very speculative. Their proposed process of this change, involving dentition, jaw/skull morphology, innervation and musculature, hearing, and many other such aspects would have had to be agonizingly slow, closely co-ordinated all the way in multiple directions, and with no loss of viability along the way — a ‘total’ improvement.

But the fossil record of mammal-like reptiles and ‘early’ mammals, with its acknowledged gaps and missing links right down to the genus and often to the species level, does not square with these speculative notions. The model of Kermack *et al.* is not the only speculation on this matter, because they say their hypothesis is the exact **opposite** of another previous attempt by Crompton in 1972.⁸²

To make matters more conjectural, the above authorities claim that the mammalian squamosal-dentary system arose at least **twice**, each event **independent** of the other — once in mammals and *Probainognathus*, and once in *Diarthrognathus*, another cynodont-type creature, because the scientific consensus is that the latter has **nothing** to do with mammals. (I will return to this most important point later.) The authors then say, ‘We would suggest that it arose at least **four times**.’ (Emphasis added.)⁸³ They seem to be pushed towards this amazing position because they do not accept *Probainognathus* and *Diarthrognathus* as being ancestral to mammals.⁸⁴ For such a transformation to have occurred even once requires a large amount of credulity, but to happen twice or four times independently is simply beyond belief.

We find a similar position in respect of the mammalian middle-ear structure — an event they admit is **far more unlikely** than the evolution of the mammalian jaw-joint:

‘We know the middle-ear **must** have evolved at least twice — once in the *Theria* and once in the *Atheria*, since the **most primitive** members of both groups (*Kuehneotherium* for the *Theria* and the *morganucodonts* for the *Atheria*) **do not** have it.’ (Emphasis added.)⁸⁵

This is fine grist for the creationist mill, but surely this problem would disappear if we could forget about mecha-

nistic evolution and begin to think about a Creator/Designer instead.

We also note from their article that, as the fossil record confirms, nobody knows the origin of either the cynodonts or of these early ‘mammals’ and further, since some cynodonts only **possibly** had the double jaw suspension as the alleged ‘primitive’ mammals may have, this type of joint has lost most of its value as evidence for evolution.

(4) This seems to confirm my suspicion that *Morganucodon* was a cynodont.

(5) Since the ‘advanced’ mammal-like reptiles as well as the ‘early’ mammals had well-differentiated incisors, canines and cheek teeth, this question seems to be irrelevant to the discussion. In any case, according to Carroll, *Morganucodon* retained the basic tooth structure of cynodonts.⁸⁶

(6) As *Morganucodon* may have had a slightly better occlusion, this point can be left only as a **possible** item in favour of it being a mammal, yet we know that other cynodonts also displayed good occlusion, such as the chiniquodontids.⁸⁷

(7) See earlier discussion above. In addition, Kemp also mentions that diphodonty in the morganucodontids is only an assumption.⁸⁸

(8) Again, this is a cynodont character.

(9) The relatively larger brain is another possible plus for mammalian status, although not conclusive because of variability in individuals. Further, Carroll points out that the larger braincase of *Morganucodon* can be partly attributed to the smaller size of the skull, which is less than half the size of the cynodont *Probainognathus*.⁸⁹

(10) See previous discussion above.

(11) This is an interesting feature because we now know that at least some crocodiles possess a secondary palate, yet they have nothing to do with either the cynodonts or the mammals.^{90,91} (As a matter of interest, crocodiles also possess a four-chambered heart like mammals, again without being related in any way.)

(12) It has already been argued that the ‘advanced’ cynodonts possessed a mosaic of ‘reptilian’ and ‘mammalian’ features, and it is not surprising that if the Morganucodontidae are also a cynodont group, that they too would possess some of these mosaics. There is nothing ‘sacred’ or absolute about either ‘reptilian’ or ‘mammalian’ characters. We have already seen that a number of these features turn up in unrelated animals, but I shall have more to say on this in the summary.

Reptiles and mammals are human constructs and are not necessarily ‘real’ groups. The situation is that we still do not know scientifically whether the various families which make up these so-called classes were created or evolved assemblages. The evolutionist position is that a transition from ‘reptiles’ to ‘mammals’ via various cynodont families is more or less proven, but because of the universally-missing lineages at the family level, this is really a statement of belief.

In 1982 Kemp wrote that

‘. . . the fossil record of the mammal-like reptiles is more complete than that of any other group of terrestrial vertebrates . . . (except for the Tertiary mammals).’⁹²

Yet two pages later he concedes that

‘. . . intermediate forms between the various groups are almost invariably unknown.’⁹³

He then resorts to reconstructing **hypothetical** intermediate stages.

We know, on the authority of no less a prestigious figure than Stephen Jay Gould, that even though the fossil bird *Archaeopteryx* possessed the wings and feathers of modern birds, plus a couple of ‘reptilian’ characters, it cannot be considered as a transitional form. In view of this and those missing interfamilial links, neither can the morganucodontids be so considered.⁹⁴ (See also points 1-11 above.)

(13, 14) These features are supposedly exclusive mammalian characters. For reasons discussed earlier, it is more likely that *Morganucodon* (and *Probainognathus*) did not have true shearing teeth. McLoughlin⁹⁵ reports on a bipedal dinosaur (*Hypsilophodon*) which had shearing teeth ‘. . . remarkably **similar** . . . to that found in ruminant mammals’ (emphasis added), while Clark *et al.*⁹⁶ wrote extensively on a Cretaceous crocodile from Malawi which had ‘. . . complex, multi-cusped **mammal-like** teeth differentiated along the tooth row . . .’ (Emphasis added.) (See Figure 5.⁹⁷)

As this type of dentition is found to a degree in *Probainognathus* and in the extinct Malawi crocodile, it is inconclusive as an argument in this discussion. While these instances are not common they still reduce the importance of this feature in this context.

To sum up, we see that some of the above features could be reasonably interpreted as evidence in favour of evolu-

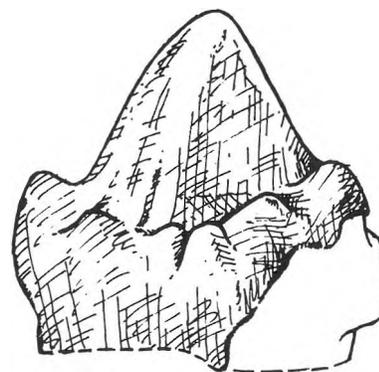


Figure 5. Labial view of complex, multi-cusped molar of an extinct Mesozoic Crocodylian from Malawi. Clear resemblances to mammalian cheek teeth are evident. This specimen also had the mammalian secondary palate, yet is not related to either mammal-like reptiles or to mammals.

tionary theory, but others cannot, as we have seen in the work of Kermack *et al.* This is backed by the absence of so many missing links, which is consistent with creation, not evolution. The chances of such complex biologic arrangements arising gradually by genetic accidents (mutations) plus selection even once, let alone up to four times independently in one case, strains credulity beyond reason and common sense.

Pierre Grasse, a leading French zoologist, was well aware of this problem as he repeatedly states throughout his work. His plain views are in strong contrast to those of his colleagues who seem to repeatedly pass over these difficulties. For example, although he believes in the general transformist paradigm, he recognizes its severe deficiencies. He refers to the question of 'intelligence' in living creatures and asks,

*'Where does it come from? This is a **problem** which concerns both biologists and philosophers, and at present, science seems incapable of solving it.'* (Emphasis added.)⁹⁸

Again he says,

*'... at present we **cannot** show the series of successive stages which make up evolution, but only a **fleeting picture** ...'*⁹⁹

That 'fleeting picture' may well be an illusion, and subject to massive misinterpretation as we shall see. On the next page Grasse attacks the attitude of some of his colleagues:

*'(Palaeontology) reveals that certain hypotheses considered (as) certainties ... are in fact questionable or even illegitimate.'*¹⁰⁰

*'Present-day ultra-Darwinism, which is **so sure of itself**, impresses incompletely informed biologists, **misleads** them, and inspires **fallacious** interpretations.'* (Emphasis added.)¹⁰¹

Grasse also writes: *'To vary and to evolve are two **different things**'*,¹⁰² and he further mentions, *'... our **ignorance** of the relationship between fossils ...'*, and *'... we **interpret** the fossil data according to the **assumption** that the Darwinian hypothesis is correct.'* (Paraphrased, emphasis added throughout.)¹⁰³

I could cite many more of Grasse's doubts, but what about his reasons? Apart from the gaping holes in the fossils, he puzzles over how it is possible that the vast and 'closely co-ordinated morphological and biological changes' needed to make over a reptile into a mammal could have come about by mutations and selection. Even forgetting about the dentition, the jaws, hearing and so on, there are many other major mysteries, such as the appearance of homeothermy, of hair and fur, and the mammary glands. To suggest these arose in a single or a few hits, or even by gradual slow processes, is simply out of the question and Dr Grasse is well aware of it: *'Mutations do not explain how co-ordinated variations play upon several organs at a time.'*¹⁰⁴ In short, he flatly rejects the Darwinian mechanism of random mutations plus selection, but neither does he supply any plausible alternatives. Few

other biologists even acknowledge there is a problem at all, and when creationists raise these legitimate questions we are ridiculed as religious fanatics.

ANOTHER POSSIBILITY?

Returning for the time being to the fourteen features of the 'mammal' *Morganucodon*, it can be seen that while this animal undoubtedly displayed a mosaic of 'reptilian' and 'mammalian' characters, the overwhelming impression is that it had many more affinities with cynodonts than with either the so-called Class Reptilia or the Class Mammalia. In short, I am asking the blunt question whether in fact *Morganucodon* was indeed no more than an 'advanced' mammal-like reptile; that is, not a mammal as we understand it, but a member of one of the cynodont groups? As stated previously, an evolutionist would expect the 'primitive' mammals to display a 'baggage' of cynodont features **if** evolution was correct, but we must not go on preconceptions. The fact is that *Morganucodon* (and as far as we can tell, *Kuehneotherium*) had many more 'reptilian' features than 'mammalian', and apart from one or two 'possibles', such as relative brain size and a more mammalian skull, every other significant characteristic was also displayed by some of the more advanced cynodonts such as *Probainognathus* and *Diarthrognathus*, and one or two other chiniquodonts. Since most evolutionists believe all cynodonts are related, can we argue that some of these odd creatures and these early 'mammals' may have belonged to a unique, created, but now extinct family with genetic variability?

Some of the 'lesser advanced' specimens such as *Cynognathus* and *Thrinaxodon*, plus perhaps some members of the Therocephalians and the Bauriamorphs, may have belonged to a different family again. In view of the considerable fossil gaps between every family and every order of mammal-like reptiles, we may be justified in calling on creationist palaeontologists and biologists to investigate these possibilities, as nobody can with any confidence point to clear fossil ancestral forms for the various taxa. We must remember that the authorities examine all these forms with the concept of evolutionary relationships firmly in their minds, and it is perhaps time that all these specimens were examined by qualified scientists who are not bound to phylogeny.

Evolutionists usually describe the synapsids as a subclass of the Chordates with two orders, the Pelycosauria and the Therapsida. I have no argument with this so long as no evolutionary implications are involved as dogma, but in view of the further fact that indisputably mammalian forms do not appear as fossils until much 'later', such as the multituberculates and the pantotheres, again with no lines of evolutionary origin, surely there are strong indications of created groups, clearly separated morphologically. The recent discovery of a multituberculate specimen with the mammalian three ear ossicles *in situ*, exactly as in modern

mammals, has confirmed the mammalian status of this group.¹⁰⁵ There is a vast gulf between these animals and the *Morganucodon*, *Eozostrodon* and *Kuehneotherium* specimens. This is supported to a degree by the fact that similar features found in two separate groups, such as the secondary palate, mammal-like cheek teeth and a four-chambered heart in **unrelated** animals such as crocodiles, could just as well mean conservative creation as evolution. Who would describe the Tasmanian thylacine and the placental wolf as being related despite the amazing similarities in their general morphology, in particular in the skull, jaws and teeth (see Figure 6)?^{106,107}

In addition, when evolutionists conclude that various complex characters or organs must have evolved several times independently, then evidently we are also free to conclude that other explanations such as creation should be considered.

Several times I have observed that some evolutionists have distorted the creationist stance by claiming that we believe every species has existed from creation virtually unchanged down to the present day, but of course this is a straw-man argument and easily demolished. I believe that God created all life forms as discrete groups, amenable to taxonomic classification, at (generally) around the 'family' level, with individuals **within** each group free to adjust or speciate in response to local conditions by means of genetic variability structured into the genes of the various members of each group. As an example, it is my conviction after

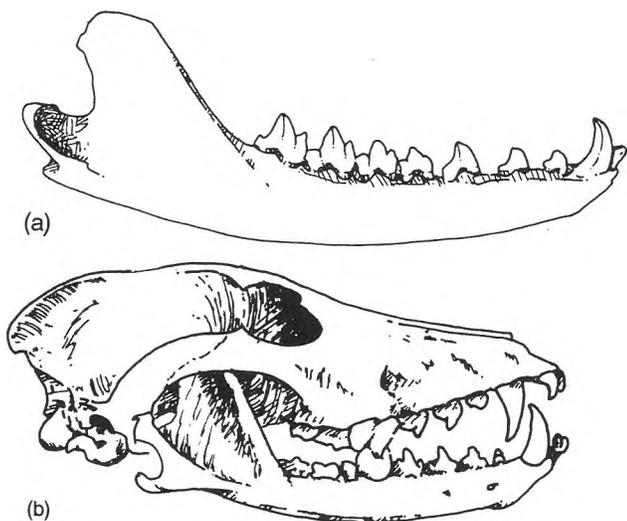


Figure 6. Jaws and teeth of

(a) An extinct Tasmanian Tiger (*Thylacine*) and (b) Placental wolf, *Canis lupus*. The similarities between these two unrelated animals are more than superficial, and only an expert could tell the difference. Similarities are therefore neither evidence for nor against evolution, but transformists frequently resort to the plea of parallel/convergent evolution in cases like this, which is a 'let-out'. Could it be that groups of mammal-like reptiles could have occupied a similar type of position? Creative design can account better for both.

studying creationist literature for over 20 years, that most students would accept that say, all members of the dog family (including foxes, wolves, jackals, coyotes, etc.), domestic or wild, large or small, could well have descended from a pair of 'representative' specimens which survived on the Ark. Apart from a very few relatively minor features, all dogs are remarkably similar in almost all features.

The possibility of mammal-like reptiles persisting as late as the Palaeocene Epoch of the Tertiary has been raised by a recent find. Fox *et al.* claim that seven teeth and a partial jaw-bone found in the Paskapoo Formation in Canada show strong cynodont affinities, yet are from deposits 100 million years later than the time of therapsid extinction in the Jurassic.¹⁰⁸ The authors have assigned the fossils to the suborder Cynodontia. The tricuspid-crowned teeth are certainly strongly reminiscent of cynodonts such as *Microconodon* and *Therioherpton* of the Triassic.

Novacek¹⁰⁹ states that the single-rooted teeth with transversely narrowed, multi-cusped crowns without cingula, are typical of therapsids, as is the jaw architecture, as can be observed in the published diagrams. On the other hand Sues has raised doubts as to the status of this specimen and believes further cranial material is required to determine its precise status.¹¹⁰ This find demonstrates how different authorities have differing interpretations when fossil material is scanty.

SUMMARY AND CONCLUSION

- (i) The fossil record of the mammal-like reptiles, as with **all** major animal and plant categories, is comprised of far more gaps than substance, despite the large number of fossil specimens available. Nobody has a firm concept of the relationships, if any, between the various orders and families, and this applies not only to the alleged 'early' mammals of the Mesozoic including the symmetrodonts and triconodonts, but to **all** the accepted mammal orders such as the marsupials, the monotremes and the various placental orders. Statements made by Simpson in 1944,¹¹¹ and Goldschmidt in 1952,¹¹² that in **not a single case** in the 30-odd orders of mammals, is there a line connecting any one group with its presumed ancestors, and that transitions between the higher categories are missing, are still **fully valid today**. Various explanations have been suggested but none is convincing: the fossil record for the synapsids is one of the best among the vertebrates, yet no sound lineages have been established from all the available forms, linking any ancestral group through to later descendant groups. The most obvious explanation, that there **were** no transitionals, is passed over by evolutionists. In spite of 150 years of searching, Kemp reminds us in 1981 and 1985, that the links are still all missing.^{113,114}
- (ii) The close and necessary co-ordination required to make all the complex and related changes by means of

genetic accidents and selection is so extremely doubtful and inadequate, that one wonders how such a theory survives — genetic variability, yes; mutations plus selection, no. For instance, Tyndale-Biscoe made the following admission in 1973:

‘... euthermy involves **so many interacting adaptations and affects every function of the body so profoundly, that its evolution must have involved a quantum step . . .**’ (Emphasis added.)¹¹⁵

In other words, such a change from cold-bloodedness to warm-bloodedness or maintenance of a steady internal temperature, is **impossible** by slow and gradual methods and a sudden jump is required, even by an evolutionist. If such an eminent zoologist as Tyndale-Biscoe was so convinced that such a large and complex change could only have come about by a genetic ‘miracle’, is this not the work of a creative Intelligence rather than of chance?

- (iii) There is no need to postulate any phylogenetic relationships either within groups or with any other ‘outside’ groups. Various families of mammal-like reptiles and so-called ‘early mammals’ may well have been simply varieties of created, discrete communities, and not necessarily evolved creatures.
- (iv) The fact of the close and numerous morphological affinities of ‘primitive’ mammals like *Morganucodon* with ‘advanced’ cynodonts, although broadly consistent with evolutionary theory, is even **more** consistent with a creative act, in view of the missing fossil lineages. Therefore, these ‘early mammals’ may well be simply varieties of a larger cynodont group. This is reinforced by the **sudden** ‘appearance’ of mammals such as the multituberculates and pantotheres without any known ancestral lineages; and this of course also applies to **all** the orders of mammals. There appears to be **no** evolutionary ‘advance’ over supposedly much older cynodonts like *Probainognathus* in such vital structures as the middle-ear and jaw suspension. As stated previously, it would appear most unlikely that *Morganucodon* could be a mammal unless it had:—
 - (1) a fully functional squamosal-dentary jaw suspension,
 - (2) diphodont dentition,
 - (3) true dental occlusion with undoubted matching shearing/slicing cheek teeth,
 - (4) was warm-blooded,
 - (5) lactation for the young,
 - (6) genuine premolars,
 - (7) hair or fur, and
 - (8) a three ossicle middle-ear auditory system.

It **did** have a **powerful and functional** reptilian-type jaw-joint. As almost all of these characteristics can only work together (excepting the last), and because it **definitely** did not possess (1) and (8), and almost certainly not (2) and (3), creationists can justifiably remain very skeptical. Various groups of what we call

mammals could very well be discrete, created groups unrelated phylogenetically.

The inclusion of *Morganucodon* into mammals or the consideration of it as ancestral to (other) mammals is not firmly established. It can just as strongly be argued, as I have done, that *Morganucodon* is part of a created cynodont group distinct from all mammals.

- (v) No single genus or even family of mammal-like reptiles has more than a few ‘mammalian’ traits; not even the chiniquodonts or *Morganucodon* itself. Even in the whole order Therapsida one cannot find more than a handful.
- (vi) Creatures which may have a trait or traits which are also possessed by some other types are not necessarily phylogenetically related. Similarities of functions or of characters do not imply anything more than that they are similar. One good example is the crocodiles with the secondary palate or the four-chambered heart. In at least one case in mammal-like reptiles and mammals, the three ossicle middle-ear is supposed to have evolved **independently** several times. Cases like this are common in the literature. This is where the cop-out of parallel/convergent evolution has to be invoked, because some sort of explanation is required to justify the very existence of problem organisms which share so many features yet are not phylogenetically close.

The current explanation is that look-alike plants or animals are the result of parallel evolution over long time-frames, because the organisms in question are subject to similar selection pressures. How is this known? How could the **same** types of mutations occur in animals up to thousands of miles apart in often quite different environments? Readers should not just take my words of criticism, as this question has been also raised by at least some evolutionists themselves. Apart from Grasse, who is obviously very cynical in this respect, two other noted authorities have expressed considerable doubts. Chérifas and Gribbin described parallel evolution as a straight-out ‘let-out’,¹¹⁶ while palaeoanthropologist Johanson is even more vocal. Writing about parallelism/convergence in a number of cases, he states:

‘The taxonomic monkey wrenches of convergence, parallelism and reversal have traditionally been treated by paleoanthropologists with a kind of half-embarrassed sleight of hand. We trot them out when we need something to explain an anomaly in an otherwise neat and tidy hypothesis, but otherwise we would rather pretend they don’t exist. In a sense, we have to proceed as if they **do not exist**, though we know that of course they do. This **deliberate self-deception** is excused by the scientific principle of parsimony. When considering competing solutions to a problem, the one closest to the truth will probably be the simplest.’ (Emphasis added.)¹¹⁷

In other words, it is easier to do this instead of seriously

asking what the real solution is, and of course because creation is taboo, the only way left is to postulate parallelism/convergence.

There is no reason why the Creator could not have brought several types of mammal-like reptiles into existence, in a somewhat similar manner as the marsupials are in relation to the placentals, some sharing various traits with other families, as well as some traits not shared. No phylogenetic relationship is required at all. This certainly would be very consistent with the missing transitionals in the fossil record.

- (vii) With the appearance of the Woodmorappe Flood Model in 1983, we now have a reasonable mechanism for the fossil separation and differentiation found in the rocks. His model sees most of the stratigraphic record laid down in the Flood year, with additional deposits completing the record in the several thousands of years since it ended. It accounts for unconformities, paraconformities and other geologic phenomena adequately without the need to postulate geologic 'periods' of immense ages. We have to remember that the fossils in question are scattered over five continents with no single landmass possessing more than a fraction of them. For example, in the United States of America there are no relevant fossils between the Upper Permian and the Upper Triassic;

the alleged 'in-betweeners' have been slotted in from deposits in the other continents. Even **within** a continent, no locality yields more than a short segment of a single 'age'. The present geological paradigm is not, I believe, nearly so precise as is generally claimed. In my opinion the Woodmorappe model is consistent with actual fossil distribution.¹¹⁸

- (viii) The fact that there is a *Systema Naturae* which is a typological perception of the natural world is pertinent here. That the 'first' representatives of any supposedly new category of organism already have the basic ordinal characters of the *bauplan* is in itself immensely supportive of natural typology, and as Denton says,

*... there has always been massive empirical evidence for the typological model of nature . . .*¹¹⁹

Variations of the basic themes **within** an order (or subclass or family) are trivial in comparison to the large discontinuities **between** such higher taxa. Over and over we read in the literature that when a new class or order appears, the member(s) of that taxon are already well differentiated into their separate types within that group, and Denton gives many examples.¹²⁰ Simpson also deeply pondered this problem.¹²¹ Neither has anybody accounted for the systematic nature of the missing links. It is obvious that there

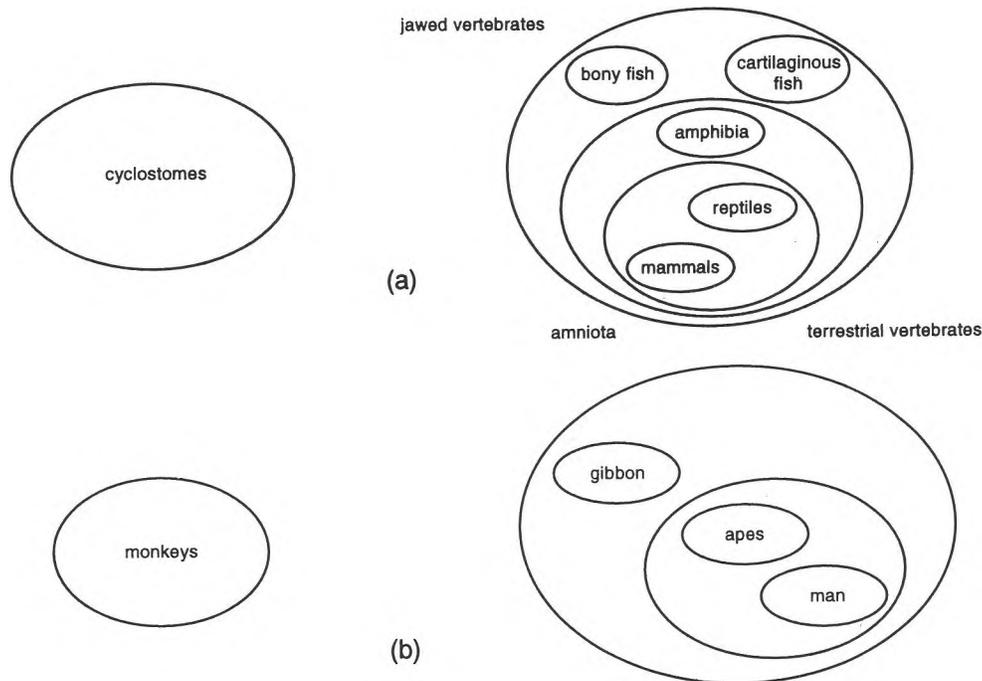


Figure 7. Molecular divisions of organisms reflect closely their morphological separation.

(a) When all the terrestrial vertebrate groups are compared with jawless fish (cyclostomes), all are equally isolated. There is no trace of the traditional evolutionary claim of jawless vertebrates to fish to amphibia to reptile to mammal.

(b) The same type of division exists right down to the family taxon; gibbons, apes and humans are clearly equidistant and separate from monkeys and from each other, as is manifest in their morphology.

should be many more intermediate species linking ancestral synapsid families and orders to descendant mammal-like reptile and mammalian groups than those at lesser taxonomic levels such as genera and species, yet the former are conspicuous by their absence. Should we not come to the most reasonable conclusion?

The fossil discontinuities and the validity of *the Systema Naturae* are backed up by evidence from the biochemical level. Studies of the degree of similarity of various proteins within the subphylum Vertebrata show that the **same** divisions exist at the molecular level and correspond exactly with the morphological divisions shown by the fossils and living organisms. This applies right down to the level of the family, and sometimes even below (see Figure 7).¹²² Denton gives quite a number of examples and says the result is ‘. . . truly astonishing.’¹²³ He closes with the remark:

‘Yet in the face of this extraordinary discovery, the biological community seems content to offer explanations which are no more than apologetic tautologies.’¹²⁴

In the case of extinct organisms, we cannot of course test for molecular/biochemical relationships. DNA tests would certainly reveal the separation of thylacine and placental wolf, but we cannot do this with cynodonts and ‘early mammals’. Such items as the mammalian-type teeth and secondary palates of some crocodiles may be seen to clash with the concept of the *Systema Naturae* and the clear molecular and morphological separation of groups, but this is not necessarily so. A Supreme Creator/Designer would not be restricted to absolutely using only one type of tooth or organ for every member of every family or **baramin**. Even if a cynodont did share a trait with say a crocodile, the overwhelming picture is still a clear-cut division between created categories.

- (ix) Marsupials share many features with placental animals yet are different and unique at the species, familial, and even the ordinal level. In short, marsupials are a ‘different’ kind.

Because we know with absolute certainty that these modern creatures are not related to placental mammals, except perhaps in a very distant sense, creationists can accept the novel taxonomic position they occupy. Both canine and thylacine forms could well have been separate creations — a position which could also apply to various mammal-like reptile groups. Being long extinct, no true and full comparisons can be made as regards the soft biology and reproduction, and I frequently wonder what evolutionists would have concluded had marsupials been found only as long-extinct fossils!

In this respect Henry Gee furnishes some interesting comments. He quite rightly points out that evolutionary lineages (unsatisfactory and discontinuous as they may

be) are ‘**created**’ by hindsight. He also says:

‘. . . what with the capacity of the human mind to **pick patterns** from apparently random information, the transformation series between reptiles and mammals is **just too good to miss**.’ (Emphasis added.)¹²⁵

Would not created variability within groups be equally valid? He continues on the same page:

‘. . . if the mammals . . . had vanished in the Palaeocene, would the transition between therapsids and mammals in the fossil record be so obvious? Would we not see instead, a **bush of competing, convergent lineages** in which the features we now see as mammalian (thanks only to the abundance of modern mammals), appear more **randomly**?’ (Emphasis added.)

Although Gee believes in the transition, he does admit that,

‘. . . the very fact of their existence **implies an ancestry** in which the characteristic features of mammals **appeared**. It is no surprise then, that these features can be **recovered from fossils**: it is easy to find such things, when **one is convinced** of the appearance of that for which one seeks.’ (Emphasis added.)¹²⁶

In other words, Gee is admitting, perhaps unconsciously, that the experts are reading their preconceptions into the fossils, which are available because of what we know about mammals **today**. Also inferred is that because mammals do exist in the present, the **implied ancestry** must be an evolutionary one and nothing else.

- (x) We have observed that every ‘reptilian’ feature in the fourteen points discussed is established, but the few ‘mammalian’ characters of the cynodonts/morganucodontids are **not** established beyond reasonable doubt, or are not exclusively ‘mammalian’, such as the crocodilian teeth and secondary palate. The more ‘mammalian’-type skull of *Morganucodon* is still very distant from the skull of undoubted mammals such as the pantotheres and multituberculates. Viewed from this angle, we can ask the question — does the mosaic of features really exist at all? The answer tends to be ‘no’, and therefore it seems highly probable that all the creatures discussed are cynodonts.

It should be noted here that in this paper it has been necessary to use terms such as ‘mammalian’, ‘reptilian’, etc. which are human concepts. For example, while it can be held that mammals and reptiles do exist as a convenient idea of classification according to morphological similarities, this does not shut out the fact that within these groups separation does exist. Morphologically and biochemically, monkeys are distinct from apes and humans; marsupials from placentals; chimps from baboons.

In view of the evidence here assembled, surely it is time for all scientists, creationist or evolutionist, to undertake a long-term and detailed review of mammal origins — the answer to this and other similar questions might very well be rediscovered in the first book of the Christian Scriptures.

ACKNOWLEDGMENTS

The drawings were done by my son Gary Mehlert. The text has benefited greatly from several reviews by Dr Kurt Wise, although I take full responsibility for the contents of the paper.

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Whether fossils like Haramiyavia are part of the crown mammals has important implications for the timing and causes of the origin of mammals. 30 million years separate the competing theories "a lot can happen in such a vast stretch of time. Illustration: Adapted from Luo et al. 2015." Such details are important to scientists studying macro-evolution; large scale patterns of life on earth and the forces that drive them. Lots of new creatures emerged in the early Jurassic as life recovered from the end-Triassic mass extinction, so if mammals appeared at this time it would make sense. However, if crown mammals diversified before the extinction event, this raises questions about what drove their evolution. Most living mammals are active at night (or nocturnal), and many other mammal species are active during twilight conditions. It has long been thought that the transition to nocturnality occurred at about the same time as mammals evolved, around 200 million years ago. It turns out that nocturnal activity might have a much older origin among ancient mammal relatives, called synapsids. The results should be useful to researchers studying the visual systems and behavior of living mammals, and they also will necessitate the rethinking of some long-held ideas, such as mammals becoming nocturnal to avoid competition with dinosaurs. Major Findings. Age The fossils in this study come from the Permian and Jurassic periods of Earth history. A fossil of Shenshou lui, a shrew-like creature that had long fingers and a tail adapted for life in the trees. Credit: Jin Meng. In the new study, which now appears in Nature , the researchers report on three new species of haramiyids. As noted by Brian Switek in the NatGeo article The traditional view is that the first true mammals evolved sometime during the Jurassic. Haramiyids, while roughly mammal-like, were thought to fall outside the group. With complete skeletons to work from, however, Meng and colleagues found that haramiyids were true mammals after all. And given the age of the earliest known haramiyid, Meng says that mammals originated "at least in the late Triassic," between 220 million and 201 million years ago. Recent Videos from Gizmodo [View More >](#). [More Videos.](#)