THE ALPINE GARDEN SOCIETY
CENTRAL SUSSEX GROUP

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ROCKY MOUNTAINS

Those of you who were at the April meeting, will recall that Phil and Gwen were unable to give their talk personally. However, thanks to Carol Hart, some last minute internet calls enabled the photographs and the text of the talk to be transmitted and the talk given by Carol. With a limited amount of editing, this has been reproduced in this newsletter, unfortunately without any photos (this one is the longest ever) although those with access to the internet can see a selection of their pictures on the AGS website). Many appear in their travel articles in the Bulletins listed at the end.

The Rocky Mountains are a chain of some 60 ranges and landforms that begin near the Arctic Circle, and end within 25 miles the Mexican border. We cannot cover these extremities but will include much of the Southern Rockies, the Middle Rockies and then just venture into the Northern Rockies; that is the Canadian border. Both Southern and Middle Rockies have a continental climate, and as much of the moisture from the Pacific Ocean is absorbed by the mountains of the Far West, some areas, the Middle Rockies in particular, are relatively dry. Geologically the Rockies are a young mountain chain, hence the abundance of magnificent peaks. - like the Sawtooth Range of Idaho. There are also impressive glaciated valleys such as those that can be seen from Wyoming's Bear Tooth Plateau, which is an extensive area of alpine tundra in the Middle Rockies In addition, these mountain ranges like the Tetons of Wyoming that rise sharply from vast, arid sagebrush-covered basins that almost surround them. We shall therefore be illustrating plants growing at elevations from 6 to above 14,000ft.

Firstly the Southern Rockies that stretch from Santa Fe, New Mexico to the Medicine Bow Mountains of southern Wyoming This continuous mountain barrier can only be crossed through high passes, all of them are over 9,000ft, some over 11,000ft This barrier must have presented a formidable obstacle to the early settlers; how ever_stage coaches crossed Mosquito Pass at 13,185ft, I do not know; we found crossing in a 4 wheel drive quite an experience The highest peaks of the whole chain are here in Colorado, 50 or more exceeding 14,000ft and it is here on Mt. Evans, rising to some 14,265ft, that we commence our Rocky Mountain Excursion. It is July Here above the tree line there are extensive areas of alpine tundra, not to be confused, with arctic tundra with it's marshes and permafrost. Hurricane force winds will blast these peaks in winter, often completely removing the snow cover from many windward slopes, one of the reasons for the dwarf stature of the tundra plants. Much of the heavy rain from summer thunder storms will either run off the surface, or will literally evaporate into very thin air; therefore there is relatively little moisture available for many of these_exposed alpine plants. The rocks here are granite, the medium granitic sand and gravel that has very little moisture holding ability**,** meaning that many of these tundra plants are growing in a cold desert environment**.** *Saxifraga chrysantha.* has tiny thyme-like leaves giving rise to the synonym *S. serpyllifolia.* It has no arching stolons, unlike *S._flagellaris_* the Whiplash Saxifrage which superficially looks similar, but has prominent stolons and much larger leaves. The light is brilliant, the air is thin and the humidity low, consequently there is intense solar radiation. Pink flowered *Trifolium nanum* **- s**ee how dwarf these plants are, a degree or so warmer on the surface than even three or four inches above**.** The other plant is *Claytonia megarhiza* which

has fleshy leaves with thick cuticles that restrict moisture loss, curved so as to channel any surface moisture into the centre of the plant. It also has a long taproot, up to eight feet long capable of obtaining moisture from deep amongst the rocks. The clover on the other hand has a very extensive, surface root system**,** capable of absorbing rain from storms before it evaporates. Next the blue plants; bottom right of this picture. Here on Mt. Evans the colour of the flowers of Eritrichium nanum varied from deep blue through gradations of purple, light blue to white. The foliage of many alpine, and for that matter desert plants, is covered with soft white or grey hairs, another adaptation that restricts moisture loss, where little is available .The hairs may enable these plants to survive on the tundra but will certainly help to kill them in our humid climate when we attempt to cultivate them.

We are now heading for Mt. Bross another 14,000ft peak at the moment under one of those thunderstorms that disturb many afternoons in July and August. Having passed through a grove of Colorado Bristlecone Pines, *Pinus aristata,* we emerge at about 12,000ft onto the windswept, treeless slopes to find a shrub that is also native in northern Britain. *Potentilla fruticosa,* the Shrubby Cinquefoil; this very common montane and alpine shrub in the northern hemisphere is almost prostrate at this altitude. These plants have been called var. *floribunda* in view its many large flowers. Small plants of the Potentilla again, but it is the white flowers in the foreground that are next. *C. gunnisonii* a common species of the S. & M. Rockies, but not at 12,000ft, usually found at lower elevations. where it will grow to 3ft. or more here are a little more than 12 inches high. This species was named for a military engineer, Captain John Gunnison who was massacred by local Native Americans whilst he was leading an expedition over the Rockies in 1856. A study of many of these plant names can easily bring to life vivid pictures of the Wild West. Same habitat and the pale lemon-coloured flowers of *Erysimum capitatum var. nivale*. Mt. Bross was once the centre of intense silver mining activity these slopes are covered with old workings and tailings. *Physaria alpina,* a Colorado endemic is restricted to the Mosquito Range and the Gunnison Basin. *Phlox condensata* is a common high elevation cushion, invariably found above 10,000ft. in Colorado. Cushion plants are natural pioneers of habitats such as this, where there is little competition from stronger plants hat are found growing at lower elevations. Perhaps I have given the impression that these mountain slopes are all dry and well drained, which is certainly not the case, because.on leeward slopes, or where obstacles or depressions allow snow to accumulate, the plants will enjoy a protective covering of winter snow. When this melts the soil becomes wet, sometimes very soggy, resulting in different plant associations, sometimes referred to as snowbed communities. *Ranunculus adoneus,* the Snow Buttercup is a well-known species. Some plants undergo significant development whilst under snowbanks and then flower literally within hours of, or sometimes before snowmelt, And then they flower in all their glory. When the well drained screes are full of colour these plants are often just beginning to emerge, so their growing season is even shorter than for the plants on the open tundra. At a lower elevation the vegetation is by now quite lush and by the side of the stream *Primula parryi,* and *Anemone narcissiflora* are in full bloom. *P. parryi* was named in honour of Charles Parry. during the early and mid 1800s botanists such as the English/American Charles Parry, accompanied the early settlers and miners into this region. They collected plants, sending them back to the east for study and naming. Charles Parry probably did more than any single person at that time to make known the flora of these Rocky Mountains. And here, *A. narcissiflora,* which is also a common native of the European mountains. As we cross to our next alpine habitat we descend briefly to about 8,000ft and Paintbrushes colour the range These semi-parasitic Castillejas are a significant part of this flora, there being over 200 species in the west. Whilst there is little difficulty in recognising the genus, as we cross to our next alpine habitat we descend briefly to about 8,000ft and Paintbrushes colour the range, the species can present no end of problems. The flowers or rather the corolla tubes of the Paintbrushes are insignificant when compared with the colourful bracts and upper stem leaves. Another species, but with pale yellow or lime-coloured coloured bracts - *C. sulphurea.* The home of the Penstemons is NA – there must be over 250 species, and so far as we are concerned many are difficult to identify. They are found in habitats ranging from open desert to moist forests, even up to the alpine zone, but roadside verges are favoured by many, Typical penstemon flowers – Penstemon meaning five

stamens We can see four of them there, the fifth which is sterile lies flat, just in here – it is covered with hairs, hence its common name of Beardtongue. Crossing the next pass and yet another roadside habitat and *P. hallii.* This common plant often found on the rocky alpine tundra is quite happy taking advantage of a disturbed slope at about 11,500ft. Moving in closer we can see the fifth stamen – less hairy than in the previous species. *Aquilegia caerulea* the the state flower of Colorado is equally happy in a mountain meadow or in a boulderfield. Although named the Colorado Columbine, it ranges from Idaho and Montana down to Arizona and New Mexico. The colour of these flowers can range from the colours you see here to pure white. Described as an excellent garden plant, but hardly one for the alpine garden. If we climb back at about 11,500ft on the edge of the tree line we find the tiny *Aquilegia saximontana,* a much more appropriate candidate for the alpine garden. Over the course of time, these larger boulders are broken into smaller rocks creating fellfields They are then further reduced in size and where conditions are favourable the stronger growing grasses and sedges will crowd out the early colonisers, forming alpine meadows, the climax vegetation at about 11,500ft, in Colorado. The small bulbous *Lloydia serotina* thrives here, there were literally thousands of flowers.

The Continental Divide all water on this side will drain into the Atlantic and that on the far side the Pacific Ocean. In the foreground is the habitat of our next two plants. The first is the Arctic Sandwort, *M. obtusiloba,* the most common of the Rocky Mountain species. Plants at this elevation are virtually all perennials, many are dwarf shrubs, often taking years to reach maturity, like this plant or this one. Note how woody this small plant is; it is probably much older than I am - they grow so very slowly. There is almost a complete absence of annuals on the tundra of these RM; the season is too short and the conditions unfavourable for an annual to complete a life cycle. The second in this habitat is *Primula angustifolia* a dainty plant but tough enough to survive, in fact flourish, in these harsh conditions of strong winds, high rate of evaporation, and intense solar radiation. .Although this plant is tough enough to flourish here, alpine tundra as an ecosystem is fragile, very fragile -- when destroyed _it may take hundreds of years to regenerate**.** But it is certainly worth waiting for the climax meadow vegetation which you see here. *Tetraneuris grandiflora*, a species of high alpine meadows – no need to say it is called the Alpine Sunflower. But we could add that you may know this genus as *Hymenoxy,s* as we did until recently And if we view the plant from behind we can see another instance of the dense covering of hairs on some of these plants. Even more evident if we take you in closer. Between these high mountain ranges lie vast, semi-desert, sometimes shrub covered areas, supporting interesting and sometimes beautiful plants. These areas cover hundreds of square miles and although often monotonous, do provide startling contrasts to the mountains**.** These plants are one of the half-a-dozen or so species of Princes Plumes **-** _*Stanleya pinnata* and S. *integrifolia,* quite attractive for a Brassica and if we take a closer look and try to ignore the exerted filaments and styles, you might be able to make out the four petals. Penstemons are not usually considered to be mat or cushion forming plants, but in this area of low rainfall there are species that do just that..The Yampa River Canyon and *Penstemon acaulis* var *yampaensis* growing in semi-desert conditions, where sagebrush is the dominant shrub. Certainly mat-forming and the flowers are a better blue than they appear in the picture. As with the plants of the exposed tundra these must be cold-hardy, and at the same time they need to withstand the heat and drought of summer These lower elevation plants (6 - 8,000ft) flower earlier than the high alpines when the alpines are in bloom, these will be in seed. June is about right. Plants like the elegant *Stanleya* or the mat forming *Penstemon* are easy to see from a distance*,* others, like our next plant *Townsendia incana* is far less obvious. No chance of seeing it from this distance, but even in the immediate foreground still not obvious, T. leptotes that was found in a similar dry habitat was also difficult to spot. – it just shows, you need to keep your eyes skinned. Typical sagebrush covered range and very many Phlox species to be found in North America. In fact all Phlox species with one exception are NA. endemics. This is *Phlox longifolia,* and as you can see the leaves are very long for a Phlox. The silver-grey foliage of the sagebrush is brightened by two common species, firstly another of the 200 or so species of Paint Brushes *C. angustifolia* the leaves look about right and *Delphinium nuttallianum.* Although we are between the

mountains we are still over a mile above sea level and will not fall below that elevation all this evening. From these semi-desert areas we now head towards the Medicine Bow Mountains which are at the northern end of the Southern Rockies. The Snowy Range (part of the Medicine Bow Mts.) is seen here across the lush green high plains west of Laramie. Growing in a wet ditch by this road was *D. pulchellum* a widespread species usually found in damp, sometimes very wet habitats. Unusual looking flower with strongly reflexed petals exposing the staminal tube giving the impression of a shooting star, hence the common name. Rather closer to the foothills with the Snowy Range still some way off , but we always stop for a picture.1983 was a very good year- was it that long ago?- but no two seasons are alike, two years later it was dry and brown at the same time of the year,hardly a flower in sight. *Oxytropis lambertii,*.leafless flower stems arising from the crown of the plant, is one of the characteristics of the genus This can also be seen in *O. sericea*. the Silky Locoweed. A number of *Oxytropis* species carry the common name Locoweed or Crazyweed. as these plants are toxic to livestock, especially horses, attacking their nervous system when eaten. A colour variation of the *O. sericea*. Just one more plant before we climb again, and that is the delightful Fairy Slipper Orchid, *Calypso bulbosa,* three plants in this picture difficult to see but easier to see this group of five.Easier still close ujp and we can see that each plant only has one leaf, characteristic of this genus. Certainly not as rare as is sometimes thought; it is tiny, often hidden in the debris and shade of the forest floor and therefore often overlooked. This habitat is more open than is usual.This variety found all along the Rockies Chain at moderate elevations has yellow hairs on the lips, and it designated C. var *americana*. Heading for Snowy Range Pass we find *Pulsatilla patens,*a delightful Pasqueflower blooming shortly after snow-melt. Its range extends to the arctic circle and eastwards to the great Lakes Sometimes referred to as the Jewel of the Plains where it will flower much earlier. We now are at 10,000ft. and it is July. An attractive and variable species, with an ample covering of soft silky hairs. The genus Erythronium is well represented in NA, particularly in the Far West:which as you know provides a number of garden worthy species. This is E. grandiflorum commonly known as the Glacier Lily. All these flowers had yellow anthers;elsewhere we have photographed plants with chocolate coloured anthers Mirror Lake, and what superb scenery. Unfortunately the mosquitoes appeared to be as large as blackbirds. Pan the camera round to the right and we have *Caltha leptosepala* the Rocky Mountain Marsh Marigold in a typical wet habitat. Instead of the yellow sepals of our *C. palustris* these are white – they are also thin as the specific name indicates and faintly blue on the reverse side. Virtually on the *Snowy Range Pass* – mid July – the snow has recently melted and the vegetation of the meadow has yet to show life. Again mid July, but another year – either the snow cover was much thinner or the season much earlier – no two seasons are alike. *Geum rossii* is beginning to flower – wait a couple of weeks and they are in full flower, The Alpine Avens is a member of the rose family, a widespread alpine meadow plant often becomes dominant, crowding out less strongly growing plants. On the Snowy Range Pass at 10,800ft, the cliffs might be another thousand feet higher.

Rocky tundra, and as I said earlier, some of these alpine ecosystems are extremely fragile; once destroyed they may take hundreds of years to regenerate. This spot may take even longer; it is now a car park. Two common plants to illustrate here - *P. pulvinata.* 'pulvinata' meaning cushion-like, and it is, the colour varies from white through varying shades of pale blues and mauves. The foliage that you can see is of a different plant, that of the Phlox is mainly hidden by the flowers. And *S. acaulis,* in a rather different form is a British native.. These cushion plants may be the early colonisers of bare or disturbed ground, but the lichens were here much earlier. Together with the elements, lichens have broken down rock surfaces, literally preparing habitats for the higher plants that evolved later. On the Snowy Range Pass looking to the south we see another of those thunderstorms, common in the afternoons during July & August:and an example of Krummholz.or Elfinwood .At this elevation, normally tall trees such as *Picea engelmannii* the Engelmann Spruce are unable to grow to their natural height; they become stunted and form islands of tangled shrub-like growth. The few erect stems that are able to survive often develop into "flag" or "banner" trees, the shoots on the windward side have been ice blasted and killed during the winter leaving those on the sheltered side to grow, after a fashion. Dropping down on the other side we see

water that began as a mere trickle from the melting snow becoming a torrent, spilling over to provide wet habitats for these moisture loving plants Here we see *Caltha leptosepala* again, but this time with *T. laxus* a relative of our European Globe Flower, *T. europaeus* .

We now descend from the Medicine Bow Mts. into the Great Divide Basin. This Basin divides the Mountains; with the Wind River Range to the north, the Medicine Bow Mts and the Colorado giants to the south, it was a relatively easy route across the Rockies for the early settlers avoiding all the high peaks. Both the Oregon and the California Trails crossed this Basin, passing through South Pass on their way to the West. Seven and a half thousand feet above sea level, some twenty miles wide; and to the early pioneers a very important gateway to the west. It doesn't look very exciting today, but in the early 19th century it was a busy highway, covered wagons, miners, stage coaches, and the pony express. And before the white man, thousand upon thousand of migrating animals, and the Native Americans moving from one pasture to another. Now that we have reached South Pass we have also reached the Middle Rockies.

Red Canyon, which is a few miles north of South Pass.and there amongst the sagebrush, *C. nuttallii,* a beautiful and variable Rockies species, some with a prominent red crescent immediately surmounting each circular gland, others where the crescent is scarcely visible. But I think the pink form is our favourite. *Calochortus nuttallii* named for Thomas Nuttall, another well-known English-American botanist who worked in and through this area in the early 1800's and crossed South Pass in 1834 on his way to Pacific. We are now NE of Red Canyon – that is the Wind River Range on the horizon, Beaver Rim on the right and we are looking for two very different Phlox species on limestone and volcanic rich sandstone. P*hlox hoodii* subsp. *muscoides* both the botanical and common names referring to a moss, which I think is an approximate description of the woolly, closely appressed foliage concealing the stems; it was very soft and silky to touch. You can almost feel it from this distance. The other species is the rare Beaver Rim Phlox, *Phlox pungens*..Growing near the Rim, there they are – fancy gardening in that stuff, but they obviously like it otherwise they wouldn't be there – certainly very little competition. Pungens means 'ending in a sharp point' – pungens by name and pungens by nature the points of the leaves are sharp enough to draw blood, and they did. And now we can compare the foliage of both plants at the same time. Another plant of these dry areas that has foliage that superficially resembles a moss is *E. acaule* which forms dense and often large cushions - this one must be three feet across. The small yellow flowers hardly exceed the appressed sheathing leaves. Those leaves, similar in appearance to *Phlox muscoides* that we have just seen, also have a dense covering of grey silky hairs. As with alpine plants the restriction of moisture loss is a priority in these semi-desert conditions. An example of cushion plants colonising disturbed ground - a rough track. This is *A. spatulatus,* 'spatulatus' referring to its spatula shaped leaves. There are so many flowers we cannot see the leaves which we can rectify by by selecting another plant, this time it is the white form Another of those afternoon storms; photography is often easier in the morning. This area was literally covered with *Lewisia rediviva*; unfortunately most were over. We were here at approximately the same date two years later, and they were all in bud. The genus *Lewisia* named for Capt. Meriwether Lewis who together with William Clark led the first organised scientific expedition from the Mississippi across the Rockies to the west coast in 1804 - 6. It is said that a dried specimen collected on that expedition was replanted in the east many months later; where it revived and grew, hence *L. rediviva*. It has a thick root or rhizome – hence its ability to revive - its common name is Bitter Root. An adjacent habitat with two species of Penstemon *P. eriantherus,* the Hairy Anthered Penstemon;.whilst it is short in stature it has relatively large flowers, Eriantherus translates into hairy anthers – so it all fits. The other was the pink form of *Penstemon laricifolius* that were scattered over this area and has the varietal name *laricifolius*. Although not growing here, this is the white form var. *exilifolius,* presumably it has even narrower leaves.

We must now head to the north**,** crossing the arid wastes of Wyoming to reach the Bighorns and then the Bear Tooth Plateau.. I appreciate we illustrated *E. nanum* in Colorado where it was growing on granitic tundra. But here in the Bighorns still on tundra, carpets were growing in

pasture n an undulating limestone plateau at about 10,000ft, which is about the tree line at this latitude. (Timberline drops about 500ft every 100 miles travelled to the north.) In summer this plateau is grazed by cattle and many thousands of sheep, replacing the large herds of wild animals that found summer grazing here until they were slaughtered by the white man. If you wish to cultivate the rare and endangered *Aquilegia jonesii* here is the ideal habitat. The rubble created by the grader supported the better plants, they were probably protected from the grazing sheep. Those on the open pasture were very poor specimens. *A. jonesii* is found in isolated colonies on, or close to the Continental Divide from here northwards to S. Alberta. Marcus Jones - botanist, Latin teacher in a girls school and mining engineer. - 1870's; I wonder which he enjoyed most The solitary flower heads of *Townsendia parryi* were scattered amongst the limestone of this rolling plateau. John Kirk Townsend and Charles Parry united in one plant. The form of *T. jamesii* growing on limestone has been given the subspecific name of *heucheriformis*. This member of the Saxifrage Family is not an impressive plant, even at close quarters and even less impressive when compared with *Telesonix jamesii* on Pikes Peak where it is growing on granite.

And now to the Beartooth Plateau straddling the Wyomong/Montana border, a tundra covered tableland all above 10.000ft and more than 30 miles across. The road that crosses the Pass at slightly under 11.000ft. is said to traverse more alpine tundra than any other road in North America. and is one of the most scenic highways in the USA. The plateau is also intersected with glaciated valleys and there is the Bear's Tooth Mountain some 13 miles away. .Our fist plant on the plateau is *Polemonium viscosum* in a rocky habitat, although it is often found in alpine meadows. Sometimes referred to as the Sticky or Skunk Polemonium, it is certainly very viscous to touch - but the skunk, it was usually blowing so hard here that it was difficult to detect any smell at all. A close relative of our Jacob's Ladder. Now a photograph of a Draba doesn't sound very exciting,.but set against this background I suggest it is a different matter. This is *Draba incerta***,** growing on a bitterly cold ledge very close to the Pass. Although this species is known as the Yellowstone Draba (Yellowstone is less than 100 miles away) its range extends into Alaska and into the Yukon Territory. Note the long stems to the flowers. Growing within a few yards was the Wind River Draba, *Draba ventosa* and the Wind River Range is not far away either. *Draba ventosa* is a high alpine - found up to 13,400ft. Note the very short stems to the flowers; illustrated together the different habit of these species is obvious. The yellow flowers scattered on the dry slope are *Pedicularis oederi.* The Louseworts are semi-parasitic - note the colour of the leaves. This is just one of a number of circumpolar species we are illustrating tonight. Many alpine shrubs are found in moist areas. This is certainly true of *Salix,* the Willows, the most common genus of the alpine shrubs. A typical habitat for *Salix arctica* growing on the edge of the water; *Caltha leptosepala* appreciated the dampness too. The Willows are dioecious, meaning the male and female flowers grow on separate plants --- here are the male catkins and here the female flowers of *Salix arctica,* the Arctic Willow. Easier to compare when seen together. What a spectacular location, even if it was cold. We have been on the Beartooth four or five times and has always been bitterly cold. *Douglasia montana,* had formed attractive cushions behind the spot from which that picture was taken. *Douglasia*, named for David Douglas, Scottish explorer - another very early plant collector, who was responsible for bringing many new plants into cultivation A plant of alpine bogs and meadows is *Gentiana algida* the circumboreal Arctic Gentian with white flowers. When many of the plants on the dry slopes have finished flowering, the Arctic Gentian will be in bloom – often until August. Here the Gentian is growing in sphagnum moss; this bog would only just support my weight. Many of these alpines on the Beartooth are also found in the southern Rockies, and a hundred or so species may also be found in the Arctic. On our way down the western slopes we found the shrubby almost sprawling Hairy clematis - *Clematis hirsutissima.* This species may be found growing from the sagebrush desert to the high ponderosa pine forests. Although it has a rather sprawling habit the flowering stems are held upright displaying the perfect hanging blue-black bells, often described as 'old maid's bonnets'. Descending a little further and the flowers of the tiny *F. pudica* which would have flowered earlier had it not been for the snowbank that covered this roadside cutting until quite late. Charming demure bells living up to their botanical name, pudica meaning bashful. And why not a closer picture of the only yellow-flowered fritillary in North America. Descend further still, a left

turn into the Chief Joseph Highway and climb again, this time to the summit of Dead Indian Hill where both *Eritrichium nanum* and *E. howardii* were in flower. I hope that this is the latter, but. **u**nfortunately *E. howardii* did not survive when the road was improved subsequently.

And now for the last lap we cross into Idaho; our objective the White Cloud Peaks via the Craters of the Moon National Monument. an area of lava flows and scattered islands of cinder cones the result of fissure volcanic eruptions over the past 15,000 years, the last being 2,000 years ago. Here Limber Pine, *Pinus flexilis* growing where moisture has accumulated,and a cinder garden, illustrating how higher plants can colonise such an inhospitable habitat..And to prove they are higher plants the white form of *L. rediviva*, the Bitter root, and *Eriogonum ovalifolium*. At the Galena overlook with the Sawtooth Mts in the distanc, that *Phlox* relative *Leptosiphon nuttallii.* Previously known to us as *Linanthus nuttallii*, prior to that as *Linanthastrum,* before that *Linanthus* again. There is no doubt about the name of our next plant. *Calochortus eurycarpus,* found flowering in thousands as we descend into the valley with the Sawtooth Mts still in the distance. You may remember the coloured blotch on the petals of *Calochortus nuttallii* was immediately above the gland, here in *C. eurycarpus,* there is a distinct gap. *C. macrocarpus,* the Sagebrush Mariposa was also found in small colonies in Idaho. Grass-like leaves and stems topped by a beautiful flower, giving rise to the generic name *Calochortus,* meaning 'beautiful grass'. Our final location is Railroad Ridge on an old silver mining mountain in the White Cloud Peaks. Mid June the snow has recently melted and it would appear that there is little worth photographing. You need to look carefully at the habitat to see the large numbers of *Primula cusickiana* This tiny species has a very restricted distribution and has been divided into two or three varieties or subspecies. White colour forms were not uncommon in this colony. Scattered amongst the Primulas were a few plants of *Synthyris pinnatifida* which has been given the varietal tag of *canescens*, and you can see why. *Phacelia sericea* are the plants with purple flowers scattered around in the habitat. Phacelia, a genus of some 200 species belonging to the Waterleaf Family and sericea meaning silky referring to the soft silky hairs covering the foliage. The flowers of this western NA endemic, variously described as violet, purple or dark blue, are given a fuzzy appearance by the long filaments extending far beyond the flower tube, accentuated by the yellow anthers. Returning to the picture of the habitat of the Phacelia you may have noticed another thunderstorm approaching; and as the open tundra at over 10,000ft is no place to sit out a storm, and as this one turned out to be the worst we ever experienced in NA, So with memories of the alpine tundra at its best, this picture of *Tetraneuris grandiflora* was taken here on Railroad Ridge some three weeks after the tiny Primula had flowered, let us leave this remote place, leave it to be enjoyed by the very few people who come here these days, and possibly the ghosts of the miners who toiled here in the 19th century.

Descend further still, a left turn into the Chief Joseph Highway, climb again, this time to the summit of Dead Indian Hill where both *Eritrichium nanum* and *E. howardii* were in flower. I hope that this is the latter. Unfortunately *E. howardii* did not survive when the road was improved. Continuing our wild west theme, there was a historical marker on the summit, peppered with bullet holes which read:- 'Through this portal, great herds of wild game seasonally migrated from the mountains to the plains. This high pass was the gateway for countless Indian hunting and war parties, and through here Chief Joseph, in 1877, led his Nez Perce Indians in a strategic and defensive retreat pursued by the U.S. Army.' Reading this with thunder rumbling overhead, we found ourselves casting backwards glances to verify that we really were alone, whether the Native Americans were still there. No fear of that - they were swindled out of their lands, herded onto the poorest of reservations and reduced to abject poverty. And the animals,.particularly the bison, on which many of the tribes relied. they were slaughtered, but that is another story. The Tetons, are a most spectacular and formidable barrier to the west. The Grand Teton rises to some 13,770ft, and is all the more impressive when we realise that these peaks are viewed from a base of 7,000ft. Here *Pedicularis groenlandica* another Lousewort , sometimes called Little Elephant's Head. Slightly further away, the Tetons reflected in the Snake River and *Geranium viscosissimum. Camassia quamash_* is normally found in meadows where early spring moisture is followed by midsummer drought. It was also found in damp areas although these were photographed further to the north. Camas

prairies once covered vast areas, the bulbs forming an essential and staple food source for the Indian tribes for thousands of years. Early explorers, Lewis & Clark for example and the early settlers relied on the bulbs for food, and provided they could distinguish the dormant bulbs from those of *Zigadenus venenosus,*

Yellowstone Park with it's geothermal spectacle of geysers, hot springs etc. and in view of the crowds and shortage of time, two plants only. Firstly *Gentianopsis detonsa* although *Gentianopsis thermalis,* one of its 17 synonyms, would be more appropriate, as we see it growing by one of Yellowstone's thermal pools It is an annual and although circumboreal its common name here is the Rocky Mountain Fringed Gentian. *Spiranthes romanzoffiana* growing in the same habitat This widespread orchid is known as the Hooded Ladies' tresses.

As we photograph**,** both here and particularly in Europe we find it disturbing to realise that in the not too distant future, many of the habitats we know, together with their plants and plants not yet on the endangered list, may exist only on film, disc or tape. Obviously the destruction of valuable habitats must be our main concern, but in the mean time the recording what we still have, whilst it lasts, must be the next best thing, making sure that we photograph the habitats. Whilst many of the habitats we have illustrated are not threatened in the short term, the hand of modern man is fortunately less evident than in California or here in Europe, the same could be said two hundred years ago of many areas that are now laid waste. Whilst the destruction of valuable habitats must be our main concern, I suggest to all you photographers, get out into the field if you can, because the recording what we still have, whilst it lasts, must be the next best thing.

Breathtaking photos, scenery and accompanying talk!
Bulletins 248/144, 249/268, 250/370
See Also Rocky Mountain Alpines – Alpines '86' (International Conference 1986, Timber Press)
PP RM

2009-10 PROGRAMME

(Some actual titles to be confirmed – when printed card will be issued)
As usual all meetings at 7.00 pm in the St. Wilfrid's Centenary Hall, Haywards Heath

19 September - Bob and Rannveig Wallis 'Caspian to Kopet Dag'
17 October – A Kew Millennium Seed Bank connection (Title tbc)
21 November – AGM & Bob Charman 'Lake Van Hakkari Yuksekova and Beyond'
12 December – Christmas Alpine Special
16 January – Paul Ingwersen 'The easy ones and others'
20 February – Joanna Wenham 'Tasmania - an awe inspiring wilderness'
20 March – Joanne Everson 'Yunnan' (Title tbc)
17 April – Joanna Wenham 'Chile' (Title tbc)

MEETING 19 September

A welcome return from Bob and Rannveig Wallis who were members of the Group before moving to Wales. Highly experienced growers and exhibitors, they have led many parties to Turkey and neighbouring countries. This is their latest talk.