Biogeography: A Creationist Perspective

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Abstract

Biogeography, or the distribution of plant and animal life, is an important topic in helping to determine the origin of different life-forms. Creationists and evolutionists have tried to reconcile the geography of life with how they believe history unfolded, the latter far more than the former. While evolutionists argue that biogeography demonstrates their worldview, nothing could be farther from the truth. The evolutionary argument consists of ad hoc rationalizations and ruling out of alternative theories by straw-man argumentation. Furthermore, the creationist view, when presented fairly, provides a much simpler and compelling explanation for the geography of life.

Introduction

Why is it that animals and plants are not equally distributed over the face of the earth? Why are some animals, like giraffes and lions, confined to only one location—Africa, whereas other plants and animals are either ubiquitously or discontinuously distributed? Biogeography, or the geography of life, has been an active field of study for centuries. Early creationists tried to explain these distributions a variety of ways. Universal Flood geologists postulated that all animals dispersed from the Middle East, and early evolutionists attempted to explain these distributions consistent with their understanding of natural history.

From the mid-nineteenth century to the present, evolutionists have dominated the biogeographical debate, and creationists have largely remained silent on the issue. As a result, it is commonly believed that evolution best explains the geography of life. Jerry Coyne, professor of biology at the University of Chicago, claimed, "The biogeographical evidence for evolution is now so powerful that I have never seen a creationist book, article, or lecture that has tried to refute it. Creationists simply pretend that the evidence doesn't exist" (Coyne, 2009, p. 88).

A review of the scientific literature reveals that macroevolutionary biogeography is far from proven. (In this context, *macroevolution* is defined as the large scale biological changes necessary for the common descent of all life.) The geography of life is complex and poses problems for both evolution and creation models. Although biogeography cannot prove either model, one of these two can *best explain* the facts. While evolutionists consider biogeography to be one of the best arguments demonstrating descent with modification, the argument from biogeography consists mostly of ad hoc hypotheses and the ruling out of alternative interpretations by straw-man argumentation. It is an argument largely based on negative evidence.

Land Bridges

Until recently, it was widely accepted that the continents as we know them have always been in their current locations. Belief in the permanence of the continents led many evolutionists to explain distributions by postulating land bridges between the continents. These land bridges crisscrossed every ocean and were thrown up or torn down wherever and whenever their theory required. Up until the second half of the twentieth century, most evolutionists employed

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this line of reasoning. Ernst Haeckel is a case in point.

> Recent history of the earth … has repeatedly been connected with the European continent and been repeatedly separated from it. Nay, even Europe and America have been directly connected. The South Sea at one time formed a large Pacific continent, and the numerous little islands which now lie scattered in it were simply the highest peaks of the mountains covering that continent. The Indian Ocean formed a continent which extended from the Sunda Islands along the southern coast of Asia to the east coast of Africa (Haeckel, 1892, pp. 375–376).

Everywhere there was a disjunct distribution to explain, evolutionists like Haeckel "sharpened their pencils and sketched land bridges between the appropriate continents" (Corliss, 1970, p. 61). Some of the land bridges were small and plausible; others, such as the landmass that stretched across the entire Pacific Ocean to allow bears, raccoons, and other animals to gain access to the American continent, were of continental proportion. After the fauna and flora reached their appointed destination, the evolutionists' "eraser disposed of the bridge when it had outlived its usefulness as evidenced by the divergence of species on the sundered continents" (Corliss, 1970, p. 61).

The problem with continental land bridges and their sudden disappearance after they served their purpose was that in nearly every case there was absolutely no geological evidence for their existence. The only reason for their construction was to explain away the puzzling distributions of life. The use of land bridges is now an embarrassing chapter in the history of biogeography.

> To get around the problems of fossil distributions, they posited ancient "land bridges" wherever they were needed. When an ancient horse named Hipparion was found to have lived in France and Florida at the same time, a land bridge was drawn across the Atlantic. When it was realized that ancient tapirs had existed simultaneously in South America and Southeast Asia a land bridge was drawn there, too. Soon maps of prehistoric seas were almost solid with hypothesized land bridges—from North America to Europe, from Brazil to Africa, from Southeast Asia to Australia, from Australia to Antarctica. These connective tendrils had not only conveniently appeared whenever it was necessary to move a living organism from one landmass to another, but then obligingly vanished without leaving a trace of their former existence. None of this, of course, was supported by so much as a grain of actual evidence—nothing so wrong could be—yet it was geological orthodoxy for the next half century (Bryson, 2003, pp. 175–176).

Ghiselin added:

> Such *ad hoc* hypothesizing was the common practice among biogeographers of the time, with the conspicuous exceptions of Darwin and Wallace. If one allows oneself the luxury of land-bridges as rationalizations—like catastrophes in geology—one can explain anything. There may well have been quite different connections between continents in the past, but their existence must be verified in terms of independent evidence, and not invoked merely to explain away difficulties (Ghiselin, 1969, p. 40).

Even Darwin, who was once an avid land bridge builder, eventually saw just how convenient it was to throw up land bridges to explain distributions. In a letter to J. D. Hooker he noted that some conjure up land bridges "as easily as a cook does pancakes" (Darwin, 1959, p. 432). This ad hoc reasoning evidently convicted most of the scientific establishment, because after the second half of the twentieth century, land bridges were invoked only as a last resort.

Oceanic Dispersal

Another way to explain the puzzling distribution of life is to have animals and plants crossing formidable water gaps by means of rafting, or, in the case of birds, postulating island colonizations achieved by transoceanic flights. Darwin and Alfred Wallace seemed to favor this explanation, and Ernst Mayr used oceanic dispersal to explain how the banded iguana came to reside in the south Pacific.

> The lizard family Iguanidae is confined to the Americas, except for one genus (with two species) found in Fiji and Tonga … Since these are endemic species they could not have been brought there by humans. The only possible explanation is that a long time ago they floated there on logs and flotsam carried by ocean currents (Mayr, 2001, p. 32).

Mayr's explanation seems plausible until one realizes that the Fiji Islands are 5,000 miles away from America. Granting a generous thirty miles of drift per day for this treacherous journey (which required a sail mate of the opposite sex), the iguanas would have arrived in Fiji eight months later! If this sounds incredible, consider the distance involved in bird colonizations. Mayr and Phelps claimed the Hawaiian Islands house many land birds that supposedly migrated there from the American continents. These birds would have had to fly over 2,000 miles without the aid of intervening islands to serve as "stepping-stones" (Mayr and Phelps, 1967). Some of these long-distance colonizations seem miraculous, and even Mayr feels that "the distances involved in some of these colonizations are truly miraculous" (Mayr and Phelps, 1967, p. 299).

The scientific literature is full of examples of long-distance dispersal that could be described only as miraculous,

including the dispersal of freshwater fish (i.e., cichlids) found only in Africa and South America. Phillip Darlington, the most prominent biogeographer of the twentieth century, flirted with a south Atlantic land bridge but favored the hypothesis that these fish traveled out of Africa, up through Asia, across the Bering land bridge, down North and Central America, and finally into South America (Darlington, 1957). The most amazing part of this story is the disjunct distribution is also explained by extinction in the intermediate parts of a wide distribution that did not leave a single fossil behind.

Nearly all stories of long-distance dispersal, whether oceanic or otherwise, are ad hoc and often downright miraculous. Dispersalism has been called "a science of the improbable, the rare, the mysterious, and the miraculous" (Nelson, 1978, p. 289). Dispersalist explanations also have been compared to "Kipling's *Just So Stories* … although Kipling's illustrations were better" (Funk, 2004, p. 649). Even ardent defenders of dispersalism have acknowledged that their conclusions are "pseudoscientific" and "nonfalsifiable" (McDowall, 1978, p. 96).

Some evolutionists are impervious to the "improbability" and "untestability" of long-distance over-water dispersal. They claim that we know dispersal over water does occur and, given plenty of time, some dispersals will reach and colonize far distant islands. Coyne for example, wrote,

> Suppose that a given species has only one chance in a million of colonizing an island each year. It's easy to show that after a million years have passed, there is a large probability that the island would have been colonized at least once: 63 percent, to be exact (Coyne, 2009, p. 106).

By simply inflating the available time, evolutionists conclude that anything that *can* happen *will* eventually happen! Or as G. G. Simpson bluntly put it, "Any event that is not absolutely impossible … becomes probable if enough time passes" (Coyne, 2009, p. 106). Like so many times before, when Darwinians encounter a complicated problem they simply appeal to more time as the solution. "Time," wrote evolutionist Alexander Wolsky (1976, p. 95), "is the only *Deus ex machina* which neo-Darwinists invoke when in difficulty."

Continental Drift

The growing frustration with dispersalism and the acceptance of plate tectonics and cladistic taxonomy in the 1960s led many evolutionists to opt for what is called vicariance biogeography, i.e., that most plants and animals were widely distributed on the super continent Pangaea and the discontinuities we observe today are largely due to the breakup of this continent. The cichlids, along with other fish, would not have had to travel tens of thousands of miles from Africa to South America (as Darlington claims); they needed only to disperse a short distance while the continents were still together. With vicariance it appeared that evolutionary biogeography was saved from the embarrassing theories of the past. "The emergence of modern vicariance biogeography and the theory of plate tectonics thus put an end to exaggerated hypotheses of jump dispersal and trans-oceanic land bridges" (Giller et al., 2004, p. 276). Or has it?

While it is claimed that continental drift can explain many discontinuities without resorting to ad hoc reasoning, it appears to have raised more problems than it solved. For example, if the continents were once connected, why are there not more fauna and flora similarities between the southern continents? (This was one reason why many evolutionists rejected land bridges for chance dispersal.)

Another problem with the vicariance theory is that it requires many taxa to have originated preceding the breakup of Pangaea. For example, it is now believed that freshwater cichlids appear in the fossil record only after the fragmentation of Gondwana (i.e., the southern hemisphere). Donn Rosen's response, "Fossils give a minimum rather than maximum age of a taxon" (Rosen, 1985, p. 636), is common and demonstrates that the vicariance biogeographers rely on ad hoc hypotheses just as much as the disperalists. Like Darlington, when the evidence does not fit the theory, the explanation is the extreme imperfection of the geological record.

More recently, evolutionary dating methods have shown that many plants and animals evolved after the continents separated. This would include freshwater fish (i.e., aplocheiloid, cichlid), ratite birds, parrots, frogs, baobab trees, and *anolis* lizards (Briggs, 2003; De Queiroz, 2005). Some have even used the fossil record to show that the entire New Zealand flora is the result of oceanic dispersalism (Pole, 1994). Evolutionists are now forced to acknowledge that long-distance dispersalism must have played an even greater role than many have suspected. In an article titled "Goodbye Gondwana," Matt McGlone (2005, p. 739) wrote:

> While vicariance remains a respectable and likely explanation for many disjunct biotic distributions around the globe, recent developments have undermined the preeminence it has enjoyed since plate tectonics and cladistics elevated it in the 1960s and 1970s. We are now in the middle of a dispersalist counter-revolution … fuelled by an outpouring of molecular phylogenies. To the credit of those who stuck by it, dispersal biogeography continued to advance through the latter half of the last century, despite the jibes that it was mainly a producer of 'just-so-stories' and despite the exhausting and unproductive task of countering the constricted worldview of cladistic biogeography and the alternative

> universe of panbiogeography. The recent flood of evidence supporting transoceanic dispersal … has put it in the driving seat in the South.

Vicariance biogeographers have tried to deal with this contradictory data by questioning the reliability of molecular dating (Sparks and Smith, 2005; Nelson and Ladiges, 2009). They have been unsuccessful in convincing many, and dispersalist scenarios are now being widely published. We are in the midst of another paradigm shift and a return to "a science of the improbable, the rare, the mysterious, and the miraculous" (Nelson, 1978, p. 289).

Immune to Falsification

Evolutionary biogeography has now come full circle. We started with the dispersal stories of Darwin and Wallace and, through many decades and many paradigm shifts, have ended with the same narratives. The "recent flood of evidence" that McGlone and others talk about is not evidence, per se; rather it is lack of evidence for drift. Alan De Queiroz (2005, p. 70) notes, "A main objection to dispersal hypotheses is that they are unfalsifiable and thus unscientific … However, this can be countered by noting that, if plausible vicariance hypotheses are falsified, then dispersal is supported by default."

Not only is evolutionary biogeography based on negative evidence, but the evolutionist also has a smorgasbord of hypotheses to choose from to explain every distribution. Rather than considering the possibility that the theory of evolution is incapable of explaining life's geography, the dissatisfaction of one hypothesis only leads them to another.

The traditional explanation for the distribution of the banded iguana is over-water dispersal, a view that has been defended as recently as three years ago (Keogh et al., 2008). Those who dislike this explanation have argued for the view that iguanas were widely distributed in the southern hemisphere and they walked on dry land from Asia or Australia to Fiji via a Melanesian land bridge (Noonan and Sites, 2010). Another way to move South Pacific plants and animals long distances (though the iguana may be too young for this approach) is to postulate a large former continent in the southwestern Pacific, the remnants of which allowed plants and animals to travel several thousand miles until the fragments became sutured into the North and South American continents (Nur and Ben-Avraham, 1981; Nelson and Platnick, 1980).

The explanations given for the dispersal of freshwater fish are just as eclectic. Evolutionists originally postulated a land bridge between Africa and South America (Eigenmann, 1909). Darlington (1957) followed this idea by moving these fish across almost every continent. Along came vicariance with its explanation of short-distance dispersal before the continents fragmented (Stiassny, 1991; Murphy and Collier, 1997). Now that many freshwater fish are judged as too young to have been moved by drift, the explanation is that they are tolerant of saltwater and made the long journey across the Atlantic Ocean.

> If, as the fossil record seems to indicate, the aplocheiloid fishes are too young to have been carried about on tectonic plates, how did they achieve their circumglobal range? The answer does not appear to be difficult. For many years, these fishes have been allocated to a category called "secondary freshwater fishes" … Some of the species live in brackish water and others can tolerate the higher salinity of seawater (Briggs, 2003, p. 549).

Other explanations of plant and animal dispersal include transportation by floating whale carcasses (Smith et al., 1989); now vanished islands that served as stepping stones for short-distance dispersal, such as the islands between Australia and Tasmania (Nunn, 2009), and Easter Island and South America (Newman and Foster, 1983); and when dispersal by natural causes seems untenable, as in the case of the coconut's sea journey from Southeast Asia to Panama, the explanation is a pre-Columbian trans-Pacific journey by human beings (Ward and Brookfield, 1992).

Although some of these explanations have contributed to understanding the distribution of life, this does not change the fact that biogeography can "explain" every distribution in a multitude of ways, while never making a prediction that could subject the theory to falsification. Even evolutionists have long recognized that it is an explain-all theory.

> The peculiarities of geographical distribution seem very difficult of explanation on any theory. Darwin calls in alternately winds, tides, birds, beasts, all animated nature, as the diffusers of species, and then a good many of the same agencies as impenetrable barriers. There are some impenetrable barriers between the Galapagos Islands, but not between New Zealand and South America. Continents are created to join Australia and the Cape of Good Hope, while a sea as broad as the English Channel is elsewhere a valid line of demarcation. With these facilities of hypotheses there seems to be no particular reason why many theories should not be true. However an animal may have been produced, it must have been produced somewhere, and it must either have spread very widely, or not have spread, and Darwin can give good reason for both results (Fleming Jenkin quoted in Hull, 1973, p. 342).
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> From a theoretical point of view held by some methodologists and philosophers of science (*e.g.* Popper) that is a poor hypothesis [dispersal of marsupials] because it is not falsifiable by any evidence now in hand or known to be obtainable. However, no hypothesis on this subject

> is absolutely and clearly falsifiable (Simpson, 1978, p. 323).
>
> Before continental drift was discovered the Darwinians explained the distribution of life on earth in terms of dispersal; after the discovery of drift they explained the same distribution without such heavy reliance on dispersal. … One is tempted to ask what observations the Darwinians can't explain. (Leith, 1981, p. 539).

Some evolutionists are convinced that biogeography could contradict contemporary evolutionary teachings. According to Douglas Theobald (2010), "We confidently predict that fossils of recently evolved animals like apes and elephants should never be found on South America, Antarctica, or Australia." Such a discovery, however, would not falsify the theory of evolution. Instead it would lead evolutionists to construct land bridges or argue, as some have, that elephants can swim long distances with their trunks used as snorkels (Brown and Lomolino, 1998; Johnson, 1980). Since a fossil elephant was recently discovered in Java, a swim from lower Indonesia to Australia with possible intervening now submerged islands could likely be postulated.

Straw-man Argumentation

If biogeography is an explain-all theory, incapable of proof or disproof, how can it be regarded as evidence for evolution? And if all animal and plant distributions can be explained by land bridges, continental drift, and over-water dispersal, what prevents the creationist from utilizing the same explanations? It is extremely difficult to make an argument for evolution from traditional biogeography (i.e., without any assumption of evolution).

Evolutionists, however, feel by alleging that creation demands certain patterns of distribution not observed in the biological world, evolution becomes the only theory consistent with the biogeographical data. This is essential to their argument and is the reason why attacks on creation permeate most every defense of this subject.

> He who admits the doctrine of the creation of each separate species, will have to admit, that a sufficient number of the best adapted plants and animals have not been created on oceanic islands; for man has unintentionally stocked them from various sources far more fully and perfectly than has nature (Darwin, 1859, p. 390).
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> Certain facts however do not fit the theory of creation satisfactorily. The rapid spread of the rabbit in Australia after its introduction by man has proved that there was no obvious reason why the rabbit should not have lived there before, if congenial surroundings were all that was required. House sparrows have spread widely through North and South America; frogs which were once absent from the Azores attained plague proportions; the grey squirrel of America has proved more successful than the native British red squirrel and is slowly supplanting it (George, 1962, p. 33).
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> Why, for example, should Australia be populated by marsupial versions of the wolf, the mole, the squirrel, and the mouse, rather than by the real articles? Why should oceanic islands lack most kinds of animals except for those few whose features suggested an ability to cross great expanses of ocean? Why should there be a woodpecker in the Argentine pampas, and hardly any trees for hundreds of miles? Why, as Darwin found in the Galapagos Islands, should the economy of nature be filled by a host of similar species of finches, each slightly modified for an ecological role that birds like warblers, parrots, and woodpeckers play in South America? In general, it appeared that a given taxonomic group of species was not distributed throughout the world wherever its special habitat occurred, as an economical Creator might have ordained (Futuyma, 1983, pp. 50–51).

The theological source for evolutionists' understanding of God was Darwin himself. Since the publication of the *Origin of Species*, evolutionists have rehashed the same talking points of Darwin. But, where did Darwin get his understanding of God? It appears that Darwin's attack was on the progressive creation/multiple centers of origin and local flood theory of Louis Agassiz (1850). Historically, though, the creationist position has been one of contemporaneous creation and a universal flood where all land animals and birds were dispersed from the mountains of Ararat.

From this single point of origin, why must "the best adapted plants and animals" be stocked on oceanic islands? Why must rabbits exist on every continent or island that suits them? Why does a woodpecker not have the freedom to migrate wherever circumstance leads it? Why do species (i.e., finches) not have the freedom to cross barriers and colonize islands like the Galapagos? And why, as Edward Dodson (1976) suggests, are discontinuous distributions evidence against creation, but explicable on a theory of evolution? "Often the creationist position," writes one evolutionist, "seems merely a straw man—set up only to be knocked down" (Gale, 1982, p. 139).

Contrary to the claims of Coyne and other evolutionists, the argument from biogeography does not prove evolution. Nor does it disprove creation. The whole structure of evolution, with its long time and progressive speciation does not bode well with the wide distributions existing in the world. To make sense out of biogeography, evolutionists are forced to build up and tear down continents and islands, disperse plants and animals across vast stretches of ocean in a way that can only be described as miraculous, and

then misrepresent alternative theories to make theirs more attractive.

A much better way to explain the geography of life exists without resorting to miracles. Like evolution, creation also has multiple ways of explaining every distribution, rendering both theories unfalsifiable. However, while creation and evolution are equivalent in this respect, the distribution of life is best explained by a theory of contemporaneous creation and a universal flood.

Transportation by Human Agency

The creationist view has always maintained that from his inception man was endowed with great intelligence, ingenuity, and technological abilities. Humans made numerous voyages across our great oceans long before Columbus. Most of the biogeographical enigmas that haunt evolutionists can be easily explained by this view.

The most convincing evidence for these transoceanic voyages comes from archaeology. The American continents, especially North America, have turned up numerous ancient coins from such places as China, Rome, Greece, and Egypt (Mahan and Braithwaite, 1975; Epstein et al., 1980). These coins cannot be easily dismissed as "recently lost" for several reasons: (1) Some coins have been found in undisturbed soil twenty-five feet deep (Deans, 1884) or in ancient Indian gravesites with stone tools found in the same locality (Butler, 1886); and (2) Chinese coins are confined to the west coast (i.e., Oregon and British Columbia), whereas Roman coins are east of the Mississippi, a pattern you would not expect to see if the coins were randomly dropped in modern times.

Archaeologists in Central America also have unearthed evidence for pre-Columbian contact from Africa, Asia, and Europe. Many large stone heads (some 9 feet high and 22 feet in circumference) from southeastern Mexico display clear negroid characteristics (Stirling, 1940; Von Wuthenau, 1975). The same Olmec culture also produced a two-foot-high basalt statuette of an oriental man, which is presently housed in a Mexico City museum (Coe and Miller, 2004). And recently, a rediscovered black terracotta head from the 1930s identified as European was dated to be 1800 years old (Knight, 2000).

The traditions of the Polynesian people also support long sea journeys. Anthropologist Roland Dixon documented the types of canoes used and their varying lengths (some were 90 feet long and could accommodate as many as 100 people). He also documented the distances of many of their excursions (Dixon, 1934). Tangiia, a man from Fiji, traveled as far as 4,000 miles to Rapanui—the native name for Easter Island (Dixon, 1934). Many others made these long excursions, including Paao priest of Upolu in the Samoan Islands, who traveled a distance of 2,300 miles to Hawaii (Emerson, 1893). Had the early explorers reached as far as Easter Island and Hawaii, the journey eastward to America would not have been difficult.

> The proven skill and daring of the Polynesian navigators within the area of Polynesia itself have naturally suggested that they may well have made adventurous voyages beyond the eastern margin of Polynesia, and so reached the shores of the New World. Such theories have been largely used in attempting to account for the presence of certain cultural traits which have analogies, real or fancied, with traits in the Oceanic area. Since Hawaii and Easter Island lie within less than 2500 miles of the Californian and Peruvian coasts respectively, the voyage thither would have been within the compass of the Polynesian sailor (Dixon, 1934, pp. 171–172).

Early humans traveled often and far for exploration, trade, and colonization. Couple this with G. G. Simpson's (1940) observation that people have always had a fascination with animals from distant places, and creationists can explain not only island distributions but even continental ones. It is far more reasonable to believe that some of Hawaii's fauna and flora arrived from southeastern Polynesia carried by humans, or that an early Polynesian explorer took back to Fiji the banded iguana than it is to believe that they transported themselves. Even some evolutionists accept this approach and have recently argued that the arrival of the coconut (Ward and Brookfield, 1992) and the Polynesian chicken in America are best explained by human transportation (Storey et al., 2007).

Furthermore, we see the same human transportations and colonizations occurring today. A multitude of books and articles have been written that show how plants and animals have colonized new and distant places and the problems this fact presents for indigenous species (Groves and Di Castri, 1991; Boersma, 2006). For example, much of Hawaii's present flora has been recently introduced by humans from all parts of the world.

> The Hawaiian Islands face a huge problem from plant invaders. There are simply too many of them to list them all in a small guide such as this, and singling out a few more for brief mention here does not do justice to the full scope and scale of the problem. There have been more than 10,000 species of alien plants introduced to the islands from all parts of the world, most of them intentionally and a few by accident. Just how many of these species are invasive remains to be seen; there are already more than 1,000 naturalized plant species reported in the Hawaiian Islands and a recent summary of the invasive or potentially invasive garden plants in the Islands listed 469 species (Staples and Cowie, 2001, p. 98).

Other colonizations occur through the releasing of many exotic pets into the wild. The Burmese and the vicious African Rock python, which are indigenous to Southeast Asia and sub-Saharan Africa respectively, have effectively colonized southern Florida, and many fear that they will soon colonize the other southern states (Fleshler, 2009; Reid, 2010; Tennesen, 2010). If, several hundred years from now, scientists do not trust the written record (as is true today) and want to explain these distributions naturalistically, then these incredible disjunctions (over eight thousand miles in the case of the Burmese python and three thousand for the African Rock) would have to be explained by rafting or some sort of land-bridge.

Humans have had a tremendous impact on the distribution of life, especially on islands. While other factors made a contribution, such as ocean currents, bird ferrying, and probably some short-distance rafting, they are likely trivial compared with transportation by human agency.

Postdiluvian Dispersal of Land Animals

One creationist view is that the continental dispersal of most land animals and birds was an unaided process. Marsupials, monotremes, and other animals dispersed themselves from a Middle-Eastern starting point to their present locations, a view considered ludicrous by evolutionists. Coyne, for example, believes that insurmountable barriers had to be crossed for marsupials to reach Australia. "How did kangaroos and giant earthworms make their way across the oceans to their present home in Australia?" (Coyne, 2009, p. 89). Contrary to the evolutionist claims, creation is not only consistent with the facts, but also provides a much simpler and non-miraculous explanation for continental distributions.

How exactly did marsupials get to Australia, and why are they mostly confined to this continent? Creationists have utilized two slightly different ways to explain these distributions, depending on when they believe continental drift took place. Some creationists have suggested that the continents were separated during the Flood and that marsupials got to Australia either by a land connection (i.e., since this area is still tectonically active) or by island hopping/rafting. This was followed by an extinction of marsupials in Asia. This view should not be ridiculed, especially since this was the *dominant* explanation given by evolutionists up until the acceptance of plate tectonics: marsupials "must have reached Australia through rafting and island-hopping … along an archipelago between Asia and Australia and then died out in southeastern Asia" (Clemens, 1968, p. 15).

Although this creationist view of dispersal is capable of explaining the existing biogeography, it has some difficulties. Other creationists believe the continents were still united after the Flood and every animal was more or less widely distributed, some even reaching as far as North America. Almost 400 years after the Flood, the continents separated (cf. Gen. 10:25), and some animals (e.g., marsupials) were spared the competition that their close cousins were suffering in other parts of the world (e.g., Asia). Due to competition, as well as other environmental factors, some members of a species died out while others flourished. What are seen are not evolutionary centers of origin followed by miraculous dispersals, but relicts, or survivors, of a once wide continuous range.

So simple and compelling is this method of dispersal that evolutionists have flirted with what is essentially a creationist explanation. Aaron Franklin Shull, a University of Michigan zoologist, wrote:

> These early northern mammals [marsupials] spread over the world, in all directions. They could not go far to the north before striking impossible climate, but the path south was open all the way to the tips of Africa and South America and through Australia. Then the true higher mammals [placentals] began to arise, also in the northern continents. They proved to be superior to the marsupials in the struggle for existence and drove the marsupials out—that is, forced them southward. Australia was then connected by land with Asia, so that it could receive the fugitives … Behind them the true mammals [placentals] were coming; but before the latter reached Australia, that continent was separated from Asia, and the primitive types to the south were protected from further competition (Shull, 1951, p. 60).

This simple way of explaining animal distributions (i.e., moving continents rather than animals) is explicable only by a theory of contemporaneous creation; that is, where *all* animals were present and widely distributed before the fragmentation of the world's landmasses. Furthermore, the empirical evidence for a more or less widespread distribution becomes more impressive with each passing year. Prior to 1985, there was no evidence for marsupials anywhere but Australia and the New World, and evolutionists took this absence of evidence as evidence of absence, but now marsupial fossils have turned up in many unexpected places, including Africa (Bown and Simons, 1984), Madagascar (Krause, 2001), and even Asia (Benton, 1985; Ducrocq et al., 1992).

We are discovering that more animals are proving to have a wider distribution than previously thought. The monotremes (e.g., platypus, spiny anteaters) were for the longest time believed to have been confined to Australia, yet to the amazement of many, a monotreme fossil was discovered in the early 1990s in South America (Pascual et al., 1992). Even elephants were far more widespread

than evolutionists were willing to admit. Elephant remains (i.e., bones, teeth) and man-made objects of elephants also place this creature in southern Mexico (Anonymous, 1903; Nomland, 1932), South America (White, 1884; Carter, 1989), and even possibly Australia (Vickers-Rich and Archbold, 1991).

As noted, discontinuities are due to partial extinctions, and in time more extinctions will shrink distributions. Not only are marsupials and monotremes today confined to a place or two, but the only locations of wild elephant herds are Africa and South Asia. The same locations apply to the once widespread lion. Due to big game hunters, both the elephant and the lion are now endangered species even in these areas, with the African lion facing extinction within twenty years unless precautions are taken.

Another factor that increases the chances of extinction is human introductions. In addition to the invasive Burmese python, an untold number of introduced foreign species are exterminating indigenous species, such as the Gambian rat in Florida (Perry et al., 2006), chameleons in Hawaii (Staples and Cowie, 2001), and the brown tree snake in Guam (Conry, 1988). Thanks to human hands, even the cichlids are expanding their range. They are outcompeting many native species (e.g., crustaceans) and have effectively colonized many freshwater habitats in the Hawaiian Islands (Staples and Cowie, 2001). As more exotic animals escape or are released in the wild, some will colonize these locations and force others into extinction.

Contrary to evolutionary claims, the random-appearing and discontinuous patterns of distribution seen in the world today are quite consistent with a creationist view. And the advantage the creationist view has over the evolutionist one is that it does not require miraculous, long-distance, over-water dispersal. All that is required is a more or less wide distribution followed by tectonic vicariance and extinctions in the intermediate range of these wide distributions.

Survival and Dispersal of Plants

Up until the time of the Flood, the world was lush with vegetation. All kinds of fruits, vegetables, flowering plants, and numerous other plant species were widely distributed on Pangaea. This tropical paradise was completely destroyed by the Flood, and only some species of plants, through the survival of their seed, succeeded in leaving representation in the postdiluvian world.

The survival of seeds during the Flood has been questioned by those who doubt the biblical narrative. There are, however, various ways seeds could have survived the Flood. (1) Many seeds can remain dormant for very long periods of time, in some cases as long as 1500–2000 years (Shen-Miller et al., 1995; Erlanger, 2005). (2) Plants of all kinds would have been brought into the ark to feed animals and people during the Flood. After the Flood Noah and his family could have used the seeds to harvest their favorite foods. (3) Seeds could have survived on floating mats.

After the Floodwaters abated, seeds were scattered over the face of the earth, and as time ensued further dispersal occurred by other means: epizoochory (i.e., dispersal of seeds attached to animals' bodies), endozoochory (i.e., dispersal of seeds inside animals' bodies), and autochory (i.e., dispersal by physical expulsion and wind). Add this to human interest in many plants (e.g., fruits, vegetables, angiosperms) and our ability to facilitate dispersal, and it is safe to predict that at the time the continents were divided many plant species were widely distributed wherever favorable climates were present.

The evidence from archaeology provides overwhelming support for a wide distribution of plants, especially fruits and vegetables. The pineapple, for example, was widespread in South and Central America when Columbus and other explorers came to the New World (Collins, 1948). As a result, it was long assumed that this fruit originated in Brazil until a wealth of archaeological evidence confirmed that the pineapple also existed in the Old World from very early times. The pineapple is clearly depicted in old Indian temple art (Gupta, 1996), found on pottery in Egyptian tombs (Wilkinson, 1837), represented on murals in Pompeii (Carter, 1953), and, to the amazement of nineteenth-century archaeologists, the pineapple was carved on walls in ancient Nineveh (Layard, 1853; Rawlinson, 1885). Regarding the discovery at Nineveh, George Rawlinson stated, "The representation is so exact that I can scarcely doubt the pineapple being intended" (Rawlinson, 1885).

The bottle gourd was also a widespread plant. Nobody can figure out where it originated or how it was dispersed. Archaeologists have found abundant evidence (i.e., rinds, seeds) for its early existence in many places in Peru (Whitaker and Bird, 1949; Macneish et al., 1970), in several caves in northeastern Mexico (Whitaker et al., 1957), and in an ancient burial site in central Florida (Doran et al., 1990). A clay replica of the gourd was also discovered in the eastern Andes (Izumi, 1971). The story is much the same in the Old World. The gourd appears in ancient Egyptian tombs (Schweinfurth, 1884), a cave site in Kenya (Cole, 1963), Spirit Cave in northwest Thailand (Gorman, 1971), and its usages (i.e., bottle, eating utensils) are mentioned in an ancient Chinese document (Li, 1969).

The peanut was once believed to have originated in the Old World because of how widespread it is there. When archaeologists recovered peanuts from ancient Peruvian tombs, it was then believed that the peanut originated in South America and was carried over to

Asia in recent times. Archaeologists have recently discovered several-thousand-year-old peanuts in China (Chang, 1973) and in caves on the island of Timor, Indonesia (Glover, 1977). Like the pineapple and bottle gourd, the peanut was universal several thousand years before Columbus.

Many other plants thought "native" to one hemisphere also existed early in the other hemisphere. Ancient Indian temple art clearly depicts plants that supposedly originated in America, such as the cashew nut, custard apple, and chili pepper (Gupta, 1996). The custard apple also was discovered in caves on the island of Timor (Glover, 1977), and the chili pepper had a history in Tahiti before European contact (Langdon, 1988).

Plants shared between the pre-Columbian hemispheres were numerous. The evolutionary claims for this wide transoceanic distribution of plants is unconvincing because plants have limited mobility and are poor dispersers. Something more is needed to move them all over the earth. There have always existed some anthropologists, who boldly proclaimed that the empirical evidence stands in sharp contrast to conventional thinking.

> Some plants positively were pre-Columbian in the Old World and the New World, and at least one such transfer can be dated at about 2500 B.C. There is a formidable list of other plants, most of them related to the Middle American-Southeast Asian areas that range all the way from probable to possible cultural transfers. The long held doctrine of the absolute separation of Old World and New World agricultures is no longer tenable. The plant evidence should be re-examined without bias (Carter, 1953, p. 71).

George Carter accepts this early and wide distribution of plants as evidence of pre-Columbian contact, and in many cases he may be right. Another possibility is that the seeds of these plants survived the Flood and were sprouting on various continents as Noah and his family left the ark. Either way, the evidence squares nicely with the expectations of creationism.

Evolutionists, however, have an *a priori* commitment to naturalism; thus they are forced to explain away the evidence. They either dismiss the data as a misidentification (Harlan et al., 1973; Pickersgill, 1976), question the reliability of the stratigraphy in which the remains were found (Harlan et al., 1973; Chang, 1973), or attribute the phenomenon to convergent evolution (Richardson, 1972). Such extravagant explanations are unnecessary. All that is required to explain plant geography is the simple explanation of an early, widespread flora followed by extinction in many parts of the world.

Conclusion

How plants and animals came to be distributed over the face of the earth is a very important topic, especially when dealing with the question of origins. Both creationists and evolutionists have tried to reconcile the biogeographical data with their understanding of how history unfolded (the latter far more than the former). An extensive review of the biogeographical literature supports the conclusions of this paper.

First, biogeography does not establish the fact of evolution. Instead, evolution can explain nearly every contingency by using every conceivable method. Evolutionists first invoked land bridges, which were soon replaced by long-distance, over-water dispersal. Not long after, they moved from *oceanic rafting* to dispersal before *continental drifting*, and presently many evolutionists are returning to the rafting events that they trashed in past decades. According to one insightful evolutionist,

> Before continental drift was discovered the Darwinians explained the distribution of life on earth in terms of dispersal; after the discovery of drift they explained the same distribution without such heavy reliance on dispersal … One is tempted to ask what observations the Darwinians can't explain (Leith, 1981, p. 539).

Evolutionists also distort and misrepresent the creationist position to give the impression that their theory is the only viable explanation. When evaluated fairly, it becomes clear that both creationists' and evolutionists' theories are unproven, make unjustifiable assumptions, and offer explanations that can only be described as *plausible*.

Second, while both views are in many respects equivalent, the creationist explanation is the better argument. The idea of a contemporaneous creation dispersed widely on the earth followed by partial extinctions is a simple approach, especially when dispersal is facilitated by humans. This view also fits with the archaeological evidence. The problem of biogeography from an evolutionary perspective is that all of life is stretched out over half a billion years, with the fragmentation of the world occurring late in the history, leaving a large percentage of plants and animals to disperse in a miraculous way.

Creationists are often chided for reliance on miracles. They require them, though only in the beginning. Evolution, however, requires them at almost every turn, especially when dealing with the geography of life. One who dislikes postulating miracles when simple explanations will do is forced to conclude that the geography of life is best explained by a theory of contemporaneous creation and a universal flood.

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