THE CONFLUENCE

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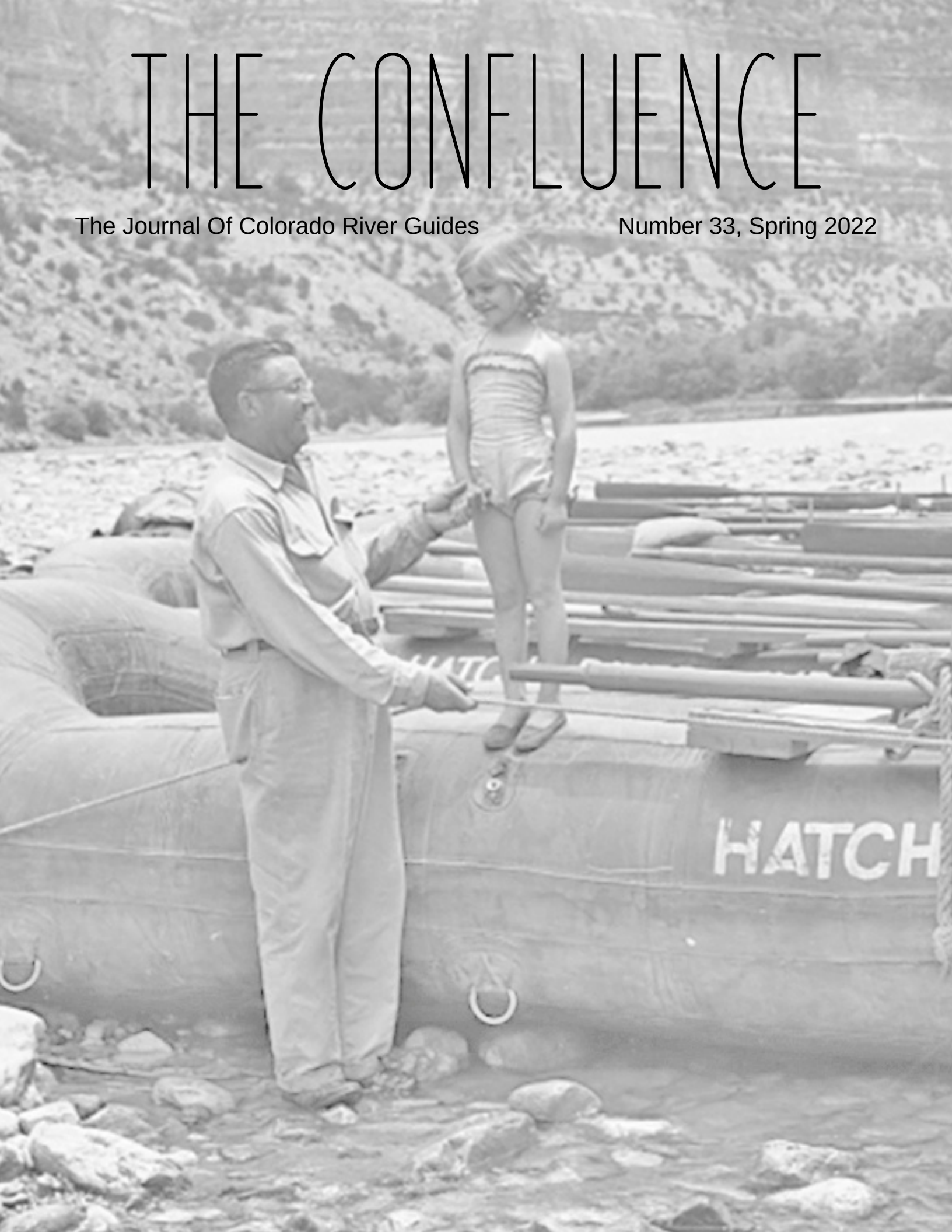

The Confluence

...wants to be the quarterly journal of Colorado Plateau River Guides. CPRG is a 501(c)(3) river and guide advocacy organization.

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We are always looking for content!

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Front Cover: Bus Hatch helps a little girl stand on a raft near the Green River., Undated, Digital image, copyright 2003 Uintah County Library

Back Cover: Lorin Bell with a rattle snake around his neck. He caught the snake on July 31, 1938 at Quartermaster Canyon. Norman D Nevills 1938 Green and Colorado Rivers Expedition. Multimedia Archives, Special Collections, J. Willard Marriott Library, University of Utah

A Message From Cora Phillips, Seekhaven's Community Prevention Coordinator:

Seekhaven is committed to making our community safer. As the community prevention coordinator, I am offering FREE training to outfitters that are interested in expanding their risk management plan to include workplace harassment. Our bystander intervention program, "Building Your Workplace Toolkit" empowers individuals to step-up and be an active bystander when they witness harassment in the workplace. This training is scenario based and can help facilitate conversations on how to address unwanted behavior from peers and guests in a positive and constructive manner.

This is a great way to bring guides in and discuss expectations at the beginning of the season while also creating space for future discussions. My goal is to provide resources unique to the needs of your organization. You know your organization best and I am here to serve you. Let's roll up our sleeves and tackle this issue together.

The "Building Your Workplace Toolkit" training program can be delivered virtually or in-person. Availability is limited, so give me a call or reach out by email to reserve a time for you and your team. It's time we step up and commit to safety, especially when it involves harassment.

Best regards,

Cora Phillips
(She/Her) Prevention Coordinator, Seekhaven Family Crisis & Resource Center
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Seekhaven
Family Crisis & Resource Center

The Prez Sez...

Welcome back Colorado Plateau River Guides to another issue of The Confluence. We are excited about the Spring 22 season getting under way. CPRG has been working with National Park Service Concessionaires in organizing our first interpretive training trip in Cataract Canyon. The trip is scheduled for April 27-30. We have an excellent host of presenters this year. We are grateful for participation from International Dark Skies, Paleo West archeology, hydrologists from the Manti La Sal National Forest, The Returning Rapids Project, and Seekhaven. CPRG has a strong history of organizing training trips for guides, and this is our return act of reprising this role. I want to take an opportunity to put out a huge thank you to World Wide Expeditions for instantly stepping up to bat to host the trip. They have played a pivotal role in helping with logistics, but more so by sparking the momentum for the trip. We are grateful for Steve Hazlett's initial support by volunteering when asked for trip hosts. It's important to mention that we understand not all outfitters have Cataract permits. It is our intention to continue to organize training trips, and the momentum created by this trip has already gotten the gears moving for hosts on other sections next season. We look forward to interpretive training trips on all the river sections of the Colorado Plateau in the future. We have been keeping up with the dire infrastructure situation down at North Wash as well.

Since the fall UGO meeting, we have participated in a meeting with a government contracting firm called Jacobs. Progress in the dynamic environment is slow, but there is a sliver of hope as we are keeping up to speed as much as possible with the situation. Maybe someday there will be a decent graded surface to take out boats there. I wanted to also say thanks to David Yeamans for his contribution 'Greasy Pilar's' to this issue, I hope you all enjoy it, and as always encourage everyone to share their stories with us for publication. Feel free to make submissions to The Confluence at coloradoplateauriverguides@gmail.com. Thanks for everyone's support. Have a safe and most excellent season.

Colin Evans

P.S. at this point there wont be any more snow, so pray for rain, or dance, or burn an effigy, whatever you think might work to summon moisture to our water depraved drainage.

Table of Contents

A special thanks to **Pete Apicella** for his incredible work painting murals inside the outhouses at the Mineral Bottom boat ramp.

UPDATED to include illustration on the following page.

UNCONFORMITY- A missing section of the rock record forming a boundary between rock strata of different ages. These are caused by a pause in sedimentation or a period of erosion or both. Steno first sketched an angular unconformity in 1669 but it wasn't until the early 1800s when Hutton moved the concept into mainstream geology. He used unconformities as part of his conclusive evidence of deep time and the cyclical nature of processes that make the earth look like it does. There are several types of unconformities, the most obvious being the angular unconformity.

Many river runners have learned about THE Great Unconformity that was first discovered by Powell way down inside the Grand Canyon. This gap in time puts the 505 million year old Tapeats Sandstone in contact with the Vishnu Schist at 1.75 billion years old. What occurred during that 1.25 billion years of missing rocks?? A rather large amount of deposition, uplift and erosion. Twice? Upstream, in Westwater Canyon on the Colorado River, we have a longer missing span of time between that same Schist and the Triassic Chinle Formation. This would put 220 million year old rocks on top of the 1.75 billion years old Schist. The Canadian Shield may be be as much as 4 billion years old with very recent Pleistocene glacial deposits on top.

A note from WR: The only thing I might change is the Cutler Group and change it to about 280 or 275 to end, and beginning at 290 or 295 to start.

Check out *Ancient Landscapes of the Colorado Plateau* by Blakey and Ranney.
Also, find one of the videos of that animates 4 billion years of plate tectonics.

When did Canyonlands form up? If you squish 4.8 billion years of Earth's history into ONE calendar year, our park sediments were laid down between Pearl Harbor Day and Christmas.-ish

So, when did the Green and Colorado Rivers decide to meet up?? Quiz Friday. 9/25/21

CANYONLANDS UNCONFORMITIES-- OUR SEDIMENT CUP IS ONLY HALF FULL

CENOZOIC 29 <-- La Sal Mountains, Henry Mtns

MESOZOIC 65 ----------Extinction by asteroid maybe 20+ mi dia. ----------

70 Laramide Orogeny-> Plateau uplift, monoclines

Cretaceous

80 Mancos Shale <--- Ray's Tavern

90 Dakota Ss

100

110 Cedar Mtn Fm <-- Utah Raptor & Moabosaurus

120

130 flowers & pollinators

----------140----------

Jurassic Morrison Fm- Uranium birds

150

Sevier Orogeny-> some Plateau monoclines

160 Curtis Fm <-- Mill Creek climbing area- Moab Tongue

?<--Upheaval Dome asteroid impact

170 Entrada Ss <-- Arches in the park

Carmel Fm Monument Upwarp

180

Navajo Ss <-- Slickrock Bike Trail

190 Kayenta Fm

Wingate Ss

----------200---------- Extinction- volcanism, CO2 rise ----------

Triassic mammals

210 Chinle Group <-- Painted Desert colors

Owl Rock

220 Church Rock

Moss Back- Uranium

230 Shinarump Cong <-- Lees Ferry

dinosaurs

240 Moenkopi Fm-

PALEOZOIC----------Extinction- volcanism, CO2 rise ----------

250

Permian

260 Cutler Group

White Rim Ss <-- erg to east, Kaibab Sea beach to west

Organ Rock Fm <-- fossil trees near Goose Neck

270 Cedar Mesa Ss

Elephant Canyon Fm

280

reptiles

----------290----------

Pennsylvanian

300 Hermosa Group

Honaker Trail Fm <-- Confluence

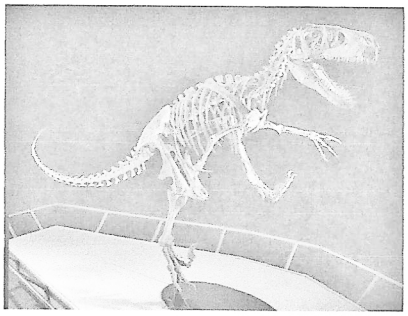
310 Paradox Fm <-- Big Drop 3

seed trees

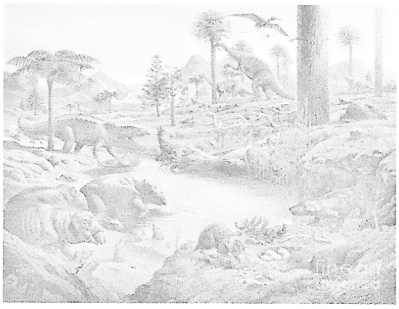
----------320----------

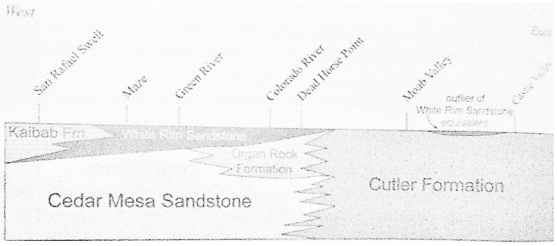
Mississippian ice age

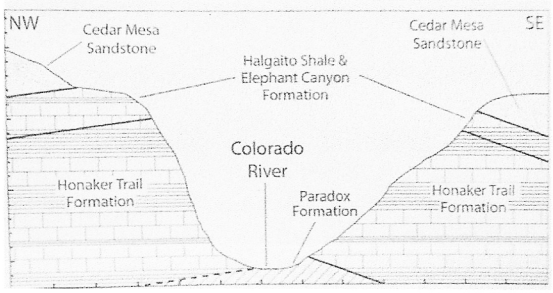
330



Formation	Member
Curtis Formation	Moab Tongue
Entrada Sandstone	Slick Rock Member
Carmel Formation	Dewey Bridge Member







Cataract Canyon- Webb, Belnap, Weisheit
Ancient Landscapes- Blakey, Ranney
Colorado Plateau- Fillmore
Geology Happenings- Allyson Mathis
Geologic History of Utah- Hintze
Geology of Utah- Stokes
Spy vs Spy- .--. /.-. /--- /.... /.. /.- /...

7-11-20

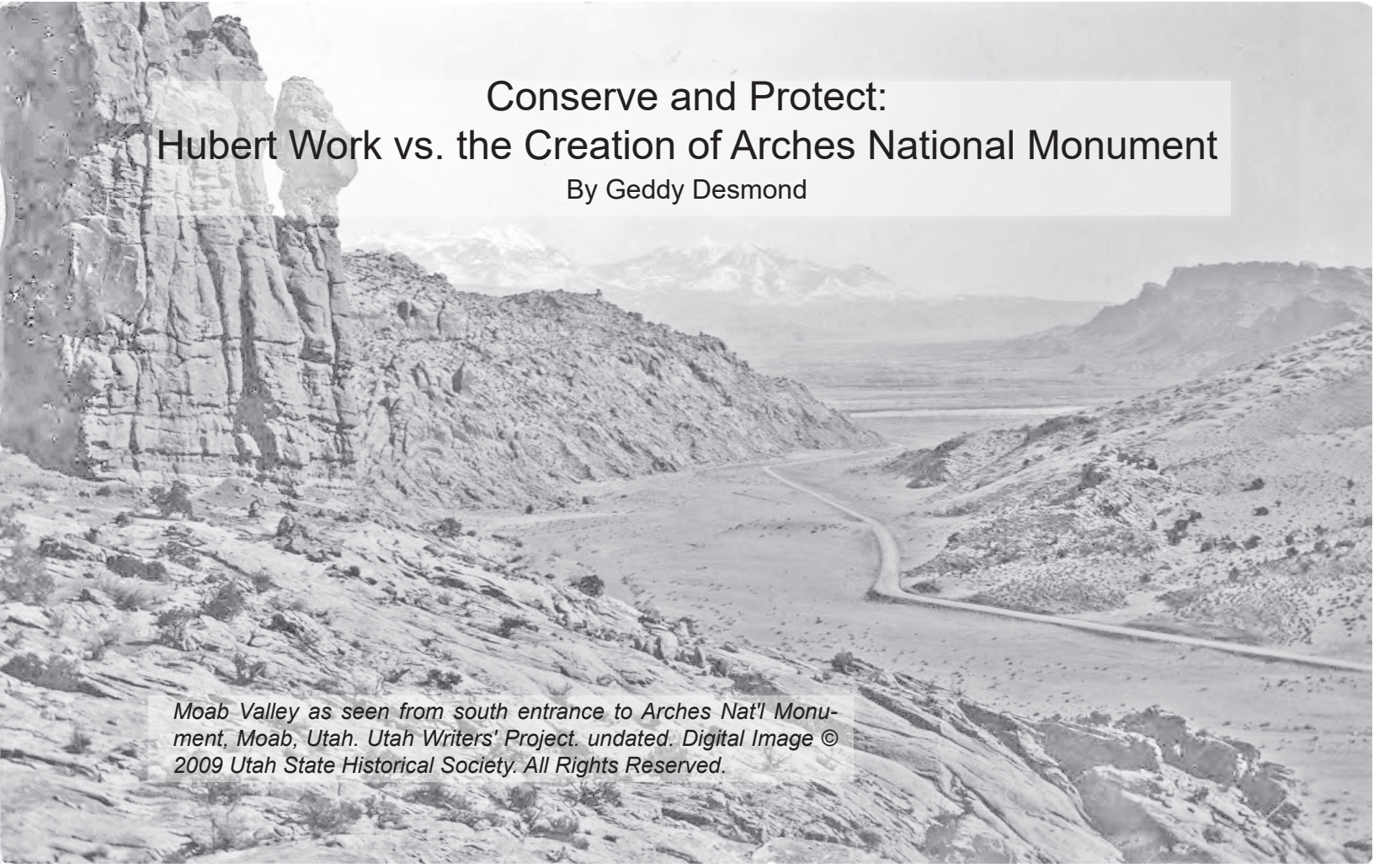
From The Editor

A few items of note upon reflection of the following article titled *Conserve and Protect.* I wrote this piece in the Spring of 2016. The world seems to be experiencing much more turmoil in 2022 than it was in 2016. Perhaps this view is “Ameri-centric”, but that is the lens through which this article is written. This gives us an opportunity to asses, to some degree, 100+ years of federal land management and reclamation policy. In the article, potash (a significant food input) plays a major role in how decisions were (and maybe still) made about local land at a federal level. The U.S. is a major food exporter but a very minor producer of potash. Driven largely by the events that have led to an ongoing war in Ukraine, roughly half of the worlds potash supply (Russia and Belarus) is unavailable to nations in the West. As a result, the price of Potash is approaching levels not seen since the summer following the financial crisis of 2008...and showing no signs of reversing (the war OR the price). For some perspective, with the global potash trade intact (prior to Russia invading Ukraine), the spot price had hung around $200/metric ton going back at least five years. As of the time of this writing, the price sits at about $562/metric ton. This has huge implications for domestic food production. Make no mistake about it, local potash production is as important and is as much of a national security issue as it was in the 1920's. What followed the 1920's was the Great Depression and WWII. Is uranium up next for regional commodity exploitation? If the market price is high enough, mining claims on the Colorado Plateau dormant for more than 40 years become profitable again.

How would that be for history rhyming?!? This leads us to another item discussed in the piece: farming. On one hand, the science of food production seems to have pushed global populations to all-time highs. On the other, this growth doesn't seem to have come from any sort of meaningful growth in small, individual or family farms. More likely this has resulted in an explosion of land consolidation, mono-culture crops, and banana republics across the globe. Locally, we have seen a reduction of farming for many reasons but natural factors seem to dictate that the desert has a highly limited capacity to produce food, despite the best efforts of the U.S. Bureau of Reclamation to turn every American into a farmer. The lengths of food supply chains are longer than they've ever been and widespread food and water toxicity are often systemic. Perhaps one begets the other. Decreasing biodiversity in food chains probably isn't helpful either. As for the water, we are very much facing a number of issues with water management in the western U.S. If a primary goal of U.S. Reclamation policy was to vastly increase the size of farming infrastructure among the citizens, it seems to have done the opposite. However, it has enabled the explosive growth of urban sprawl which was also a stated goal. And now the Colorado River is in a dry spell and the sediment behind the major dams in the system is a largely unspoken, large-scale, ecological disaster. On the bright side, we are getting some *Returning Rapids*...so long as the water runs.

Conserve and Protect:
Hubert Work vs. the Creation of Arches National Monument

By Geddy Desmond



Moab Valley as seen from south entrance to Arches Nat'l Monument, Moab, Utah. Utah Writers' Project. undated. Digital Image © 2009 Utah State Historical Society. All Rights Reserved.

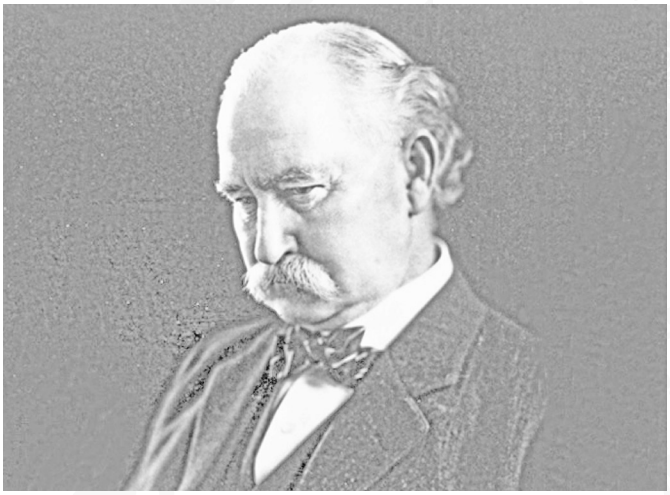
"... A more thorough and intelligent conversion of our remaining natural wealth to industrial necessities. Nothing can justify reckless use of our people's inheritance from Nature or other encroachment upon the capital of our future generations; While the federal government is rapidly reducing its indebtedness, cities, counties, and States are mortgaging themselves for the next generation."

-Hubert Work (Secretary of the Interior)
Construction of American Falls Reservoir July 13, 1925

Many National Monuments were established under the administration of Hubert Work. Arches National Monument was not one of them, despite what appeared to be overwhelming public support. Examining what each side had to lose or gain in the creation of the Monument may reveal an interesting insight into the reasons for Works' reluctance to establish yet another National Monument under his leadership. But let's start with how Hubert Work came to be the Secretary of the Interior.

With the Department of the Interior reeling from the political scandal known as the Teapot Dome Scandal, President Harding was looking to replace Albert Fall as Secretary of the Interior following his resignation. As the Secretary of the Interior, Albert Fall was responsible for spearheading the Teapot Dome Scandal. This scandal was broke by The Wall Street Journal on April 14, 1922 which reported that Secretary Work awarded leases to a private oil company, bypassing the competitive bidding process.

The next day, a resolution was introduced in the Senate that would lead to a federal investigation of Fall. Motivated by questions about how Fall became wealthy so quickly, he was eventually found to have accepted bribes in exchange for oil drilling claims to friends in the U.S. naval petroleum reserve located near Teapot Dome, Wyoming.[1] A crime for which he was convicted in 1929, and in 1931, became the first U.S. cabinet member to be imprisoned for crimes committed while in office. Fall served nine months in a New Mexico state prison.[2]



Albert B. Fall courtesy of lib.nmsu.edu

Fall was also controversial for his policies in favor of exploiting the West's land, timber, and minerals.[3] He also supported private ownership and operation of reserves.[4]

In an era known for widespread National Monument creation by Presidents of the United States, this administration had the lowest output and poorest conservation record in the first forty years since the creation of the Antiquities Act of 1906. Section 2 of this act begins with:

> *That the President of the United States is hereby authorized, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments…*

Beginning in 1906, all Presidential administrations from Theodore Roosevelt to Franklin Roosevelt designated 10 or more National Monuments, with the exception of the 8 under Harding.[5] The President's largely depend on information and advice from the Secretary of the Interior and the Director of the the National Park Service when making decisions about National Monuments. This could be considered especially true in the case of Harding as he allowed each cabinet secretary to run his department as he saw fit.[6] In this case, Stephen T.Mather was the director of the National Park Service (prior to, during, and after this administration) and as such, was concerned with land conservation within that context. By default, he was inclined to lobby for monument creation. Naturally, this put him at odds with the pro-resource exploitation policies of Fall. However, despite their apparent differences, the 8 National Monuments that were created under Harding/Fall rank them closer to average in terms of overall Presidential conservation. Keep in mind, National Monuments often include monuments of war. To be fair, Harding died with just over a year left in his first term so we will never know if he would have declared more. One interesting coincidence lies in the fact that information regarding the Teapot Dome Scandal and it's subsequent investigation became known in April of 1922.[7] 7 of the 8 National Monuments were designated many months after news of the scandal broke. This fact might suggest a softening of an administration that had campaigned in the last Presidential election on a "return to normalcy" theme. "Normalcy" suggesting a time before WWI which took place under the "abnormal" Wilson Administration which happened to also oversee the creation of a relatively high number of National Monuments. Nearly double that of Harding at 14.[8]

About the same time the Teapot Dome Scandal was taking place, Hubert Work was making his presence felt in Washington D.C. as the United States Postmaster General. Serving the position for just over a year, Work impressed many with his commitment to "business-like efficiency in government operations".[9] Despite recommendations from different government officials throughout the country nominating others, no evidence seems to exist that President Harding considered anyone besides Work to succeed Fall as Secretary of the Interior.[10] After all, Work's business approach to government was exactly what Harding was looking for.

Hubert Work approached his new post with the same diligence as he had done as Postmaster General, with efficiency and a business-like approach. The actions and policies of the previous Department head had left the reputation of the Department in shambles. Many outsiders believed the Department of the Interior was "corrupt and inefficient as well as the enemy of conservation".[11]

Hubert Work 12.27.18 (courtesy of uspresidentialhistory.com)

Work immediately set out to change the public's perception. He allowed anyone that had business with the department to see him and to be heard. He arrived to work early and stayed late. He studied his department. He made his philosophy known to his employees and officers in a memorandum sent to them on March 27, 1923 noting that

> "*Underlying every governmental activity is the idea of service to the people. It is the only excuse for the existence of your job and my job, and if we acquire the habit of considering the public as a necessary evil incident to our employment, we fail to justify our continuance in office. We cease to be public servant and become, instead, one of a class of petty bureaucrats.*"[12]

Once he addressed the concerns regarding the public perception, he went to work on increasing efficiency. Believing that the government was the biggest business, Work felt it best to apply business methods to achieve this efficiency. He reached out to the Department of Agriculture in April 1923, noting that the Department of the Interior and the Department of Agriculture were accomplishing much by mutual cooperation and that both could still do more. He noted that "both departments are obligated to contribute through mutual cooperation to the successful administration of the government as a whole".[13] Work also supported government reorganization that kept related services within their respective departments, noting that " the line between interlocking Services should be clearly defined so that equipment, employees, bureaus, and divisions of the government departments may not be duplicated."[14]

Not only was Hubert Work involved in conserving money for the U.S. Government, he could also be considered a champion of land conservation. The Coolidge Administration (1923-1928) oversaw the creation of 13 National Monuments under the direction of Work. This places the administration in the top 5 administrations for National Monument Conservation.[15] These monuments were quickly becoming a part

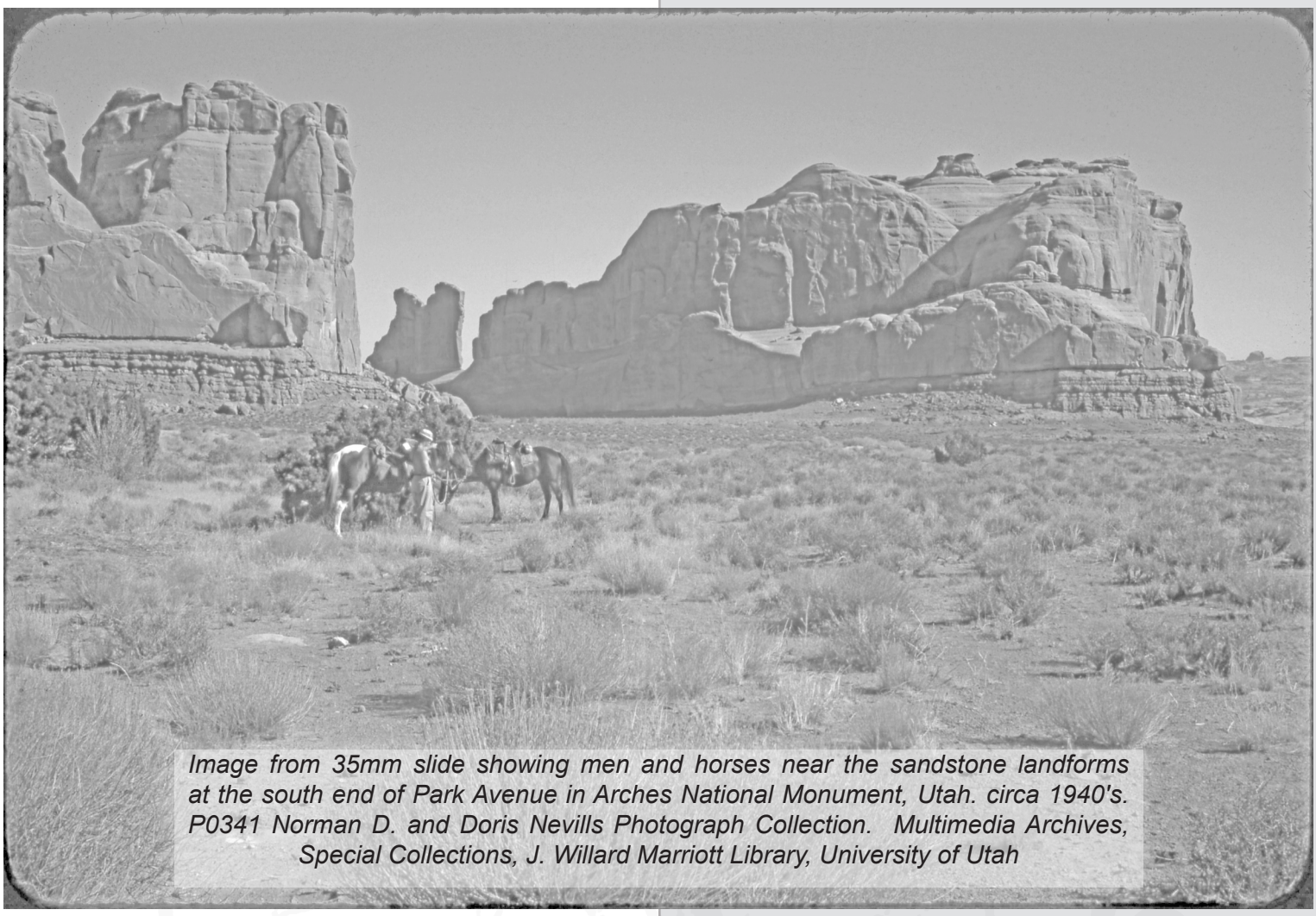


Image from 35mm slide showing men and horses near the sandstone landforms at the south end of Park Avenue in Arches National Monument, Utah. circa 1940's. P0341 Norman D. and Doris Nevills Photograph Collection. Multimedia Archives, Special Collections, J. Willard Marriott Library, University of Utah

of the American identity. Some of these monuments were as small as a fort, cave, or battleground, but others were large tracts of uninhabited land where one could find complete solitude or even get lost or eaten by wolves. Some were chosen because of their cultural significance but many of the large tracts, valued above all for their scenic characteristics, would eventually gain the Presidential designation and support of a National Monument. Nearly all of them tended to attract tourism.

Enter Grand County, Utah. A very sparsely populated section of the country that is relatively rich in natural resources. A Hungarian-immigrant prospector named Alexander Ringhoffer and his two sons were looking for precious metals in an area of the county now known as Klondike Bluffs in 1922.

Ringhoffer was so impressed by what he saw there that he wrote a letter about the visual impact of the area to officials of the Denver & Rio Grande Western Railroad (D&RGRW), hoping to attract attention to the area as tourism was big business to the railroads. One of the officials, Frank Wadleigh, was so impressed that he immediately wrote a letter to none other than National Park Service Director Stephen Mather, lobbying for National Monument status for the area.[16]

Utah Senator Reed Smoot had also become well aware of the area by way of a letter from a University of Michigan Geologist named Lawrence Gould who in 1924, had been shown the area by Grand Counties only physician. His name was J.W. “Doc” Williams. Smoot also began to pressure Mather who had already conducted his preliminary survey of the proposed area in July of that same year and was preparing a second survey the following year.[17]

With the support of notable locals such as the Grand Valley Times newspaper, Doc Williams and Senator Smoot, regional officials of the transportation industry at the D&RGW, and federal officials such as Mather, all signs pointed to a clear path to National Monument status under the name of “Arches National Monument”. This would seem to have been especially true considering the Coolidge/Work administration’s past record regarding National Monument creation. However, Hubert Work and others in the Nation’s capital were in no mood for more National Monuments. He was even considering downsizing or eliminating some already in existence.1 This would seem to have been especially true considering the Coolidge/Work administration’s past record regarding National Monument creation. However, Hubert Work and others in the Nation’s capital were in no mood for more National Monuments. He was even considering downsizing or eliminating some already in existence.[18]

This must have come as a bit of a shock to everyone involved in gaining support for a National Monument in Grand County. Efforts were made by Park Service officials to gain additional, national public support and attention by going to the *New York Times Magazine* which published a featured article on the area in the May 9, 1926 edition. To no avail. Work and Coolidge weren’t budging.[19]

To get a better sense of why they were unsupportive we must examine what Hubert Work was facing and what Coolidge generally expected when considering this particular decision regarding a proposed National Monument in Grand County. We must look at factors that each one faced that worked together against increasing the amount of land under Monument designation. The first factors being Coolidge’s position on cutting taxes for the American people, and the growth of farming in the U.S. In his First Annual Message in 1923, when discussing the burden of taxes he mentions:

> *"For seven years the people have borne with uncomplaining courage the tremendous burden of national and local taxation. These must both be reduced. The taxes of the Nation must be reduced now as much as prudence will permit, and expenditures must be reduced accordingly. High taxes reach everywhere and burden everybody. They gear most heavily upon the poor. They diminish industry and commerce. They make agriculture unprofitable. They increase the rates on transportation. They are a charge on every necessary of life. Of all services which the Congress can render to the country, I have no hesitation in declaring to neglect it, to postpone it, to obstruct it by unsound proposals, is to become unworthy of public confidence and untrue to public trust. The country wants this measure to have the right of way over any others"*[20]

From the same speech he addresses the growth of farming in the West:

> *"Aided by the sound principles adopted by the Government, the business of the country has had an extraordinary revival. Looked at as a whole, the Nation is in the enjoyment of remarkable prosperity. Industry and commerce are thriving. For the most part agriculture is successful, eleven staples having risen in value from about $5,300,000,000 two years ago to about. $7,000,000,000 for the current year. But range cattle are still low in price, and some sections of the wheat area, notably Minnesota, North Dakota, and on west, have many cases of actual distress. With his products not selling on a parity with the products of industry, every sound remedy that can be devised should be applied for the relief of the farmer. He represents a character, a type of citizenship, and a public necessity that must be preserved and afforded every facility for regaining prosperity."*[21]

Coolidge was actively trying to reduce the size of the government by shrinking its tax burden while trying to ensure the success of the farmer (particularly in the western states). One of the most important Departments for land management was the Department of the Interior and it was this Department that oversaw Homesteading and Reclamation.

That brings us to Work and what he faced. Work was responsible for many smaller departments under his direction as Secretary of the Interior. As was mentioned earlier, Work studied his department well, and true to his nature, he also had plans to improve operational and financial efficiencies in other agencies under his control. These included agencies with other motivations and needs for land use that ran counter to the National Park Service agenda whose primary concern was land conservation for scenic and cultural value rather than the economic value provided by agriculture and resource development. These other agencies include the Bureau of Indian Affairs, The General Land Office (now the Bureau of Land Management), Office of Surface Mining, and the Office of Reclamation Services (changed to the Bureau of Reclamation under Work) to name a few. In short, the list of agencies whose land use philosophies were inherently oppositional to the NPS far outweighed the number of agencies with a common philosophy, which is almost none.

But before we get into land use policies, let's begin with Work's contributions in reducing the Government's tax burden, aligning with Coolidge's philosophy. During his time as Secretary of the Interior, Work submitted annual reports to Harding and Coolidge. The first three years of these reports give much attention to information regarding changes within the Department and budget. He made sure to note that department appropriations in 1922 were $342 million; in 1923, $327 million; and in 1924, $325 million. In other words, he was saving money. He also pointed to the fact that he was striving to reduce the department staff, while increasing services.[22] By 1927, Work claimed to have saved the Federal Government over $131 million and reduced the Department workforce by 2,722 permanent employees.[23] The savings were not coming from the National Park Service, and while their services were in fact increasing, the increasing amount of land that came under the control of the NPS came at a cost that can't be measured. Just looking at the financial aspect of operations of the NPS, according to a 1927 annual report issued by the Secretary of the Interior (Hubert Work), the expenditures of the NPS totaled just over $3.9 million. Total revenue for the same time period equaled just over $700,000. In other words, operating the NPS was costing the penny-pinching administration that prided itself on cutting costs over $3 million dollars.[24] On paper, that must have been a tough pill to swallow. However, Work must have seen beyond the dollars and cents of his own budget to realize the benefits would be felt in the private sectors of tourism and transportation. As mentioned before, the railroad considered tourism a big business and highways were currently being built connecting National Parks in the west to the east while accommodating the increase in automobile ownership and usage.[25] [26]

However, Coolidge supported an overhaul of the railroad system, in general, so the opinions of current railroad officials were likely secondary to the immeasurable cost of increasing amounts of land under the NPS and the cost to the other agencies in terms of what was available for their uses in natural resource development and agriculture.[27]

While the complicated web of agencies that make up the Department of the Interior each have their own individual needs and desires that, in many cases, take time and resources from each other, this seemingly overwhelming array of interests to cater to may not have individually been responsible for Works' decision to not support new National Monuments. He understood what was at stake in the movement for conservation. He also understood a balance must be found between conservation and the utilization of natural resources.

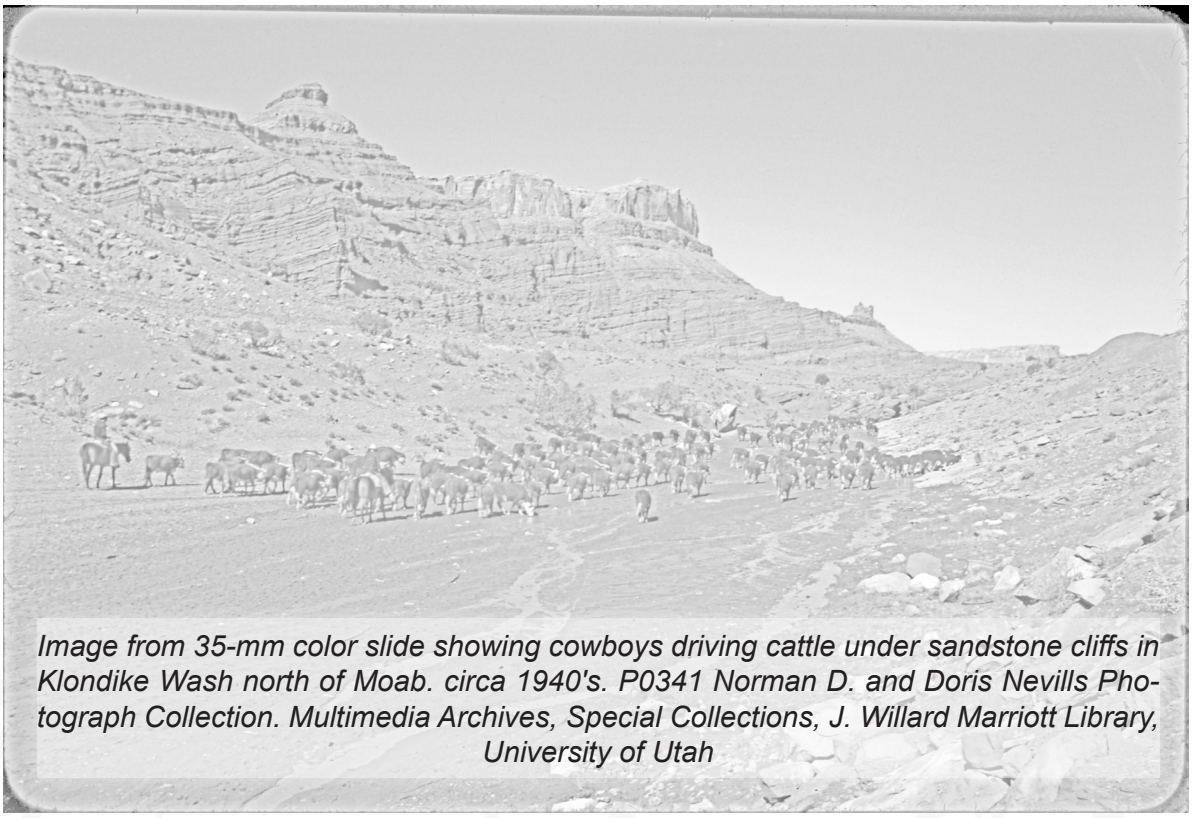


Image from 35-mm color slide showing cowboys driving cattle under sandstone cliffs in Klondike Wash north of Moab. circa 1940's. P0341 Norman D. and Doris Nevills Photograph Collection. Multimedia Archives, Special Collections, J. Willard Marriott Library, University of Utah

In a speech given before the Commonwealth Club in San Francisco, California on March 24, 1927, Work stated:

> *"The public land grabs of the last century are a soiled page in our history, but the remaining public domain is protected for future generations. Our public coal deposits were shamelessly exploited during the last century, but since 1906 Government coal lands have been withdrawn from entry and protected by leasing."*[28]

Again here, the essence of Hubert Work's philosophy in the Department is expressed. He is suggesting a conservationist's and balanced approach to all aspects of his department. In a sense, National Monument or Park designation was a "land grab" that in many ways actually increased the size of the federal government and cost of administration. Monument or Park designation inherently limits land use to only one or two special interest, travel and tourism, as it removes the ability of the land itself to provide any other service to the people, not to mention it's run almost exclusively by the federal government. This must not have been lost on Work. Arguably, continuing this prolific trend of Monument designation wasn't exactly balanced. When examining the dates of National Monument designation under Coolidge's and Work's leadership a bit closer, there are no National Monuments designated after 1925.[29] When viewed in light of this information and the information regarding the budgetary requirements of the NPS, the administration's lack of action would actually suggest that their opinion on a National Monument in Grand County, Utah and their opinion towards National Monuments in general was more consistent with their philosophy than their overall record in terms of numbers of Monuments designated, relative to other administrations, would suggest.

To be fair, the area was showing great promise in other aspects of his department, as well. Much like the NPS, Reclamation Services directly costs the Federal Government more to operate than it sees in direct return. To Work:

"The benefits which come from reclamation are indirect. They include increase[s] in taxable wealth, not only of farms but of the towns which those farms create and support, increase[s] of population in thinly peopled areas, an equalization in railway transportation; a cheapening of local food supplies which permits the operation of mines, the better use of grazing lands, and the settlement of local manufacturing industries. Private enterprise can not absorb these benefits but they justify Federal reclamation as a public policy."[30]

Good access to water for agriculture and flood control were crucial, in Works' opinion, for future development. The development of the Colorado River Basin was the single most important project during this period, largely driven by the fact that the river is both interstate and international as well as provides water for the rich agricultural resources of Imperial Valley, California and Yuma, Arizona, and Work was interested in helping farmers succeed while protecting them from seasonal flooding.[31] [32] He felt reclamation was important because

"no conservation policy, in its broad sense, that does not deal primarily with production of human food near to the place of consumption is sound. The farmer's place in conservation is fundamental. All branches of human industry eventually trace back to the ground."[33]

And Work wasn't even original in his philosophy towards land ownership for agriculture and it's importance to the American way of life. His views reflect a philosophy that precedes the birth of the Republican Party, back to the short-lived Free Soil Party that existed from 1848 until 1854 when the party was largely absorbed by the newly-formed Republican Party.[34] Although the Free Soil Party's primary goal was abolition of slavery, the theme of their first official political convention in Buffalo, New York was in the spirit of the French Revolution that took place fifty years prior. The convention proceeded under the banner of Liberté, égalité, fraternité (Liberty, equality,

The most famous Free-Soiler Martin Van Buren, c. 1849. Mathew Benjamin Brady - Beinecke Rare Book & Manuscript Library, Yale University

fraternity).[35] The Party's platform: Free soil, free speech, free labor, free men.[36] After the Free Soilers were largely absorbed into the Republican Party, the Homestead Act of 1862 was signed by Abraham Lincoln which was established to encourage settlement in the western U.S.[37] Settlers were given 160 acres of land to occupy for a minimum of five years at which time they could purchase the land at $1.25 per acre.[38] This act fulfilled a campaign promise of the Republican platform.[39] In 1902 under Theodore Roosevelt, passage of the Reclamation Act created Reclamation Services and put the Federal Government in charge of reclaiming water to further enable homesteading.[40] In 1909, the amount of acres available to homesteads increased from 160 to 320 per homesteader under the Enlarged Homestead Act. 1916 brought the Stock Raising Homestead Act that allowed homesteads for livestock and not just farming. By Hubert Work's time as Secretary of the Interior, the Republicans had long since established their philosophy supporting agriculture as a means to economic success for citizens and therefore the country. Reclamation was just another way to support this philosophy.

The proposed Arches National Monument occupied land less than 10 miles north of the Colorado River and Moab. Both Moab and the Colorado River itself were attempting to support many farmers at the time.[41]

Elwood Mead, Commissioner to the newly renamed Bureau of Reclamation under Work noted that "the Reclamation Bureau was the agency of the government charged with changing wastelands into farms."[42] An argument could easily be made that the area of proposed Monument designation was, in a sense, a wasteland. After all, the area receives less than ten inches of moisture, annually.[43]

But the situation and political climate get even more complex. An important mineral used in fertilizers for farming is Potassium Chloride, more commonly known as Potash. Potassium is a primary ingredient in plant growth.[44] For Coolidge's thoughts on the importance of fertilizer and its impact on farmers, in 1923 he stated:

> *"Indirectly the farmer must be relieved by a reduction of national and local taxation. He must be assisted by the reorganization of the freight-rate structure which could reduce charges on his production. To make this fully effective there ought to be railroad consolidations. Cheaper fertilizers must be provided."*[45]

Prior to 1925, the U.S. produced no Potash, domestically, and the majority of the world's Potash had been exported from the now war-torn Germany and France.[46] On January 7, 1926, Headlines in the Grand Valley Times read "World's Richest Potash Bed Discovered in Grand County". Bureau of Land Management records reveal permits for exploration were issued after 1926 for areas that are now part of Arches National Park.[47] Domestic production meant cheaper fertilizer amongst other benefits such as economic growth. Even though domestic production would not begin until 1932, potential mineral claims needed to be protected until determined otherwise.[48]

Under the circumstances of the time, Work had good reason to avoid a hasty recommendation for designation of a National Monument that might interfere with his larger plans of conservation and increased services in other aspects of his leadership. In the end, both Arches and Work seemed to achieve success.

Work accomplished a degree of success in his own goals of conservation and organization on many fronts. The Colorado River Basin has seen much work towards irrigation and flood control. Beginning with the Hoover Dam, a project which began in 1928, the development of the Colorado River Basin continued for many years on a foundation built by Work.[49] The Potassium industry continues to operate in Grand County as one of the most prolific in the country.[50] While Work's policies were not agreeable to everyone, he seemed to take actions with the intent of protecting the right of future generations to make the decisions of what is done with the land and how it is done.

Arches National Monument also achieved designation. Hubert work retired in July of 1928, six months before Herbert Hoover took office. The new Secretary of the Interior Ray L. Wilbur was in favor of Arches National Monument, as was Hoover. As a result, Arches National Monument was created by executive order on April 12, 1929 in one of Hoover's first acts as President.[51]

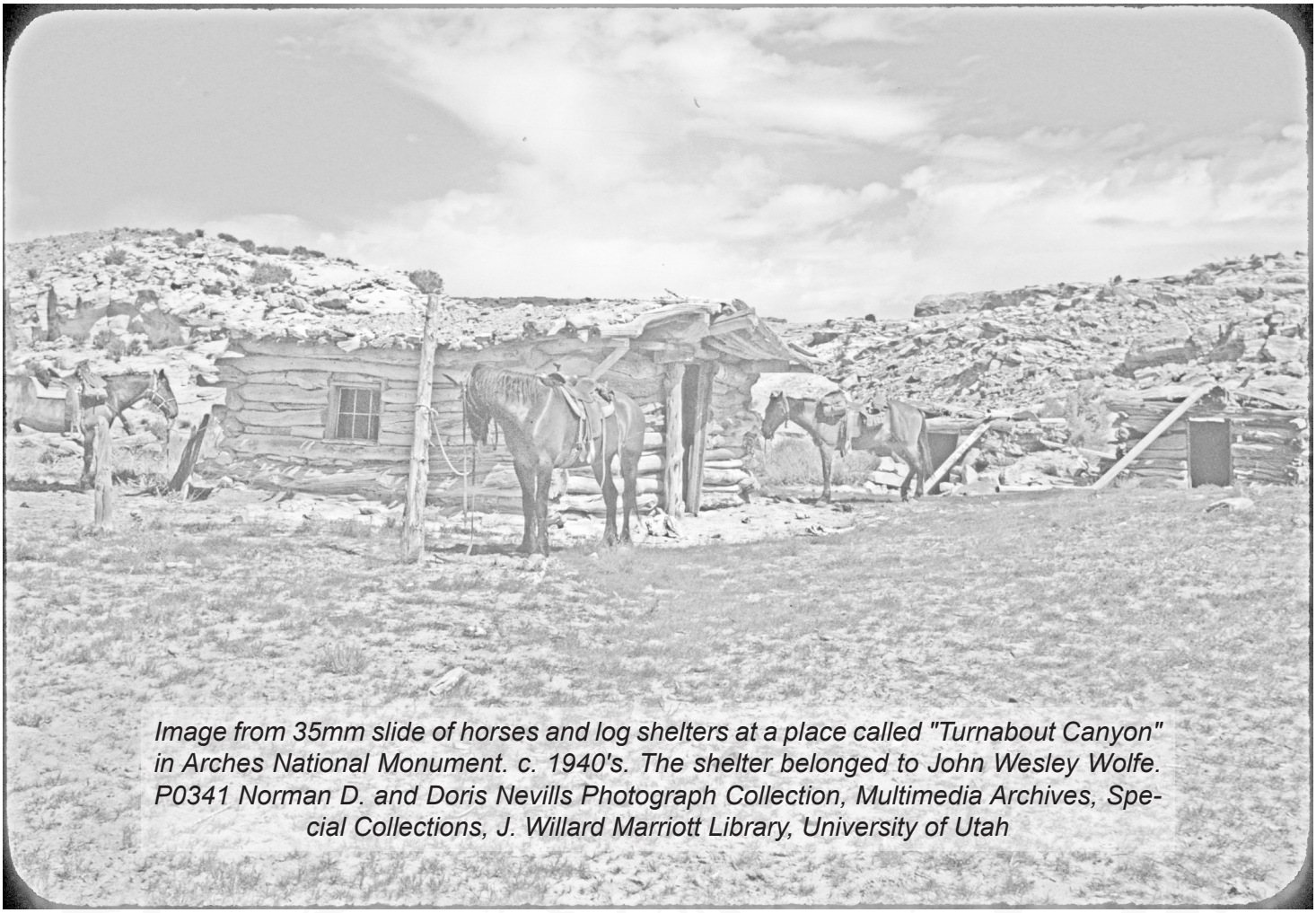


Image from 35mm slide of horses and log shelters at a place called "Turnabout Canyon" in Arches National Monument. c. 1940's. The shelter belonged to John Wesley Wolfe. P0341 Norman D. and Doris Nevills Photograph Collection, Multimedia Archives, Special Collections, J. Willard Marriott Library, University of Utah

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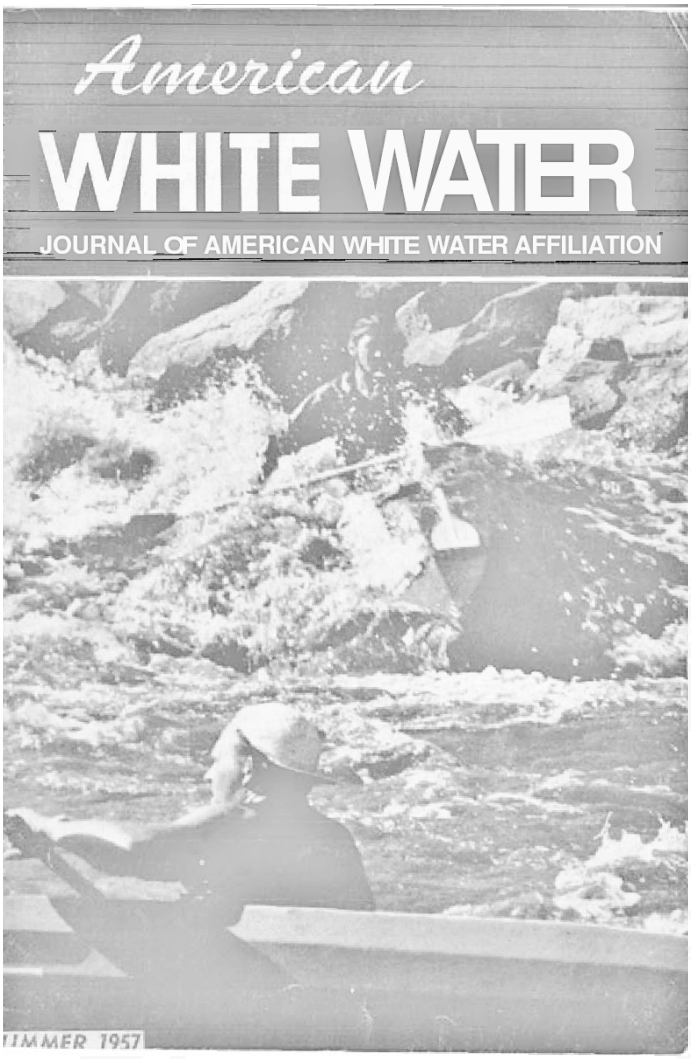

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Summer 1957

The Case for Rubber Rafts by DON HATCH

A top boatman discusses boats for the really big rapids.

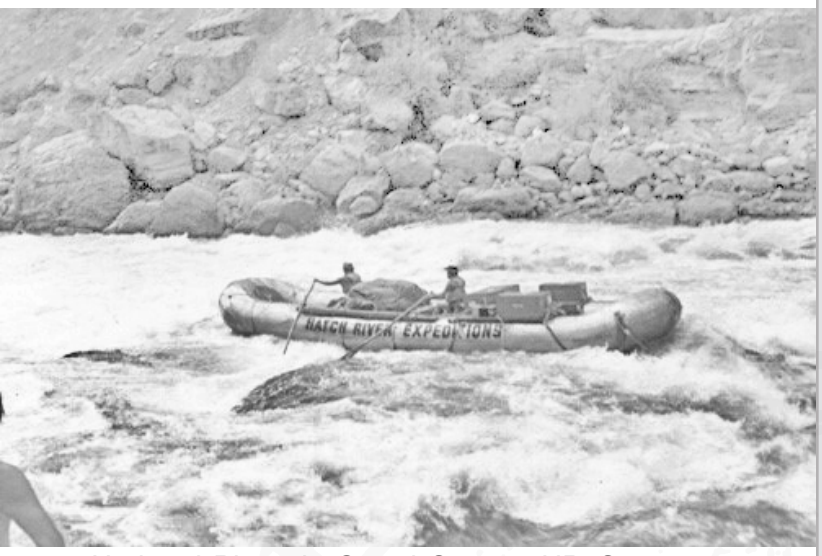
Their appearance after WWII revolutionized the river boating world. Since that time far more people have navigated large western rivers with rapids by rubber boats than any other type used.

They have done so for these reasons: 1. They are inexpensive. 2. They are safe. 3. They are easily portaged should the need arise. 4. They operate easier in shallow water thus extending their operating season three or four months longer than most Galloway, Sadiron or power boats. 5. They take more punishment and survive better on small rocky streams such as the Middle Fork of the Salmon River. 6. The pontoon in particula can carry at least four times more passenger and gear weight than most other popular boats operating today. For most river running, operations I would say the pontoon is unbeatable in the department of safety and getting through the tough spots.

But with all these points in its favor, the rubber raft lacks in other departments. Certainly it is among the ugliest boats afloat today. No amount of paint can snake it attractive. It has a slow for- ward speed although it manuevers remarkably well through rapids, During the past few years motors have helped over-come part of the speed factor. A1- though the seats are comfortable when one sits on the rolls, the softness causes the rubber boats to bend and buckle with the waves. Most solid boat operators detest this action, but it certainly amuses the passengers.

I had an excellent chance to compare solid boat operation with rubber boat operation on a trip through Upper Granite Gorge in the Grand Canyon last season. I weighed the advantages and disadvantages at the time. My personal conclusions are these: The safest trip to date through the Grand Canyon can be made in a pontoon with a motor on the back and two oarsmen midship. The advantages of this lay-out is obvious. Should he motor fail, oarsmen will continue doing a good operating job in a boat rigged specifically for oars. Likewise, oarsmen help turn and hold the craft into position. Thus far in operations through Cataract and Grand Canyon we have not found the need for a full oar crew and a full motor set-up to operate at the same time. The potential is certainly there when needed.

Potential exists in carrying power too. Because of the great space inside pontoons one is able to carry more emergency supplies, more food, more of the "comforts of home" if needed. On occasions I have carried a full tool kit-hammers, saws, drills, nails, etc. - a tool kit large enough to construct a wooden boat on the banks of a river should the need arise (and should I find



Undated Photo in Grand Canyon NP. Courtesey of John Hatch

the wood!) It is entirely possible to carry a rolled up spare boat inside a pontoon. Should one go to pieces, the other is ready to go. Foldboats have been carried inside on occasions. Many people ask how it is possible to maneuver with such loads. The answer lies in letting the river do most of the work, instead of the oarsmen. Here is the way we approach the difficult rapids facing downstream for best visibility. We're seated at least 30 inches or more above the surface of the water, and often times we stand on the seat to make a better inspection as we approach. After picking out the best run, the boatmen seat themselves, and should they desire to cut right or left, they angle the boat on about a 45 degree angle and row against the current. The resistance of the boat in the water effected by rowing causes the current to move the boat either right or left. Thus it isn't done with muscle power alone. A smart boatman can make use of the current ferrying action the way a smart sailor makes use of wind on the sails on his boat. With the pontoon being 2.5 feet, long, the current is noticeably effective and useful. Upon entering the worst of a rapid, it is wise to point the nose straight downstream in most instances. Hang on too, for the ends of the boat "crack the whip." If the boat appears to he in the right spot while running a rapid, it is wise to "park the oars in the air or waves will twist them from you or break them.

So far I have mentioned why we use pontoons for 90 per cent of our runs today. This wasn't the case five or six years ago. We used ten man rubber boats almost exclusively. I took one from Green River, Wyoming on the Green River, to Lees Ferry, Arizona in about thirty days and experienced no "pain." Dick Griffith and his wife Isabel soloed from Wyoming to Hoover Dam in one ten man. Others have used the small seven mans even through such giant killers as Grand Canyon, but with less success. We didn't abandon these boats because of instability, but because they carried no more than the Galloway or Sadiron boat. We desired to carry more supplies for passengers and have an even safer trip, thus the change by us from ten mans, to pontoons.

Stability of a ten man boat lies in its rigging. We believe a solid oar frame resting on the boat is all but indispensable. We've tried many other ways, but this seems best. A wooden seat, wooden foot rest, and wooden frame all aid to improve rubber boat performance. In such a rigging you obtain some of the best qualities of wooden boat performance and maintain the fine qualities of the rubber boat.

Jaws – Miod-1980s Dinosaur National Monument. Courtesey of John Hatch

The use of paddles on rubber boats have proven inferior to most a11 other rigs. River runners are all but unanimous on this point. Paddles have been used successfully through bad canyons, but success was due mostly to low water and not to the paddle system. A high water run through Grand or Cataract Canyon with paddle would be next to if not disastrous.

Rigging a suspended floor in the pontoons keeps gear high and dry while passengers obtain sure footing. Angle iron frames provide part of the floor which is suspended from the rower frame. Suspension is done with chain. Series of boxes can be wedged between the rubber rolls for storage of food, tools, etc. Boxes should be water tight, of course, with rubber gasket lids.

Many people believe that rubber boats will become extinct as did the dinosaurs. Surely they're just as ugly, but don't deserve that end. Demand has certainly out-lasted supply, and undoubtedly we'll see no more of rubber boats should the present trend continue.

My case, then, for the rubber boats has been stated. But one important after- thought.Unskilled operators can get hurt regardless of the type boat they use. Stay out of rough canyons if you are unskilled.

Undated Photo of Don Hatch. Courtesey of John Hatch

Background of David Yeamans relative to the CPRG publishing my story of the Greasy Pliers

I was born in 1948 in Portland, Oregon but spent most of my life in New Mexico, the state with the least surface water. I thank my father and others, especially James A. "Stretch" Fretwell, who showed me how to be gracious in the outdoors whether it be fishing a stream, climbing a mountain, camping, or floating rivers. Rivers had a special attraction to me like the compelling romance of a teenage girl friend. In fact, when I was 13 I married the Colorado River, at Kane Creek before she died under rising waters of Lake Powell. It wasn't much of a ceremony but it was a fundamental agreement that she would set the tone, had all the power, and had my lasting loyalty.

At the time, June 1961, my dad and friends were taking a week off work to drive the shuttle for the San Juan/Glen Canyon river trip mounted by Explorer Post 20, BSA, of Los Alamos, New Mexico. Ever since my older two brothers joined the Post I anticipated joining myself. When I turned 14 I could be there with the big boys and spend glorious weeks on major river trips and take day trips every weekend in spring. We did everything ourselves — planning trips, patching boats, building rowing frames, driving split axle trucks and buses, cooking, and of course, running our own boats. It was a perfect training ground for me and future generations of life long boaters, both commercial and private.

Boats to us were 40 to 60 pound cotton/neoprene Air Force life rafts bought on the black market, they not being available to the public. We ran those gossamer life rafts down Grand Canyon, Middle Fork of the Salmon, Lodore, Cataract Canyon, and any place we could find flowing water with access near our home in Los Alamos. Of course some places were off limits because of severity of the water. And yet, I rowed my own fragile 12-footer through Cross Mountain Canyon on the Yampa, and six of us took three like it through the Upper Taos Box of the Rio Grande on 2200 CFS — I should rather say we survived another boneheaded adventure that involved loss of boats, unscheduled campouts, and long hikes to safety. We still wink and nod when we say, "Yeah, boys, we coulda handled a lot more water."

In 1964 I was on my third major trip, this time a 14-day Cataract Canyon adventure. In the flat water near Ouray, Utah we encountered a Hatch River Expeditions trip with a crazy kind of huge boat I had never seen before. It was enormous, probably 27 feet long, three feet high and rigged with unthinkably damaging steel chains. Standing atop this barge was a bronzed river god. Instantly I knew I was going to be him one day. When I found out he got paid to run rivers I was just flabbergasted. In fall of 1965 I wrote some outfitters who might hire a boy such as I. Ken Sleight said he had all the staff he needed but I should keep trying because guiding is such a good game. Don Hatch who was also fully staffed thought I could come to Vernal, Utah anyway just in case.

I got plenty of work with Hatch over six years as I ran trips in Grand Canyon, all over Utah, in Colorado and in Idaho. When the Vietnam Conflict happened and I had a conscription lottery number of 18 I mistakenly believed my river running career was over. Uncle Sam was now my boss. But rather than my becoming canon fodder, Sam let me fulfill my obligation to the national safety, health, or interest by becoming a Colorado Outward Bound School employee. I ran rivers for them in Dinosaur National Monument and Canyonlands National Park for five years even though the Draft Board only required me to work for two.

After eleven years in the profession I gave up commercial boating and worked other career-like jobs such as well driller, ski instructor, retail sporting goods, teaching high school math/science, heavy equipment repair, Bible scholar, and finally, because I needed money and a home for my children, technical work at Los Alamos National Laboratory. During the week I destroyed nuclear weapons but on the weekends I floated on water.

I kept my hand in river activities by becoming an adult advisor to the youth of Explorer Post 20 and I joined the Grand Canyon Private Boaters Association where I became a board member and its president. We contributed heavily to the current Colorado River Management Plan. As president, and a stakeholder representing private boaters, I sat on the 20-member advisory board for managing Grand Canyon overï¬‚ights air tour noise.

As part of my continuing involvement with river running I designed, built and used the first of Leviathan class catarafts. Barcofelis was, and still is, if I am to believe my eyes — I saw it on top of a truck moving on I-580 in California a few years after I had given it away — a 20-foot x 30-inch inflatable with PVC tubes made by Jack's Plastic Welding. I fabricated my own nesting basket frames. I ran it on the Chama, Salt, Grand Canyon, Cataract, Selway, Deso, and more. Again I was the bronzed river god standing on my mahogany gangways and sleeping aboard. It seems like the natural progression of boaters, from no boats to small boats to big boats and back to no boats.

I built Barcofelis in 1998 as a result of a nasty swim in Cataract when I ran out of choices after I stopped on the wrong side of the river to scout BD2. When my first-of-kind tubes arrived from JPW and I put the frames on, it occurred to me that I needed a non heroic way to get back aboard in case of a recreational or other kind of swim. After all, I was losing strength and growing some intransigent belly fat. Thus was born the world's only self-stowing raft entry ladder, the Rescue Rung. I could go on about the development and history of the Rescue Rung but I'll leave that for Zach Baird who now owns it as the Rapid Rung produced by Raftfix in Salida, Colorado.

River running has been a way to express my creativity. Creativity is what led to my leaving the crowds behind at the Upper Taos Box and drew me to the mild section of the upper San Juan. No one I knew had ever run it so I thought it best to figure it out on my own.

That's also why I discovered on my own how to enjoy the Villanueva to Tecolotito run on the Pecos. I imagined and executed a mostly solo Trans-Utah trip on the Green/Colorado in 2004 surmounting such barriers as aligning all the permits and portaging Flaming Gorge Dam. This spirit of weird adventure later led me to photograph every state bird in its own state (https://ravenson.smugmug.com/DavesBirds/50-State-Birds/). I don't mind following but leading has its unique rewards.

I'm like many other boaters who, as we believe in our self flattery, have the better way — the improved route in a rapid, the best boat, the best experience. I am abashed when I think I might sound like the clusters of boatmen (now we call them guides or pilots) standing around flexing their biceps and their vocal cords. But creativity is what makes for good stories, and stories should survive whether or not they are historically accurate because every word of them is true.

Many of my generation are still alive to pass on stories to river people who weren't there at the time. It seems wise to hear from them before it's too late. The Boatman's Hall of Fame, when such a thing is created, might include people who aren't so much famous as they are worth listening to. As raconteurs I think of Ellen Meloy RIP, Christa Saddler, Bill Bernt, Jerry "Snake" Hughes, Al Holland, Huck Truitt, and my best friend from sixth grade, Earl Perry.

Because Mike Ferguson asked (Confluence #32 Fall 2021, Page 25), I offer you the story of how Greasy Pliers earned its name.

How The Greasy Job Became Greasy Pliers Rapid

There is a rough stretch of water on the Green River 1.96 miles downstream of the Jones Hole campground near the border of Utah and Colorado with the unlikely name "Greasy Pliers." Riverbrain.com says the rapid was named for Bus Hatch's pliers which he used to handle Dutch ovens when cooking for commercial river trip passengers.

This is wrong but only slightly wrong. It is named, or rather, misnamed, for a messy job involving canned bacon, pliers, and silly romantic boatmen cooking for dudes.

We were 20 years old in 1968, our third year rowing gigantic 33-foot pontoon boats for Don and Ted Hatch in Vernal, Utah. Earl and I and many other river runners ran the Weekly Special for a grab bag of customers down the Yampa and Green rivers. Every trip had the same menu: steak, chicken, ham; bacon/eggs/pancakes; sandwich smorgasbord. We cooked it often enough to become efficient. This was especially useful at Jones because we needed to break camp early so we wouldn't have to row against the afternoon winds in the flat water of Island Park.

At our last breakfast of the trip we got up in the dark, broke sticks for the fire, made coffee and started on the bacon. We used Hafnia brand canned bacon in those days. People my age, 73 at this writing, remember Spam, sardines, and ham preserved in this kind of early 20th century can which had a key that wound up and peeled off a narrow band of steel. The coiled metal band had sharp and jagged edges which would slice human flesh badly if it squirmed off the spool. If our careless handling caused such an unreeling, we'd have to rewind the springy ribbon onto its mandrel and then resume turning the key until the can lid separated from the body.

That bit of winding up the key worked well enough for the first can of bacon. However, by the time we got to the second and third cans our hands were so slippery from hog fat we couldn't turn the key. We learned to use our ever ready, belt holstered pliers for twisting. It greased them up alright, but it was fast and maybe even a bit safer. In the end, we ignored the key and just ripped the band off with our greasy pliers.

After opening the can we grabbed the slab of pork with our pliers and slung it into the dutch. The whole process of baconing was called The Greasy Job. No one wanted to be the greaser so we decided by lottery or fisticuffs or resignation.

"Who's going to do the Greasy Job today? Let's draw straws. No, wait, let's have a pliers fight — loser does The Greasy Job."

A rain storm in 1967 or 1968 caused a debris flow which turned a negligible riffle in Whirlpool Canyon into a roller coater ride when the water was high enough every two years or so. We had a good string of high water years then and the rapid was one we really looked forward to each week of high flows. Because it was new we wanted to name it before somebody else decided to call it Hiram Smith Draw or Dainty Dabble or some other thing unrelated to the experience of those people who had the first attachment to the place. It had to be a name evoking experience, spirit, drama, mystery, and fun. Earl thought "The Greasy Job" was perfect and so did I.

We wanted to codify the name as a memorial to those men (there were no women rowing pontoons in Dinosaur) who fed hundreds over sagebrush fires, so with calculated social manipulation we spoke to each other in overhearable drama about how we feared The Greasy Job, about how trainees just couldn't be expected to survive it at this water level, about how Bus and the Dusty Dozen before us had wrecked boats there, about whether we would walk our dudes around it, and other such nonsense. There's nothing like repeating nonsense to create an urban legend.

As The Greasy Job name spread beyond our community it went through the Dinosaur National Monument river rangers, outfitter literature, and finally arrived as "Greasy Pliers" in Belknap's Waterproof Dinosaur River Guide, 1973. Currently the name has not been adopted by the Board on Geographic Names and is not printed in the USGS quadrangle map "Jones Hole, UT-CO, 2014," as is Hell's Half Mile on the Lodore quadrangle. Is the Board or USGS squeamish? We don't know but we wish the name had persisted as "The Greasy Job." Spread the word and maybe The Greasy Job will become more than just a true story.

Leaving Traces in Park Waters

Contaminants of emerging concern on the northern Colorado Plateau

HANSEN CAVE, TIMPANOGOS CAVE NATIONAL MONUMENT. NPS PHOTO

***Maintaining pristine water quality** is crucial to both visitor experience and ecosystems in the national parks. New research shows that even individual park visitors can help make a positive difference by eliminating waste well away from water sources and avoiding contact with low-flow waters.*

Background

For many years, it's been apparent that the things we use in everyday life are ending up in the environment. Agricultural pesticides, antibiotics, household microplastics, and even sunscreen and insect repellent are all being found in streams and rivers. It's not too surprising to find those kinds of contaminants near cities or farms—but would you expect to find them in a national park?

Scientists from the National Park Service, Environmental Protection Agency, and U.S. Geological Survey wanted to know. For several years, they sampled waters across the National Park System—everywhere from urban settings to predominately natural landscapes, like the Colorado Plateau.

The samples were tested for contaminants of emerging concern (CECs). CECs are substances that are largely unregulated in the United States but are now commonly found in surface waters. The study analyzed three kinds of CECs: pesticides, pharmaceuticals and personal care products (PPCPs), and wastewater indicators (WWIs).

What We Found

From 2012 to 2016, hundreds of samples were collected at 21 sites in eight national parks of the Northern Colorado Plateau Network (NCPN; see box for list).

The results showed that even in isolated areas, CECs are not uncommon. Waste is getting into natural aquatic systems where it might not be expected.

At most NCPN sites, at least one PPCP and/or WWI was detected on over half of all sampling visits. However, they were generally found less often, and at lower concentrations, than in urban or agricultural watersheds. The contaminants most frequently detected were DEET, caffeine, household flame retardants, bisphenol A (BPA), fecal indicators, and polycyclic aromatic hydrocarbons (byproducts of biofuel combustion from sources like vehicle exhaust, power plants, and wildfires).

Northern Colorado Plateau Network parks where CECs were sampled:

Arches NP
Bryce Canyon NP
Canyonlands NP
Capitol Reef NP
Dinosaur NM
Hovenweep NM
Timpanogos Cave NM
Zion NP

At a few sites, the same contaminants showed up over and over (in 50% or more of samples taken). These are referred to here as "chronic."

- Certain pharmaceuticals were chronic at sites on major rivers with upstream communities and wastewater-treatment discharge (see table). The Colorado River at Potash site, about 15 miles (24 km) downstream from the Moab, Utah, wastewater treatment plant, had the highest number of chronic CECs of any site in the study.

- Personal care products were chronic at two cave locations in Timpanogos Cave NM (see table). Located high in a forested watershed, these two sites receive about 100,000 visitors per year. Consistent visitation, paired with slow atmospheric and cave-water turnover, may contribute to this contamination. (In contrast, samples from The Narrows, at Zion NP, had no chronic CECs, despite thousands of visitors wading in the river each day during the recreation season.)
- The pesticide, triclopyr, was chronic in and near Canyonlands and Arches national parks (see table). This may be associated with the use of a triclopyr-based herbicide to control tamarisk in these parks.
- Fecal indicators were chronic at streams and isolated springs at four parks (see table).

What it Means—and What You Can Do

The amounts of contaminants found in NCPN parks were generally very low. When it does occur, chronic contamination seems most likely if there is a wastewater treatment plant upstream, or in situations with low or stagnant flow, where contaminants can't easily be washed out of the system.

At current levels, the CECs detected aren't likely to affect vertebrates, such as fish or frogs, or be a public health risk. That's good news for park managers and visitors. But some type of contaminants were found at most sites—even isolated sites—on at least half of sampling visits. Wherever we go, we take our contaminants with us.

Every park visitor can make a difference in the quality of park waters on the Colorado Plateau. Because contaminants can come not only from human waste, but also from skin and clothing, there are two important ways visitors can help keep park waters healthy and pristine:

- Whenever possible, answer nature's call (i.e., deposit human waste, whether liquid or solid) at least 200 feet from water sources, and
- Avoid making physical contact with low-flow springs and pools.

GREEN RIVER, DINOSAUR NATIONAL MONUMENT, NPS/L. GOMMERMANN

Contaminants of emerging concern consistently found in Northern Colorado Plateau Network parks.

CEC	Description/use	Potential source	Site	Park (in/near)	Site type
Pharmaceuticals	Various types	Human	Colorado River at Potash	Canyonlands NP	Major river
			Green River at Mineral Bottom	Canyonlands NP	Major river
			Yampa River at Deerlodge	Dinosaur NM	Major river
Caffeine (dissolved)	Common stimulant	Human	Hansen Cave	Timpanogos Cave NM	Cave pool
DEET	Insect repellent	Human	Middle Cave	Timpanogos Cave NM	Cave pool
Galaxolide	Synthetic fragrance in household products	Human	Middle Cave	Timpanogos Cave NM	Cave pool
Triclopyr	Pesticide	Human	Colorado River at Potash	Canyonlands NP	Major river
			Lower Courthouse	Arches NP	Isolated spring
p-cresol	Colorless solid used in the production of other chemicals	Human/Natural	Upper Courthouse	Arches NP	Isolated spring
			Green River near Jensen, UT	Dinosaur NM	Major river
indole	Fecal indicator	Human/Natural	Sleepy Hollow Spring	Arches NP	Isolated spring
			Sulphur Creek	Capitol Reef NP	Stream
			Green River near Jensen, UT	Dinosaur NM	Major river
			The Grotto	Zion NP	Isolated spring
			North Creek	Zion NP	Stream

Information presented here was summarized from Weissinger, R. H., B. R. Blackwell, K. Keteles, W. A. Battaglin, and P. M. Bradley. 2018. Bioactive contaminants of emerging concern in national park waters of the northern Colorado Plateau, USA. Science of the Total Environment 636:910–918.