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# The Jurassic Coast: Evidence for the Flood

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## Abstract

A portion of the Dorset and Devon coastline, considered a 185-million-year "walk through time," has been declared the UK's first geological world heritage site. But there are numerous contradictions to its deep time, evolutionary, and uniformitarian interpretations. One of the most obvious is the lack of erosion within and between geological layers—a feature common in practically all sedimentary rocks. Surficial Jurassic Coastal erosion rates, similar to the rest of England, suggests that the entire island would be eroded to sea level in only a few millions years, contradicting the elongated timescale. Evolutionary dating, based on the fossils, especially the classical ammonite series, shows several problems. Other strange features of the Jurassic Coast challenge its uniformitarian explanation, such as the absence of a significant change at the supposed Paleozoic/Mesozoic boundary, when 90% of species supposedly went extinct. We examined Lulworth Cove, an iconic area for the Jurassic Coast that includes so-called stromatolites, a "fossil forest," and "dirt beds." Dinosaur tracks also were found, as well as catastrophically deposited shell layers in the Purbeck Limestone. These, and many other features, suggest better interpretations are provided by the Genesis Flood. One in particular is the erosion of the sedimentary sequence, which created a unique gravel-capped planation surface, which was subsequently dissected, creating local water gaps perpendicular to ridges. This corresponds to the recessive stage of the Flood, with its two phases of sheet and channelized erosion. The Jurassic Coast makes a better "icon" for biblical history than for deep time and evolution.

## Introduction

The United Nations has set aside iconic areas around the world that supposedly demonstrate deep time, uniformitarianism, and evolution. In 2001, they designated 155 km (95 mi) of the Dorset and Devon coast of south-central England as the UK's first geological world heritage site. It is called the Jurassic Coast, since much of the strata are dated as Jurassic, but the strata also include Permian, Triassic, and Cretaceous deposits. Some scientists also include the patchy Tertiary in the eastern part of the area. The Jurassic Coast is promoted as an area of outstanding natural beauty, fantastic ecology, and wide-ranging recreational opportunities that emphasize England's contribution

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**Figure 1. The Jurassic Coast draws millions of tourists every year and teaches them millions of years, uniformitarianism, and evolution.**

to Jurassic geology (Zielinski, 2014). It is claimed to be a 185-million-year "walk through time" demonstrating evolutionary earth history:

> This internationally important landscape not only represents major states of the Earth's history spanning 185 million years, but gives us an insight to past environments and the record of life held by fossils. (Pfaff and Simcox, 1999, p. 4)

Some claim the walk shows 265 million years, if the Tertiary is included. The Jurassic Coast attracts millions of tourists each year (Figure 1), and there is no attempt to discuss the problems caused by false dating information and fossil evidence that contradicts evolution. This article intends to mention the contradictions to the evolutionary/uniformitarian paradigm.

We are aware that most mainstream scientists consider themselves "actualists," not uniformitarians. Actualism is a part of uniformitarianism (Reed, 2010, 2011), but the change in terminology allows a modicum of neocatastrophism when needed, such as impact events. While admitting that the present is not necessarily the key to the past, geologists insist that only natural processes operated in the past. This hidden philosophical naturalism often causes geologists to not see evidence from the rocks and fossils that contradict present processes. But since few people understand the distinction between actualism and uniformitarianism, and since most geologists default to uniformitarianism anyway, we will use that term, especially since it was the philosophical principle used to dismiss the Flood.

The Jurassic Coast begins at Studland, Dorset, and goes to Orcombe Point near Exmouth in East Devon and includes the land between the cliff top and the low water mark (Figure 2). The main towns, travelling westward, are Swanage, Weymouth, Portland, Bridport, Charmouth, Lyme Regis, Seaton, Sidmouth, and Budleigh Salterton. Many of these towns have museums or visitor centers that describe the geology in uniformitarian and evolutionary terms. Under the auspices of the UK's Natural History Museum, fossil fairs are regularly held at places like Lyme Regis.

## Lack of Time in the Sedimentary Rocks

Not counting any Cenozoic rocks, the sedimentary rocks are dated from Permian to Cretaceous (Table I), so the very

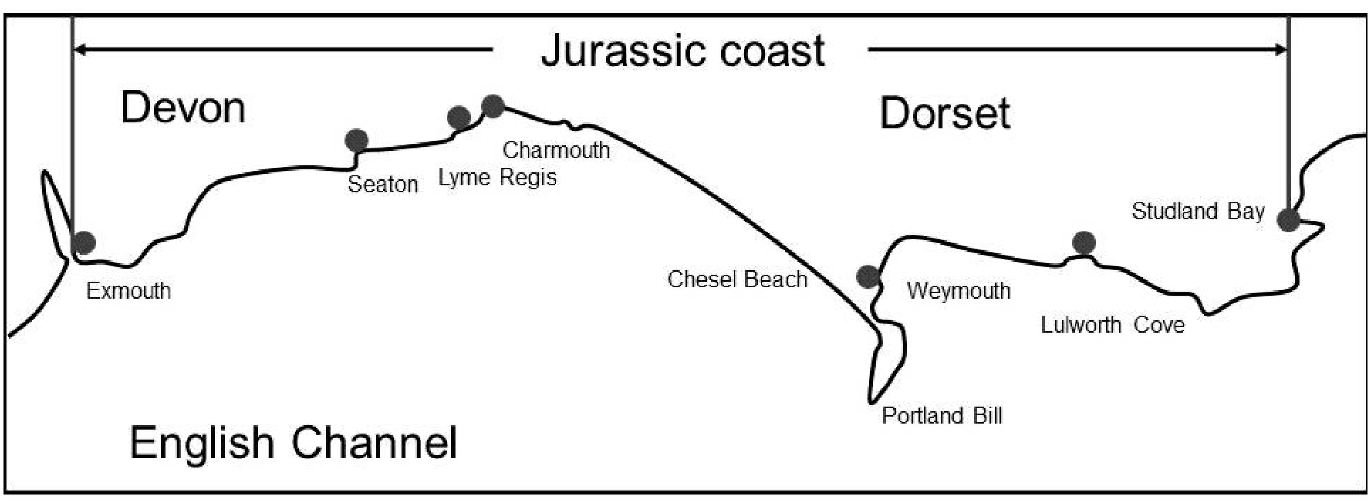


**Figure 2. The Jurassic Coast from Exmouth to Studland Bay.**

| Period | Western Jurassic Coast | Eastern Jurassic Coast |
|---|---|---|
| Cretaceous | Chalk | Chalk |
| Cretaceous | Upper Greensand | Upper Greensand |
| Cretaceous | Gault | Gault |
| Cretaceous | | Lower Greensand |
| Cretaceous | | Wealden Group |
| Cretaceous | | Purbeck Limestone |
| Jurassic | Charmouth Mudstone | Portland Group |
| Jurassic | Blue Lias | Kimmeridge Clay |
| Jurassic | | Corallian Group |
| Jurassic | | Oxford Clay |
| Triassic | Penarth Group | |
| Triassic | Mercia Mudstone | |
| Triassic | Otter Sandstone | |
| Triassic | Budleigh Salterton Pebble Bed | |
| Permian | Aylesbeare Mudstone | |
| Permian | Exe Breccia | |

**Table I. Strata of the western and eastern Jurassic Coast are generally different lithologically.**

**Figure 3. Large ammonite fossil found at the Jurassic Coast.**

late Paleozoic and the whole Mesozoic are represented.

The dates are provided mainly by fossils, such as the classic ammonite index fossil sequence (Figure 3). The layers are tilted at 2° to 3° down to the east, so as one travels west along the coast, one travels into older rocks—from Cretaceous gradually into Permian. There are some local areas of major folding with high-angle strata exposed, such as at Lulworth Cove (Pfaff and Simcox, 1999). Half way along the Jurassic Coast, a near vertical fault has caused many more Jurassic formations to be exposed to the east that do not exist in the west and are thought to have been eroded (Figure 4). The reality as one travels along the Jurassic Coast is somewhat more complicated than shown because of occasional local dipping of strata to the south and a coastline that is not straight. The erosion apparently took place before the deposition of the Cretaceous sequence, producing a slight angular unconformity (Figure 5).

However, there is little if any erosion within and between the layers (except what shows up at the angular unconformity) during this 185 million years. Modern erosion rates, which are based on river sediment output into the oceans, imply that the continents would have been eroded to sea level in just 10 million years (Roth, 1998)! However, Roth's rate neglects coastal erosion, which has been shown to be quite rapid in areas like the Arctic coast. Adding this factor would result in the erosion of the continents in around 8 million years. Other factors could act to slow erosion down; it is thought that man's influence has doubled the rate, so a corrected extrapolation would see the continents leveled in around 16 million years. Of course, as the relief of the terrain is reduced, the erosion rate decreases. Schumm (1963) neglected coastal erosion but included many other factors to estimate that the United States would be planed to sea level in

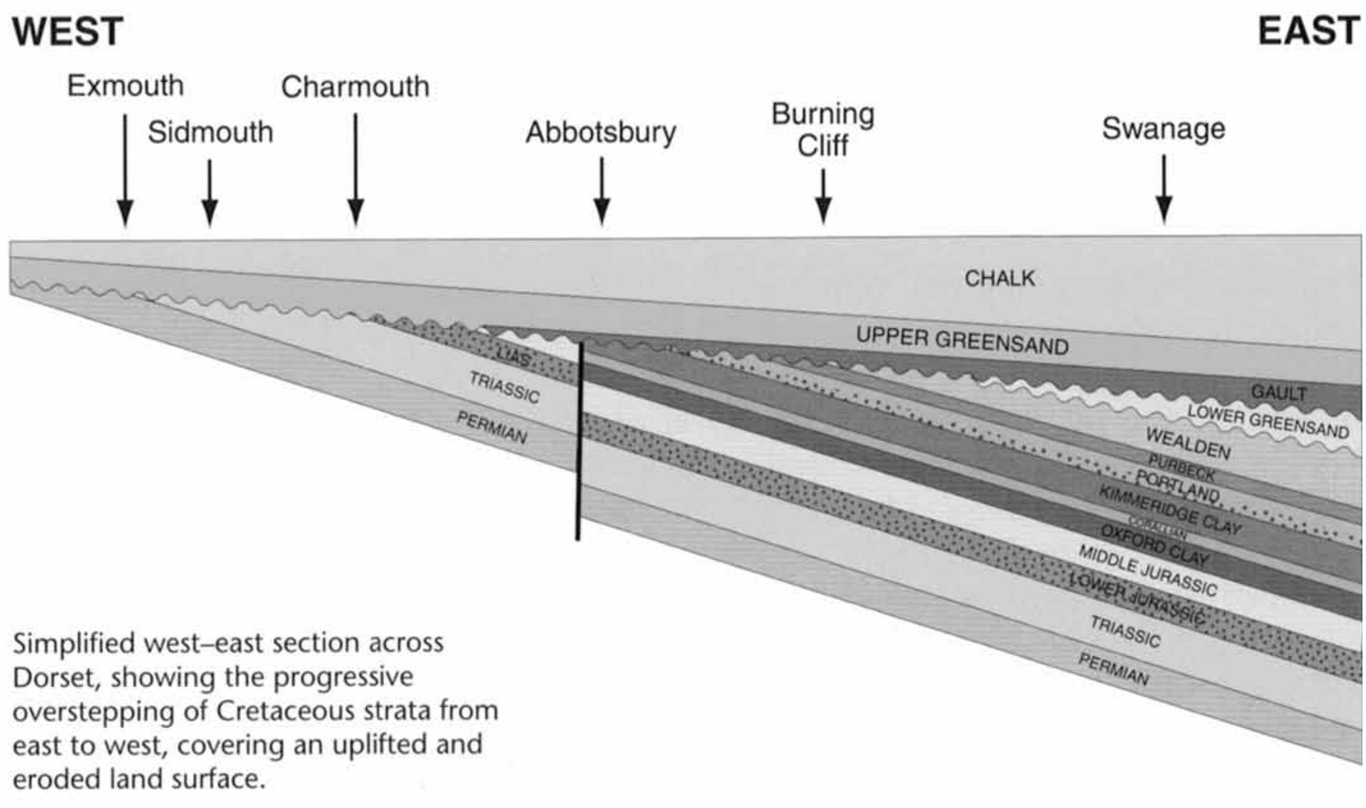


**Figure 4. Geological map of Jurassic Coast showing the periods and/or formations and the fault near Abbotsbury (from Ensom and Turnbull, 2011, p. 13).**


**Figure 5. Angular unconformity between Triassic and Cretaceous rocks.**

33 million years, granted a warm, humid climate. But rates depend on local factors, too. Erosion can be significant in drier climates, due to flash floods and heavy rainstorms in the spring and summer, and the absence of vegetation (Summerfield, 1991).

In any instance, however, on the scale of a million years, there should be abundant evidence of erosion in the strata of the Jurassic Coast; canyons and valleys can be cut in thousands of years. The fact that one layer is laid upon another with little if any erosion within and between layers (Figures 6 and 7) is strong evidence against the millions of years. The fact that most of these layers can be traced over wide areas of England (Winchester, 2001) with little or no erosion within and between layers is

**Figure 6. Sedimentary layers showing little or no erosion within the Jurassic Coast sedimentary rocks (Beverly Oard for scale).**

powerful evidence for rapid catastrophic deposition. Even at the angular unconformity (Figure 5), there is little or no evidence of channels; rather it appears to be a planation surface with 120 million years of evolutionary time missing (Edwards, 2008).

So, the Jurassic Coast is *not* a walk or trip through time but a reminder of the devastation wrought by a global Flood. The lack of erosion within and between layers of strata is common everywhere. We suggest the deposition was early in the Flood by sheet deposition (Walker, 1994). Dinosaur tracks found in the Jurassic Purbeck Limestone in the eastern Jurassic Coast reinforce this conclusion (Oard, 2011).

It is also interesting that the layers show evidence of being deposited in sheets and not by fluvial or other processes, since there is a lack of channels in some of the sedimentary rocks that should have been conduits for sediment transport before deposition, for instance within the 400-meter-thick (1,312 ft) Permian Aylesbeare Mudstone:

> These muds and sands [of the Aylesbeare Mudstone] were probably laid down in a type of inland lake that periodically dried out (a playa lake). It used to be thought that the sandstones were laid down by rivers, but this now seems less likely in view of the *lack of channels* and improbability that such a thickness (400 m) of mudstone would be deposited on a floodplain *without any channels*. Instead, it now seems more likely that the sandstones were laid down by wind, representing the movement of sand dunes across the dry lake surface. (Edwards, 2008, p. 32, emphasis ours)

The lack of channels shows that the mudstone with interbedded sandstone was laid down as a sheet, as expected in the Genesis Flood. It is curious that uniformitarian scientists often propose a paleoenvironment inconsistent with the field evidence. We are unaware of any field evidence of sand dunes in the Aylesbeare Mudstone. Such situations are the norm within evolutionary/uniformitarian paleoenvironmental interpretations (Oard, 1999).

## Coastal Erosion Shows That the Millions of Years Do Not Exist

The chalk cliffs and other cliffs around England are eroding, with large blocks falling into the sea. It is typically episodic, like that at the rocky coastal cliffs along the North Sea of the York shoreline. Average erosion is around 5 cm/yr (2 in/yr) (Rosser et al., 2013). At that rate, 50 km (31 mi) of coastline would erode in one million years and 500 km (310 mi) in ten million years.

Similar erosion takes place along the Jurassic Coast. Cliff falls and rotational slides occur episodically, sometimes with fatal consequences. The sea then removes the fallen material from the beach. One of us has observed these kinds of events for more than 50 years and recorded 2 to 5 cm (0.8 to 2 in) retreat of the chalk on average per year (Matthews, 2009a). Goudie and Brunsden (1997) record 40 to 70 cm/yr (1.3 to 2.3 ft) retreat at Lyme Regis over a 100-year period. At that rate of erosion, the Jurassic Coast and all of England would have eroded to sea level within less than ten million years, but uniformitarians claim the Jurassic Coast has existed since early Tertiary times, based on the youngest sedimentary rocks.

## What about the Fossil Dating?

Ammonites are used as index fossils for biostratigraphical correlation (Figure 8) to date and identify the rock layers on the Jurassic Coast. But ammonites show no evolutionary progression through the strata, as even Winchester (2001, p. xiii) acknowledges. Woodmorappe (1978) noted that the ammonite taxonomy is

**Figure 7. Red Triassic Mercia Mudstone east of Seaton with interbeds of banded grey-green limestone.**

subjective because differences cannot be shown to be caused by evolution. Thus, ammonite biostratigraphy is based on taxonomic manipulation.

There are fossils unique to different strata, such as the ammonite beds on Monmouth Beach, immediately west of Lyme Regis. Some layers in the Blue Lias contain the oyster bivalve *Gryphaea arcuata* without ammonites; other layers contain mainly ammonites. This differentiation, of course, needs an explanation, but there are other possibilities besides evolution, especially if the strata do not reflect the uniformitarian paleoenvironments but instead were the result of rapid inundation by sediment. *Gryphaea* is often found resting at angles that suggest burial in a disturbed environment (West, 2013). Ammonites also suggest sudden deposition. As De La Beche (1839, pp. 229–230) noted, "The number of ammonites found under conditions from which we may suspect that the animal was alive and retreated into its shell when overwhelmed with mud, is considerable." Pulman quoted De La Beche at length:

> "Some of the fossils are so beautifully preserved, their bones so well connected, with even the contents of their intestines between their ribs, and with traces of skin upon them, that many Ichthyosauri and Plesiosauri must have been suddenly enveloped alive, or immediately after death, by the matter of the rock enclosing them, so that neither their decomposition took place in the water nor the predaceous animals existing in the same seas had access to their bodies. Fish also are so frequently found entire that we would adopt the same conclusion respecting their remains. So that while we suppose the layers to have been gradually accumulated, minor accessions to the mass from time to time may have been more suddenly caused. The number of Ammonites found under conditions from which we may suspect that the animal was alive and retreated into its shell when overwhelmed with mud, is considerable." (Pulman, 1975, p. 11)

Therefore, evidence of rapid burial in these strata has been known from the early nineteenth century. Buckland reported on the presence of extractable *sepia* from fossilized ink-bags associated with belemnite fossils in the Lias near Lyme Regis. The fossil resembles the living *Loligo vulgaris* and requires both sudden death and rapid burial for such organic material to remain:

> I might register the proofs of instantaneous death detected in these ink-bags, for they contain the fluid which the living Sepia emits in the moment of harm; and might detail further evidence of their immediate


**Figure 8. A display of the dating of Jurassic Coast sedimentary rocks by ammonite biostratigraphy from the fossil museum at Charmouth.**


**Figure 9. Well-rounded (but split) quartzite rock from the beach at Lyme Regis, western Jurassic Coast. The quartzite likely came from the Budleigh Salterton Pebble Beds or the Otter Sandstone a little farther west.**

burial, in the retention of the forms of these distended membranes; since they would speedily have decayed, and have spilt their ink, had they been exposed but a few hours to decomposition in the water. The animals must therefore have died *suddenly*, and been *quickly* buried in the sediment that formed the strata in which their petrified ink and ink bags are thus preserved. The preservation also of so fragile a substance as the pen of a Loligo, retaining traces even of its minutest fibres of growth, is not much less remarkable than the fossil condition of the ink bags, and leads to similar conclusions. (Buckland, 1869, pp. 256–259)

Other evidence for rapid burial of fossils includes the presence of fossilized stomach contents and skin with various *Icthyosaur*, *Plesiosaur*, and *Scelidosaurus* fossil remains (De La Beche, 1839; En-

**Figure 10. Lulworth Cove of the Jurassic Coast.**

som, 1989; Martill, 1991). Marine and terrestrial fauna and flora is found buried in the same Jurassic layers, including wood and very fine structures such as insect wings. Snelling also reports the presence of $^{14}C$ in wood and ammonites from Jurassic layers, strongly pointing to a more recent burial (Snelling 2000, 2008).

## Further Contrary Features

The Jurassic Coast shows a number of other features that are problematic for the uniformitarian and evolutionary paradigms. These will be noted and left for future research. Secular scientists believe that the transition from the Permian (late Paleozoic) to the Triassic (early Mesozoic) was a major time of earth upheaval, resulting in the extinction of 90% of Earth's species (Erwin, 1996). However, the transition on the Jurassic Coast shows no catastrophic break but rather steady sedimentation. In fact, the supposed Permian and Triassic portions are so devoid of useful fossils that the boundary cannot be identified, and a symbolic one has been subjectively chosen (Matthews, 2011). Some geologists admit the problem, labeling these sediments as "Permo-trias" with a question mark. Likewise, the dramatic extinction event at the base of the Jurassic shows nothing unusual along the Jurassic Coast.

Another interesting feature is the presence of abundant dinosaur tracks in the Purbeck Limestone and occasionally in the overlying Wealden strata (Ensom and Turnbull, 2011). Tiny pieces of eggshell have also been found. Like other track sites around the world, bones and teeth are rare. Tracks and eggs have been explained in the Flood paradigm by the BEDS (Briefly Exposed Diluvial Sediments) hypothesis (Oard, 2011) and by the "recolonization" view (Tyler, 2006), although problems have been noted with the latter (Reed et al., 2009).

In addition, there are several features that indicate rapid, if not catastrophic, accumulation. The Purbeck Limestone has areas of concentrated mollusk-shell beds called coquinas, which represent catastrophic conditions (personal observation). Well-rounded quartzite rocks (Figure 9) occur in the Budleigh Salterton Pebble Beds and the Otter Sandstone (Edwards, 2008). Quartzite is metamorphosed sandstone, likely representing deep burial and heating. The currents that deposited the original sandstone were from the south. So the quartzite rocks represent deep burial to metamorphose the sandstone, then rapid tectonic uplift, erosion, and long-distance transport—all indicating catastrophic action.

Catastrophic action is also indicated by feldspar grains found in the Otter Sandstone (Edwards 2008). Feldspar weathers rapidly, so feldspar in sedimentary rocks is evidence of rapid deposition.

## Lulworth Cove Iconic Area

Lulworth Cove is famous for its outcrops (Figure 10). It is regarded as a good training ground for neophyte geologists (Goudie and Brunsden, 1997) but is difficult to explain, especially in conjunction with the dry valleys that surround it. Earlier views on how the cove formed were based on erosion by the sea. At present, geologists think the erosion was the opposite—from land to sea. But the very short, dry valleys leading to the cove and the source of the eroding currents are not discussed. A reasonable explanation can be made for rapid uplift at the end of the Flood, but despite its fit with the field evidence, it is not acceptable to uniformitarian geologists.

To the east of the cove is an area known as the "fossil forest," with stromatolite-like bulbous forms (Figure 11). Some of these contain cavities, giving them the appearance of an open bird's

**Figure 11. "Stromatolites," the bulbous forms, at the "fossil forest" at Lulworth Cove.**

**Figure 12. A stromatolite-like feature around an upright log, which has since disappeared, partly due to collectors of petrified wood.**

nest (Figure 12). These cavities contained silicified fragments of fossilized conifer trees (until collectors removed all the samples). The trees are assumed to have grown in situ (West, 2013) on what are known as the "dirt beds," thin layers of about 5 to 10 cm (2 to 4 in) of rock fragments and organic matter, really a black limestone (West, 1975). Although these obviously are not sufficiently substantial to support trees, the idea that the beds represent ancient soil horizons fits the uniformitarian model and thus is interpreted in that fashion. West stated: "The trees rooted in the dirt beds confirm the origin of these as soils" (West, 1975, p. 217). A better explanation for the vegetation at this location is its transport there by floating log mats and trees sinking in a vertical position into accumulating sediments (Oard, 2014).

## Dissected Planation Surface

After the strata of the Jurassic Coast were deposited early in the Flood, differential vertical tectonics uplifted continents and mountain ranges, while ocean basins and valleys subsided (Psalm 104:6–9). There is significant evidence for this general sequence around the world, which resulted in the erosion of the continents and the transport of that sediment to the continental margins. This explains the thick sediment wedges at continental margins and the erosional features on the continents, which include large planation surfaces, erosional remnants, water and wind gaps, the long-distance transport of resistant rocks, pediments, and submarine canyons (Oard, 2008, 2014). To the east of the Jurassic Coast is an uplifted dome called the Weald, which was eroded at least 1,300 m (4,260 feet) (Matthews and Oard, in press; Oard and Matthews, in press).

Sheet-flow erosion planed this area, forming a flat-to-rolling planation surface in the chalk. This surface is especially well developed in the area

Figure 13. Rolling planation surface about 240 m above msl (Hardy's Monument in the distance from the hill at Hell Stone).


Figure 14. Flat planation surface near Seaton, seen in the background, dissected about 50 to 110 m.

north of the Jurassic Coast (Figures 13 and 14). In fact, it is thought that a planation surface formed all across southern England and was especially well developed in East Devon and west Dorset (Jones, 1999). This erosion left a gravel cap that is often matrix supported, called "Clay-with-Flints" (Figure 15). This gravel cap is unlike those seen in the western United States, being composed of angular flint, eroded from flint nodules, layers, and lenses within the chalk and deposited in a fine-grained matrix (Jones, 1999; Loveday, 1962).

Consistent with the two-phase erosion of the latter half of the Flood, the sheet erosion that formed the planation surface was followed by channelized erosion, which dissected the planation surface. In places it eroded the flat surface to more of a rolling erosion surface (Figure 13). In other places, it formed valleys, some occupied today by rivers and others with little or no water flowing in them (Figure 16).

The streams or rivers flowing in these relatively large valleys are *underfit*, which means that the water flow is too small to have formed the larger valley and its meanders. Dury (1964a, 1964b, 1965), who has spent a considerable part of his research career analyzing underfit streams all over the world, has produced several equations for estimating the amount of water that could have flowed in the larger valleys. Those valleys of southern England not associated with the Ice Age are underfit. Dury primarily focused on the wavelength of valley meanders and the width of the valley compared to the current stream or river. Meander wavelength is about ten times the valley width (Knighton, 1998) and is the best criterion for determining the size of historic maximum flow: "Meander wavelength is the most unambiguous measurement of channel properties that can be made" (Moore et al., 2003, p. 3). At one time, Dury concluded the valleys contained up to 100 times more water than the current rivers. He later revised that figure to 20 to 50 times as much water (Dury, 1976, 1986), possibly due to the catastrophic implications. Regardless, he showed that valley formation required much larger volumes than are present today. Thorne and Brunsden (1977) estimated a volume differential of 50 times the present. At 2 to 3 times today's average rainfall, Dorset becomes flooded in many places. The amount required to carve the valleys would almost completely flood the area (Matthews 2009b). The erosional sequence from a large planation surface to large valleys fits well with the scale and predicted sequence of the late phase of the Flood.

It is possible that the smaller dry valleys could have been caused by heavy Ice Age precipitation (Oard, 2004), but that mechanism seems insufficient for the large ones. The dry valleys had always been a puzzle to the early geologists:

**Figure 15. Clay-with-Flints capping the planation surface in Figure 13.**

**Figure 16. A dry valley near Lulworth Cove called Scratchy Bottom.**

**Figure 17. The Corfe Castle water gap (actually a double water gap on either side of the ancient castle) (view north).**

> Valleys were observed to be of many forms. A few could plausibly be attributed to erosion by the streams that flowed in them, but most could not. For example, the "dry valleys" of the Chalk hills of northern France and southern England were just like some other valleys in form, but they contained no streams at all. (Rudwick, 2005, p. 102)

Earlier in his career, William Buckland considered the dry valleys evidence for the Genesis Flood:

> Buckland discussed early controversies between science and religion in an 1822 paper 'On the Excavation of Valleys'. He noted that the hills and valleys of East Devon are abruptly terminated by the sea, and considered that the present-day streams were incapable of having shaped the valleys. He concluded that the valleys had been eroded by torrential floodwaters which he took as evidence of the biblical Flood. (Edwards, 2008, pp. 17–18)

Goudie states that the origin of the dry valleys is unknown, with many hypotheses for their origin:

> One of the most widespread and most discussed features of the British landscape is the dry-valley network that is developed on many rock types. The classical localities are on Chalk … There are a vast number of hypotheses that have been developed to explain the presence of dry valleys. (Goudie, 1990, p. 176, 178)

## Water Gaps

During the channelized-flow phase of the recessive stage of the Flood (Walker, 1994), water flowing off the continents would often have eroded through barriers, such as ridges. This process created the numerous wind and water gaps observed today. There are thousands documented; in the Susquehanna River drainage basin alone above Harrisburg, Pennsylvania, USA, there are 653 water gaps (Lee, 2013).

Water gaps are observed near the Jurassic Coast. There is a classic water gap through the Isle of Purbeck's uplifted and tilted chalk ridge at Corfe Castle, near the coast (Figure 17). This double gap was likely formed from currents moving north to south as the English


**Figure 18. One of the small streams passing through the Corfe Castle water gap.**

landmass rose relative to the English Channel. However, the flow of today's streams is in the opposite direction because of a small uplift near the coast, the Isle of Purbeck. Figure 17 faces north, and small streams from the southeast and southwest turn to flow north through the water gap (Figure 18). Uniformitarian scientists have had little success in explaining water and wind gaps (Oard, 2008, 2014).

## Conclusion

The Jurassic Coast is said to be a 185-million-year walk through time: a showcase for evolution in the late Paleozoic and Mesozoic. Millions of tourists visit every year and are told only the evolutionary story. However, the actual field evidence along the Jurassic Coast shows numerous contradictions to that story. Many pieces of the field evidence actually support the paradigm of rapid erosion, deposition, and uplift during the Genesis Flood. For example, the limited erosion between and within the strata and its sheet deposition both argue for Flood processes. Likewise the presence of a broad planation surface dissected by valleys is consistent with late Flood processes. Instead of being an icon to secular science, the Jurassic Coast is actually an icon to the Genesis Flood.

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