Rockin’ with Cacti and Succulents

is it a cactus and succulent garden?... Jeff and Marie Thompson – Pueblo CO: Echinocereus reichenbachii
…or a rock garden? Mike Kintgen, Denver CO / Escobaria missouriensis / Pterocactus fischeri

hallmarks of traditional rock gardens: Panayoti Kelaidis rock alpine garden / Gentiana acaulis
- motivated by plant collecting
- small plants with alpine origins
- primary objective – making a habitat hospitable to plants (rocks, raised beds, troughs)
- restricted to temperate climates
- color peaks in spring
- water features

collecting tendencies drive rock gardeners:
- Rabiea albipuncta / Sedum anacampseros var. majus / Sedum tatarowinii ‘Mongolian Stardust’ / Sempervivum ‘Oddity’ (Thymus pannonicus)
- Panayoti Kelaidis, Denver CO: Lapidaria margaratae / Ebracteola wilmaniae / Bergeranthus jamesii, Dudleya cymosa / marsh orchid Dactylorhiza sp.
- South African Plaza – Denver Botanic Gardens: Ruschia pulvinaris / Aloinopsis spathulata
- Sunscapes, Bill Adams, Pueblo CO: Aloinanthis x ‘First Light’ / Aloinopsis ‘Orange Rush’ / Rabiea albipuncta
- Cold Hardy Cactus, Kelly Grummons, Lakewood CO: Opuntia aurea ‘Coome’s Winter Glow’ / O. ‘Dark Knight’ / O. arenaria reblooming in August / O. phaeacantha ‘Paradox Form’

myth #1 – rock gardeners grow only small, alpine plants: Dare Bohlander, Littleton CO: Sphaeralcea coccinea / Maihuenia poeppigii / Hesperaloe parviflora
- true alpine succulents on Mt Evans Scenic Byway CO: alpine spring beauty Claytonia megarhiza / queen’s crown Rhodiola rhodantha / king’s crown Rhodiola integrifolia / yellow stonecrop Sedum lanceolatum
- the other hens and chicks: Jovibarba heuffelii / J. hirta / Orostachys furusei / Rosularia serpentinica
- Echinocereus reichenbachii ‘Albispinus’ / Escobaria missouriensis / Escobaria vivipara var. buoflama / Pediocactus simponii / Echinocereus x rotteri / Echinocereus x lloydii
- South African succulents: Aloinanthis x ‘Last Night’ (Aloinopsis x Nananthus) / Aloinopsis spathulata / Delosperma basuticum ‘White Nugget’ / Rabiea albipuncta / Bergeranthus jamesii / A. rubrolinetea
- in Colorado, rock gardens have evolved into a mix of large and small plants from diverse origins: Delosperma ‘Gold Nugget’ / Agave parryi (pasqueflower seedheads Pulsatilla vulgaris)

the rock gardener’s primary objective is making habitats to suit the needs of the plants: sand bed: Raoulia australis / sand bed

myth #2 – rock gardens always contain rocks: Yucca harrimaniae, Penstemon pseudo-
spectabilis, Eriogonum umbellatum ‘Kannah Creek’
cacti and succulents frequently occur in rocky environments: Hwy 34 Wheatland to Laramie WY / Pediocactus simpsonii
- Delosperma cooperi ‘Mesa Verde’ / D. ‘White Nugget’ / Orostachys furusei / Opuntia whipplei ‘Snow Leopard’ (Tanager gazania Gazania krebsiana)
- the rock effect, hardiness: Coryphantha sulcata / Echinocereus dasyacanthus and hybrids / Mammillaria melanacantha / Agave havardiana
- rocks collect and concentrate run-off: in an arid climate a small amount of extra water can be the difference between life and death of a plant / Lewisia rediviva (Split Rock WY)

myth # 3 – raised beds are essential to rock gardens: raised beds do increase the number of microclimates, improve drainage and increase air circulation (helps prevent rot), accommodate more plants and stage for viewing: Lewisia cotyledon
growing cacti in damp climates: Pediocactus nigrispinus (Ann Arbor MI) / Agave ovatifolia (Twello NL)
- Dryland Mesa – Denver Botanic Gardens: Agave huachuensis / Coryphantha orcuttii var. koenigii / O. echinocarpa, Calylophus lavandulifolia / Opuntia aurea ‘Coonbe’s Winter Glow’
going vertical with walls (use engineered walls when the slope exceeds 30% or is over 3 ft.): Delosperma nubigenum
- macroclimates (4 sides by compass orientation) and microclimates (any areas that differ from prevailing conditions, i.e., wetter, drier, sunnier, shadier, less windy, soil type): within each macroclimate there are dozens of microclimates
small changes can have a huge impact on plant health (every nuance of exposure, every pocket of incongruous soil, every swale that holds a bit more moisture expands planting options): Manfreda maculosa

myth # 4 – all cacti and succulents want to bake (intense solar radiation – UV light is 12% higher in Denver than at sea level): Sempervivum arachnoides / Sedum sieboldii ‘Mediovariegatum’ / Chiastophyllum oppositifolium
- horizontal rock gardens: Jovibarba sobilifera / Lewisia cotyledon
- going below grade for extra protection: Chamaebatiaria millefolium (Craters of the Moon ID)
- insider tip: put “zone denial” selections next to a house wall: Cylindropuntia kleinii / P. winkleri
- expanding container options: Cylindropuntia echinocarpa ‘Golden Lion’ / Orostachys chanettii
- wood containers

myth # 5 – rock gardening is restricted to temperate climates: rock gardening does have its origins in damp or wet climates where the biggest concern is too much precipitation
- rock gardens at Boyce Thompson Arboretum State Park, Superior AZ / Huntington Botanical Gardens Desert Garden, San Marino CA
- water restrictions have fostered a revolution for rock gardeners in the West: Yucca harrimaniae (Cytisophyllum sessilifolium, four-wing saltbush Atriplex canescens, Himalayan aster Aster himalacus, Alyssum stribryni) / Yucca pallida
- desert tundra high steppe model (plants that are adapted to cold winters, hot summers, strong winds, high UV light, high precipitation, fire, grazing): tufted milkvetch Astragalus spatulatus / perky Sue Tetraneuris acaulis, sandwort Arenaria hookeri - Pawnee Buttes National Grasslands CO
- unirrigated rock gardens: Delosperma ‘Lavender Ice’ (prairie phlox) Phlox andicola / Sedum obtusifolium / Opuntia aurea ‘Chiffon Pink’ (Penstemon pseudospectabilis)

wood containers
- Opuntia polyacantha ‘Nebraska Orange’ / O. imbricata ‘White Towers’ / Eastern prickly pear O. humifusa
- Alpenridge, Sandy Snyder, Littleton CO: Opuntia fragilis f. desnuda / Orostachys furusei / O. spinosa crested form
- Dare Bohlander, Littleton CO
- Linda Boley, Boulder CO: Sempervivum ‘Pinecone’ / Sedum kamtschaticum
- Leo Chance, Colorado Springs CO: mosaic of cacti and succulents

**myth #6 – color peaks in the spring:** Denver Botanic Rock Alpine Garden
- summer: Yucca pallida / Y. thompsoniana
- autumn: Sedum cauticola ‘Lidakense’ / Opuntia phaeacantha var. major, Sedum ‘Purple Emperor’
- winter: Agave chrysantha / Sedum spurium ‘Tricolor’
- evergreen succulents: Delosperma ‘John Proffitt’ / D. nubigenum / Sedum spurium / Stomatium beaufortense

**water features:** small pond / bubbling rock

**building rock gardens**

**choosing a site:** front yards / against a house wall, hillsides, odds and ends
- Elaine Menter, Centennial CO: Echinocereus coccineus / E. reichenbachii
- insider tip: don’t site rock gardens under messy trees or where you pile snow in winter

**soils (to amend or not?)**
xeric plants evolved in native soils that are high in minerals and low in organic matter: Yucca filimentosa ‘Bright Edge’ (Salvia officinalis ‘Icetina’) / Coryphantha vivipara
- amended soil: changing the soil to meet the plants’ needs (Kendrick Lake Garden, Lakewood CO): Yucca glauca
- amend selectively to create soil microclimates—patchy environments suit larger number of plants: for rock gardens, amend only lightly to aerate compacted soils and to increase the water-holding capacity (WHC) – 2% OM = 75% increase in WHC / common denominator soil mix for rock garden plants: 1/3 existing soil, 1/3 sharp sand, 1/3 small rock
- Nolina texana / Agave parryi, Sedum ‘Angelina’ / Othonna capensis / Phemeranthus (Talinum) calycinum / Solidago ‘Wichita Mountains’
- display gardens at Timberline Gardens, Arvada CO:
  - Agave parryi var. neomexicana / Yucca pallida / Y. rupicola
  - growing opuntias in junk soil: Opuntia aurea ‘Golden Carpet’ / O. ‘Mandarin Sunrise’ / O. nicoillii
- Chinle Cactus and Succulent Society display garden, Grand Junction CO: Sedum sichotense

**rock choices:** sandstone / lava / pinal schist
- choose only one type of rock if design unity is your goal
- rules are meant to be broken
- rock alternatives: hypertufa / concrete culverts / broken cement sidewalks / drain pipes

**rock arrangement**
- placing rocks: rock garden construction – Gardens at Spring Creek, Ft. Collins CO
- nature’s rock gardens: observe geology if convincingly naturalistic arrangement of rocks and plants is your objective
- Pediocactus simpsonii / Front range twinpod Physaria bellii / alpine bladderpod P. reediana in shale wall / succulents in stylized planting of shale
setting rocks: start at the base, large rocks first, follow strata, don’t space evenly, slope into hill, bury 2/3’s, shim as necessary (red Cherokee sandstone at Gardens on Spring Creek, Fort Collins CO)
crevice gardens: (vertical and horizontal): crevice garden class / *Physaria bellii*, *Delosperma sphalmanthoides*, *Erigeron compositus* and *Veronica saturejoides*

- Raven Ranch, Rebecca Day-Skowron: two different crevice garden schemes
  - *Talinum brevifolia* / *Yucca angustifolia* / *Agave toumeyana* v. *bella*, *A. nana* / *Grusonia clavata* / *Castilleja integra*
- APEX crevice garden, Arvada CO: *Agave lechugilla* / *A. toumeyana* spp. *bella* / *Escobaria leei*
- paths: access for maintenance & to view the garden
- stairs

**mulch:** reduces evaporation and erosion, keeps crown dry, finished look: decomposed granite / stones / glass
- insider tip: collect mulch at the same time as collecting rocks
- insider tip: use the same mulch in paths and beds

**plant selection (where the fun begins)**
- gneiss crevice garden by Kenton Seth
- essential to match cultural conditions: sunlight, soil (fertility, drainage), water needs
- determining a plant’s needs is not always intuitive: *Lewisia cotyledon* / *L. nevadensis* / *L. tweedii* / *L. pygmaea* Pike’s Peak / *L. rediviva*
- plant placement
- art in the rock garden: *Agave parryi* spp. *neomexicana* / *Delosperma dyeri*

*for more information about rock gardening, go to:* www.rmcnargs.org and www.rockstarplants.com

**references:**
- Tatroe, Marcia. *Cutting Edge Gardening In the Intermountain West* (Johnson Books, 2007).