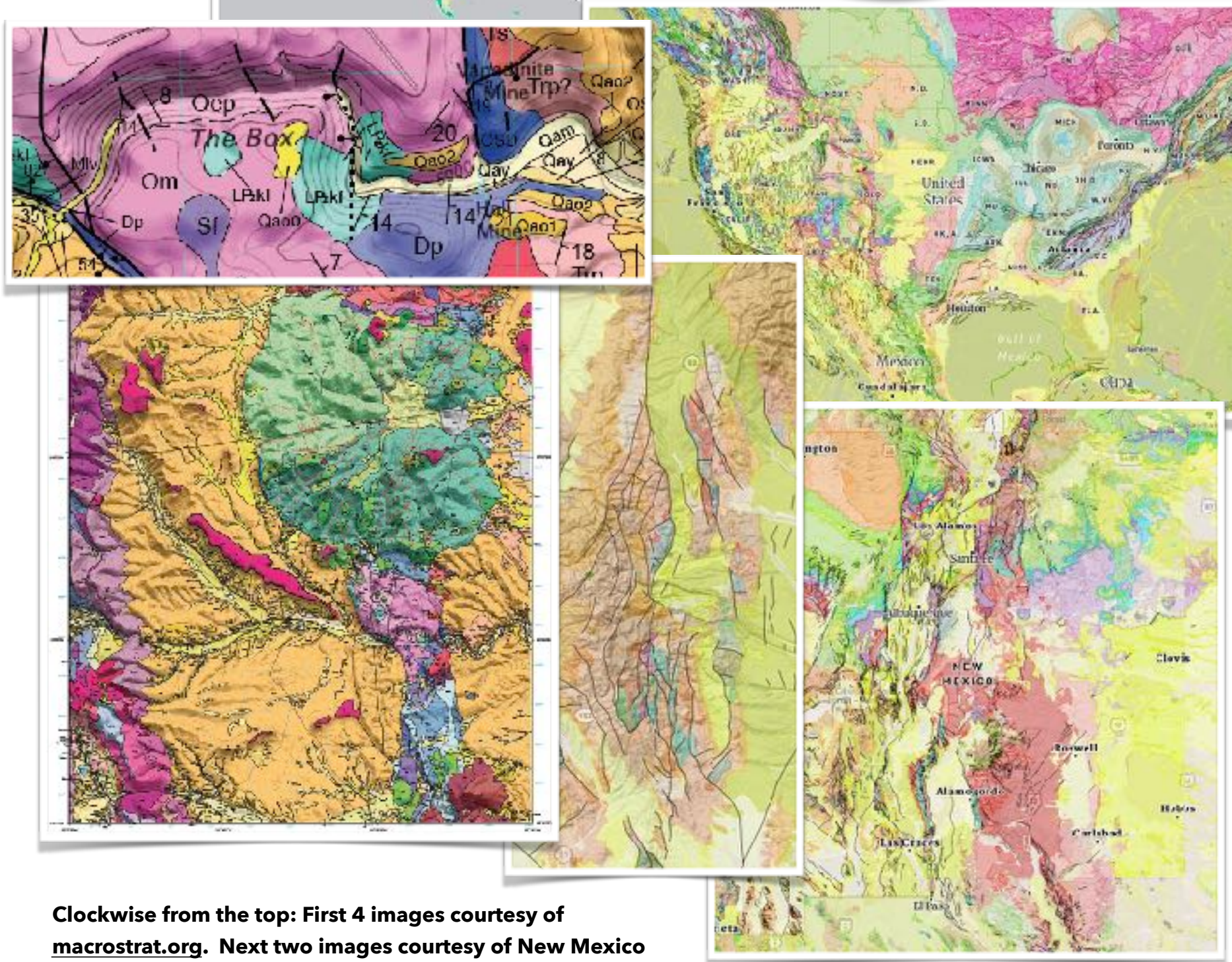


Volume Two, Number Four
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THE BLACK RANGE NATURALIST

Published in Hillsboro, New Mexico
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Clockwise from the top: First 4 images courtesy of macrostrat.org. Next two images courtesy of New Mexico Bureau of Geology and Mineral Resources.

The complexity of the geology depicted on the Hillsboro Geologic Quadrangle (see images 5 and 6, above) is not simply a function of granularity. The collage above shows the effect of granularity. The closer we get, the more we see. In much of the world those patches of color on the map are larger, the geology is more uniform. Not here.

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[\(www.blackrange3.org/the-black-range-naturalist/\)](http://www.blackrange3.org/the-black-range-naturalist/)**

Our Geology

The Black Range of New Mexico is a geologic paradise, full of convoluted, complex formations created by eons of crustal activity, erosion, and myriad pressures. The geology here is also naked, not covered in a lot of vegetation, not built over, and still in the public domain, so it is accessible to study, enjoy, and for many - exploit.

One of the events which make the Black Range an interesting place to explore was the creation of the Emory Caldera about 35.3 million years ago (mya). Calderas are formed by the most powerful and catastrophic type of volcanic eruption. Following a series of major pyroclastic and plinian eruptions (the ejection of gas and ash high into the sky, sometimes miles high) - which leave a hollow space in the earth, the crust collapses into the hollow with an even more catastrophic effect. The Emory Caldera formed during an intense period of vulcanism in this area. Part of the outer fault of this caldera is found at MP 44.2 on NM-152. When the caldera collapsed a massive amount of material was ejected which covered hundreds of square miles in an ash deposit 500-600 feet deep. This ash deposit developed into the Kneeling Nun Tuff deposit. The caldera is 55 x 25 km in size (compare with the Yellowstone Caldera which is 85 x 45 km in size) making it one of the largest in the world. At about the same time the Emory Caldera was forming, the Socorro Caldera just to the north (35 x 25 km in size) was forming. The resulting tuff deposits formed a dramatic landscape, a landscape of rock columns and sheer cliffs. In "Giant of the Mimbres" we discuss the rock formations along the Mimbres which are known by that name. They were first publicized by John Russell Bartlett (the United States Boundary Commissioner from 1850 to 1853) shortly after he visited the site in 1851. But the formations and rock associated with the Emory Caldera are not the oldest formations and rock in the area. In fact, they are some of the younger material.

Near Kingston there is a formation of Precambrian granite (Pickett Springs Granite) which is 1.6 billion years old. Before the Black Range and the Rockies were formed there were the proto-Rockies, which formed about 300 mya. Before the proto-Rockies there was this rock which formed part of the continental crust at that time. That granite was around well before the proto-Rockies rose from the earth's crust to form a

massive mountain chain, a mountain chain which was worn away by wind and water, only to see a new massive mountain chain rise and start to be eroded (our modern mountains). 1.6 billion years is a long time. This is Precambrian. That is in our back yard.

With all of the metamorphic and igneous rock about, you might think that the Black Range is not a hot bed for fossil hunters. You would be correct. But that is not to say that there are no fossils. The specimen shown to the lower left was found just east of Hillsboro. And this issue's back cover is a crinoid head found by Steve Morgan near Kingston. The geology, flora, and fauna of the Black Range make this an intriguing area in which to live and research.

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(All material not directly attributed is by the editor.)

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Inside Front Cover: An assortment of geologic maps

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Back Cover: Crinoid found by Steve Morgan

FEATURED AUTHORS

STEVE MORGAN: Steve is a naturalist, educator, and landscape architect focused on retaining and recreating natural habitat. He has called the wilds of the Southwest his home for 44 years. He currently resides in Kingston.

BOB BARNES: Describes himself as a videographer who specializes in natural history. His internet presence includes www.birdtrips.org, www.earlypeople.org, www.airandground.org, and www.blackrange3.org. His recordings have appeared in various broadcast programs and on non-profit websites in the US, Australia, Canada, and Europe.

REBECCA HALLGARTH: In addition to her role as copy editor for this magazine, Rebecca is a life-long hiker and observer of natural history.

STEPHEN SIEGFRIED: Among other things, Steve is the retired outdoor editor for the Silver City Daily Press. Many of his articles on natural history have been published in magazines and journals. He lives in Hillsboro, New Mexico.



Geologic Maps of the Black Range

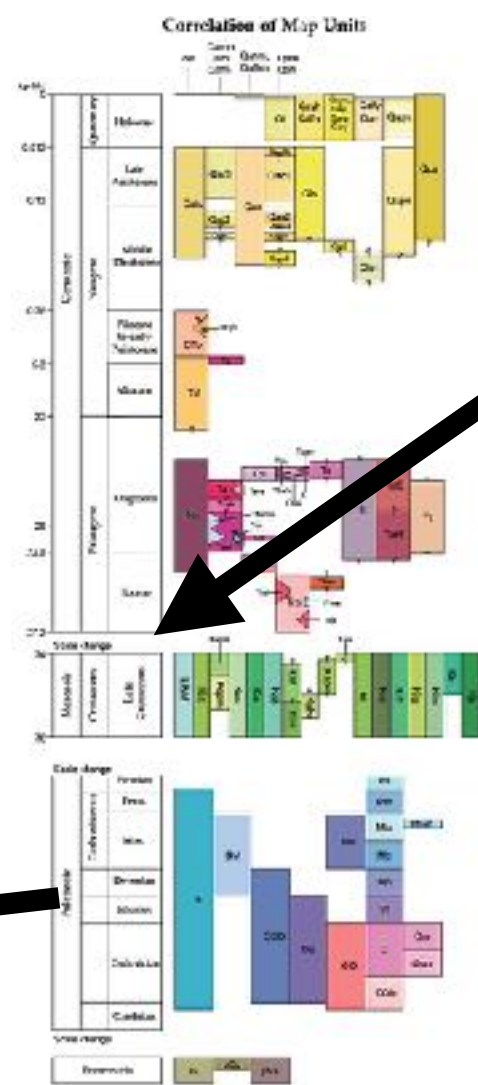
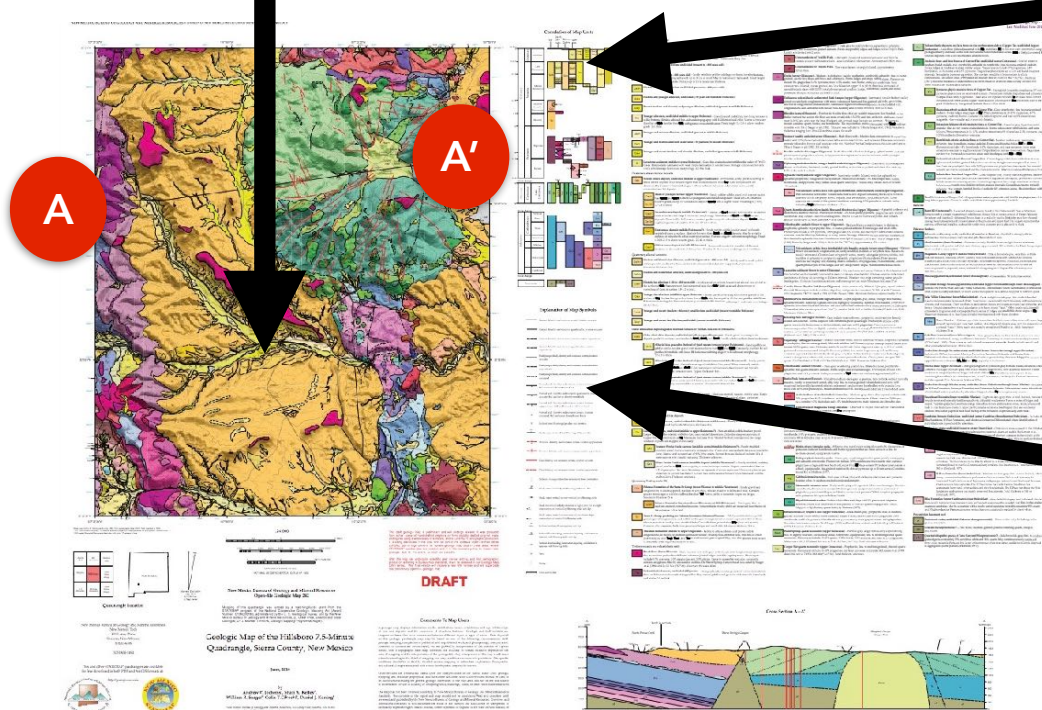
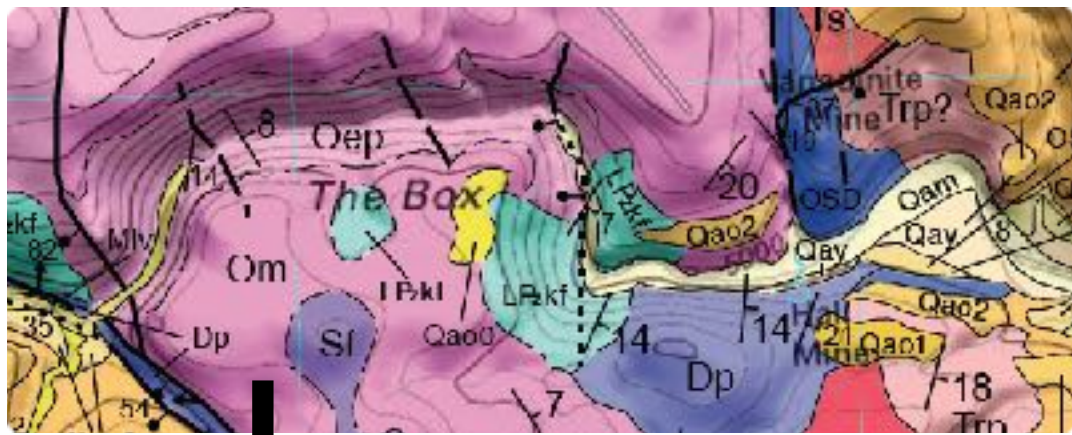
Although detailed geologic maps of the entire Black Range do not exist we are lucky enough to have several excellent

examples of geologic quadrangles from the area. The "Geologic Map of the Hillsboro 7.5-Minute Quadrangle, Sierra County, New Mexico" is shown on this and the following page. Let me note - it is a thing of beauty.



This map and the accompanying report can be downloaded directly from the New Mexico Bureau of Geology & Mineral Resources website. To truly appreciate this map it needs to be seen in full size.

The map contains a significant amount of information. A detail (image below) from the map shows an area just east of Hillsboro, known as the Percha Box.



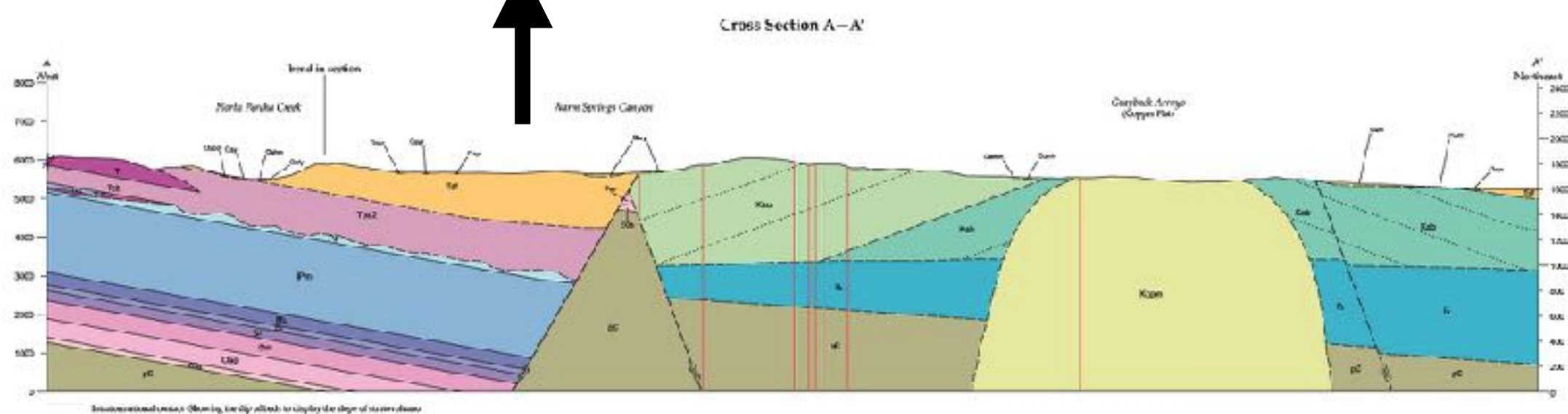
than the rock below, often by a significant amount of time, because there has been a significant period of erosion after the lower formation developed and before the upper formation was deposited. (In the case of extensive folding the "upper" and "lower" may be reversed - what is important is the gap.)

Below the geologic time-scale there is a key to the symbols used on the map, an "Explanation of Map Symbols". A detail of this part of the map document is shown below.

The last major part of the map document is the “Map Unit Descriptions”. Each unit on the map is color coded and

Explanation of Map Symbols

- Contact -Identity and existence certain, location accurate
- ? Contact -Identity and existence questionable, location accurate
- — — Contact -Identity and existence certain, location approximate



A depiction of what the geology below the surface looks like is furnished via a cross-section of the map (detail shown directly above). The cross-section crosses the top of the map from A to A'.

To the right of the map, upper center of the image, there is a “Correlation of Map Units” which shows the geologic time scale for this particular geographic area. Of particular interest are the gaps in the timeline - geologic nonconformities. A nonconformity exists when there are no strata for a particular time period. The rock above is younger

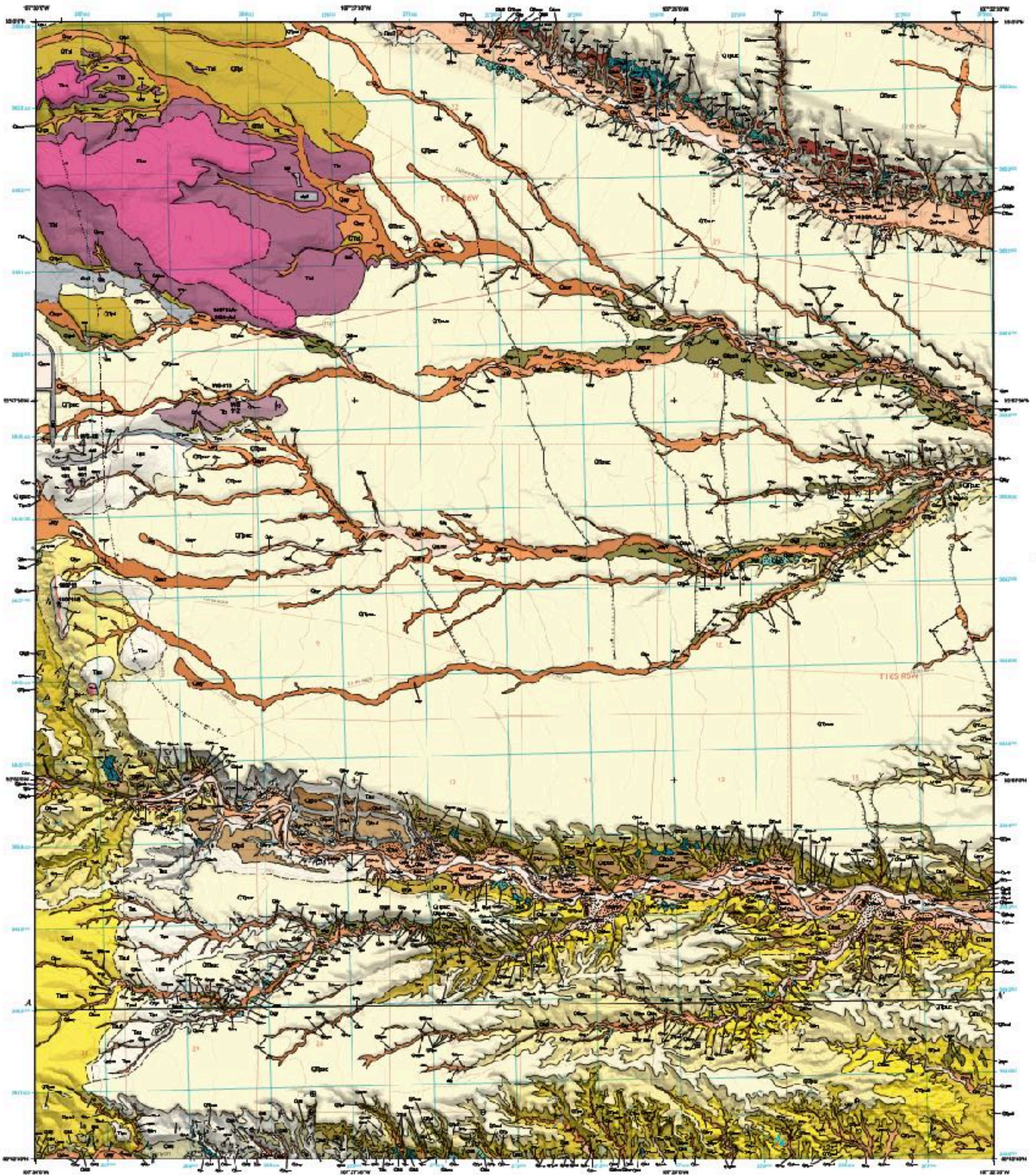
described in this section. The “Descriptions” take up most of the left side of the map document. (See example below.)

Precambrian basement rock	
pC	Proterozoic rocks, univided (Paleo- to Mesoproterozoic?) – Cross-section only. Includes gneiss, gneiss, and schist.
pG	Granite (Mesoproterozoic?) – Pink to red, medium-grained granite containing quartz, feldspar, and biotite.
pCs	Quartzofeldspathic gneiss of Tank Canyon (Paleoproterozoic?) – Pale-brownish-gray, fine- to medium-grained gneiss containing 70% sericified albite and 30% quartz. May contain accessory biotite and ferric oxide minerals. Features thin layers of hornblende schist that strike parallel to foliation observed in aggregated quartz granules (Hedlund, 1977).

These map elements are typical of all geologic maps.

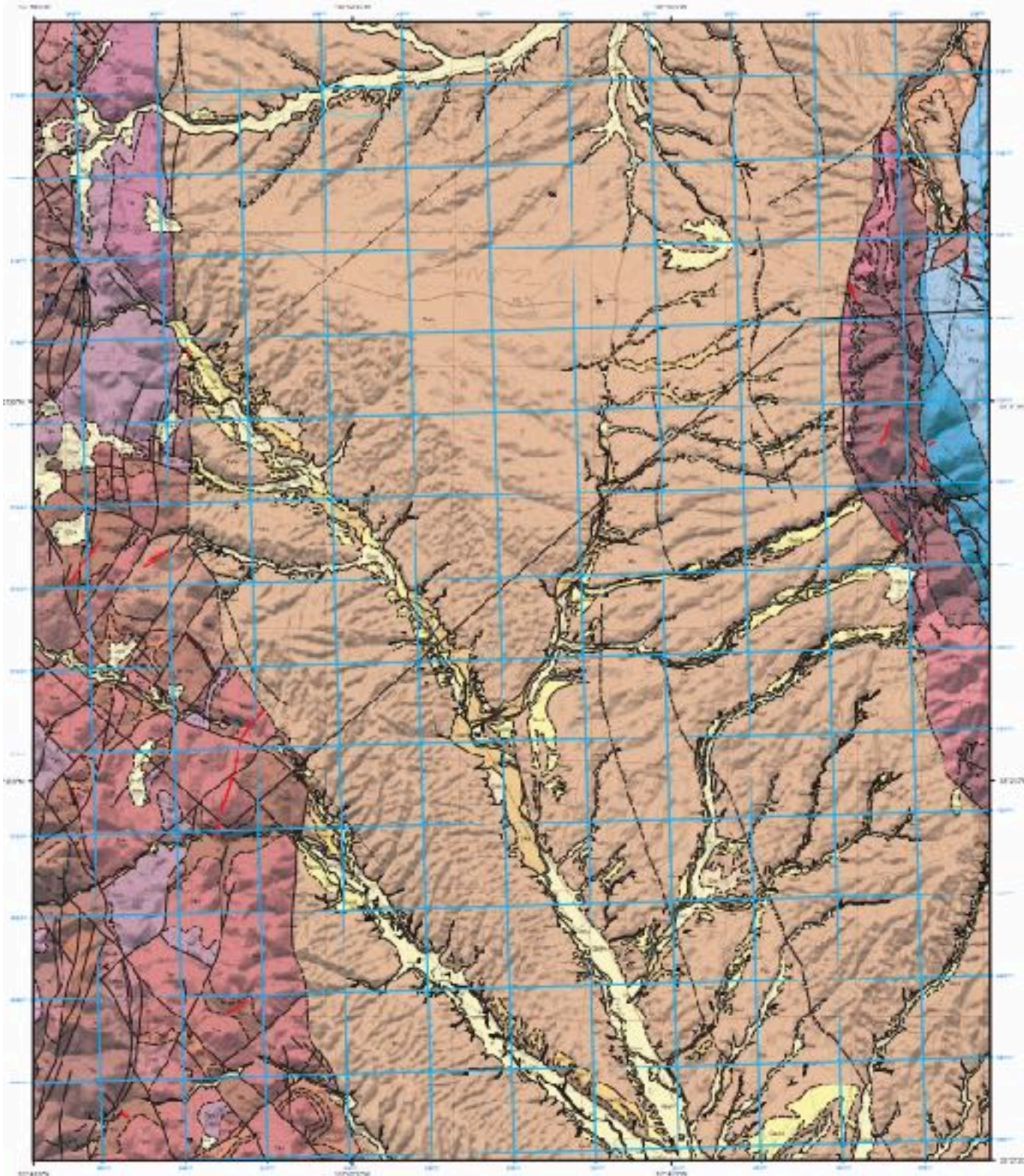
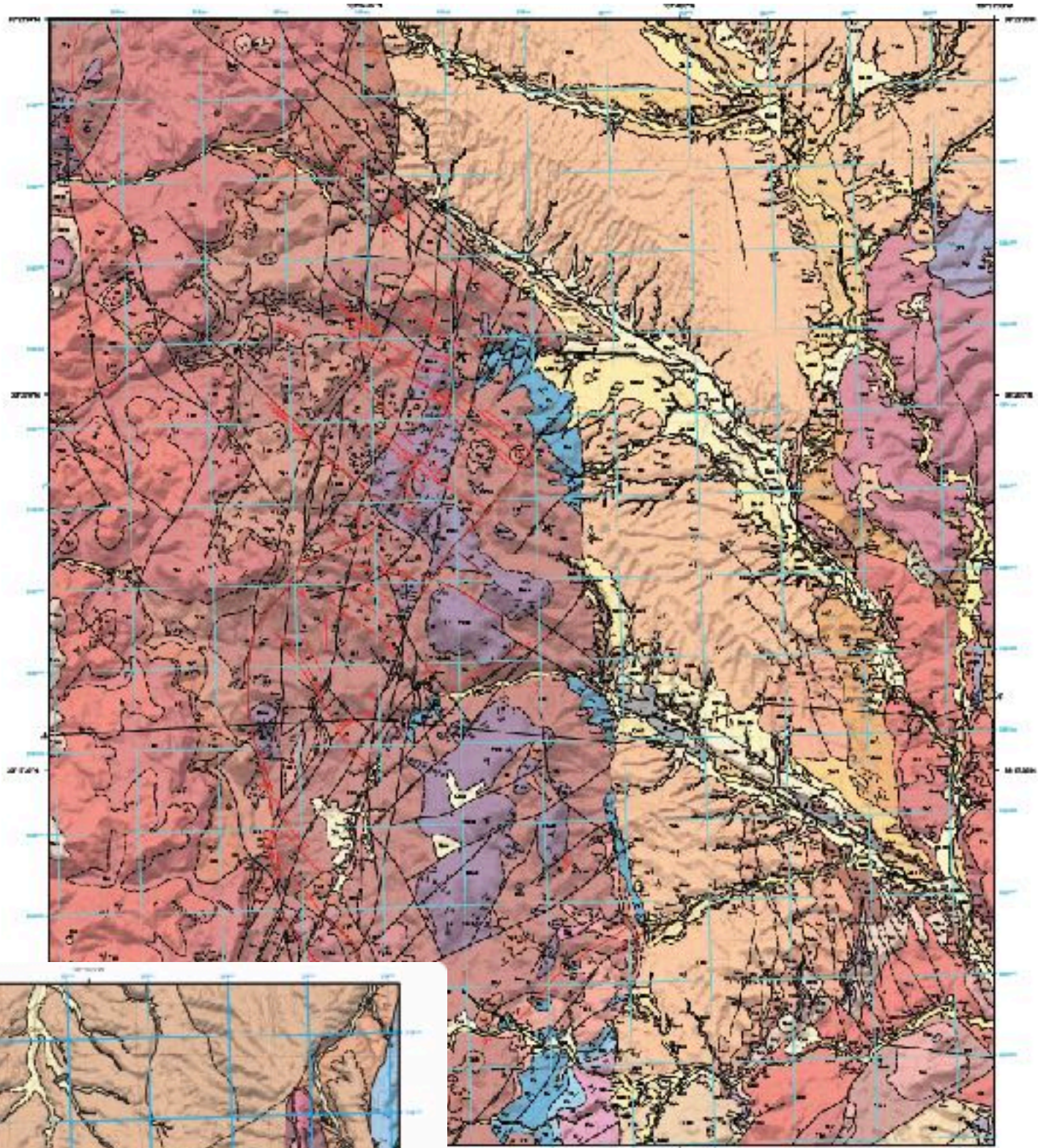
Immediately to the east of the Hillsboro Quadrangle lies the Skute Stone Arroyo 7.5-minute Quadrangle. The geologic map of this quadrangle is shown below ([download map](#)). Note how quickly the landform changes between the two

maps. Although the areas are adjacent to each other, their geology is very different.



The Black Range is described by a few other geologic maps, including the Winston Quadrangle ([download](#)) shown to the right. Just to the north of the Winston Quad is the Iron Mountain Quadrangle ([download](#)) shown below. Other geologic maps from the area include those for the Dusty Quadrangle, the Wahoo Ranch Quad, and the Chise Quad. All of these maps can be accessed at the New Mexico Bureau of Geology and Mineral Resources [Maps and Publications Portal Page](#). In each case there is an accompanying report which describes the geologic history of the quadrangle.

The portal page also indicates the Bulletins, Circulars, etc., that are available from other sources. Links to download material may not be available at this page, but once you know the material exists you can probably find it elsewhere. For instance, "Geology and Mineral Resources of the Lake Valley area, Sierra County, New Mexico and geophysical evaluation of Lake Valley area" is available from the Australian National Library. (You can pay to have it copied.) But wait, there's



more - go to the [USGS Publications Warehouse](#) and you will find that the referenced report has been superseded by "Geologic investigations in the Lake Valley Area, Sierra County, New Mexico", which is available for download at that site or from the listing of [Geology resources](#) on the Black Range website. At the Black Range website (using the Lake Valley area as an example) you can also find a Lake Valley Geologic Map, "Geology and Mineral Deposits of Lake Valley Quadrangle...", "Systematics...Crinoids of Nunn Member, Lake Valley Formation...", etc.

If you are in the mood, and know of other sources of information about the geology of the Black Range, please let us know (rabarnes@blackrange.org), and I will post the information on the Geology resources page for all to access.

To Be Known As A Variety

Dr. Frederic Miller Endlich was Superintendent of the Sierra Mines at Lake Valley, New Mexico in the 1880's. In *The Proceedings of The American Philosophical Society*, Volume XXII (January to October 1885 – pp. 367-369), a description of a new species of mineral was made. The mineral? Endlichite, named in honor of F. M. Endlich by N. H. Muhlenberg. Endlichite was found at the Sierra Bella and Sierra Grande mines.

The chemical composition of Endlichite is now understood as $Pb_5([V,As]O_4)_3Cl$. Mineral "speciation" is as complex as biological speciation. Endlichite is now described as Aresenatian Vanadinite by some authorities and Vanadinite var. Endlichite by others. The [V,As] portion of the chemical formula describes the relationship between Vanadinite and Mimetite. V is the element Vanadium and As is the element Arsenic. If the mineral formula of a specimen is $Pb_5(VO_4)_3Cl$ then the mineral is Vanadinite. If the formula is $Pb_5(AsO_4)_3Cl$ then the mineral is Mimetite. An intermediate form $Pb_5([V,As]O_4)_3Cl$ is described as Endlichite. Yes, we are talking clineal mineralogy here.

Naming the mineral from Endlich was no mere whim. Endlich was a well established geologist and naturalist who found himself Superintendent of the Sierra Mines at Lake Valley at this particular time. Dr. Endlich (1851 - 1899), among many other things, did some early observational research on Big Horn Sheep in the Wind River Mountains of Wyoming. He was the first to observe that the sheep vary their coats depending on the season, hair in summer and wool in winter. ([Popular Science Monthly](#), p. 764, October, 1878) In 1878 he had published an article about the "Erupted Rocks of Colorado", "The Catalogue of Minerals Found in Colorado", and "Report on the Geology of the White River District" (a [Report of the US Geological Survey of 1873](#)). In the March 1882 issue of the *American Naturalist*, he published "[Barbados](#)" - a Scientific Travelogue. I recognize these publications only to note that Endlich (and many other people who found themselves in the Black Range 150 years or so ago) was a person of some accomplishment. He was among other things a mineralogist at the Smithsonian Institution (which maintains his [pocket compass as an artifact](#)), an assistant on the Hayden geological surveys in the American West in the 1870's, and a member of the Philosophical Society of Washington (1873 to, at least, 1887) and published many articles in the Society's journal. His work was recognized internationally; for instance some of his publications are referenced in *A Catalogue of the Library of the Royal Geological Society of Cornwall* (1882). In Volume 17 of *The American Naturalist* he published "Mining Regions of Southern New Mexico" (pp. 149-157).

For those who like linkages, there is the matter of E. D. Cope. Mining in the west has a nasty reputation. That reputation was well deserved in the case of Lake Valley. The mines at Lake Valley were owned by the Sierra Grande Mining Company. Whitaker Wright established that holding company and increased his wealth immensely by selling \$5 million in

Geoth and Van Bath, J. 388 April 17, 1885

Deducting the admixture the pure mineral contains:

			Atomic ratio.
Cl	=	2.48	= 0.001
As ₂ O ₃	=	10.73	= 0.047
V ₂ O ₅	=	7.94	= 0.043
PbO	=	79.15	= 0.325
		100.00	

The small excess of lead is evidently owing to an admixture of cerussite, and the mineral is a combination of one molecule of mimetite with one molecule of vanadinite = $Pb_5Cl(AsO_4)_3 + Pb_5Cl(VO_4)_3$, corresponding to which is the following:

Cl	=	2.44
Pb	=	7.11
As ₂ O ₃	=	11.90
V ₂ O ₅	=	9.00
PbO	=	68.55
		100.00

The name has been suggested by Mr. N. H. Muhlenberg in honor of Dr. F. M. Endlich, Superintendent of the Sierra Mines at Lake Valley, N. M.

Since the above has been written Mr. Muhlenberg sent a new supply of endlichite which was different in appearance from that previously seen. It consisted of groups of crystals of a columnar structure, some radiating from a centre and also forming sheaflike aggregations. In many of them the hexagonal form could be distinctly seen, especially towards the diverging ends which show the basal plane and pyramid very distinctly. They are all strongly striated. The individual crystals are white and yellowish-white or straw-yellow, towards their terminations often changing to yellow and in a few groups to a deep orange-red. The largest groups were 10^{mm} in length.

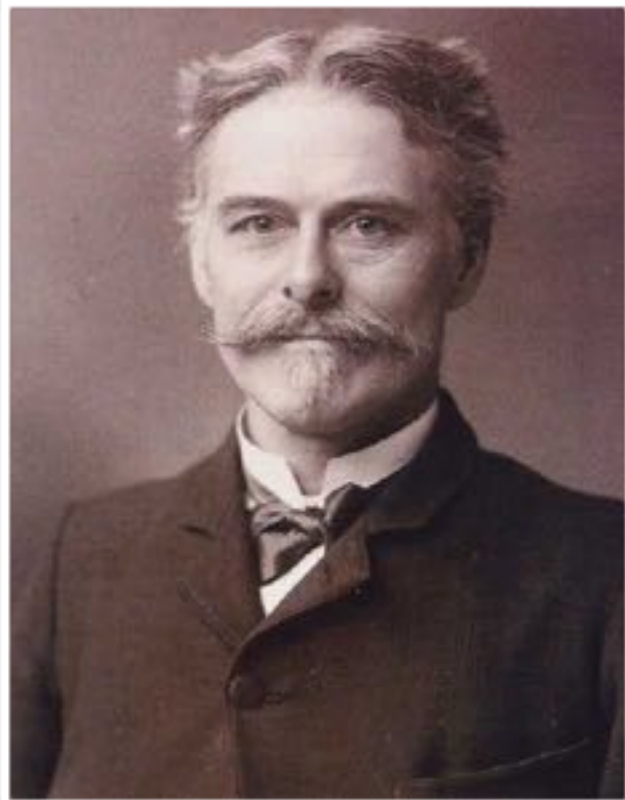
The whitest gave a spec. grav. of 6.884 and contained:

		Atomic ratio.
Cl	=	2.45
PbO	=	73.45
CaO	=	0.84
As ₂ O ₃	=	13.02
V ₂ O ₅	=	10.08
P ₂ O ₅	=	trace
		100.77

From this the ratio of the constituents appears to be about the same as

shares in his company all over the world. It is reported that the Sierra Grande Company was paying out \$100,000 a month in dividends at this time. His business practices were based on misleading and often fraudulent information. He died a rather dramatic death, taking cyanide in a London courtroom rather than going to prison for fraud.

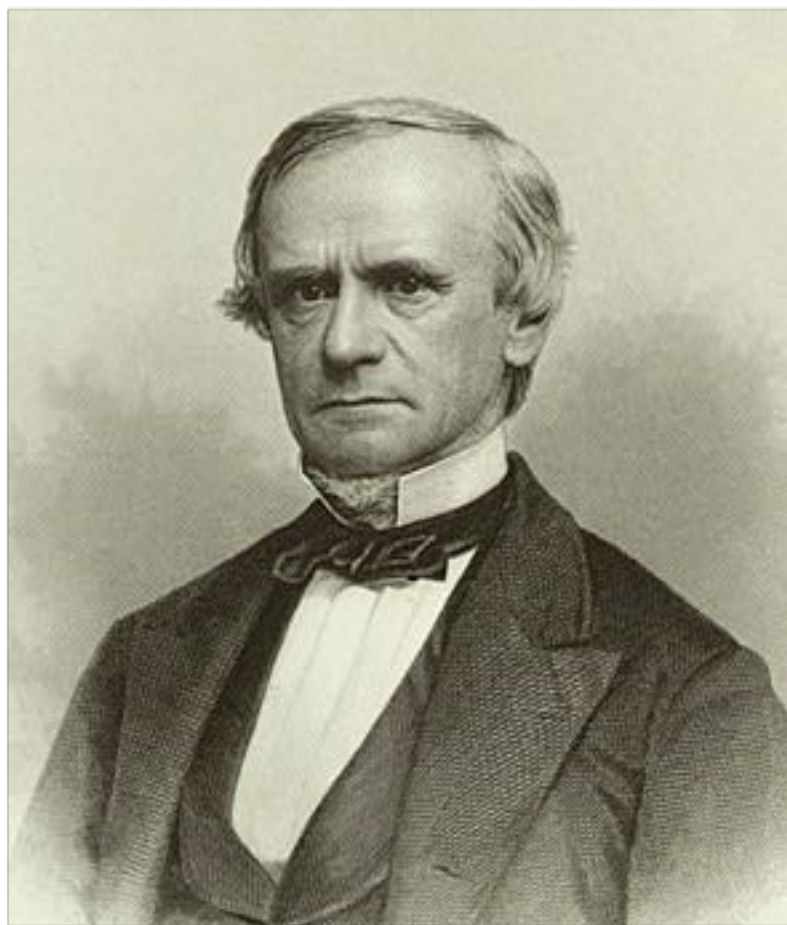
Good can be in the eye of the beholder, and sometimes "good" comes from dastardly deeds. Starting in the 1860's, the great bone war broke out between Edward Drinker Cope (who is one of America's great paleontologists and a person who kept one of the largest private collections of fossils at the time) and Othniel Charles Marsh, another of America's great paleontologists. The competition between the two became bitter and expensive and grew to include their major sponsors (John Wesley Powell and the US Geological Survey in the case of Marsh). To continue his collecting, Cope sought to augment his



personal fortune by purchasing a lot of stock in the Lake Valley mines. His funds had become depleted following his purchase of *The American Naturalist* - the magazine in which Endlich published "Barbados" in 1882. The mines played out in 1883. In 1886 he had to sell his worthless stock, and in 1895 he sold his priceless set of mammal fossils from the west (over 10,000 specimens) to the American Museum of Natural History for \$32,000. Cope's travails and hardships became the American public's gain. (Photo of Cope on the previous page was taken prior to 1897.) But note the dates. Endlich and Cope were both associated with Black Range geology - at the same time.

Giant of The Mimbres

At about milepost 7 on Highway 61, in the Lower Mimbres, there is a bit of history. A geologic feature, a geologic feature of the type which fascinated in the middle of the 1800's. In the mid-1800's, the Giant of the Mimbres was noteworthy enough to make it into three books about western journeys. Today, it is a feature that we are all to prone to look at and say "that's cool" or "that's nice" and be on our way. Reference to the site today is difficult to come by unless you delve into some professional geological articles. (See discussion and links below.) Even with a name like "Giant of the Mimbres" the fame of the site has come and gone, overshadowed, if you will, by the nearby City of Rocks State Park. The site is referred to as both "Giant..." and "Giants...". The site appears to be on private land but can be seen from NM-61.



John Russell Bartlett was a historian and linguist of the 1800's. The photograph of him above was taken sometime during the 1850's. Of significance to us is the fact that between 1850 and 1853 he was the United States Boundary Commissioner working on one of the many surveys of the border between the United States (Estados Unidos de Norteamérica) and Mexico (Estados Unidos Mexicanos). In

that position he traveled the southwest, pursuing his duties and his love of linguistics. On May 1, 1851 he was camped on the lower Mimbres:

"May 1st. In camp on the Mimbres. As our animals had been poorly fed since leaving El Paso, I determined to remain here to-day to give them the benefit of the fine young grass. All the party seemed to enjoy the relaxation; and they sallied out after breakfast, some in search of game, others of the picturesque. For my part, I took the two together; for when I went to the hills in search of game I carried my sketch book with me, as it was only among the wooded hills, the defiles, and the thick groves along the river bottom, that game was to be found; and there, too, was the most picturesque landscape scenery, and the best field for the exercise of my pencil. I first walked down the stream about two miles to a thick grove of large cottonwoods. The bottom was much contracted here; nevertheless, it was thickly wooded and forest-like. Ash and oaks were interspersed among the cottonwoods. Saw many signs of turkeys, but shot none myself. Some of the party were more fortunate and brought in several. About five miles north of our camp the river enters the hills, and a little further up, is closely hemmed in by lofty mountains. Noticed wild roses in great profusion, also wild hops, and the Missouri currant. These, in some portions of the valley, were so closely entangled together that it was impossible for one to work his way through. Found several old Indian encampments, with their wigwams standing, and about them fragments of pottery. Many well-marked Indian trails followed the river on both sides, showing that it had been, and probably is now, a great thoroughfare and place of resort for the Apaches. In the afternoon, Mr. Bausman, one of our most indefatigable sportsmen, came in from a hunt, and reported that he had seen some remarkable rocks about five miles up the river, to the north of our camp, which were worth visiting. I immediately had my mule saddled, buckled on my pistols, attached my rifle to the pommel of the saddle, and taking my sketch book, accompanied him to the place referred to, which was about half a mile from the river on the western side.

Arriving at the place, I found some singular masses of sandstone standing detached from the adjacent hills, one of them bearing a curious resemblance to a man. My timid mule was much alarmed at the gigantic object which stood before it, trembling from head to foot. We therefore stopped a short distance from it and hitched our animals to an oak which hid from view the source of their terror. Around us stood these singular isolated rocks, some appearing like castles, others like single pedestals and columns. The one resembling a human figure, which is shown in the accompanying sketch, and which I christened the "Giant of the Mimbres," measured but three feet in its narrowest part near the ground; while its upper portion must have been at least twelve feet through, and its height about fifty. Others of equal height stood near. All are disintegrated near the earth, and are gradually crumbling away, several having already fallen. When I had completed my sketch, we mounted our mules, and hastened back to camp, which we did not reach until some time after dark, my long absence meanwhile causing much uneasiness.

Several turkeys were seen during our ride, and a couple shot. A number of fish of the trout species were taken here." From *Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua, Connected With the United States and Mexican Boundary Commission During the Years 1850, '51, '52, and '53*. John Russell Bartlett. pp. 222 - 225 Report of activities on May 1, 1851.

The lithograph image, to the right, is from the book. Bartlett left his archives to the John Carter Brown Library at Brown University.

Among the items left to the University were two images of the Giant of the Mimbres done with "pencil, sepia wash, and color on coarse beige paper". Quoted material in this section is from the Luna website of the University.

Right: "View of rock formations and valley with figures on horseback in the foreground". On the verso is "Giant of the Mimbres" in Bartlett's handwriting. May 1, 1851 .

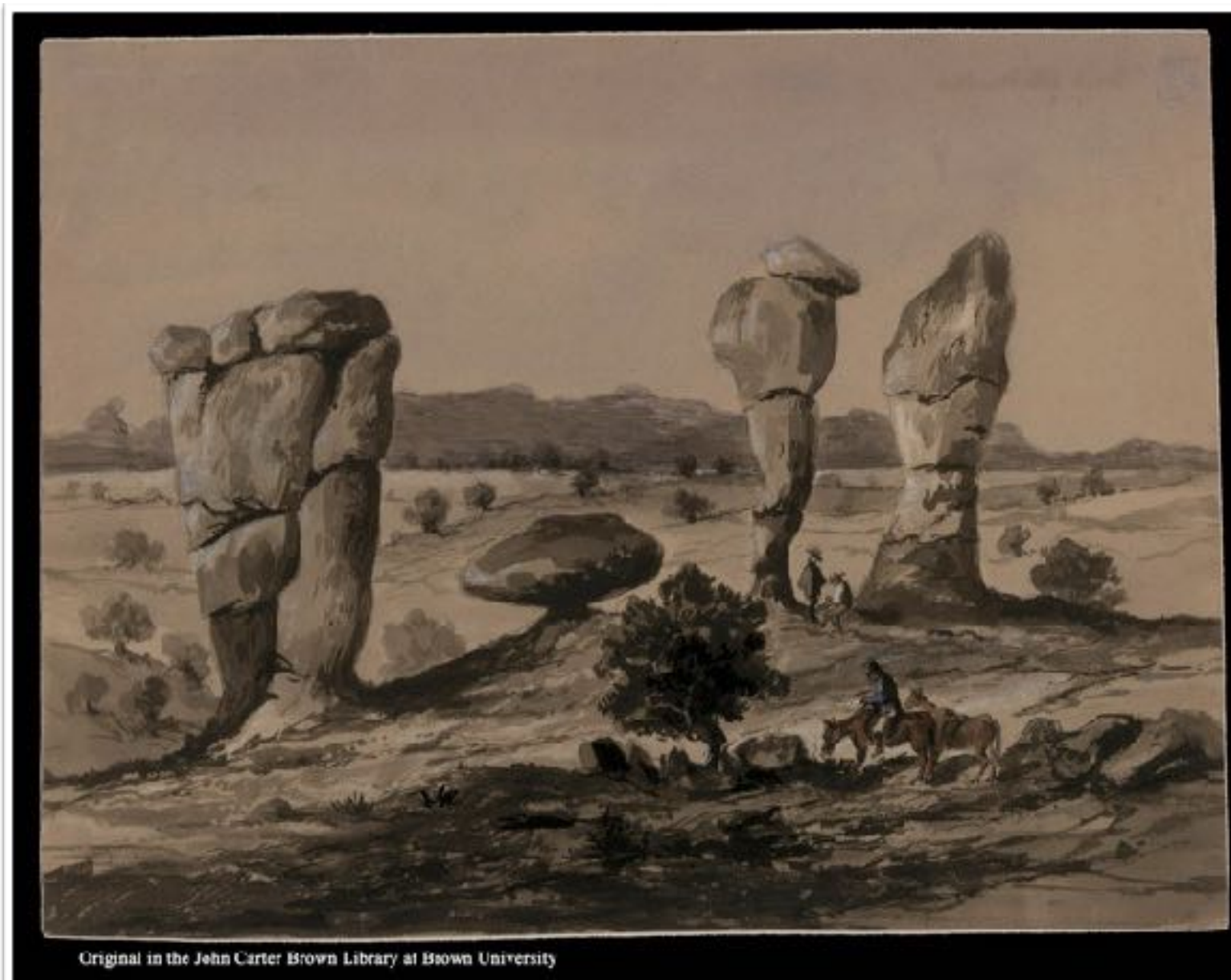
In 1857, *Reports of Explorations and Surveys, to Ascertain the Most Practicable and Economical Route For A Railroad From The Mississippi River to The Pacific Ocean, Volume VII* was issued. It contained the report of

Lieutenant John G. Parke about railroad route options, entitled "Report of Explorations For Railroad Routes... 1854-5". At page 157, Parke states that: "Northeast of 'Agua Caliente', between it and the river, is an upheaval of felspathic

porphyry, which has carried up the sandstone strata on each side, which dip northeast and southwest. The upheaval itself presents the appearance of a battery or fortification presenting its semi-circular point to the south. At some distance from this upheaval immense blocks and loose masses of sandstone rock lie heaped together in the most grotesque forms; some of

them consist of several masses, one piled on another, and in some instances nicely balanced and ready to topple; seen from a distance, in this highly refracting atmosphere, now they resemble trees, and now men; least of all would they be taken for really what they are, disintegrated sandstones. They

are now known as the Giants of the Mimbres. The wearing away of these grits, whitish and yellow sandstone, such as are described near Ojo de la Vacca and the Mimbres, show what a loose texture these rocks have; every heavy shower denudes them to some extent, and after some years they have no longer the same appearance or outline which



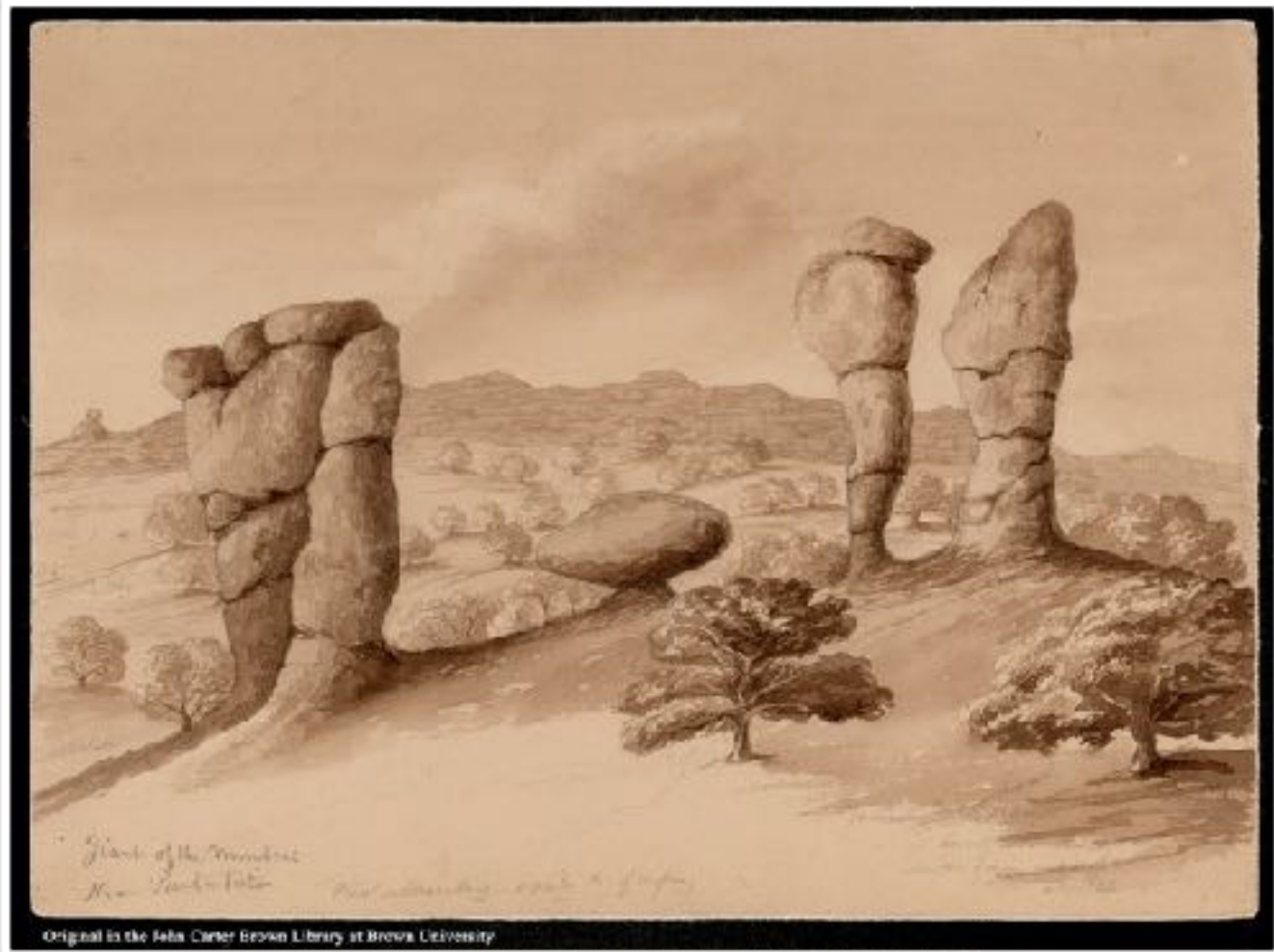
they formerly showed." At page 188, Parke notes that mineral specimen 87 "sandstone grit, Giants of the Mimbres" was collected. The importance of water sites in western explorations and ventures is epitomized by the careful mapping of water sources and the distances between them, in this report. (See right.)

Middle Right: "View of rock formations and valley with figures on horseback in the foreground". This drawing was never completed (the men and horses were not drawn in) and contains many notes in pencil: on the lower left is "Giant of the Mimbres Near Santa Rita;" in the lower center: "View on Mimbres -- 6 miles n. of crossing;" on the left is "grass, line of oaks, valley;" and on the lower right are "Yucas" and "Yucas and Prickly pear, dwarf oaks, 10 feet high, height of man about 50 ft. Ankle 3 ft." On the verso is "Sandstone Rocks, Rio Mimbres," the title used in Bartlett's Personal Narrative, vol. 1, p. 224"

Lower Right: From *New Tracks in North America, Volume 2* by William A. Bell, plate between pp. 26 & 27. Titled "The City of Rocks" but actually the Giant of the Mimbres. "There are the valley of rocks, the city of rocks, &c., in which huge masses of sandstone form pillars, chimneys, altars, giant mushrooms, and temples which would compare not unfavorably with Stonehenge, had they not been geological curiosities only. I enjoyed a few hours' photographing

amongst these grotesque forms, for they made splendid subjects for the camera." (p.26) He visited the area in 1867, when he took the photograph at the top of the following page, which was the basis for the lithograph in the book (lower left).

	Miles.		Miles
From the Rio Grande to Neide's spring...	40	From Puerto del Dado to Castro spring...	3
From Neide's spring to Cooke's spring...	12	From Puerto del Dado to Croton springs...	30
From Cooke's spring to Rio Mimbres.....	21	From Castro spring to Croton springs.....	18
From Rio Mimbres to Agua Fria.....	15	From Croton springs to Pheasant creek..	12
From Agua Fria to Ojo de la Vacca.....	6	From Pheasant creek to Antelope spring.	3
From Ojo de la Vacca to Ojo de Inez.....	12	From Antelope spring to Dove spring.....	24
From Ojo de Inez to Valle del Sauz.....	40	From Dove spring to Bear spring.....	16
From Valle del Sauz to Puerto del Dado..	23		



Above, I alluded to modern geologic reports which contained information about these formations. Jerry Mueller & C. R. Twidale's, "[Geomorphic Development of the Giants of the Mimbres, Grant County, New Mexico](#)" appeared in *New Mexico Geology* in May 2002 (Volume 24, Number 2). It is an excellent work, containing wonderful photographs and a thorough documentation of the geologic questions associated with the site. The same authors published "[Landform Development of City of Rocks and Giants of the Mimbres.](#)" (See cover of .pdf for attributions.)

The rock at the Giant of the Mimbres site is Kneeling Nun Tuff, specifically Sugarlump Rhyolite.

The following page shows these formations in 2016 as well as Bell's photograph from 1867.

There is a significant amount of rhyolite, forming spectacular spires and other forms in this area.

Just beyond the High Bridge on NM-152 (two miles west of Hillsboro) there are many spires visible on both sides of the



Giants of the Mimbres, William A. Bell, 1867



Giants of the Mimbres, March 22, 2016, by Bob Barnes



Giants of the Mimbres, March 22, 2016, by Bob Barnes

road. These formations are just as striking as the Giants of the Mimbres but they did not benefit from mention in the publications of the 1880's - too far north to draw the attention of officials from the Boundary Survey. Most of these formations are on private land and are not accessible.

Those of you who received the original electronic copy of the last issue may have noticed an error in Harley Shaw's "bio" on page one. Harley is a graduate of the University of Arizona - not Arizona State. His career was with the Arizona Department of Game and Fish - not Fish and Game. The errors are the editor's (Harley knew where he went to school and where he worked) - my apologies.

Hematite and Specularite

Because the geology of the Black Range is complex and diverse, the mining of the Black Range was more nuanced than silver and gold extraction.

Take, for instance, Hematite and Specularite, iron ores mined west of Winston (Taylor Creek Tin District) and in the Tierra Blanca drainages ([see listings](#)). Specularite is a variety of hematite which is “shiny”, made up of “[silvery, metallic, specular \(mirror like\) hematite flakes of tabular, adhedral crystals](#)”.

Those of you who are strictly human-centric will be yawning by now. When Steve Elam of Hillsboro read (on the Black Range Website) that some mines extracted both minerals at their site he noted (personal correspondence of March 1, 2019), “This mine would mine part of the year and then would change their mode of operations to process the ore. Hematite is non-magnetic and was easy to process. Specularite was hard to process and was very dusty...”. What a precise and concise assessment of how differences in the natural world effect humankind all the time. A slight change in the chemical makeup of a rock changes the mining operations of a mine, a bit of mining history if you will.

The Round Mountain Mine in the Taylor Creek Tin District mined these ores. The geologic map for the area (below)



shows that it was located in Upper Middle Tertiary rhyolitic lavas and local tuffs dating from 33 to 23 mya (million years ago), during the Oligocene. The particular formation is known as the Chattian-Rupelian. It contains units like “Taylor Creek Rhyolite”.

Rhyolite and Tuff

Rhyolite is “a group of extrusive igneous rocks, typically porphyritic and commonly exhibiting flow texture, with phenocrysts of quartz and alkali feldspar in a glassy to cryptocrystalline groundmass; also any rock in that group; the extrusive equivalent of granite. Rhyolite grades into rhydacite with decreasing alkali feldspar content and into trachyte with a decrease in quartz.” ([mindat](#))

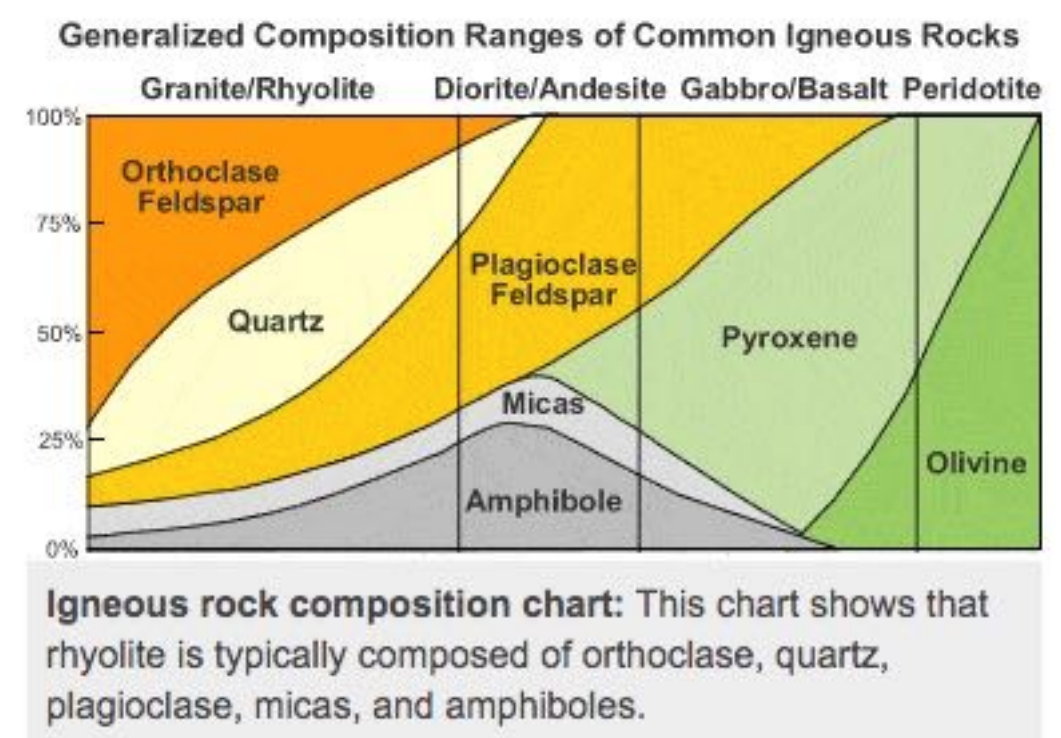
Let us translate this to something beyond mining operations. Into gardening? Gardening is a good way to define the above. Rhyolite is acidic. There is a lot of rhyolite in the Black Range. Does all that acidic rock gum up your gardening sometimes? Blame geology.

Into the history of warfare? Rhyolite was named by the grandfather of the WW I German fighter pilot, Baron von Richthofen. If you explore the human history of Europe, and are Snoopy enough, this may be an interesting fact.

“Tuff” you say, “local tuffs”. We are not speaking of local hoodlums here, that would be too tough. Nor are we talking about “tufa”, that would be much too tranquil. We are talking about “a pyroclastic rock where the average size of more than 75% of the pyroclastic fragments is less than 64mm and less than 25% of the fragments are lapelli.” ([mindat](#)). Pyroclastic rock is composed of “volcanic fragments derived from explosive volcanic activity”. ([mindat](#))

So what was it like twenty-five million years ago (that is - 25,000,000 years ago - you know - 21,900,000,000,000 hours ago)? Rhyolite and tuff paint the story. These are igneous rocks, in particular they are volcanic rocks, and they are everywhere. And, if you were standing in Hillsboro 25 mya wondering where the [General Store Cafe](#) was you would have a visual understanding of how they are different.

Both rhyolite and tuff form when granitic magma is forced to the surface on land (rarely in the ocean). Effusive eruptions (like lava flows) are formed by rhyolite because rhyolite is generally a viscous material. When (more rarely) rhyolite is full of gases which are superheated they can explode violently forming pumice. (See personal note below.) Tuff, on the other hand is generally associated with violent explosive eruptions. The Kneeling Nun rhyolite tuff found throughout the Black Range is over 200 feet thick, up to 600 feet thick in places. Put that all together and you can picture the future locale of the General Store Cafe, 25 mya. All hell was breaking loose. Lava was flowing, huge explosions were covering everything in ash and debris as deep as a sixty story building is tall. Of course, all of that was not happening all of the time.



[Chart from geology.com](#)

I tend to think of rock in terms of a "group type", granite or basalt for instance. When I do so I lump rocks with very different chemical/elemental makeups into broad categories. But nature is much more complex than we understand. Rocks are clinal, for instance. Just like bird and mammal species, they contain gradations of differences which form clines over distance. Chemically, granite and rhyolite grade into each other with granite having significantly more orthoclase

feldspar than does rhyolite, for instance. And by the time you get to andesite, all of the orthoclase feldspar has been replaced by plagioclase feldspar. (See chart on previous page.)

And that is the way it works. The mines of the Black Range are certainly portals into the cultural history of this area. But even more, they are portals into the complex natural history of the range.

Mt. St. Helens Pumice by Bob Barnes

On May 18, 1980, Mt. St. Helens in southwestern Washington blew up. Three months before, I had been driving in the area. I had my camera with me; the day was beautiful with just a few clouds; The Mountain, Mt. St. Helens, was out in all of its beauty - the mountain that Mt. Fuji copied. But I was in a hurry and The Mountain would always be there.

A few days later, in March, steam vents opened and plumes of ash would rise high into the sky. From my office in Portland I would watch the huge mushroom clouds climb into the sky, a rather eerie feeling in cold war America. The daily drama ended in mid May with an enormous sound and a sky full of ash. The weight of the ash caused rain gutters to buckle, auto paint jobs were ruined, air filters were clogged, and it was dark at noon.

A month after the eruption I was deep in the blast zone (photo above). The landscape was mostly rubble, but where the trees were not buried in ash they looked as if they were contour lines on a topographic map, aligned perfectly by the blast as it curved around the hills. It was a cold and dangerous place at this time. The ash had yet to consolidate, hot spots abounded, and the earthquakes continued.



The photograph below (from August 2007) shows one of the domes building inside the crater. The domes would build to roughly the height of the crater and explode, then begin to build again, repeating the cycle many times. While studying the slope of one of the domes from a few feet away I was almost overwhelmed with awe, or was that trepidation? Vents were belching steam from all over the slope, boulders were breaking free and tumbling down the slope, and each time they hit there was an eruption of steam and dust. The sound of erupting steam and crashing boulders highlighted the low rumble which was constant and so intense that my body and, I feared, the body of the helicopter, would disintegrate from metal fatigue. It was an all-consuming experience, something like looking for the General Store Cafe, 25 mya.

Oh, the pumice. Well, if you spend much time in such an environment, dust and pumice creep into every fold of your body and clothing. On a trip to the southeastern US I found myself in a swimming pool with bits of Mt. St. Helens pumice floating about me - don't ask, I don't know. The kids were fascinated by the stuff. Their awe reminded me of the magic of the geologic processes that surrounded us. Floating rock, that is mystical.



150 Years of The Periodic Table

150 Years ago, as of March 1, 2019 Dmitrii Mendeleev created the first periodic table (see right). More than a simple listing of elements, the periodic table describes the properties of elements and provides insight into how they interact and act.

A strange thing to reflect on in this magazine perhaps, but consider the role that some of these elements have played in the cultural history of the Black Range. Cu is copper, Ag is silver, Au is gold, Pb is lead, and V is vanadium. (See following page.)

Most of the elements extracted from the Black Range were not found in their pure form, but rather in a mineral form (of which there are many). The vanadium mined in the Hillsboro Mining District, for instance, was often in the form of vanadinite (Macy Mine, Petroglyph Mine, Sierra Bella Group, Wolford Mine, etc.).



Vanadinite from the Hillsboro Mining District. Photo by Bob Barnes, specimen from the Mineral Museum at the New Mexico Institute of Mining and Technology in Socorro, N.M.

It is not much of a reach to posit that elements are the reason the human communities of the Black Range exist. Until recently the only other significant source of income was ranching, and it is not clear, at all, that ranching, in itself, would have been significant enough to support the Anglo incursion into the area.

The Black Range website uses [mining as a mechanism to describe the distribution of minerals](#) in the range. That website also has a significant section on the [geology of the range](#).

The purpose of this article is not to dwell on the mineral wealth of the Black Range. We can save that for some future date. Nor is it to wax eloquent about the obvious role of elements and minerals as economic drivers in human culture. Instead, let us focus on the study of elements and minerals in the Black Range. "Say what", you say?

Our understanding of the natural world often comes as a result of economic drivers and in turn those economic forces often result in a more precise understanding of our surroundings - not pure science, more the applied sciences.

For instance, all of that ore which was taken from the Black Range: Its identification did not come as the result of some

ОПЫТЪ СИСТЕМЫ ЭЛЕМЕНТОВЪ,
ОСНОВАННОЙ НА ИХЪ АТОМНОМЪ ВѢСѢ И ХИМИЧЕСКОМЪ СХОДСТВѢ.

		Ti=50	Zr= 90	?=180.
		V=51	Nb= 94	Ta=182.
		Cr=52	Mo= 96	W=186.
		Mn=55	Rh=104,4	Pt=197,1.
		Fe=56	Ru=104,4	Ir=198.
		Ni=Co=59	Pd=106,8	Os=199.
H=1		Cu=63,4	Ag=108	Hg=200.
	Be= 9,4	Mg=24	Zn=65,2	Cd=112
	B=11	Al=27,3	?=68	Ur=116
	C=12	Si=28	?=70	Sn=118
	N=14	P=31	As=75	Sb=122
	O=16	S=32	Se=79,4	Te=128?
	F=19	Cl=35,5	Br=80	I=127
Li=7	Na=23	K=39	Rb=85,4	Cs=133
		Ca=40	Sr=87,6	Ba=137
		?=46	Ce=92	Pb=207.
		?Er=56	La=94	
		?Yt=60	Di=95	
		?In=75,8	Th=118?	

Д. Менделѣевъ

insight from the ether. People were using their applied knowledge for economic gain. Sometimes crude, sometimes rather sophisticated. Every mining town had an assay office which determined the elemental makeup of the rock miners brought in. It was a place where an understanding of the natural world was exploited for economic gain. These people were not anti-science; they understood the practical benefits of scientific endeavors.



The photograph above is of a lab in Lake Valley at the turn of the century, 1895-1905. You can bet that someplace in that laboratory there was a copy of a periodic table, though it may not have looked like that on the next page. After all, the original version of the table (above) had been published only 30 years before. And, as with most endeavors, Mendeleev stood on the shoulders of others. In the previous decade (during the 1860's) there were at least five unsuccessful attempts to parse an explanation of the elemental world.*

*J.W. van Spronsen, *The Periodic System of Chemical Elements: A History of the First Hundred Years* (Elsevier, 1969) and E. Scerri, *The Periodic Table and its Significance* (Oxford University Press 2007)

The layout of the Periodic Table is familiar to most of us, but an understanding of the intricacies which it describes is lost on many, including me.

Atomic weights were used by Mendeleev to organize the initial periodic table and have been the core of the methodology used to describe the relationship of elements ever since. Atomic numbers have been increasingly useful in understanding how elements act over time. The decay of uranium and of carbon from one form to another is the basis for radiocarbon dating and an understanding of nuclear energy (and weapons), for instance.

The study of **stellar nucleosynthesis** is used to explain how all of those elements in the Periodic Table evolved. At the moment of the Big Bang (14 billion years ago, on a Thursday I believe) a process of creating the elements we find every day in the Black Range began. At first there was only hydrogen, helium, and a bit of lithium (yeah - that stuff in batteries). Star formation and failure produced the elements which we know today. Certain types of stars created certain types of elements. Of the elements we began discussing in this article, gold was produced by merging neutron stars. Vanadium and copper, on the other hand were produced by exploding white dwarf stars and exploding massive stars. Silver and lead were produced by merging neutron stars and dying low-mass stars. Think of the wonder of all of that. The next time you pan for gold in a wash or argue about the merits of a copper mine, take a moment to reflect on what you are talking about - about the

basic substance you are talking about - about the element. That stuff, whatever it is, has been through a lot before it became the focus of our greedy little hands. We are talking about time scales of billions of years, processes which began well before the formation of our planet began.

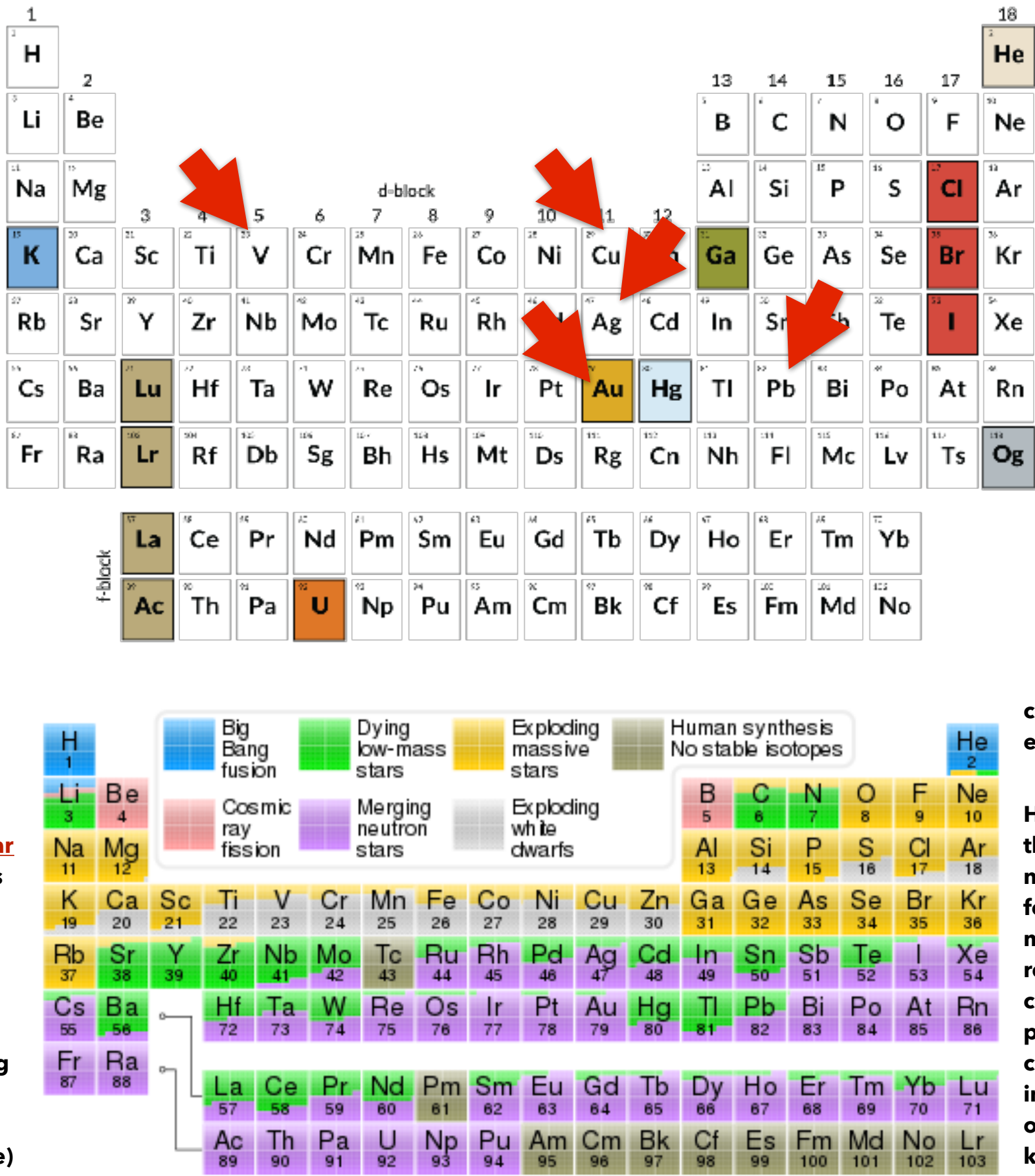
Once the earth was formed the long slow process or aggregation and separation began. Elements combined together to form mineral and rock; sometimes elements underwent a process which resulted in concentrations of "native" material. A chunk of native copper, for instance, is a chunk of pure element.

Humans used those chunks of native elements to form their first metal tools. Until recently cultures continued to process those chunks of element into utilitarian objects, objects to kill with, and objects of art. In the Black Range,

indigenous people used native copper to form such

objects well after the archaic period. It was this use which led the Spanish to what would become the Santa Rita mine west of the Black Range, for instance.

But look at that chart, that wondrous chart. All of what we have discussed flows from that chart and the understanding of the physical attributes of the natural world which are all around us in the Black Range. And, for those who are enamored of the cultural history of humans, that chart describes the basis of some of our most basic emotive drivers - good and bad.



Please see the link to the left for a full description of this chart.

ALDO LEOPOLD - His Legacy

by Steve Morgan

Three miles up a dirt road from the paved end of Kingston Main Street is the boundary of the Aldo Leopold Wilderness. Step over that imaginary line and you are suddenly in the eastern half of the area set aside on June 23, 1924 as our nation's first designated Wilderness Area. Almost 100 years later it is still a very wild area.

The wilderness areas within the Gila National Forest encompass 760,000 acres or 1,187 square miles. The western half retains the original name of the "Gila Wilderness," the eastern portion was named the "Aldo Leopold Wilderness" in 1980. In 1922 Aldo Leopold, along with Fred Winn, Supervisor of the Gila National Forest, facing the impacts of increased human encroachment into wild areas of the Forest, proposed the establishment of a wilderness area within the Gila National Forest. In discussing what qualities an area needed to possess to be worthy of a wilderness designation, Leopold said the following, "It should be a continuous stretch of country, preserved in its natural state, open to lawful hunting and fishing, big enough to absorb a two weeks pack trip and kept devoid of roads, artificial trails, cottages and other works of man."

Who was this man who pushed to have this wild land protected from the ravaging ways of progress? Aldo Leopold is considered by many to be the father of wildlife and restoration ecology, and is arguably the most influential conservationist of the 20th century. He was a forester, a philosopher, an educator, a writer, and an outdoor enthusiast. Among his most influential ideas is that of the "land ethic", which calls for a principled, concerned relationship of people with nature.

Aldo Leopold was a man of many interests. Leopold said, "there are two things that interest me the most: the relationship of people to people and the relationship of people to the land". It was his own relationship to the land

that is revealed in his well-known book, *A Sand County Almanac*.

Born on January 11, 1887, Aldo Leopold grew up in Burlington, Iowa where his childhood home was perched high on a bluff above the Mississippi River. The wild and rich riparian lands wrapping the mighty Mississippi were a perfect setting for a young naturalist with a thirst for learning about the natural world. He spent hours observing, journaling, and sketching his surroundings.

His father, Carl Leopold, had a quiet way of teaching respect and love for the natural world, mainly by giving others the opportunity to make their own discoveries and experience the wonders and joys that resulted. There were always stories to

be read, be it a new set of muddy tracks along the stream's edge, or a punky log with the top knocked off revealing a lunchbox of tasty insects, or even a flight of geese about which to marvel as they made their way south for the winter. Those early experiences gave Leopold a strong framework to develop his thinking about a land ethic. Carl was a sportsman pioneer in his own way; he observed the impact that spring hunting had on the migratory waterfowl and pushed to have the rules for hunting during the breeding season changed.

Upon graduating from the Yale School of Forestry, Aldo eagerly pursued a career with the newly established U. S. Forest Service in the Arizona and New Mexico territories. In 1909 at the young age of 22 years old, after attending several forestry training camps, he took a train from Albuquerque to Holbrook in the Arizona Territory. Heading south from Holbrook he spent the next two days riding stagecoach. The road to Springerville gave Aldo his first glimpse of Escudilla Mountain to the southeast and the alpine capped White Mountains to

the west. The volcanic cinder cones, clad with high desert grasses, fascinated him as they approached the little town at the end of his journey. He was primed for the adventure he knew lay before him, for this was still a time of wild lands. There were very few roads through the rugged forests and canyons, and the Forest Rangers of that day rode horses everywhere they went.



Steve Morgan brings Aldo Leopold to life in his portrayals of the famous environmentalist and writer.

He was in his new job for three months when an incident happened that ultimately changed his way of thinking about predators. In *A Sand County Almanac*, he tells a story called "Thinking Like a Mountain". I'll let you have the pleasure of reading his words but in that story, he recalls an incident that occurred on the rimrock bluffs high above the Black River in eastern Arizona. Leopold and his crew had emptied their rifles into a wolf pack at the rivers' edge and had experienced a dying wolf and a "fierce green fire" that he saw blaze then fade and die in her eyes. He says, "I was young and full of trigger itch. Back then we thought that fewer wolves meant more deer and that no wolves meant a hunters' paradise."

In a letter to his mother written in late September, 1909 he only mentioned "the killing of two wolves" but apparently the incident left him feeling that there was something he did not understand. Something he would later note that was "known only to the wolf and the mountain." It took him many years to realize the importance of predators to the natural world, but in time he was advocating their right to be part of the natural community.

This incident was one of the more important life experiences that helped shape his thinking about the Land Ethic. Leopold said, "If the land mechanism as a whole is good, then every part is good whether we understand it or not. If the biotic community over the course of eons has created something beautiful and works well, then who but a fool would discard seemingly useless parts. Why to keep every cog and wheel is the first precaution to intelligent tinkering."

That wolf he helped shoot and watched die was one of those cogs. What happened to the wolf pack of young pups that had greeted her and then fled back into the rocky talus piles? Did they survive? What balance of the deer population that would have been checked by predation by this wolf pack was lost? A piece of balance in the natural world was removed because of ignorance. Leopold said, "the last word in ignorance is that of a man who says of a plant or animal, what good is it?" From the way he wrote about the incident more than 35 years later, it is likely that he reflected back and realized that he was guilty himself of saying, "What good is it."

The southwest in 1909 was still a place with few roads piercing square miles of wild lands. The Apache and the Gila National Forests were only established four years earlier in 1905. The National Forest Service was a young and small organization at that time, so promotions were rapid. The Head Forester of Region 3 was Arthur Ringland, and he had been watching Leopold's progress and felt it was time for a promotion. In April of 1912, at the age of 24, Leopold took over the post of Supervisor for the Carson National Forest in northern New Mexico.

He spent a month in Albuquerque during which time Ringland decided how he wanted to use Leopold's talents. There was an entertaining night life there in city which had been wholly lacking in Springerville, and Leopold was enjoying it. There he met Estella Bergere. Once Leopold decided he wanted something, he had dogged determination, and so it was with

Estella. She came from an affluent, well known sheepherding family deeply rooted in New Mexico. Leopold had competition in courting Estella with a young Albuquerque lawyer.

In the end, Estella gave in to Leopold's persistence, and on October 12, 1912 they were married in the Cathedral of St. Francis in Santa Fe. Before his wedding day, Leopold moved the Carson National Forest Supervisor's headquarters from Antonito, Colorado to Tres Piedras, New Mexico. With an allotment of \$650 in building funds, Leopold designed and built a new home for the Supervisor and for his soon to be bride. They fondly named their new home Mia Casita. This home still stands at Tres Piedras.

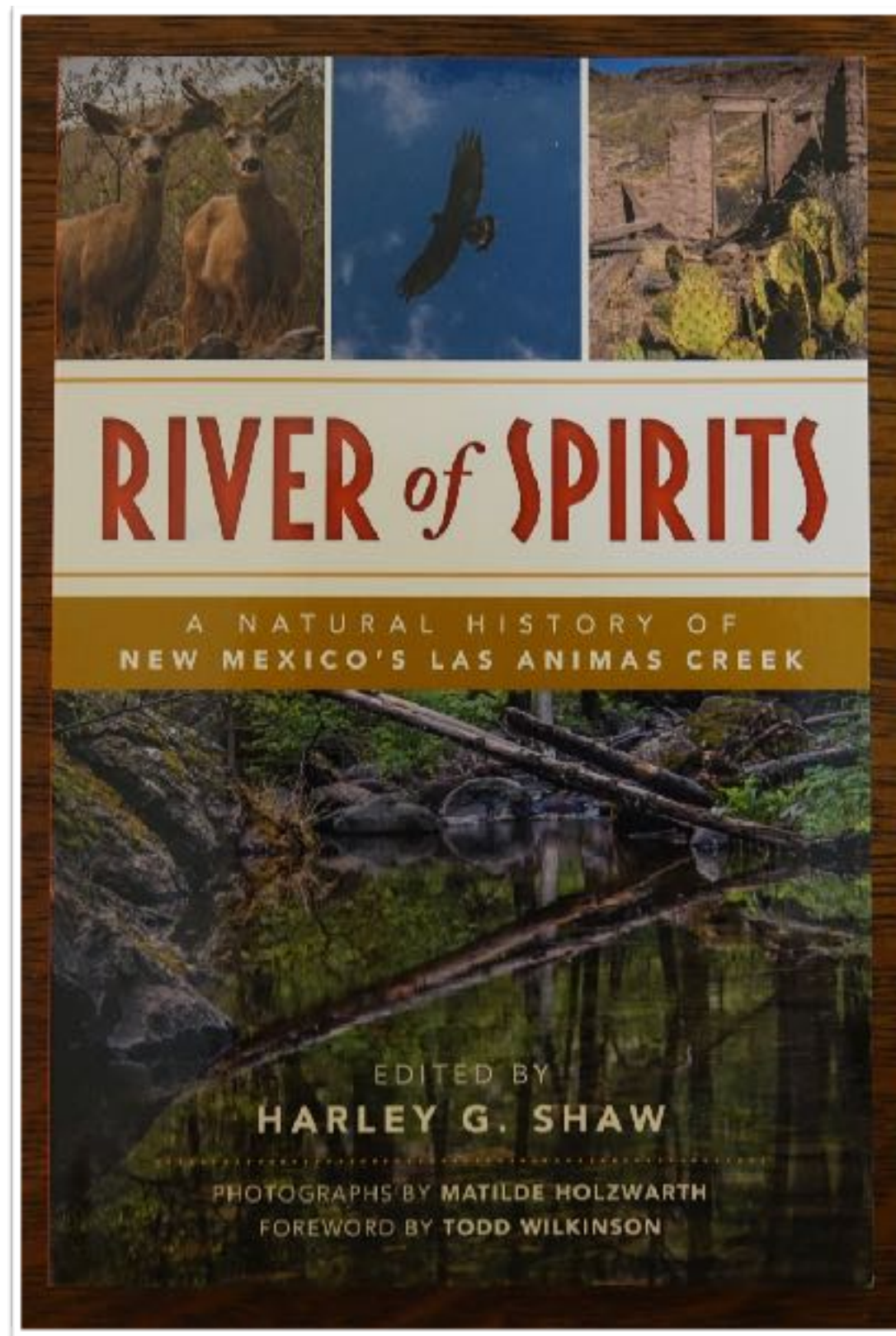
This was a milestone in Leopold's life. He could stand on the porch of the home he built and bask in contentment enjoying one of the prettiest views on the continent, knowing he was the first Forest Supervisor from his graduating class, and he had the deep love of his life by his side. In his words, "He was enjoying the best of all worlds."

There is so much more to share about Aldo Leopold's life and work, and this story will continue in future issues of the Black Range Naturalist.

"Zane Smith's introduction to the Forest Service in the 1920's was a three-day fire training session on Hillsboro Peak, and then helping to install some lightning protection on the old wooden lookout at Diamond Peak where he was to be stationed for the summer. 'We were having some dry lightning storms,' Smith recalled. 'There was no lightning even close; otherwise I would have left the tower and gone down into the cabin as we were instructed to do as a protective measure. All of a sudden a bolt of lightning struck the tower and burned big black strips down the legs where the copper wire was located, knocked the phone out and blinded me for about 30 minutes. It was tremendous white light and it just left me blinded. I couldn't see, and it just about scared me to death. I went down to the cabin, and I was still pretty scared. The lightning hit a big old fir tree right back of the cabin and knocked a huge slab off. This slab bounced over and hit the back of this log cabin. On the inside, we had an apple box tacked up there in which we kept our tin dishes, tin cups and so forth. All the tinware fell off on the floor, and the rattle and tremendous crash of thunder just about spooked me off the mountain. I almost quit the Forest Service and ended my career right there. Actually I wasn't hurt, and I'm sure my safety was due to the fact we had installed this lightning protection.'"

Men Who Watched The Mountains: The Forest Service in the Southwest

By Edwin A. Tucker and George Fitzpatrick, 1972, USDA, Forest Service, Southwestern Region



River of Spirits, edited by Harley Shaw with photographs by Matilde Holzwarth, is available from [Aldo's Attic](#). The essays in this book provide excellent discussion of the natural and cultural history of the Las Animas drainage on the east side of the Black Range. Multiple perspectives and topics, along with beautiful photographs, make this book a must for your bookshelf.

The Sonoran Coral Snake **by Stephen Siegfried**

"Red on yellow, kill a fellow," the aphorism goes. But that shouldn't happen unless a fellow is careless and lets the pretty little snake hang on to a finger or toe while it works its tiny fangs into the skin.

Of the three clearly distinct species of coral snakes in the U.S., only the Sonoran coral snake (*Micruroides euryxanthus*) is found in New Mexico. A small, slender snake, seldom longer than 20 inches and a half inch in diameter, the coral snake is the most brightly colored of our poisonous snakes. Brilliant bands of red, yellow and black make the snake highly visible against almost any

background, a marked contrast to the protective coloration found on most poisonous snakes.

Coral snakes are generally shy and non-aggressive. They will bite a finger if one is offered, but unlike rattlesnakes and other vipers, this mellow little snake does not strike at its victims. A close kin to the cobras and mambas of India and Pakistan, the coral snake also injects a neurotoxic venom into its victim. The venom slows down or arrests breathing, heart rate and other vital processes. If the snake injects enough venom, the bite can be fatal.

Frequently in the case of rattlesnake bites, the victim has surprised a snake, or vice-versa. Most injuries from coral snakes, however, occur when the snake is being handled. One characteristic is predictable from most documented

accounts: Once the snake attaches itself, it doesn't want to let go.

But like most snakes, the coral snake carries its share of folklore and superstition. It was long a common belief that the snake could not only bite, but inflict a venomous sting with its tail. The tail posturing and movement seems to be a kind of warning, somewhat analogous to the posture and buzz of a rattlesnake.

The coral snake much prefers to feed on insects, lizards and the young of other snakes, compared to biting humans. Content to live the life of a recluse, it gets into trouble for a couple of reasons. One, it is a small, colorful, non-threatening snake with a docile nature that seems to invite handling. Two, it looks enough like a number of non-poisonous snakes to be mistaken for a harmless mimic.

All instances of biological mimicry require the acting out of three roles: the model (coral snake), the mimic (another look-

alike species), and a dupe (a creature that mistakes the mimic for the model). Milk snakes and king snakes hope to be avoided by predators because they mimic the coral snake.

There is no label for the person who mistakes the model for the mimic, but nine of 14 coral snake victims in a list of studies thought they were handling a harmless snake (from the Journal of the American Medical Association).

If you see a pretty little snake, think of the red and yellow warnings of a traffic light before you pick it up. One means stop, the other caution. "Red and yellow, kill a fellow."

This article first appeared in the May-June 1990 issue of New Mexico Wildlife.

Letters to the Editor

RE: The Packrat Articles Which Appeared In the July 2019 Issue of the Black Range Naturalist

"...at the SE corner of the Hillsboro jailhouse ruin and directly across Rosa Street is a gate leading to a path up the slope toward the open area just west of the cemetery where many folks walk their dogs. Off to the side of this short ascending path is (or was, at any rate – it's presumably still there) a large, fat, roundish rock graced with a pile of sticks and dried cholla buds and other detritus--the proud construction of a packrat. It became the subject of a painting I did a few years ago titled Packrat Palace, which image I attach here.

As always, this most recent issue of the Naturalist is a phenomenal compilation of fascinating stories, reports, photos, history--the best of the Black Range and a tribute to you and all the contributors. I thank all of you for your efforts and fine-tuned observations of our local world. (I will always consider myself part of the Hillsboro/Black Range vicinity – emotionally if not residually – it resides deep in my heart.)"

Melody Sears
Tucson, Arizona



(Editor's Note: Melody's Website, [Melody Sears Fine Art](http://MelodySearsFineArt.com), has many other examples of her art work.)

RE: Hummingbird Articles/Updates

"We banded and released this dramatic hummer (editor: photo right) a couple weeks ago near Dripping Springs was seen once at Visitor Center and banded 10 days later (if the same one) when we saw it in the trap one morning !! Not seen since, as a probable true wandering, adventurous, and exploring vagrant. Would be VERY surprised to catch also a female or younger of that species in the same area. Thought that might happen also with the Lucifer male we banded last season at Aguirre Springs.

A first reported southern migrating adult Rufous male was also seen and photographed by the Volunteer who maintains the feeders at the Dripping Springs Visitor Center 6-28-19. "

Ned Betchelder
Las Cruces, New Mexico



Ipomoea gilana, East Slope of Bald Hill, Black Range

RE: *Ipomoea gilana*

In our April 2019 issue we referenced the description of a new species of Morning Glory from the Black Range ([Vol. 2, No. 2](#), p. 24). This summer Rebecca Hallgarth, Jon Barnes, Harley Shaw, and Bob Barnes made trips into the area to further document the distribution of the species and to photograph it for the Black Range Website. ([See photo gallery.](#))

Ipomoea gilana is a night blooming species. It, apparently, opens at about 3:00 a.m. and most blossoms have closed by 8:30.

The approximate center of the known distribution of this species is at 33.002385 -107.715431 or if you are a [what3words](#) app user "barbecued.curable.pitied." The limited range seems to extend for not more than 200 meters from this center point. Obviously, much more needs to be done in defining the geographic range of the species. Thumbnails to the right.



*Rivoli's Hummingbird, *Eugenes fulgens*, Dripping Springs, by Ned and Gigi Batchelder. The Batchelders are regular contributors to this magazine. If you have an older field guide, you might identify this bird as a Magnificent Hummingbird. In 2017 the IOU split the species then known as Magnificent Hummingbird, *Eugenes fulgens*, into two species. The northern form, found in the borderlands south to Nicaragua, was renamed Rivoli's Hummingbird and (being the nominate subspecies before the split) kept the scientific name. The southern form became *Eugenes spectabilis*, the Admirable Hummingbird. Not all authorities agree with the split. Not all authorities agree on the English Common Name of the split species. But the important thing for us is, as Ned and Gigi have demonstrated so elegantly, the Rivoli's Hummingbird can be found in our area. It has been seen in Hillsboro. Keep an eye on those flowers and feeders.*



*Our checklist for the Dragonflies of the Black Range was augmented a bit when this Variegated Meadowhawk, *Sympetrum corruptum*, was photographed by Bob Barnes in Hillsboro on September 5.*



PLANT FORM	FAMILY	GENUS SPECIES	RECENT SYNONYMS	COMMON NAMES	HABITAT ZONES
tree	ADOXACEAE	<i>Sambucus cerulea</i>	[There are several!]	blue elderberry	diverse mountain & riparian habitats
herb	APIACEAE	<i>Pseudocymopterus montanus</i>	<i>Cymopterus lemmonii</i>	false springparsley, mountain parsley	forests
herb	ASTERACEAE	<i>Achillea millefolium</i>		common yarrow	various mountain habitats
herb	ASTERACEAE	<i>Artemisia carruthii</i>		Carruth's sagewort	open sandy soils 6,000 to 9,000 feet
herb	ASTERACEAE	<i>Erigeron flagellaris</i>		trailing fleabane	forests, meadows, grassy slopes, moist areas
herb	BORAGINACEAE	<i>Lithospermum multiflorum</i>		manyflowered gromwell, puccoon	forests, gravelly soils
herb	BRASSICACEAE	<i>Erysimum capitatum</i>		western wallflower, sanddune wallflower	open slopes
shrub	CAPRIFOLIACEAE	<i>Symphoricarpos rotundifolius</i>	<i>Symphoricarpos oreophilus</i>	roundleaf snowberry	mountain & piney wood forests, rocky slopes
herb	CARYOPHYLLACEAE	<i>Arenaria lanuginosa</i> subsp. <i>saxosa</i>	<i>Spergulastrum lanuginosum</i> subsp. <i>saxosum</i>	spreading sandwort	coniferous forests 5,500 to over 10,000 feet
tree	CUPRESSACEAE	<i>Juniperus deppeana</i>		alligator juniper	dry, rocky slopes
herb	FABACEAE	<i>Oxytropis lambertii</i>		purple loco, Lambert crazyweed	sandy soils in open & in pine forests
small tree	FABACEAE	<i>Robinia neomexicana</i>		New Mexico locust	woods, canyons
herb	FABACEAE	<i>Thermopsis montana</i>		mountain golden pea, golden banner	sunny locations with rocky sandy soil
vine	FABACEAE	<i>Vicia americana</i>		American vetch, American purple vetch	pine forest from 5,000 to 10,000 feet
tree	FAGACEAE	<i>Quercus gambelii</i>		Gambel's oak	ponderosa pine forests
herb	GERANIACEAE	<i>Geranium caespitosum</i>		pineywoods geranium	pine forests
tree	PINACEAE	<i>Pinus ponderosa</i>		ponderosa pine	elevations 5,000 to 9,000 feet elevation
tree	PINACEAE	<i>Pseudotsuga menziesii</i>		Douglas fir	slopes 5,000 to 9,000 feet elevation
herb	PLANTAGINACEAE	<i>Penstemon barbatus</i>		scarlet beardtongue, scarlet bugler	rocky, sandy soil, woodlands to 10,000 feet
grass	POACEAE	<i>Bromus tectorum</i>		cheat grass, cheat brome	open waste or overgrazed land, roadsides
herb	RANUNCULACEAE	<i>Thalictrum fendleri</i>		Fendler's meadowrue	moist areas 5,000 to 9,500 feet
herb	ROSACEAE	<i>Fragaria vesca</i>		wild strawberry	mid elevation forest floors
shrub	ROSACEAE	<i>Rubus strigosus</i>	<i>Rubus idaeus</i> var. <i>strigosus</i>	American red raspberry	rocky soils, coniferous forests, 6-11,000 feet
herb	RUBIACEAE	<i>Galium fendleri</i>		Fendler's bedstraw	moist shade or rocky slopes, talus slopes
tree	SALICACEAE	<i>Populus tremuloides</i>		quaking aspen	colonizes higher elevation burned areas
herb	SCROPHULARIACEAE	<i>Verbascum thapsus</i>		common mullein, woolly mullein	disturbed soils, burned areas, roadsides
herb	VERBENACEAE	<i>Glandularia bipinnatifida</i>		Dakota vervain, verben	widespread in rocky sandy soils

Native Plant Society of New Mexico

The Native Plant Society of New Mexico has several branches around the state. The branch from Las Cruces takes outings into the Black Range, and its observations and efforts are noteworthy. Above is a listing of some of the species seen in outings along the Sawyer's Peak Trail. It is an organization

On June 30, 2019, *Townsendia formosa*, Smooth Townsend Daisy was found along the Sawyers Peak Trail at about 9,000 feet. Not big news in itself, but this is almost the exact location in which O. B. Metcalfe discovered the type specimen of the species on September 30, 1904.



that deserves our support. Our endorsement does not indicate a reciprocal relationship.

To join the Native Plant Society of New Mexico - follow [this link](#).



Sawyers Peak Trail

by Rebecca Hallgarth and Bob Barnes

Locally, the section of the Black Range Crest Trail which runs south from Emory Pass to Sawyer's Peak is known as the Sawyers Peak Trail. The Trail is 3.9 miles long and has a net elevation gain of 1,638 feet. It is generally considered a



moderate walk. Note, however, that since the Silver Fire the exposure to the sun along this route is much more intense than it was in the past.

Trail condition as of June 2019: There are sections of blowdown along the trail, but the trail, see above, is generally easy to follow. The section of trail from Emory Pass to the Grandview Trail Junction was in very good condition. Above the junction there was a significant amount of blowdown for about a quarter of a mile. Further along, the blowdown decreased, and for the last mile or so the trail was in good condition. There is no longer a "trail" from the Crest Trail to the summit of Sawyers Peak. Route finding is easy, however. Once you get to the saddle at the base of the Peak turn west and go up.

The natural history along this trail is typical of the Crest Trail generally. There are ladybugs found at the summit of Sawyers Peak in the summer.

The caption numbers for the following photographs are keyed to the route map at the end of this article. We start at the peak and head north to Emory Pass in this description - it is easier that way since it is downhill. The first link (in red) in each caption links to our photo gallery of the species at www.blackrange3.org.



1. [Convergent Lady Beetle, *Hippodamia convergens*](#). The "red stain" at the base of the tree is a mass of ladybugs. (See previous page.) The trees at the summit of Sawyers Peak are covered like this and it is not advisable to try to eat a picnic lunch at the summit - because the lady bugs are everywhere. This species generally has twelve spots, six on each elytron (the hard wing case which forms the "back" of the beetle) and the prothorax (area behind the head) has distinctive white lines which converge near the elytrons.



The Convergent Lady Beetles have been gathering at this site for at least ten years (based on personal observations) and probably much longer. Such congregations are not unique to Sawyers Peak. **In 1930, J. R. Douglass** reported on such a mass on Mosca Peak (9,462 feet - SE of Albuquerque) stating that "...have been observed for a number of years to hibernate on the summit of Mosca Peak, New Mexico". The University of Florida paper [linked to above](#) notes a similar assemblage on Alamo Peak in Otero County, New Mexico.



5. **Forage Looper, *Caenurgina erechtea***. This moth is common in the U.S. and southern Canada. For you allergy people, it eats ragweed.



6. **Blue Fungus Beetle, *Gibbifer californicus***. We have seen these beetles in a number of places in the Black Range, especially after the Silver Fire. They eat the fungus which grows on the dead trees.

Numbers 1 through 8 were all found at the summit of Sawyers Peak, all on June 30, 2019, except the Olive Warbler.



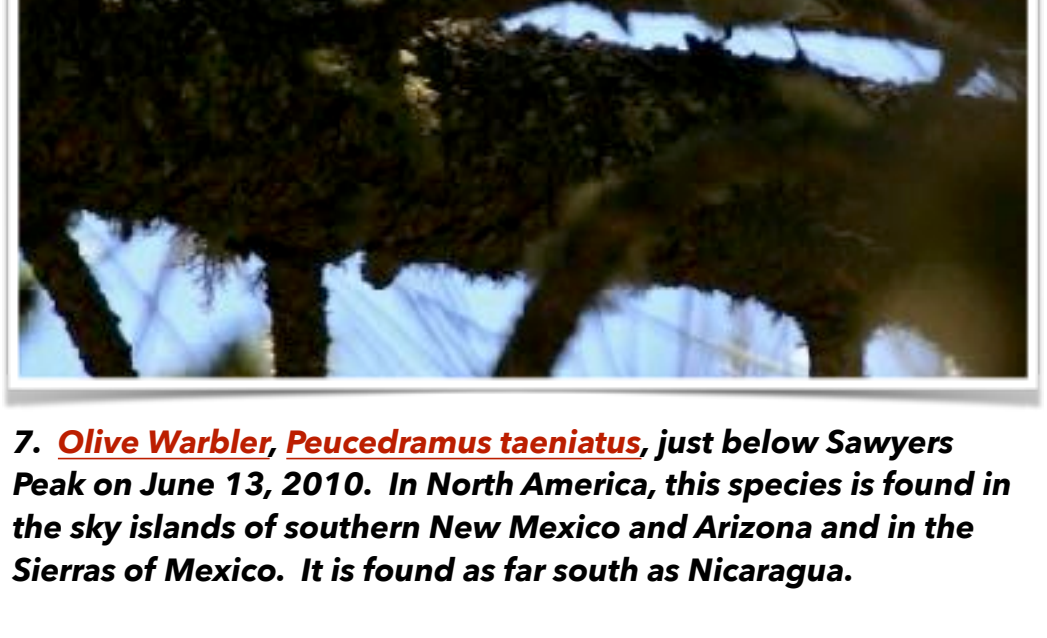
7. **Olive Warbler, *Peucedramus taeniatus***, just below Sawyers Peak on June 13, 2010. In North America, this species is found in the sky islands of southern New Mexico and Arizona and in the Sierras of Mexico. It is found as far south as Nicaragua.



2. **Black Swallowtail, *Papilio polyxenes*** (probably *P. p. asterius*). There were several butterfly and moth species at the summit of Sawyers Peak. (See following.)



3. **West Coast Lady, *Vanessa annabella***. This species is found primarily in California, but its historical range extended throughout the western U.S., the very southern part of western Canada, and Mexico as far south as the Federal District.



4. **Funereal Duskywing, *Erynnis funeralis***. This species is found throughout the southern half of the U.S. and southward into Mexico.



8. *Villa* sp.? (probably *Villa lateralis*). *Villa lateralis* is widely distributed in the United States and is found as far south as Panama. It has at least one scientific synonym, *Anthrax lateralis*.



The U.S. Coast and Geodetic Survey Marker from Sawyers Peak, dated 1936.

Flowers vary with the season and the amount of precipitation. And, as we are learning, the opening of the canopy by the Silver Fire has created a patchy network of plant communities which seem to be associated with the amount of sunlight/shade they receive. Unfortunately, I do not know of a flora survey prior to the fire with which I could compare the current community.



9. *Lithospermum multiflorum*, *Wayside Gromwell*. Like the primrose shown below, the Wayside Gromwell is found at higher elevations in the Black Range, this one on the summit slope to Sawyers Peak. And, true to nature, I found that the only decent photograph I have shows a partially eaten flower.



10. *Primula rusbyi*, *Rusby's Primrose*. We found this primrose along the Black Range Crest Trail not far north of the saddle below Sawyers Peak. The only other time I have seen this species was at a similar elevation below Hillsboro Peak.



11. ***Campanula rotundifolia*, Harebell.** In this, the higher elevation portion of the trail, we also found several clumps of Harbell, also known as Bluebells of Scotland. This species generally prefers more water than is always present along these slopes.

Farther down the trail we encountered a community of composites at the saddle. This was the area where we traditionally see Iris.



12. ***Potentilla anserina*, Silverweed.** This species is best identified by its leaves (see below).



13. ***Iris missouriensis*, Rocky Mountain Iris.** The first time we walked up this trail we were struck by the fact that there were blooming Iris high on the mountain - followed by the ladybugs. At this time of year, they have gone to seed and the insects are feasting.



14. ***Western Bluebird*, *Sialia mexicana*.** On the way down the mountain we flushed two juvenile Western Bluebirds from a tangle of down trees. The juvenile of the Western Bluebird can be told from that of the Mountain Bluebird by the spots on the back of the Western. See the first link for larger images.



15. ***Townsendia formosa*, Smooth Townsend Daisy.** This species is found at middle elevations and has purple streaking under the rays of the flower.



16. ***Echinocereus triglochidiatus*/*Echinocereus coccineus*.** Cactus plants are hard (for us) to identify. This plant was found in the saddle above the junction with the Grandview Trail. In addition to everything else, cactus plants of the same species can be highly variable. To separate the two species referenced here you have to look at the chromosomes to be sure - *E. triglochidiatus* is diploid, *E. coccineus* is **tetraploid**.

The resources available to us grow by the day, and increasingly many of those resources are open access. That is the spirit of this publication, no paywalls around here. And, at least for now that is the spirit of many governmental resources, such as **The Feather Atlas** maintained by the U. S. Fish & Wildlife Service, Forensics Laboratory.



17. ***Great Horned Owl*, *Bubo virginianus*, primary wing feather.** Although we saw several of these feathers along the trail, this particular one was just below the junction with the Grandview Trail.



18. ***Polemonium foliosissimum*, Jacob's Ladder.** This species was just coming on in mid June; the week before we saw our first specimen in the Silver Creek Drainage at lower elevation.



19. ***Tragopogon dubius*, Yellow Salsify.**

As we crossed the ridge to the west side of the range we found Jacob's Ladder, Yellow Salsify, and Scarlet Penstemon growing closely together.



20. *Penstemon barbatus torreyi*, *Scarlet Penstemon*.



21. *Holodiscus dumosus*, *Mountain Spray*.

The lower slope of the trail held its own special treasures, including Mountain Spray growing beside the trail. This is a species which I have not often seen (or at least not observed).

And, as odd as this may seem, the third wonder of the trail's flora came in the form of a multicolored Wallflower. Flowers at higher elevations are often darker in color, but this particular plant was a wonder of hues.



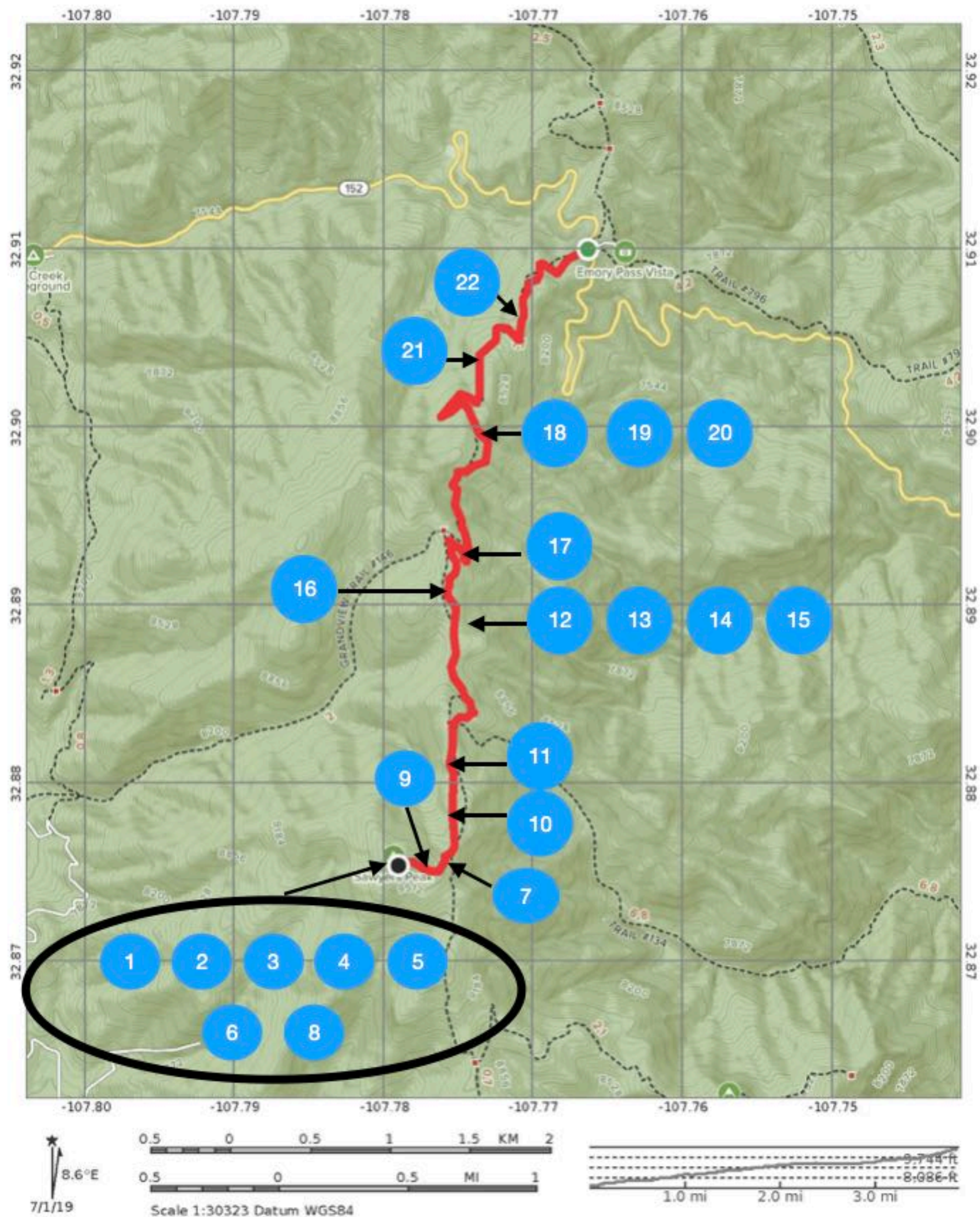
22. *Erysimum capitatum*, *Wallflower*.

This listing is not complete by any means. There were several other blooming plants which we observed and photographed along the way, including: Fendler Meadowrue, *Thalictrum fendleri*; New Mexico Locust, *Robinia neomexicana*; Purple Loco, *Oxytropis lambertii*; and Mountain Parsley, *Cymopterus lemmonii*. The bird life was dominated by a few species. Hairy Woodpecker, Dark-eyed Junco, Western Bluebird, Turkey Vulture, Common (Nothorn) Raven, and Brown Creeper were common at various spots along the trail.

And the trail, for the most part, was in excellent condition. We have hiked this trail in all seasons and it never ceases to inspire - and in the case of Bob, when I am in a particularly poor state of physical condition, it never ceases to cause me to perspire.



Sawyer Peak Trail





Crinoid fossil found in the Black Range
by Steve Morgan of Kingston, NM.