

THE FLOOD

Geologists

BY JAMES L. HAYWARD

No epic tale captures the human imagination better than Noah and the Great Flood—all those animals marching two by two up to the ark, all that rain and the rising floodwaters, all those questions about what the animals ate and how they all fit into the big boat, all those claims about the discovery of Noah's Ark on Turkey's Mount Ararat.¹ In fact, flood stories are nearly universal, showing up among diverse peoples of the world—the Mokens, Greeks, Hindus, Chinese, Native Americans, and many others.² And now, in the twenty-first century, American and Dutch evangelicals flock by the thousands to ponder full-scale replicas of Noah's Ark, designed and built to bring the biblical narrative to life for the faithful.³

Not so well known is the fact that current interest in Noah's Flood can be traced back to the writings of a peculiar, but linguistically gifted, armchair philosopher, George McCready Price (1870–1963). Price enjoyed little scientific training and avoided geological fieldwork, but he invented what today is called “Flood geology,” based on selective gleanings from the geological literature and absolute confidence in the writings of a nineteenth-century prophet whose visionary experiences influenced



Model of Noah's Ark at the Ark Encounter, Grant County, Kentucky. The Ark Encounter, a young earth creationist theme park, opened in 2016 by Answers in Genesis.

her writing on many topics, including the Flood. Price's 726-page tome entitled *The New Geology*, published in 1923, made little impact on the scientific community. But because *The New Geology* squeezed earth history into a few thousand years, Price's views became a central plank in the platform of “young-earth creationism,” held sacred by large segments of the US population.⁴

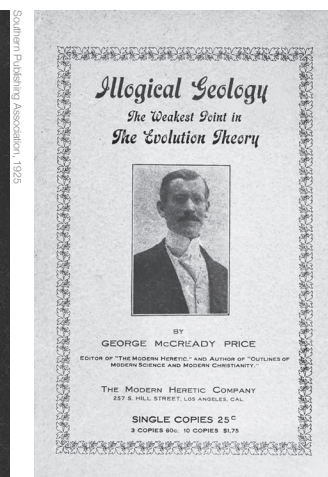
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writings of another twentieth-century maverick, J Harlan Bretz (1882–1981), a University of Chicago-trained geologist with no religious faith, precipitated a sea change in the way professional geologists viewed the past. His 33-page paper entitled “The Channeled Scabland of the Columbia Plateau,” published the same year as Price’s *The New Geology*, provided evidence that a humongous flood had shaped much of the eastern half of Washington State. This and subsequent publications by Bretz, who enjoyed extensive field experience, sent repercussions through an initially skeptical scientific community, long accustomed to thinking in terms of slow, gradual, earth-modifying processes.

Despite enormous differences in their training, philosophy, temperament, and conclusions, both Price and Bretz claimed evidence for the impact of one-of-a-kind megaflooding in the distant past, both vigorously challenged the doctrine of strict uniformitarianism, and both set into motion views that would foster opposing perspectives in large segments of the American population nearly a century later. Ultimately, however, the views of only one of these two iconoclasts would stand in the face of evidence from the earth itself.

George Edward Price was born the eldest son into a New Brunswick farm family.⁵ When his father died, his mother, with her two young sons, converted to Seventh-day Adventism, a fledgling apocalyptic sect that had emerged from the ashes of the Millerite Movement.⁶ Adventist apocalypticism was hitched to a belief that the seventh day of the week was to be kept as a sacred reminder of God’s creative handiwork and as a sign of



Left: George McCready Price (1870–1963), father of modern “Flood geology.” Frontispiece from *The Predicament of Evolution*
Right: Cover of Price’s second book, *Illogical Geology*

commitment to God and his kingdom in the end times.⁷

As young George matured, he aspired to become a man of letters. In 1891, he enrolled at Battle Creek College (now Andrews University) in southern Michigan. Although the college offered a “scientific course” of study, George chose the “classical course.” But after two years at Battle Creek, he was forced to drop out for lack of funds. He sold Adventist literature for a time, and earned enough to complete a one-year teacher-training course, including a class in mineralogy, at Provincial Normal School of New Brunswick (now the University of New Brunswick). In 1897, with his only science course and his formal education behind him, George Price launched a teaching career, a stepping stone, he hoped, toward his dream of becoming a literary figure.⁸

One of Price’s first jobs was teaching at a small high school in Tracadie, New Brunswick. There he was befriended by Dr. Alfred Corbett Smith (1841–1909), a local physician and one of the few educated, English-

speaking people in the little francophone community. Upon learning of Price's religiosity, Smith informed the young teacher of his evolutionary views. Price expressed ignorance about evolutionary theory, so Smith loaned him several volumes on the topic.⁹

Price read the books and, despite his limited exposure to science, came close to being persuaded by the force and logic of evolutionary arguments. The geological evidence impressed him the most. If the fossils "occur in a definite sequence . . . there must be something to the geological ages," he reasoned; and if the fossils were arranged in a definite sequence and the earth is very old, evolution must be true. Finding himself in the untenable position of either acceptance of science or loyalty to his faith, he appealed to the writings of Ellen G. White (1827–1915).¹⁰

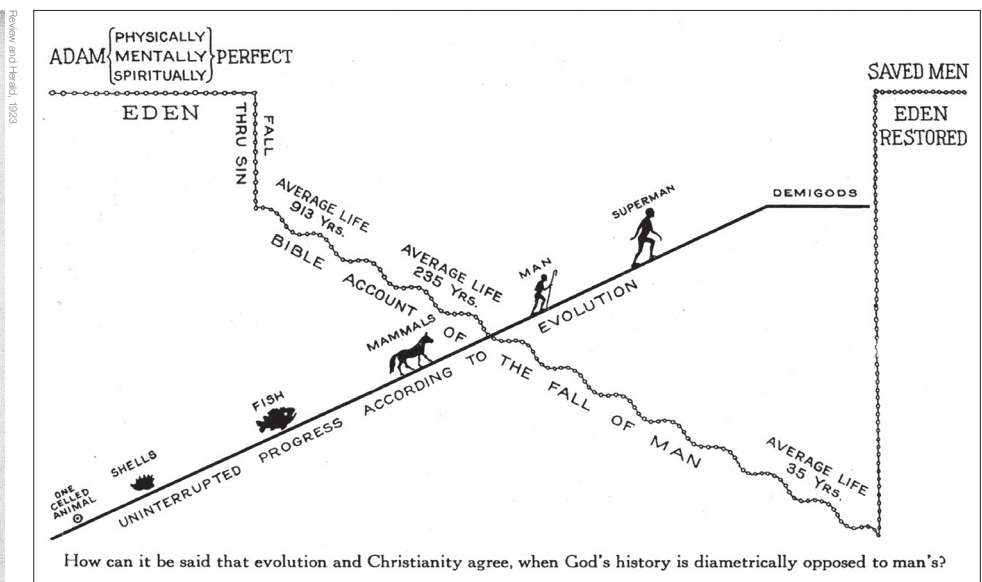
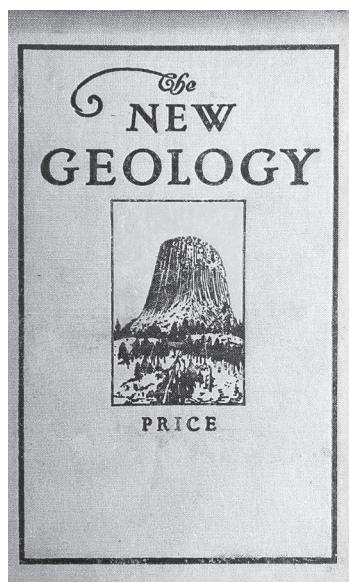
White's comments on the Genesis Flood were unequivocal—and horrifying. She reported that the "muttering of thunder and the flash of lightning," mingled with "large drops of rain," caused beasts to roam "about in the wildest terror, and their discordant cries seemed to moan out their own destiny and the fate of man." She described water bursting "from the earth with indescribable force, throwing massive rocks hundreds of feet into the air." She wrote of parents who "bound their children and themselves upon powerful animals, knowing that these were tenacious of life, and would climb to the highest points to escape the rising waters. . . . Often man and beast would struggle together for a foothold, until

both were swept away."¹¹ Then, as if anticipating Price and his doubts, she told readers that "Geologists claim to find evidence from the earth itself that it is very much older than the Mosaic record teaches. . . . But apart from Bible history, geology can prove nothing."¹²

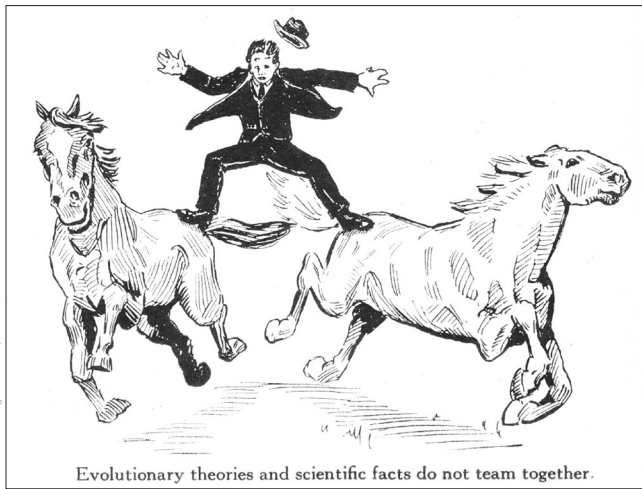
Convicted by White's graphic descriptions, assertions, and claim to divine insight, Price determined to find a way to interpret the geologic record in line with her views and his fundamentalist assumptions. As he read more geology, he convinced himself that "the actual facts of the rocks and fossils, *stripped of mere theories*, splendidly refute this evolutionary theory of the invariable order of the fossils, *which is the very backbone of the evolution doctrine*" (italics his).¹³

Determined to share his new-found discovery with the world, Price drafted what, over the next fifty-three years, would be the first of twenty-five books, *Outlines of Modern Christianity and Modern Science* (1902). In this small volume, he stated the hope that Christians would return to the "primitive principles" of their faith, especially that the worldwide Flood described in Genesis was responsible for the geologic record. He denied the notion that the fossil record proved there had been a succession of life, a denial that would recur again and again in his writings. He identified himself on the title page as "Geo. E. McCready Price." In later works he would drop the "E" for "Edward" and use his mother's maiden surname in place of his actual middle name.¹⁴

From 1902 to 1906, Price moved from job to job in



Left: Price's magnum opus, *The New Geology*, a 726-page textbook written from the perspective of "Flood geology." Right: Price believed the biblical story of human history was diametrically opposed to the history of life proposed by evolutionists. From Price, *The Predicament of Evolution*, page 104



According to Price, no common ground exists between evolutionary theory and scientific fact.
From Price, *The Predicament of Evolution*, page 96

Canada's Maritime Provinces, and then on to a series of jobs in the United States, eventually landing in Loma Linda, California. During this time, he tried his hand at evangelism, teaching, school administration, writing, and construction work—experiencing failure after failure, even at one point contemplating suicide. But writing remained his passion.¹⁵

In 1906, using borrowed funds, the oft-defeated but persistent Price self-published his second book, *Illogical Geology: The Weakest Point in Evolutionary Theory*, priced at 25 cents. The front cover featured the bespectacled author sporting a trim mustache, high collar, white vest, and dark jacket—a scholarly visage belying the author's paltry training and desperate last few years. In Part I, Price “examined critically this succession of life theory.” He asserted that “It is improper to speak of my argument as destructive, for there never was any real constructive argument to be destroyed. It is essentially an exposure . . .” He then brashly offered “a thousand dollars to any one [*sic*] who will, in the face of the facts here presented, show me how to prove that one kind of fossil is older than

another.” In Part II, he endeavored to “build up a true, safe induction” that the fossil record, which depicts a “sudden world-wide change of climate . . . [and] marked degeneration in all organic forms” provides evidence “beyond a reasonable doubt that our once magnificently stocked world met with a tremendous catastrophe some thousands of years ago, before the dawn of history.” And then, “With the myth of a life succession dissipated once and for ever, the world stands face to face with creation as the direct act of the Infinite God.”¹⁶

Swagger—born out of naiveté—became a trademark of Price's writings. He boasted that “the Lord providentially led me to work out a scientific demonstration that these geological ‘ages’ based on the fossils are artificial and untrue.”¹⁷ In apparent compensation for his own lack of scientific acumen, he skewered those with more legitimate credentials. Of trained scientific investigators he wrote, “Some day [*sic*] it may appear that the reigning clique of ‘reputable’ scientists have never had a monopoly of the facts of nature.”¹⁸ Of literary people with no interest in science, he sniffed, “Such people may as well sleep on, amusing themselves in their dreams with the scholastic pedantries of a bygone age.”¹⁹ And of his ultimate nemesis, Charles Darwin, he wrote, “His mind was of the slow, unimaginative type so frequently found among English country squires . . . singularly incapable of dealing with the broader aspects of any scientific or philosophic problem.”²⁰

Price mailed the slim 93-page *Illogical Geology* gratis to some 500 scientists and theologians, attracting widely divergent responses. William G. Moorehead, for example, of conservative Xenia Theological Seminary, found Price's arguments sound and unanswerable. By contrast, David Starr Jordan, the famous ichthyologist and founding president of Stanford University, suggested that Price should get into the field and learn some real geology.²¹

At the very least, notes historian Garry Wills, “Price deserves some kind of award for creative imagination, and for economy of argument: He countered all the Darwinian arguments with one simple chess move of the mind,” Noah's Flood.

In 1907, when a language professor at the College of Medical Evangelists (now Loma Linda University) took another job, Price, who during the past year had worked there as a handyman, was asked to teach the professor's courses in Latin and Greek. And drawing on his meager science training, Price also taught chemistry and tutored incoming medical students who, upon arrival, were deficient in one course or another.²²

Price spent the next five years teaching at the College of Medical Evangelists. Upon his departure in 1912, the medical school gifted him with a Bachelor of Arts degree, based in part on his writings. A few years later, a second Adventist institution, Pacific Union College, awarded him an honorary Master of Arts degree. These perks, along with 18-hour days, fundamentalist zeal, undeniable intelligence, and a decided flair for writing, were his tickets into the world of opinion and publication.²³

Price's *The New Geology* (1923) was his *magnum opus*, even reviewed—albeit unfavorably—in the prestigious journal *Science*.²⁴ Crafted as a textbook, this vast expansion of his earlier works described the major principles of geology and hammered away at his major theme, that because fossils from presumptively earlier organisms sometimes occurred in strata situated conformably *above* layers with fossils from presumptively later organisms, the progression-of-life view held by evolutionists fell apart. Although conventional geologists explained these instances of out-of-order fossils to be the result of the well-established process of overthrusting,²⁵ Price insisted this was a lame excuse designed to prop up evolutionary progression. He declared, instead, what he called his “great law of conformable stratigraphic sequences . . . by all odds the most important law ever formulated with reference to the order in which the strata occur.” The so-called “law” asserted that “Any kind of fossiliferous beds whatever, ‘young’ or ‘old,’ may be found occurring conformably on any other fossiliferous beds, ‘older’ or ‘younger.’” That is to say, the supposed order in the fossil record—regardless of the fact that it was carefully built on nearly two centuries-worth of field data collected by armies of seasoned geologists—was no more than a thinly veiled attempt to support the notion of evolutionary change, a plot to make null and void the plain scriptural teaching of the real source of all those fossils, Noah's Great Flood.²⁶

Price's descriptions of the Flood were even more

chilling than Ellen White's. He postulated “a jar or a shock from the outside,” perhaps an asteroid, which knocked the earth's axis of rotation 23½ degrees from right angles to its plane of orbit and caused the earth to wobble. Twice each day, the wobble would cause the oceans to “sweep a mighty tidal wave around the world, attaining a maximum, every 150 days, of about six miles in height at the equator.” The wave would travel “at a rate of 1,000 miles an hour at the equator, and proportionately in the other latitudes.” The “enormous ebbs and flows of the tides, the latter rising a little higher each day over the ever-narrowing lands, [drove] the men and animals before it, until, after over a month of this agony long drawn out, those who still survived looked out from their pinnacles of mountain tops over a shoreless ocean.” The lives of these survivors were eventually snuffed out as the raging waters rose still higher.²⁷ At the very least, notes historian Garry Wills, “Price deserves some kind of award for creative imagination, and for economy of argument: He countered all the Darwinian arguments with one simple chess move of the mind,” Noah's Flood.²⁸

It would take two mainstream, albeit fundamentalist, Christians in the early 1960s, both with earned doctorates, to bring Price's perspectives front and center within society. John C. Whitcomb, Jr., an Old Testament scholar, and Henry M. Morris, a hydrologic engineer, were dismayed by a rising anti-Price sentiment among Christian scholars interested in earth history. Their critique took the form of the 518-page *The Genesis Flood*, first published in 1961, two years before Price died, and still in print. More biblically based than Price's *The New Geology*, Whitcomb and Morris's tome nonetheless reiterated Price's primary assertion that the rock record provided testimony of the worldwide Flood depicted in Genesis, and it resurrected his primary arguments. *The Genesis Flood* led directly to the development of “scientific creationism” or “creation science,” a religiopolitical movement with worldwide adherents, and for which Pricean arguments in support of a worldwide Flood loom large.²⁹ As Bernard Ramm, a prominent critic of Price, noted, “the influence of Price is staggering.”³⁰

Ironically, Price's final post within Adventism during the 1930s was a teaching position at Walla Walla College (now Walla Walla University) located at the edge of Washington's famed channeled scablands, a

topographic region replete with evidence for enormous flooding events, and one destined to provoke a shift in the perspectives of geologists to make allowance for singular catastrophic events like massive floods in the past. There is little indication, however, that Price ever consulted the work of the well-trained, idiosyncratic, pipe-smoking contemporary who first brought this evidence to the world's attention in 1923, J Harlen Bretz.³¹

Harley Bretz was born a few miles east of Grand Rapids, Michigan to the farming family of Oliver and Rhoda Bretz.³² Young Harley was a lad of insatiable curiosity who pummeled his parents with questions: “What is under the ground? . . . What makes it rain? . . . Why did it rain today and be sunny yesterday? . . . What makes the wind blow? . . . How does a hen make an egg out of a straw nest?”³³

In 1905, Harley graduated with a degree from Albion College in southern Michigan, having earned the distinction as the institution's highest achieving student. Not only did he stand out in the sciences, but he also excelled as a writer. He soon began to sign his name, “J Harlen Bretz,” with no punctuation following the “J” and “Harlen” instead of the informal sounding “Harley.” He simply added the J, which stood for nothing but sounded

erudite, to the front of his name.³⁴

In the fall of 1906, Bretz was hired to teach biology at the Flint high school, where he quickly developed a penchant for “enthusing youngsters with my own enthusiasm for bugs, snakes, rocks, minerals and the local flora.” On weekends he bicycled around the surrounding county, studying its natural history and mapping its glacial features. These became the first published geologic maps of the Flint region. While attending the annual meeting of the Michigan Academy of Science in 1907, he met several field geologists to whom he shyly displayed his glacial maps. The scientists were impressed, and as a result of these interactions, Bretz was intensely drawn to field geology. He decided to find work in a region of the country where he could prove his potential in that discipline. Thus, when a job opened up at Franklin High School in Seattle, Washington, he applied and was accepted for the position.³⁵

During the four years he taught in Seattle, he read everything he could find that dealt with geology, including about the local landforms and deposits. He spent his spare time happily engaged in mapping the numerous ice age features found in the area and publishing scientific papers describing his discoveries.³⁶

By 1911, Bretz had saved enough funds to enter the graduate program in geology at the University of Chicago.



Courtesy of the Special Collections Research Center, University of Chicago Library



Aerial photos: Google Earth

Left: J Harlen Bretz (1882–1981), the University of Chicago geology professor who postulated the occurrence of a colossal flood that swept across eastern Washington State during the Pleistocene Epoch. Right: Potholes Coulee, the topographic map of which caught Bretz's attention in 1910. Note the deep east-west-trending channels that open west into a nearly two-mile-wide coulee before emptying into the Columbia River. At the east end of each channel is a once-receding cliff over which flowed the raging Missoula flood waters.

Of particular interest to Bretz were the curious U-shaped cross section of the canyon, which shared little resemblance with the typical V-shaped valleys carved by other rivers, enormous sand bars located hundreds of meters above the river level, marks of tremendous erosion high along the nearly vertical canyon walls, and the presence of large erratic boulders unrelated to the native rock of the canyon itself.

He was well prepared, having already completed much of the reading required of incoming graduate students. This preparation allowed him to focus on his dissertation. The data he had collected on the glacial history of the Puget Sound region while teaching in Seattle formed the topic of his paper. He graduated with his PhD, *summa cum laude*, in 1913, only two years after moving to Chicago.³⁷

After a one-year teaching stint at the University of Washington, Bretz assumed a professorship at the University of Chicago, where he would remain until retirement. Washington State's geology continued to exert a strong attraction on the young Chicago professor, however. Back in 1910, when he taught high school in Seattle, he had seen a newly published topographic map of the Quincy Basin of eastern Washington. Upon seeing the map, his eyes immediately fell on contour lines that depicted an enormous notch in the basaltic rocks bordering the eastern shore of the Columbia River. At the far end of the notch were what appeared to be huge dry falls and plunge pools where colossal cataracts once emptied into a much larger river than what is seen today. But where would all the water have come from to form such features in this now arid region?³⁸

For one month each summer, 1916 to 1919, Bretz organized field courses to study the geology of the Columbia River Gorge, which forms the border between Washington State and Oregon. Of particular interest to Bretz were the curious U-shaped cross section of the canyon, which shared little resemblance with the typical V-shaped valleys carved by other rivers, enormous sand bars located hundreds of meters above the river level,

marks of tremendous erosion high along the nearly vertical canyon walls, and the presence of large erratic boulders unrelated to the native rock of the canyon itself. What forces could have generated these features? Was canyon formation somehow related to the enormous notch he had noted years before on the map of the Quincy Basin, a feature located some 125 miles to the northeast?³⁹

During the summer of 1922, Bretz and his Chicago-based students visited eastern Washington's "channeled scablands," an odd topographic region bounded by the mighty Columbia River to the north and west. The region consists of thousands of bare drainage channels—"coulees"—cut through the Columbia River Basalt and trending in a generally southwesterly direction, with individual channels diverging into separate passages, then converging once again. Today, many of these anastomosing channels are dry, or nearly so, but they provide evidence for the existence of powerful erosional forces in the past. High areas bordering the channels are covered by deep soil tilled by farmers for growing dryland crops. The walls of some of the larger coulees feature "hanging valleys," cross-sections of ancient V-shaped river channels that once carried water crosswise to the direction of the coulee before there was a coulee. The coulees themselves range from tiny canyons a few meters deep to enormous three-mile-wide chasms, many miles long, constrained by 1,000-foot-high walls. The mind-boggling Grand Coulee, one of these chasms, contains the magnificent Dry Falls. With a width of three miles and a 400-foot plunge, this enormous cataract dwarfed present-day Niagara Falls.⁴⁰

On this trip, Bretz finally got an opportunity to inspect

Potholes Coulee, the massive notch he noticed on the Quincy Quadrangle map twelve years earlier. Scientific reports typically convey little emotion, but Bretz scarcely contained himself when describing this incredible gash. “The Potholes’ is the best example mapped of a receding waterfall over lava flows which is known to the writer,” he gushed. “The ancient stream spilled over the Columbia cliffs at an altitude of about 1,200 feet above tide and descended at least 400 feet over two great rock terraces.” Much of the water that drained from the anastomosing channels to the east flowed into the Columbia River over this receding notch—the same way the Niagara River flows over the diminutive but similarly receding Niagara Falls today.⁴¹

By 1923, Bretz was ready to make public his discoveries and cogitations. His first paper on the topic, published in the *Bulletin of the Geological Society of America*, contained detailed descriptions of the scablands and coulees. He reasoned that meltwater from the Cordilleran ice sheet carved out the eastern Washington landscape. But this notion begged an important question: How could meltwater alone, cutting and grinding even over many years, account for the dramatic features he described?⁴² A second paper, published the same year in *The Journal of Geology*, faced this question directly:

The magnitude of the erosive changes wrought by these glacial streams is nothing short of amazing. The writer confesses that during ten weeks’ study of the region, each newly examined scabland tract reawakened a feeling of amazement that such huge streams could take origin from such small marginal tracts of an ice sheet, or that such an enormous amount of erosion, despite high gradients, could have resulted in the very brief time these streams existed.⁴³

He concluded *The Journal of Geology* paper with a bold but prescient declaration:

Fully 3,000 square miles of the Columbia plateau were swept by the glacial flood . . . More than 2,000 square miles of this area were left as bare, eroded, rock-cut channel floors, now scablands, and nearly 1,000 square miles carry gravel deposits derived from the eroded basalt. It was a debacle which swept the Columbia Plateau (*italics his*).⁴⁴

But where on earth did all the water come from—and seemingly all at once? This was the question that would plague Bretz for years to come and result in rejection of his views by skeptical mainline geologists.⁴⁵

Despite his inability to identify a source for the water, Bretz pressed on with his exploration of eastern Washington and continued to collect data on anastomosing channels, huge gravel bars, giant ripples, enormous dry falls, hanging valleys, erratic boulders, and all the other bits and pieces of evidence that supported his novel hypothesis. In addition, he worked on linking the evidence from eastern Washington to the flood features he had identified to the west in the Columbia River Gorge.⁴⁶

Bretz’s publications had created a significant stir in the geological community—so significant that he was invited to present his flood hypothesis to the January 12, 1927 meeting of the Geological Society of Washington at the elegant Cosmos Club on Massachusetts Avenue in Washington, DC. He was hopeful his presentation would convince the geological elite in attendance that his hypothesis was worthy of further consideration. He carefully prepared a veritable legal defense of his views, optimistic that his rationally minded colleagues would endorse his position once they understood the evidence.⁴⁷

Pardee provided stunning evidence that an ice dam, which held back the water in Lake Missoula, broke, releasing about fifteen cubic miles of water per hour over the surrounding landscape.



J. L. Hayward



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Left: View into the Columbia River Gorge from about 1,000 feet atop the west side of Wallula Gap, Washington. Note the rounded basalt boulders, indicative of water erosion, in the foreground. Missoula flood waters, more than 1,000 feet deep, overflowed the steep sides of Wallula Gap. Right: Moses Coulee, one of several large gorges carved out by the Missoula floods. Note the steep canyon walls displaying V-shaped hanging valleys, cross-sections of old river channels that once carried water perpendicularly to the orientation of the coulee before the coulee was formed.

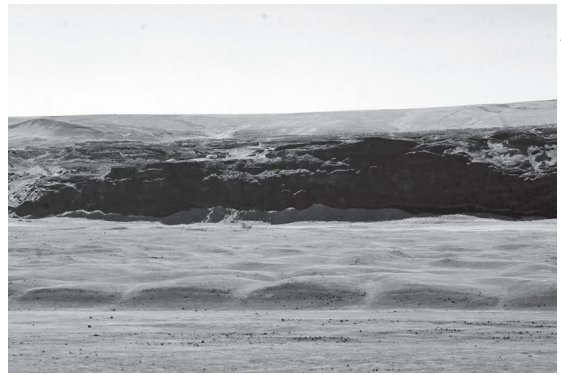
To say that his listeners, mostly prominent leaders within the US Geological Survey, gave his views a cool reception would be an understatement. One after another, they raised their objections. Bretz did his best to defend himself against the salvos hurled at his model, but in the end, he felt defeated. He had failed to convince the very people he needed most to convince. Perhaps sensitized by the claims of fundamentalists like Price, who attributed nearly every rock formation and fossil to the action of Noah's Flood, the geological establishment could not yet swallow the possibility of a catastrophic flooding event of the magnitude suggested by Bretz. Bretz knew, however, that most of his detractors had never even been to eastern Washington, and, privately at least, he realized that he still was the expert. After a few months of nursing his wounds, he resumed his visits to the scablands and continued to make his case in the literature.⁴⁸

The solution to Bretz's water-source problem actually had been suggested to him two years before in a brief letter from a fellow geologist, Joseph T. Pardee (1871–1960). An employee of the US Geological Survey, Pardee had spent years gathering evidence for the existence of a huge Pleistocene lake in a region surrounding present-day Missoula, Montana. In his letter, Pardee suggested that glacial Lake Missoula might have been the source for the water. Bretz, however, was cautious. At the time of his Cosmos Club presentation, he seemed more inclined to pin the blame of the flooding on jökulhlaups, subglacial

outburst floods created by geothermal melting of the ice, phenomena well known in Iceland.⁴⁹

Years went by, with Bretz's opponents continuing to hold their views and Bretz his. Weary of the battles, Bretz moved on to other topics, including studies of cave and karst formations in Missouri, Illinois, and Bermuda.⁵⁰ Almost imperceptibly, though, as more and more geologists visited eastern Washington and viewed the evidence for themselves, Bretz's megaflood hypothesis gained traction. An important contribution to this reassessment was a talk by Pardee at a 1940 American Association for the Advancement of Science meeting held in Seattle. In both the talk and in a paper published two years later, Pardee provided stunning evidence that an ice dam, which held back the water in Lake Missoula, broke, releasing about fifteen cubic miles of water per hour over the surrounding landscape. Although Pardee did not explicitly link the water release from Lake Missoula with the scablands, Bretz and others made the connection.⁵¹ And further evidence strongly suggested the ice dam reformed and broke multiple times, each time releasing huge volumes of glacial meltwater over the scablands.⁵²

A mechanism for Bretz's flooding had been found and he could now claim victory for his interpretation. As James Gilluly, a one-time skeptic who had been present at Bretz's Cosmos Club talk, exclaimed years later when he viewed the eastern Washington evidence for himself, "How could anyone have been so wrong?"⁵³ After a 1965 field trip



Left: This enormous granite boulder was brought into position on a block of ice floating in Missoula flood waters surging through the Grand Coulee at speeds of more than 60 miles per hour. The ice melted, dropping the boulder atop Steamboat Rock in the middle of the coulee. No native granite exists in this region. Note the nearly vertical, 800- to 900-foot-high canyon wall of the Grand Coulee in the background. Above: West Bar giant current ripples created by the Missoula flood waters near the town of Trinidad, Washington. The ripples stand 250 to 300 feet apart, crest-to-crest.

to eastern Washington, sponsored by the International Union for Quaternary Research, the 82-year-old Bretz received a telegram from the group stating, “We are all now catastrophists!”⁵⁴

In 1979, at age 97, Bretz was awarded the ultimate prize of his profession, the Penrose Medal of the Geological Society of America.⁵⁵

The year 1979 also was the year I began doctoral dissertation research on a narrow lake occupying a deep, Missoula-flood-carved channel in eastern Washington; I completed my study there in 1981, the year Bretz died.⁵⁶ Since then, I’ve continued to explore the wonders of this region. Among other treats, I’ve hiked to the edge of the

ancient waterfall bordering Potholes Coulee; perched atop Steamboat Rock to enjoy Grand Coulee’s gaping vista; peered into the Columbia River Gorge from the top of Wallula Gap; traversed the gorgeous rocky corridor of Moses Coulee; stood with awe at the base of the vast Dry Falls; watched rainbows shimmer in the foreground of Palouse Falls; and viewed with amazement the giant ripple marks bordering the Columbia River—all stunning evidences of the megafloods that scoured this region. Each time I explore this area’s stark but informative topography, I ponder the disparate legacies of George McCready Price and J Harlen Bretz.

Both Price and Bretz were born during the “gilded age” of the late nineteenth century, both were drawn into geology from other interests, both directed the attention of their readers to the role of raging waters in earth

Price, the armchair philosopher and master of hubris, exhibited little interest in field work and rejected the predictable order of fossils in the geologic column, thrust faulting, and continental glaciation—concepts underpinned by massive quantities of data and universally accepted today, even by knowledgeable young-earth creationists.

history, both exhibited a flair for writing, both altered their birth names upon becoming authors, both suffered the wrath of professional geologists for their catastrophist views, and both lived to be nonagenarians. Beyond these superficial likenesses and their obvious intelligence, the two men shared little in common.

Price, the armchair philosopher and master of hubris, exhibited little interest in field work and rejected the predictable order of fossils in the geologic column, thrust faulting, and continental glaciation—concepts underpinned by massive quantities of data and universally accepted today, even by knowledgeable young-earth creationists.⁵⁷ One of his former students, Richard L. Hammill, recalled that “Often in class, while showing us pictures of some geological feature high on a mountainside, he would remark, ‘Why should I risk my neck trying to climb up there when the pictures show it very clearly?’”⁵⁸ When a group of Walla Walla College students invited Price to join them on a fossil-collecting fieldtrip to northern Oregon, they were shocked to discover his inability to identify the fossils they bagged.⁵⁹ Would Price have defended the views he held if

he had taken an opportunity to view firsthand the features he wrote about? Would “creation science” have developed into such a cultural juggernaut had Price not made his uninformed assertions so authoritatively? Would creationist museums draw the flocks of followers they do today?

Bretz, the crusty empiricist who spent every spare moment with his beloved landforms, lived to see his evidence-based views confirmed and embraced by virtually all professional geologists. Unlike Price, “Bretz was more than a book geologist. He had field experience—lots of it . . .”⁶⁰ Ironically, young-earth creationists have looked to Bretz as a source of inspiration for their data-challenged models of Flood geology, constructs far removed from his evidence-based views.⁶¹ Unlike young-earth creationists, however, Bretz contributed in a major way to his chosen field, with the result that today’s earth scientists support a more nuanced, data-based, “neocatastrophist” view of earth history: one that allows for gradual change punctuated by catastrophic change.⁶²

If the tale of these two men teaches us anything, it is that belief about physical reality—regardless of how



Giant potholes on Harper Island, Sprague Lake, Washington, formed by underwater vortices called kolk. Potholes occur widely in the basaltic rocks of eastern Washington.



T. M. Thompson

Layered lake sediments called rhythmites are common in eastern Washington. This photo is of Burlingame Canyon, located 10 miles west of Walla Walla University, the final teaching post of George McCready Price. Each rhythmite was deposited in a temporary lake formed by back-flooded water waiting to get through the constricted Columbia River Gorge on its way to the Pacific Ocean. The forty or more layers constitute primary evidence for multiple flooding events which are thought to have occurred over a period of about 2,000 years.

fervently held or dramatically presented—will stand the test of time only when derived from a set of patiently collected and honestly evaluated data. The story of how the scablands of eastern Washington came to be, along with all the other findings of genuine science, stand as perpetual reminders of this fact.

Endnotes

1. Norman Cohn, *Noah's Flood: The Genesis Story in Western Thought* (New Haven, CT: Yale University Press, 1996). In this article, I capitalize "Flood" when referring to the event described in Genesis, but use "flood" when referring to other such events.

2. David R. Montgomery, *The Rocks Don't Lie: A Geologist Investigates Noah's Flood* (New York: W. W. Norton & Company, 2012), 8, 158–59, 171–72, 212–215.

3. Laurie Goodstein, "A Noah's Ark in Kentucky, Dinosaurs Included," *The New York Times*, June 26, 2016. https://www.nytimes.com/2016/06/26/us/noahs-ark-creationism-ken-ham.html?_r=0; "Noah's Ark Full-Size Replica Opens in Netherlands," The Associated Press, December 10, 2012. <http://www.cbc.ca/news/world/noah-s-ark-full-scale-replica-opens-in-netherlands-1.1289548>

4. In 2007, a Gallup poll revealed that 66% of Americans polled said they believed that the statement that life was created by God less than 10,000 years ago was "Definitely true" or "Probably true." "Evolution, Creationism, Intelligent Design," Gallup. <https://news.gallup.com/poll/21814/evolution-creationism-intelligent-design.aspx>

5. George Edward Price's father and mother were George Marshal Price and Susan McCready Price. From a previous marriage, George Marshal had produced nine children, who were thus half siblings to George Edward. Harold W. Clark, *Crusader for Creation: The Life and Writings of George McCready Price* (Mountain View, CA: Pacific Press, 1966), 11.

6. Clark, *Crusader for Creation*, 11, 13; Jonathan M. Butler, "The Making

of a New Order: Millerism and the Origins of Seventh-day Adventism," in *The Disappointed: Millerism and Millenarianism in the Nineteenth Century*, eds. Ronald L. Numbers and Jonathan M. Butler (Bloomington, IN: Indiana University Press, 1987), 189–208.

7. J. N. Andrews, *History of the Sabbath and First Day of the Week*, 3rd ed. (Battle Creek, MI: Review & Herald, 1887), 14–32, 44–50; *Seventh-day Adventists Believe . . . : A Biblical Exposition of 27 Fundamental Doctrines* (Washington, DC: Ministerial Association, General Conference of Seventh-day Adventists, 1988), 248–66.

8. Clark, *Crusader for Creation*, 13–14; Ronald L. Numbers, *The Creationists: From Scientific Creationism to Intelligent Design* (Cambridge, MA: Harvard University Press, 2006), 89–91.

9. Clark, *Crusader for Creation*, 14–16.

10. Numbers, *The Creationists*, 90–92.

11. Ellen G. White, *The Story of Patriarchs and Prophets as Illustrated in the Lives of Holy Men of Old* (Mountain View, CA: Pacific Press, 1958), 99–100. First published 1890.

12. White, *Patriarchs and Prophets*, 112.

13. Numbers, *The Creationists*, 92.

14. Geo. E. McCready Price, *Outlines of Modern Christianity and Modern Science* (Oakland, CA: Pacific Press, 1902), ix, 123–53.

15. Clark, *Crusader for Creation*, 19–21; Numbers, *The Creationists*, 94–95.

16. George McCready Price, *Illogical Geology: The Weakest Point in Evolutionary Theory* (Los Angeles, CA: The Modern Heretic Company, 1906), 9.

17. George McCready Price, *Theories of Satanic Origin* (Loma Linda, CA: Self-published, n.d.), 8.

18. George McCready Price, *The Phantom of Organic Evolution* (New York: Fleming H. Revell, 1924), 8.

19. Price, *Phantom*, 9.

20. George McCready Price, *Modern Discoveries Which Help Us to Believe* (New York: Fleming H. Revell Company, 1934), 118.

21. Clark, *Crusader for Creation*, 29; Numbers, *The Creationists*, 106.

22. Clark, *Crusader for Creation*, 30–32.
23. Numbers, *The Creationists*, 98, 107.
24. Charles Schuchert, “The New Geology: A Text-book for Colleges, Normal Schools and Training Schools; and for the General Reader. By George McCready Price. Pacific Press Publishing Association, Mountain View, California,” *Science* 59, no. 1535 (May 30, 1924): 486–87.
25. Overthrusting occurs when a mass of older rock is pushed over a mass of younger rock by a horizontally induced force. Examples of overthrusts are relatively common and found at many locations throughout the world.
26. George McCready Price, *The New Geology* (Mountain View, CA: Pacific Press, 1923), 296, 637–638.
27. Price, *The New Geology*, 682–88.
28. Garry Wills, *Under God: Religion and American Politics* (New York: Simon and Schuster, 1990), 121.
29. Numbers, *The Creationists*, 208–38. See also Kurt P. Wise, “Contributions to Creationism by George McCready Price,” in *Proceedings of the International Conference on Creationism*, ed. J. H. Whitmore (Pittsburg, PA: Creation Science Fellowship, 2018), 683–94.
30. Bernard Ramm, *The Christian View of Science and Scripture* (Grand Rapids, MI: William B. Eerdmans, 1954), 125.
31. I have found only one reference by Price to the region affected by the Missoula floods. In *Genesis Vindicated* (Takoma Park, MD: Review and Herald, 1941), he wrote that the “so-called ‘Dry Falls’ of the old Columbia River, near the Grand Coulee Dam in the State of Washington, constitute a good illustration of former conditions vastly different from the present” (p. 270). When referring to Dry Falls, he made no mention of Bretz, seemed to endorse a hypothesis for their formation rejected by Bretz, and made no mention of eastern Washington’s scablands.
32. John Soennichsen, *Bretz’s Flood: The Remarkable Story of a Rebel Geologist and the World’s Greatest Flood* (Seattle, WA: Sasquatch Books, 2008), 6.
33. J Harlan Bretz, *Memories: Some Recollections of a Geologist on Entering His 90th Year, Parts I, II, and III* (Homewood, IL: Self-published, 1972–1974).
34. Soennichsen, *Bretz’s Flood*, 12–13.
35. Soennichsen, *Bretz’s Flood*, 13–16.
36. Soennichsen, *Bretz’s Flood*, 16–17.
37. Soennichsen, *Bretz’s Flood*, 26–33.
38. Soennichsen, *Bretz’s Flood*, 21–26, 33–41.
39. Soennichsen, *Bretz’s Flood*, 52.
40. Soennichsen, *Bretz’s Flood*, 79–97.
41. J Harlan Bretz, “Glacial Drainage on the Columbia Plateau,” *Bulletin of the Geological Society of America* 34 (September 30, 1923): 597.
42. Bretz, “Glacial Drainage,” 597.
43. J Harlan Bretz, “The Channeled Scablands of the Columbia Plateau,” *The Journal of Geology* 31, no. 8 (Nov–Dec 1923): 621.
44. Bretz, “The Channeled Scablands,” 649.
45. J Harlan Bretz, “Washington’s Channeled Scabland,” *Bulletin No. 45, Division of Mines and Geology, State of Washington* (Olympia, WA: State Printing Plant, 1959), 1–57; see especially pages 51–52; Soennichsen, *Bretz’s Flood*, 161–68; David Alt, *Glacial Lake Missoula and Its Humongous Floods* (Missoula, MT: Mountain Press, 2001), 21–22; John Eliot Allen, Marjorie Burns, and Scott Burns, *Cataclysms on the Columbia: The Great Missoula Floods*, rev. 2nd ed. (Portland, OR: Ooligan Press, 2009), 52–65.
46. Soennichsen, *Bretz’s Flood*, 143–87.
47. Soennichsen, *Bretz’s Flood*, 189–91.
48. Soennichsen, *Bretz’s Flood*, 191–94; Allen, Burns, and Burns, *Cataclysms on the Columbia*, 52–55.
49. Soennichsen, *Bretz’s Flood*, 176–78, 185–86, 206–10; Allen, Burns, and Burns, *Cataclysms on the Columbia*, 51.
50. Soennichsen, *Bretz’s Flood*, 215–16; J Harlan Bretz, “Solution Cavities in the Joliet Limestone of Northeastern Illinois,” *The Journal of Geology* 48, no. 4 (May–June 1940), 337–84; J Harlan Bretz, “Vadose and Phreatic Features of Limestone Caverns,” *The Journal of Geology* 50, no. 6, part 2 (Aug–Sept 1942): 675–811; J Harlan Bretz, “Bermuda: A Partially Drowned, Late Mature, Pleistocene Karst,” *GSA Bulletin* 71, no. 12 (December 1960): 1729–54.
51. Soennichsen, *Bretz’s Flood*, 221–29; J. T. Pardee, “Unusual Currents and Glacial Lake Missoula,” *Bulletin of the Geological Society of America* 53 (1942): 1569–1600.
52. Richard B. Waitt, Jr., “About Forty Last-Glacial Lake Missoula Jökulhlaups Through Southern Washington,” *The Journal of Geology* 88, no. 6 (November 1980): 653–79.
53. Soennichsen, *Bretz’s Flood*, 228.
54. Soennichsen, *Bretz’s Flood*, 231.
55. “Penrose Medalists,” Geological Society of America. Accessed August 11, 2020. <https://www.geosociety.org/awards/past.htm#penrose>
56. Bretz died on February 3, 1981. Soennichsen, *Bretz’s Flood*, 248. My research involved a study of the behavioral ecology of two species of gulls that nested on Harper Island, a little land mass scarred by large potholes gouged out by the Missoula floods. The impact of the floods on this island is dramatic and unmistakable.
57. George McCready Price, *Evolutionary Geology and the New Catastrophism* (Mountain View, CA: Pacific Press, 1926), 105–46, 258–74. For acceptance by knowledgeable, young-age creationists of the predictable order of continental glaciation, fossil order, and overthrusts, see Leonard Brand and Arthur Chadwick, *Faith, Reason, & Earth History: A Paradigm of Earth and Biological Origins by Intelligent Design*, 3rd ed. (Berrien Springs, MI: Andrews University Press, 2016), 337–44 (continental glaciation), 344–49, 374–79, (fossil order), 371, 373 (overthrusts). There is some evidence that Price softened some of his more extreme positions later in life. See, for example, Numbers, *The Creationists*, 113, 156–57.
58. Richard J. Hammill, “Fifty Years of Adventist Creationism: The Story of an Insider,” *Spectrum* 15, no. 2 (August 1984): 33.
59. Numbers, *The Creationists*, 107.
60. Allen, Burns, and Burns, *Cataclysms on the Columbia*, 40.
61. See, for example, Michael J. Oard, “The Lake Missoula Flood—Clues for the Genesis Flood,” *Creation* 36, no. 2, (April 2014): 43–46; Brand and Chadwick, *Faith, Reason, & Earth History*, 333–34.
62. G. H. Dury, “Neocatastrophism? A Further Look,” *Progress in Physical Geography: Earth and Environment* 4, no. 3 (September 1, 1980): 391–413; Olav Slaymaker, “Neocatastrophism,” in *Encyclopedia of Geomorphology*, Volume 1 & 2, ed. Andrew Goudie (London: Routledge, 2004): 709–11; Cassandra Tate, “Bretz, J Harlan (1882–1981),” HistoryLink.org Essay 8382. Accessed August 11, 2020. <https://www.historylink.org/File/8382>



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