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ON THE INTERPRETATION OF POTHOLES

DOUGLAS E. COX*

Since potholes are generally considered to have been formed by erosion over long ages of time, the rocks in which they occur would also seem to be of great age. Some geologic interpretations account for these topmost rocks as deposits formed during the Biblical flood. The presence of potholes poses a problem for these interpretations. The details of the uniformitarian theory of the formation of potholes are examined, and contrasted with the well-known characteristics of potholes. It is evident that the uniformitarian theory of pothole erosion falls short of accounting for the phenomenon of potholes in many ways. Potholes therefore cannot be regarded as evidence for a great age of the rocks in which they occur.

Introduction

A factor that strongly influences any interpretation of the age of a rock formation is the degree of erosion detected. Potholes are usually regarded as one of the erosional features that may influence age estimates of rocks in which they occur. The traditional interpretation is in terms of the process of abrasion of the bedrock by rotary currents inside the potholes, and vibration of pebbles and stones by the water, that gradually wore the holes deeper and deeper into the bedrock.

The immense size of some examples, upwards of 40 feet and 50 feet in depth, and similar diameters,[1] might be supposed to be indicative of long ages of abrasion by powerful currents. This would lead one to conclude that the topmost rocks of the earth's surface, in which such large potholes occur, are really very old; and must antedate the flood of Noah's time, that cannot have been more than a few thousand years ago.

Potholes pose an important question for flood geologists. Do they indicate the rocks in which they occur are really of great age? Certainly, if they have been formed by gradual abrasion of their walls by currents, they would. This would have to be a very slow process, considering the hardness of some of the rocks in which they occur. They are common in sandstone, dolomite, and granite.[2]

In the sandstones of Wisconsin Dells, Wisconsin, potholes abound. Along the top of the Niagara Escarpment, in Southern Ontario, many examples of potholes in hard dolomite and limestone may be found. Potholes also occur along the North Shore of Lake Superior. At Interstate Park, Taylor's Falls, Minnesota, a group of potholes occur in basalt.[3] Most potholes occur in sedimentary rocks, that cover most of the continents.

Usual Uniformitarian Interpretation

In the usual interpretation presented by uniformitarian theorists, potholes are considered to be the effects of erosion by streams and rivers over very long periods of time. The actual work of abrasion is considered to have been done either by hard grains of sand held in suspension by the rapidly flowing water; or by large boulders, called "grinders," in the bottom of the pothole, that were agitated constantly by the currents swirling around inside. The tiny grains in the rapid currents are thought to have gradually worn down the rock into a depression, that was deepened by the motion of the grinders.

Considering the remarkable depths of potholes, this process would seem to require great ages of time. Alexander[4] noted one example of 12 feet in diameter and 60 feet deep at Taylor Falls. Uniformitarian

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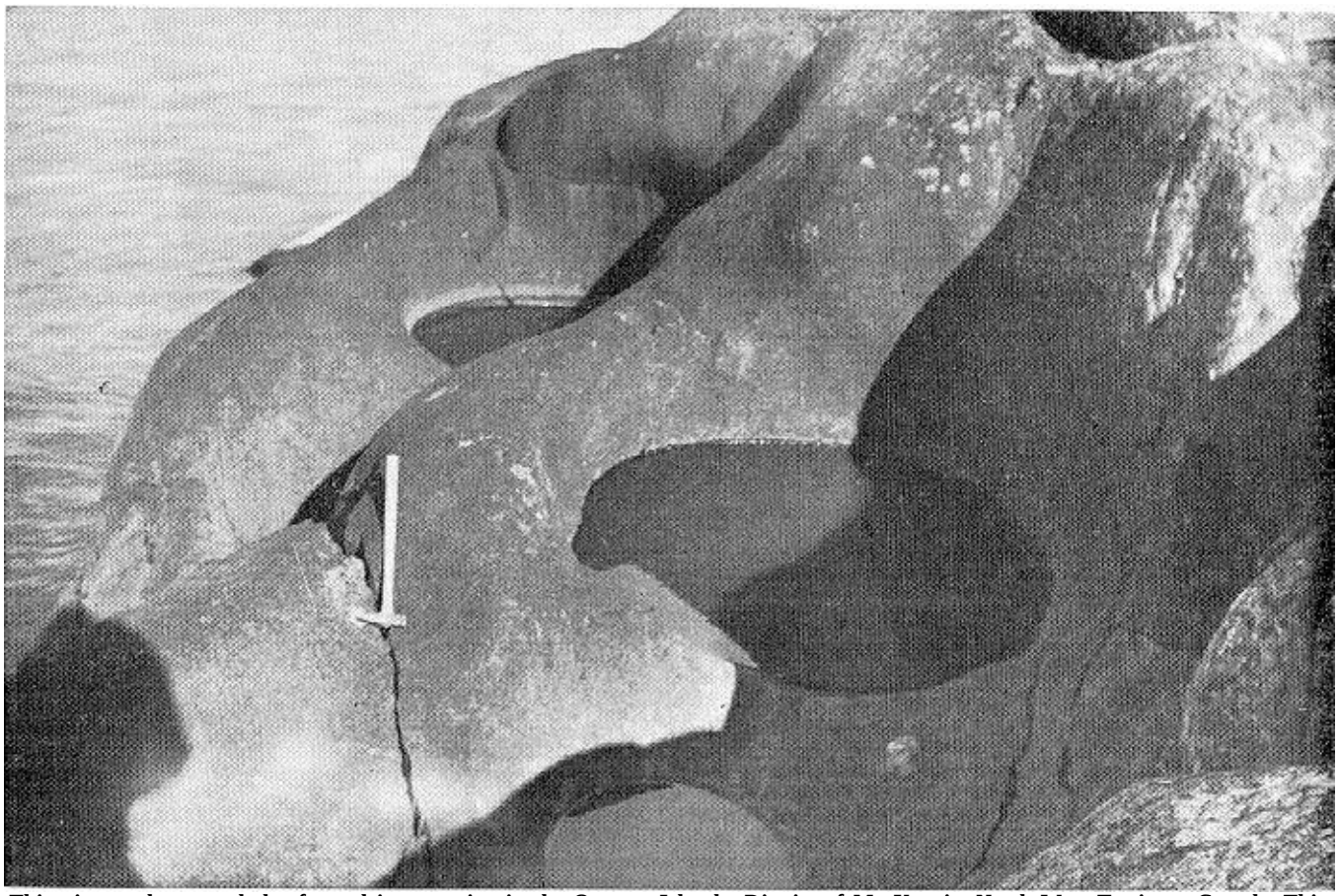

This picture shows potholes formed in quartzite, in the Outpost Islands, District of MacKenzie, North West Territory, Canada. This is Print Number 81755, by the Geological Survey of Canada, Ottawa, Ontario, Canada, and is used by arrangement.

geologists would have no trouble accommodating long time, but some flood geologic interpretation would have to be conceived so that this kind of effect would be possible within just a few thousand years, in the time elapsed since the Biblical flood.[5]

The slowness of the process of abrasion by which the potholes are supposed to have been formed seems to indicate the holes would be long ages in formation, but this problem is further compounded by the fact that the vast majority of all potholes are not in the process of formation at the present time. They are frequently far from the courses of streams or rivers, and many are filled up with stones and sand or other debris.

If they have been formed by erosion, the process has long since ended. The time since they were completed, together with the period of time they were in the process of formation, seems to add up to a considerable age for the latest sedimentary rocks of the earth in which they occur. Certainly this is a problem for flood geologists. How is it to be resolved?

Potholes that occur far from streams and valleys, sometimes high up on hillsides and mountains, have been explained by uniformitarian geologists as the effects of the great ice ages of the Quaternary. Supposedly, during this time, there were potholes formed when the ice melted, as rivers flowed underneath the ice and on its surface. Sometimes these surface rivers plunged down a crevasse, and eroded the bedrock beneath, forming potholes on the most unlikely places, the glacial theorists claim.

The ice ages of the Quaternary are considered to have lasted from about two million years ago until about 10,000 years ago. In all those areas that have been glaciated, there has been sufficient time for a cover of vegetation to develop, after the ice melted. All this goes to show that potholes on hilltops and mountain sides, as they are presently understood, tend to increase estimates of the age of the earth,

Yet systems of geologic interpretations involving the flood often place the ice ages after the deluge.[6] This means that all potholes, that are presently explained as the effects of glacial "moulins," formed while ice was spread thickly over the continents, while most of the ice melted, and subsequently trees grew, etc.—all this happened, according to these interpretations, since the flood.

Potholes: Problem for Flood Geologists

Potholes present a significant problem for flood geologists, since they occur in the topmost "solid" sedimentary strata, as well as in the older granites. These rocks are sometimes identified with deposits of the flood. Yet the presence of potholes in them indicates apparently they are in fact very old.

Can the potholes be explained apart from the assumption of a great age of the earth? Could there be

another explanation of their origin, apart from the one that is generally accepted today? Most geologists assume that potholes have been carved by streams and rivers, by abrasion of grains of sand and pebbles against the bedrock. Let us look into this interpretation of origin, and see whether it is possible to really account for the phenomena.

Certainly potholes often do occur in the beds of streams and rivers. Yet they are not confined to the courses of present day streams, by any means. They also occur on the sea shore, on hill tops, and steeply sloping rocks where it is difficult to imagine any former stream. Alexander noted:

> They are generally found in the beds of streams or in abandoned stream channels. Many are found, however, where the presence of a stream at any time in the past appears difficult to demonstrate. In Norway many appear along the coast near sea level and close to the water edge.[7]

Potholes are not limited to stream beds. Those in the Taylor's Falls area in Minnesota are not in the course of the river, but many are on top of cliffs high above the river bed. Some were discovered only after a covering of gravel had been removed. Upham wrote,

> The greater number were originally empty, or with only a partial filling of rounded grinding stones, silt, mud, or peat, differing much in their contents. Others, mostly of small size, were found completely filled, and some were covered and hidden by a hard deposit of glacial drift, almost typical till.[8]

Near Elk City, Idaho, gold miners had scraped off a layer of gravel from the bedrock, revealing several potholes. Of course it was supposed that a river had formerly flowed there. Professor George H. Stone described it:

> On the hills between Red Horse and American rivers the miners have washed away the overlying gravel. The rock beneath the gravel is very much smoothed and polished, but is very uneven, containing many rounded depressions, bowls, and potholes up to 5 feet in depth. Evidently here was a broad river that flowed up and over hills and valleys.[9]

Upham also reported that the "giants' kettles" at Christiania, Norway (now Oslo), when first discovered, were found buried under a layer of gravel. This gravel was very carefully removed, and a record kept of the depth and positions of the boulders, etc., that were found. Upham wrote,

> Taking up the question of the probable epoch or stage of the Ice Age in which the Christiania giants' kettles were eroded, we are confronted by the occurrence of marine shorelines and shells in deposits overlying the glacial drift, which demonstrate that during the time of the glacial recession there the land was depressed about 600 feet below its present height. It is impossible to ascribe the moulins and potholes to torrential agency so far beneath the sea level, and consequently they must belong at Christiania to the earlier time of high land elevation and snow and ice accumulation.[10]

So, at the famous Christiania (Oslo) site, the potholes were found buried under a layer of gravel. This is typical of many pothole findings. Only recently, one was discovered during excavations under a house in Buffalo, N.Y. A similar find led to the development of Glacier Gardens, in Lucerne, Switzerland. Alexander wrote,

> The great potholes of the Glacier Garden at Lucerne, Switzerland, have excited the wonder of two generations of travellers. At that place a group of potholes was discovered in 1872 during the process of excavating for a basement in the glacial drift. Later the drift was removed uncovering over 30 holes irregularly grouped in waterworn and striated bedrock.[11]

It is natural to suppose, when potholes are discovered under a layer of gravel and sand, that there was a former river in the area. But, since many potholes are discovered far from river courses, and deeply buried, would it not be equally reasonable to suppose, since these potholes were found apart from the course of any stream, that their formation therefore has nothing to do with currents and stream erosion? Certainly this would be logical.

And furthermore, those that occur in the courses of streams today might not have been carved by the present stream, but merely exposed when the currents washed out the loose sand. The same process, of washing the bedrock clean of layers of gravel, would explain the presence of the potholes at the sea shore. They were already there, buried under a layer of sand and gravel, until the waves washed the bedrock clean of its cover, and the potholes were exposed.

For if the sea had been pounding the shores where the bedrock was covered with a thin layer of gravel, the sand would be washed away soon and the features underneath exposed, including potholes. The water would not have carved them, but merely exposed them. And the same applies to rivers.

Usual Cause: Water Erosion?

It is interesting that in the geologic literature on potholes there is hardly a reference to them that does not associate them with currents, and erosion. That potholes are formed by abrasion, in streams, is a deeply ingrained axiom. However unlikely it may seem, it is taken for granted that wherever potholes are found, a river must have eroded them. Even where they occur right on the very tops of hills.

A particularly remarkable example of this occurs near Archbald, Pennsylvania, where, in 1884 and 1885, two large potholes were discovered in coal mining. Below about 15 feet of drift, the first hole discovered was excavated, and found to be 38 feet deep, with a diameter of about 15 feet at the bottom, increasing to a maximum of 42 feet, and a width of 24 feet across the top. The second pothole extended a depth of 50 feet in the bedrock.[12] Another remarkable example of potholes on high hills was mentioned by Alexander:

> For such potholes as those on the high quartzite bluff east of Devil's Lake, Wisconsin, it must be assumed either that this bluff was glaciated—which it evidently was not—or that some ancient river flowing hundreds of feet above the present

> lake level across the then-buried quartzite ridge eroded the holes in rapids coursing down its southern slope.[13]

No matter how improbable it may seem, the majority of geologists take for granted that potholes have always been formed by rivers. Yet it is quite logical to reason, since potholes occur in areas that are unlikely to have ever been the site of a river, that their formation is not related to river action.

However, uniformitarian geologists seem to always interpret the significance of potholes the other way round. Of course, as many recent philosophers of science have said, "there are no uninterpreted facts."[14] Observations, such as those just quoted, are expressed in terms of certain conceptual formulations. All "data," Hanson[15] says, is "theory laden." This situation must be realized when it comes to interpretative thinking about potholes.

Instead of assuming that potholes must have been carved by erosion in streams, let us try to be objective, and determine whether the facts confirm this assumption. As has been shown, patterns of distribution of potholes do not confirm it. They occur in areas where it seems most unlikely that a stream could have existed.

Initiation of Erosion Process

Another important problem is, how is the process of their erosion in streams initiated? What causes the formation of a cylindrical depression in level bedrock? Alexander described[16] potholes at Taylor's Falls, Minnesota, as small as three inches in diameter and 12 inches deep. Do these represent the initial stages of pothole erosion?

Also the writer has seen several examples of potholes two or three inches in diameter, along the top of the Niagara Escarpment in Ontario. The time involved in the erosion of such narrow holes, if they were formed by erosion, would seem comparable to the age of even the largest variety. At Taylor's Falls these tiny holes are associated with giant potholes up to 60 feet deep. Over a hundred potholes occur in that vicinity.

The initiation of the pothole boring process, according to the uniformitarian approach, is described by von Engeln:

> Where the rocks of a stream bed are non-uniform in texture, or are frequently intersected by joints, or have any kind of localized weakness, a small pit may be dug by differential erosion, or a hollow may result from the breaking out of a large fragment. Once a depression is formed in the bed of a stream it can become the lodging place of sand grains or pebbles slightly too coarse for the current to move across the low spot. The sand and pebbles do not, however, remain at rest. They are, more or less continuously, given a circular motion around the bottom of the hollow. By such grinding the depression is enlarged and deepened. In consequence more pebbles and more of the current are involved. Thus a pothole, progressively deepened and widened at the bottom, comes into being.[17]

The difficulty with this proposal is that once a depression is formed in the bed of a stream, it tends to get filled up, not excavated deeper. The added sand and pebbles would tend to protect the particles in contact with the walls of the depression from vibrations caused by the current. This can be demonstrated easily. For a stream to behave in the manner described above, that is progressively widening and deepening holes, rather than filling them up with sediment, would be quite exceptional. It is not at all characteristic of present day streams.

This can be verified even in the examination of potholes in the courses of streams today. Where a stream passes over a pothole, the hole usually goes much lower than the bed of the stream, but it is filled up with sand and stones. There is **no abrasion** occurring below the level of the stream where the pothole walls are protected by all the material contained in the potholes. Of course, some potholes happen to reach a depth equal to the present level of the stream, and it is these that seem to demonstrate the process of their erosion.

When potholes occur in areas where bedrock is flat, it is unlikely that there would be much of a current that could initiate the pothole boring process. An initial depression of a few inches in the bedrock hardly seems likely to set up eddies in the stream flowing over it that could wear the depression into a hole several feet deep. Where the bedrock is inclined, the problem of the means of initiation of a vertical pothole is compounded. Why would the current bore a hole *into* the rock, rather than just flow across it?

A famous example of a pothole in a steeply sloping schist with a striated surface has puzzled generations of students at Inwood Park, New York City.[18] The difficulty is not only that the surface of the rock is slanting, but it is striated, and according to the glacial theorists, such marks have been caused by the movement of the ice of the glacial period over the surface of the rock.

The problem is, if the glacier was moving, how could it have been the cause of the pothole? The crevasse, or "moulin," a waterfall in the former ice cap, must have moved along too. The water could not have fallen down on the rock below at the site of the pothole long enough to have eroded it.

This paradox, and the fact that potholes contain horizontal flutings and ridges on the inside walls, have led to a considerable amount of skepticism about the glacial "moulin" concept of the formation of potholes. Higgins and Alexander have argued against the interpretation that waterfalls could have caused potholes in the glacial age. Alexander noted:

> The main objection to the hypothesis lies in the difficulty of conceiving the moulin as existing long enough in the necessary definite form at the same spot, or as reforming in the same manner and at the same spot often enough to account for the work accomplished. Where the ice passed over knobs or ridges, crevasses may be supposed to have formed repeatedly, but to assume that in each succeeding crevasse the moulin formed over the same identical spot and in the same manner so as to continue the work of its predecessors rather strains the theory of

probability. There are no apparent reasons for its so forming.[19]

Higgins has written:

> There is no *direct* evidence that moulin waterfalls form potholes. Neither is there, as noted above, any *indirect* evidence that they might have done so. Furthermore, there are grave mechanical difficulties in the moulin hypothesis.[20]

Experiments on Pothole Dynamics

Mechanical difficulties involved in accounting for the formation of potholes by a vertical flow of water in a waterfall or "moulin" led Alexander and Higgins to abandon completely the possibility of a moulin origin for potholes. They found the mechanical difficulties insurmountable.

Alexander actually conducted experiments with a specially designed apparatus to determine the effects of introducing jets of water into a container, shaped like a pothole, from different directions. The flow produced when the jet was vertical was radial rather than rotary, and he concluded that that type of current would tend to produce a shallow, flaring plunge-pool depression.

He found that a rotary motion in the water within a pothole would be produced only when the water jet entered the pothole obliquely at a low angle, and the current flowed in a spiral motion down the walls, rotating at the bottom, and flowing up again in the center. Alexander found that *only very fine* particles were lifted by this upward current. He reported:

> In the 8-inch glass cylinder used for the observations of these currents, with a vortex velocity as high as 80-100 revolutions per minute, very fine sand was lifted only a few inches from the bottom. It would thus seem that in eddy holes, after depth exceeds diameter to any extent, only matter of exceeding fineness would be removed.[21]

The full extent of the difficulty this observation makes for the idea of pothole formation by erosion does not seem to have been appreciated by Alexander. He was, in fact, proving its impossibility by his experiments. In the long time that potholes are supposed to have been eroded, swift streams would no doubt carry a considerable amount of sediment. Much of this would find its way into potholes. Any large particles that fell into them would remain, settling down, and protecting the surfaces from any further abrasion by currents. Only the very finest material could escape, as he noted, in an upward current in the center of a spiralling, downwards swirling current.

A major difficulty with the assumption that running water could have carved the potholes lies in the characteristic forms of the potholes. Often they are surprisingly deep and narrow. Many of them widen with increasing depth.

Alexander[22] described one at Taylor's Falls, called the "hourglass," that contracts from three feet in diameter at the top to about 18 inches, and then expands again to three feet below the narrow section. The 60 foot hole is 12 feet in diameter at the top, 15 feet in diameter at a depth of 40 feet, and three feet at the bottom.

It is difficult to see how a current or eddy in a river flowing above such holes could have increased in power with increasing depth. Alexander found, in his experiments, that the power of a jet at the surface decreased with increasing depth.[23]

Problem of Ridges, Flutings

A significant proof that the potholes are not in the process of formation at the present time, and that they are not worn by the abrasion of streams, is due to the presence on the walls of typical examples of little ridges, or flutings. These are often inclined at an angle to the horizontal.

Where potholes are being washed by streams today, these flutings can often be seen above the level of the water, but in the vicinity of the water they are *gradually being worn away.* They are **not** formed by the action of the water, or by pebbles and sand abrading the walls of the hole. Actually such flutings are destroyed by these agents.

When one uncovers potholes below stream beds, which penetrate deep below the water level, and are filled up with sand and stones, one finds that their surfaces down under the stream contain these tiny ridges and flutings, while the walls being abraded by the water do not. The water action tends to make the walls of the potholes smooth, not abrade them in such a way that flutings are produced.

Since the water does not form ridges and flutings on the walls of potholes today, neither could it have done so in the past. These flutings therefore could not have originated by an abrasion process.

Potholes sometimes occur in a series, forming a canyon, with a stream flowing along the bottom. In the uniformitarian interpretation, the stream that flows along such a canyon was supposedly the agent that eroded the potholes. In such a canyon, the potholes would either have formed one at a time, consecutively, or concurrently, all at the same time. In either case, the difficulties with erosion as the causal agent seem to be substantial. A description of the process, as it has been explained as due to erosion, has been given by von Engeln.[24]

> Once begun, the pothole persists, as such, deep below the vertical penetration of the rock inequality by which it was initiated. Meanwhile the grooving scour of the stream lowers the general level of the bed. Upstream or downstream, another pothole site is brought into the zone of the stream action, and another pothole is initiated. In time the whole stream bed may become a succession of potholes. Most of these will have been descended or inherited from rock conditions that are no longer in evidence. By lateral enlargement adjoining potholes intersect at the bottom from time to time. The miniature natural bridge that then separates the upper portions is broken down at the next period of flood flow. Shortly the complete length of a gorge-cutting stream becomes a succession of independent and intersecting potholes. The whole current of the stream must, in consequence, move in a series of gyratory swirls passing from one pothole to the next. The downcutting erosion of the gorge thus becomes chiefly a business of pothole grinding.

> When the significance of the linked potholes so regularly observed on gorge floors is appreciated, it becomes clear how generally the pothole process of downcutting is operative and effective.[24]

In pothole canyons such as that of Watkins Glen, New York, there are many examples of potholes intersecting. Many others are evident in Mohawk River Gorge at Little Falls, New York. Along the walls of this canyon, the sides of a whole series of intersecting holes can be seen. But an explanation is not quite as simple as the foregoing quotation might indicate. Consider a hypothetical example of the formation of just two potholes, formed in the manner outlined, that intersect for part of their length:

Hypothetical Example of Pothole Formation

As a hypothetical example, let us call the one pothole "A" and the other "B"; and let us suppose that "A" began to erode first, a little downstream from "B", but close to it. After "A" has got a good start, let us say eddies in the stream cause pebbles and sand to begin wearing the depression where "B" is eventually supposed to form.

By then "A" would be down a few feet in the rock. All goes fine until one day "B" begins to enlarge in diameter, near the bottom. Actually there is a hole worn in the side. Presumably the two potholes have begun to join. What happens?

Since the walls of "B" are not completely round where the two potholes intersect, the currents in "B" would not circulate. They would have no boundary on one side. So the process of boring in "B" would cease. And in "A", likewise, a hole would have appeared in the wall, and the swirling around of currents would cease below the hole, because the energy imparted to the water by the current entering at the mouth of the hole would be lost into "B" at the point of contact.

There would be no further swirling action of the current below the hole. There is no possible erosion of the two holes past the point of intersection, since each hole has a portion of wall missing. Currents do not keep following a curve unless bounded completely by something solid. The water would no longer "swirl" where there was an intersection of two holes.

So based on this hypothetical example, one would expect that whenever two holes intersect, they would not be eroded any deeper, since the current flow that supposedly caused their abrasion inside would no longer exist. Is this what is actually found?

Wherever canyons have been formed by intersecting potholes, the intersection extends for a considerable vertical distance. There is no evidence that development has been limited below the point of intersection of two or more holes. In the walls of such canyons, arcing grooves are evident that represent parts of the walls of former potholes, intersecting with a whole series of other potholes.

According to the concept of pothole erosion by flowing water, the motion of water inside the potholes would have to be rotary. This would be possible only if all the walls of the potholes were intact.

A series of potholes in a canyon is made up of intersecting holes; and, if they were formed successively, each new hole that intersected a previous one would have to have been formed with one side missing. The water eroding it would have to rotate without any enclosing wall on one side of the pothole. Clearly this goes beyond the bounds of common sense.

In the case of a series of potholes that intersect being eroded simultaneously, at the same level, the difficulty with the assumption of carving by currents is that there would be no means for water to carve the walls into arcs, since the direction of flow of the currents, when not bounded by the walls of the pothole, would tend to be in a tangent rather than to continue in a curve. There would be no means for water to form rounded, symmetrical holes at all.

The shape of the walls of the canyon on one side could not control the shape of the walls of the other side. Also the pattern of turbulence of a river eroding its bed for successive ages, would not cause vertical, cylindrical holes to form. Could eddies form in the same part of the stream, year after year, age after age, and make the wall of a canyon arc in just the same way, down through time?

Conclusions

Potholes, properly considered, and without the prejudice of a uniformitarian axiom that they have been caused by the erosion of currents, do not prove a great age of the earth. It will be found that they penetrate far below their present depths. The stream was only an agent of exposing them.

Potholes occur wherever the bedrock is covered by a thin cover of gravel and sand, which when uncovered by natural or human agents exposes them. The difficulty of the interpretation of potholes does not lie in the phenomena, but in the assumptions of uniformitarian geologists: that they are caused by erosion over long ages of time.

When creationists propose a new framework, such as the Biblical flood, it is necessary to explain many familiar phenomena in a completely different way. Potholes are an example.

According to the principle of uniformity, geological processes as causes are limited to those processes that can be shown to be in operation at the present time. However, if there was a worldwide flood in the past, that covered all the continents of the earth, and even the mountains, conditions would have been completely different than they are today.

For instance, the effects of high pressure would have to be taken into consideration. Perhaps some effects of high pressure would not be easy to discern today, especially those that might have involved the effects of a release of pressure on rocks.

It is hoped in a later article, to investigate some possible effects of the hydraulic pressure to which rocks and sediments were undoubtedly subjected during the Biblical flood.

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[18]Fairbridge, R W. Editor. 1968. Encyclopedia of geomorphology. Reinhold Book Corp., N.Y., p. 457.
[19]Alexander, H S. *Op. cit.*, pp. 310 and 311.
[20]Higgins, C. G. 1957. Origin of potholes in glaciated regions, *Journal of Glaciology*, 3 (21):11 and 12.
[21]Alexander, H. S. *Op. cit.*, p. 319.
[22]*Ibid.*, p. 307.
[23]*Ibid.*, p. 317.
[24]von Engeln, O. D. *Op. cit.*, p. 172.

SELECTION MEANS CHOICE

It seems certain that some kind of "natural selection" is needed for evolution to occur. For otherwise, even though there might be variations, the creatures concerned would soon revert to type, as can be observed actually. Yet what is meant by "natural selection" is rarely investigated. In fact, it is not "nature" which does the selecting, unless by a metaphor; it is the creatures concerned.

Remember, "selection" is the same as "choice." Consider Darwin's alleged (proto-) giraffes with necks a little longer than their fellows'. "Nature" did not choose that they eat from treetops, and thus survive hard times. The giraffes chose it presumably; they could have ignored the treetops, and starved. Or the alleged fish, on the way to becoming an amphibian, chose to go up onto the shore, and breathe a little air directly. "Nature" did not command the fish to do so. (These common allegations are used only for the sake of illustration.)

Now such a thing might work, with living things of some complexity if they were already established. But however useful this doctrine of "selection" might be in explaining the diversity of life, it is obviously useless in explaining **origin** of diversity of life.

So those who try to apply this to the origin of life, who talk of "natural selection at the molecular level" or something of the sort, are talking nonsense. Molecules do not choose to do this or to do that. Anybody would agree that, if a thing chooses, then it should be called alive. Thus "selection," i.e. choice, can never explain the origin of life, for it presupposes life.

Clearly, then, all attempts to reason that life arose "naturally" somehow are doomed as failures. So the only plausible conclusion is that life came by some intervention from "outside"; i.e., by the Creator.

As was remarked, it is perhaps somewhat easier to think of "selection" when considering living beings already established. But, in fact, there are grave difficulties there, as has often been noted in this and in other publications. Since it is necessary to admit creation to explain the origin of life, why not apply Ockham's razor and grant that creation is also the most satisfactory explanation of the diversity of life?

—Contributed by Harold Armstrong