Issue 17: August 2016

Carleton College 1966 Post 50th Reunion Newsletter

Rationale for further reading.

1. What suggestions did classmates make at the 50th Reunion for rising senior and newly graduated Carleton College students?
2. Michael Gordy addresses the issue of 'Facing an Uncertain Future' with, first, a reminder that the future has always been uncertain, but, without some major rethinking, there are some certainties for the globe's future that appear scary. He provides ideas about needed changes.
3. Susan Moyle Studlar shares her report to Professor Emeritus Bardwell on the mosses and lichens in the Japanese Garden.

http://climate.nasa.gov/

Reunion Update

During the 50th Reunion, there were a number of Carleton students who were our hosts and assistants. These students were helpful, attentive beyond belief, articulate, and very interesting. During Saturday evening's dinner, there were many formal and informal exchanges between the two different age groups present. Bill Craig provided each table with several 3x5 cards and the request for one sentence "words of wisdom" to pass on to young people just starting out in life. Below is a list of the suggestions. Because the list is very long, I have taken all the words and asked the program Wordle™ to create an image that is attached below; thereafter follows all the pieces of advice.

Some appeared to speak specifically to today's Carleton students:

- Be sure to be truly engaged with your Carleton experience so that you have real learning, you don't just go through the academic motions.
- All undergraduates need both business courses & courses in teaching.
- Life is more than academics!
- Sign up for the laundry service.
- Challenge your professors!
- Find joy in each day; don't aim to study all the time.
- Get to your classes on time and have fun!
- Come to class reunions—you will keep seeing Carleton in new lights.
- Take time to explore all corners of the arb, sit and observe and listen—breathe deep—then go back to the books.
- Make friends with your classmates, teachers, and college staff-if you make an effort, they can enrich your life and career.
- Relax, taste a little of all life's experiences, make wise choices—and don't forget to study.
- One of the most important courses that almost all students should take is business management.
- Keep calm and graduate.

The rest appear to apply equally to all young people:

- Listen to your elders—always remember they've been there.
- Be like a trout; it is sleek and fast, but can't swim backward.
- Learn to speak another language fluently by living where they speak it for at least six months.
- When life seems chaotic, confused, or even deeply disappointing, take time to breathe deeply and enjoy nature.
- Explore widely until you find your passion.
- Choose Great National Happiness over Gross National Product.
- Music — sing, play, listen, dance, write!
- Follow your heart but keep your feet on the ground.
- Treat others as you would like to be treated.
- Don't give advice. (editor's note: didn't that just happen?)
- Failure is just a momentary obstacle to success — never give up.
- Having more material things does not increase one's degree of happiness—having good human relations does increase happiness.
- Marry the right person—the rest is detail.
- Never stereotype anyone, nor place anyone in a box (e.g. "jock" or "player" or "nerd")- they are all multifaceted complex individuals.
- Have courage and be kind.
- You will hear a lot of chatter about various issues in life; try to ignore 99% of this and critically look for the core.
- Follow your heart but do so using your head.
- Don't compare your insides to everybody else's outsides.
- Take care of your physical and emotional health—your work is not more important.
- Keep up your friendships as your life changes—there is real value in long-term friendships.
- Every day, do something that does not compute!
- Don't be afraid!

- Listen!
- Talk to the person next to you—it could change the direction of your life.
- Carpe Diem- you may never pass this way again.
- You can't be grateful for everything, but you can be grateful in every moment.
- Proverbs 3:5-6 (Trust in the Lord with all your heart and lean not on your own understanding, in all your ways acknowledge him, and he will make your paths straight.)
- Joy happens.
- Travel, learn another language, live in another country, sing, get outside and hike!
- Be kinder than absolutely necessary—you never know what struggles another person is facing.
- Be courageous with your ideas.
- Make a mistake EVERY DAY to grow and learn—just NOT the same mistake over and over again.
- Get over it.
- Carry on and remain calm.
- Do what you agreed to do, on time and to your best ability, and you'll easily be in the top 5%.
- Hope is not optimism, or woo-woo—it's the realization that we cannot predict what will happen, even in the next second—it's in that realization that hope lives.
- The fear of the Lord is the beginning of wisdom.
- Bloom where you're planted, trust serendipity, and be grateful.
- Do not be afraid to be wrong, speak up, but be respectful of others.
- Marry well and infrequently.
- It is important to learn to ask the right questions.
- Do not trust the theology/ideology of anyone who cannot genuinely laugh at themselves.
- Join a book club.
- To thine own self be true—otherwise, strive to do good and be happy.
- Discernment.
- Before you do anything you might think twice about, consider how long it will be recalled by your friends.
- Enjoy every minute!
- Fight fair.
- Be strong enough not to hate.
- Grit!
- Be yourself.
- Don't expect the world you are heading for to have safe spaces if your feeling are insulted and people can't have opinions diametrically opposed to yours!
- Live the life you love, and love the life you live.
- Do something in life you are passionate about—love, be generous.
- Get active, because the revolution will not be televised.
- Be grateful, be kind and love life fully.
- Have music in your life-it can be a "team spirit"—it requires discipline and is soul satisfying.
- Do not get married before age 30.
- Seek out conversation with people that are much different than you, take the courage to do that and listen deeply.
- Be open to what you may learn from people who might find you interesting.
- Enjoy life and share your joy with others.
- Keep your left arm straight and your head down.
- "Living with the consequences of your actions" (Owen Jenkins 1966)
- Learn from your failures.
- Pay your bills on time.
- Learn from your own mistakes.
- Don't be afraid—take risks; for success often follows failure (sometimes repeated failures).
- Don't sweat the small stuff, and much of life is small stuff.
- Go out of your way to be kind.
- Learn to love yourself and get along with others.
- Wisdom comes with age, but sometimes age comes alone.
- Color outside the lines—there's always a way to be resourceful.
- For young men—always flirt with older women; they know it's a game and they love it.
- Expect to do something very different than what you expect to do now.
- Measure "listen/talk" ratio (must exceed 2:1); ask what your customer/client needs, before you reveal what you can do.
- Pick a beautiful mountain meadow, go there and spend at least one night.
- Always add a 10% grace factor to everything you do.
- Learn to love yourself and others—respect differences!
- Think for yourself—challenge political correctness!
- Be respectful, but don't be intimidated.
- A ship is safe in harbor, but that is not what ships are for.
- Don't be afraid to change jobs or careers; it doesn't mean failure, it is normal.

- As part of your education and preparation for the working world, learn how to deal with stress, because the more intensely you get involved in things, the more it can eat you up.
- Whatever you choose to do, do it with class.
- Never lose your thirst for knowledge and never discount the ideas of another.
- Practice kindness, dignity, and respect.
- You can charge more if you put it in Greek.
- Retain an open and critical mind, always be a skeptic but never a cynic, spread love, be of use to others.
- Try hard not to lie to yourself, much less others- misnaming things is a great way to lie.
- Don't work for jerks!
- Love yourself and follow your heart and intuition—between pessimism and optimism, choose optimism.
- Remember to relax and have fun.
- "Don't look back, something may be gaining on you"—ponder that quote- it gets stronger as you get older!
- My parents always said that one's faith should keep one's body as a temple to protect from illegal substances, and they added that science says we only need water and food.
- Listen, and remember that change is the only constant, and that listening offers the possibility for change.
- "This above all- to thine own self be true" – easier said than done, but you can do it!
- What is the meaning of life- Freud: "love and work," Maharishi: "be useful and happy."
- Follow your heart, listen to your gut.

Program Information

Although there was one presentation and several speakers at the 3 to 4:30, Saturday afternoon session headed by Lawrie Cherniak and entitled 'Facing an Uncertain Future,' the printed version of the presentation by Michael Gordy was requested by several.

The subject of our meeting here is 'facing the uncertain future', which seems to imply that the uncertainty of the future is something new. But the future has always been uncertain, and if that really is a problem, it is a perennial one. A newer problem, and one that may be unprecedented, is the way that the future of humanity seems to have become increasingly certain over the past forty years or so. I've had a few thoughts about this which I'd like to share with you.

First of all, uncertainty about the future is the foundation of hope. No matter how bad things look, uncertainty allows us to believe that the future might hold some pleasant surprises, if not for us as finite, mortal individuals, then for the human race as a whole. Second, some people try to relativize current problems by pointing out, for example, how dark things looked in the Western world in the 14th century, and how nonetheless humanity struggled through that time and eventually experienced a Renaissance. In that instance, of course, the Arab world and the Middle Kingdom conveniently kept the flames of culture and civilized behavior alive, even though our current punditry and Western-oriented scholars often don't seem to think that this counts for much. So the West survived and now aspires to rule the world, or so it seems.

We have arrived at a stage of history where virtually the whole world is organized around a Western-originated system whose internal contradictions and material self-destructiveness are seemingly out of control, and where according to the system's own logic it is unsustainable. In terms of human survival, that self-destructiveness is dragging us towards collective suicide.

Most of us who contemplate this are terrified, for we have been raised to think of the system as having a life of its own. We overlook the obvious fact that all social systems are the dynamic product of human interaction and that all social relations can in principle be changed by people acting together. If we forget this fact, we become paralyzed, ensuring that a future that is still uncertain becomes certain. That seems to be what has been happening, but I think that things are starting to change. Before getting to this, however, let's have a brief look at several important features of our present reality. Two aspects of our current condition present particular terrors.

First is the economic system. Seen from the perspective of private monetary accumulation, which is the only metric that seems to count in capitalism, it is immensely more 'profitable' to speculate than it is to produce anything or to render any kind of non-financial service. Even sections of the business community recognize that this is unsustainable, but there are few serious ideas being put forth in that world about what to do about it. The inherent individualism and competitiveness of business practice makes a concerted, collective response from the top extremely improbable and, for most people, hardly imaginable. Everyone at the highest levels of the financial and corporate elite seems to be scrambling to grab as much as they can for themselves before the inevitable collapse occurs.

Second is the environment. Can we preserve a minimal physical environment that will allow humans to survive? The private accumulation of monetary profit makes that goal a fool's errand. Any effective, widespread action just does not make "business sense." For the past five years I've consulted with the World Meteorological Organization about the economic and political barriers to meaningful responses to climate change. This has led me to the brink of despair. I have concluded that "business sense," like "business ethics," is an oxymoron when applied to human survival.

The inescapable connection between what we call 'our way of life' and the rapid acceleration of all forms of environmental degradation should be obvious to any one of us who opens his or her eyes to the world and remembers what our physical environment was like when we were kids. The explosion of consumerism fueled by the postwar boom that many of us Americans enjoyed was expressed ideologically as the worship of 'growth,' with little thought about what growth means, both environmentally and socially, when it is not subordinated to the need all of us have for a peaceful, healthy, equitable, and just life.

The boom times of our youth spoiled us and gave many of us a rather superficial sense of hopefulness. After all, we lived in a country that was the most powerful in the world, both economically and militarily. Ours was a life of possibility, especially if we attended an elite school like Carleton. Environmental degradation was not part of the dominant discourse then, nor did most of us have any idea of the effects our boom times had on so many parts of the rest of the world. So the subsequent disintegration of what we had felt was the normal course of things has come as a shock, shaking our sense of the uncertain future that I said was a foundation of hope. That is why, as the future begins to look terrifyingly certain, we mistakenly think of it as increasingly uncertain.

We grow old, and the hopefulness of our youth has passed into history along with the boom times. We worry about the future because, although we are near the end of the line, there are people we will leave behind whom we care about. And we sense that finding meaning in the present is pretty much impossible if we really believe there is no future for the human race. So what can we do?

The first thing we can do is to think about what is happening from new perspectives, opening ourselves to a more systemic and historical understanding of what is happening to us as a species. We can all do this by talking with each other and by expanding our conversations to include people who may not be part of our usual circle of interlocutors. If we really are people capable of making "critical and independent judgments" as claimed in the Carleton catalogue of our youth, and if we are capable of critical self-reflection as well, then what I'm suggesting is already part of our lives.

The second thing we can do is to recognize that piecemeal changes and tinkering simply will not do the job, and that a far-reaching transformation of the way we produce, distribute, and consume on this planet is everyone's most urgent task. If we do not do whatever we can to contribute to this, according to our present capacities, then that transformation will occur anyway but without our participation, and that it will most likely have characteristics we will abhor. Without such a transformation we will be facing either a complete monetary breakdown, with all the suffering that this implies, or,

if we continue on the path we are on, the destruction of the environmental basis of human life.

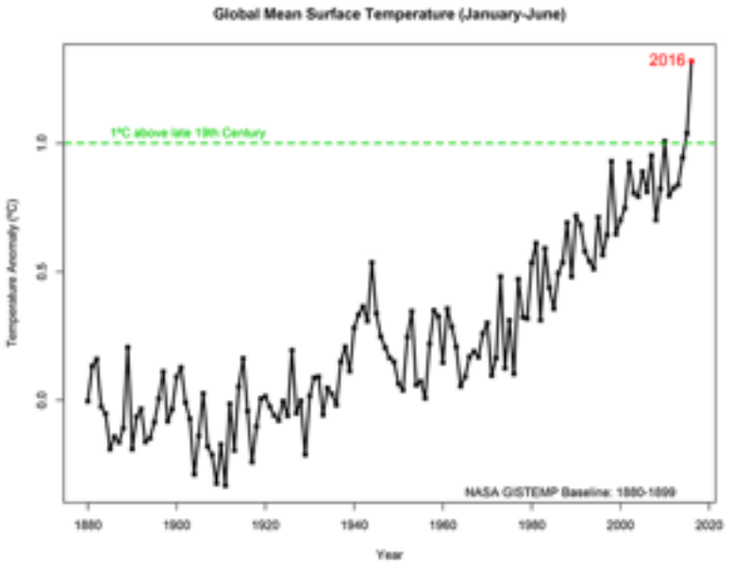
The first alternative is the more hopeful one, since if money loses its value, as would occur in a global monetary collapse, this will not mean that there won't still be things to do, materials to do them with, and people who know how to do them. What it will mean is that the world's social relations, insofar as they are based on money, will collapse. The things people do for money they will no longer do, and relationships based on the amount of money one has will be finished. New social relationships, if they have a chance to emerge, will do so rapidly and will be based on two values that have little place in the present system except as pious hopes, namely, cooperation and sharing. Must we await a global economic disaster to take steps in a positive direction? Or can we contribute to moving these values to the forefront now, even though we are in our dotage?

One of the more hopeful signs these days is that a great many people on the planet are beginning to recognize the necessity for thoroughgoing change and starting to resist the direction we are headed. This resistance is opening up a space for people to think together about ways to stop the machine-like march towards human extinction. We need to enter that space. We need not only to think from the perspectives I mentioned earlier but also to seek openings to encourage and contribute in practical ways to this hopeful dynamic.

I am well aware that what I'm suggesting does not constitute an answer. I've tried, however, to indicate first steps that people here can take. We know that ideas are powerful, and we must join together to contribute to ideas that offer at least the possibility of returning us to the uncertainty of the future. But we are also obliged to do what we can to help implement those ideas. We must not allow a 'certain' future to overwhelm us. We are not permitted to 'retire.'

Divestment: Yes or No

Again, back to the session on 'Facing and Uncertain Future,' the final speaker and a member of the Carleton College's board of trustees strongly suggested that we persist in asking the College to end its Divestments in fossil fuels. As a follow-up, Clay Russell provided this website, https://ericgrimsrud.org, "On the science and implications of climate change." This site is a blog written by a former St. Olaf student who Clay knew through basketball. The author of the blog is Eric P.G. Rimsrud, who has a 1970 Ph.D. in Analytical Chemistry from the University of Wisconsin-Madison and who is a retired faculty member from Montana State University. His blog is thorough, well written, interesting, and comprehensive. One recent post worth reading is entitled 'Our colleges' and universities' cowardice concerning divestment.'



Japanese Garden at Carleton

Shortly after the 50th Reunion, Visiting Associate Professor of Biology, Sue Moyle Studlar, provided a report on the mosses and lichens in the Japanese Gardens to Professor Emeritus Bardwell Smith. She had committed to this report at some point during our 40th Reunion, had dinner with Professor Smith at the 50th and, as a result, sent a copy of the following to Professor Smith. Some of her photographs are inserted.

THE JAPANESE GARDEN at CARLETON COLLEGE from a Lilliputan Perspective: Mosses and Lichens

by Susan Moyle Studlar (Class of 1966) on 24 June, 2016
Curator, Bryophyte & Lichen Herbarium, West Virginia University Morgantown, WV

Preliminary List of Species: Based on a few collections made By S. M. Studlar on 6-19-16. Note: More species, especially of lichens, are present in the Garden than this brief inventory revealed. And more bryophytes and lichens will continue to arrive and colonize. Substrata in the Garden are noted.

Mosses

- *Ceratodon purpureus*. Purple moss. Disturbed soil by faux moss - Scottish Moss (angiosperm, pink family)
- *Entodon seductrix*. Cord glaze Moss or Seductive Entodon. On granite boulders and in between wooden slats of benches
- *Grimmia laevigata*. Hoary Grimmia. On granite boulders.
- *Hedwigia ciliata*. Medusa Moss. On granite boulders.
- *Leskea gracilescens*. Necklace Chain Moss. On wooden benches and granite boulders.

Lichens

- Sunken Disk White Crustose Lichen. (Species unknown; specimen not collected). On top of granite boulders.
- *Dermatocarpon luridum v. xerophilum*. Common Leather Lichen or Brook Stippleback (xeric/drought- tolerant variety of a stream species). On shaded part of granite boulder.
- *Phaeophyscia adiastola*. Powder-tipped Shadow Lichen. On stone lantern, benches, granite boulders.
- *Xanthomendoza fallax* (formerly Xanthoria fallax). Hooded Sunburst Lichen. On wooden benches.

Cryptobiotic Crust

Cyanobacteria and filamentous green algae. On shaded part of granite boulder, forming small black sheets.

Background Information

What are Lichens? Lichens are symbiotic organisms comprised of photosynthetic algae or cyanobacteria (formerly called blue-green algae) and fungi. The name of the lichen is the name of the fungus which comprises most of the lichen. Two growth-forms of lichen are present in the Garden are foliose and crustose. Foliose lichens are leaf-like with an upper "skin" (compact fungal cells) and a lower skin (cortex) and can be removed with a knife. Crustose lichens have an upper skin but no lower skin and are therefore inseparable from the substrata (e.g., wood or rocks).

What are Mosses? Mosses and liverworts are bryophytes, small plants that produced stalked dependent spore capsules. They are sponge-like plants ("non-vascular" plants with limited conducting tissue for food and water) that, like virtually all bryophytes, possess a remarkable physiology allowing them to revive quickly from a desiccated state, and endure repeated wet-dry cycles.

What Lichens and Mosses are Present In the Garden? Several species of foliose lichens are conspicuous and dominate the benches as well as (in part) selected boulders and rocks. Generally, however, on the slabs and boulders, crustose lichens prevail. No crustose lichens were collected for identification, as a rock hammer would be needed to remove them! One of the most striking crustose lichens, a white species with sunken reproductive bodies, dominated the tops of two granite boulders.

Where Did the Lichens and Mosses Come From? Propagules rode the wind, the water (rain) and animals (from mites to mammals) and by chance landed in favorable microsites in the Garden where they were (and are) competitively superior: such sites are severe from the standpoint of flowering (and other "vascular" plants with well-developed conducting tissue for food and water); these sites include hard rock and bare wood, where nutrients are scarce, water evaporates quickly, and the temperature may fluctuate widely.

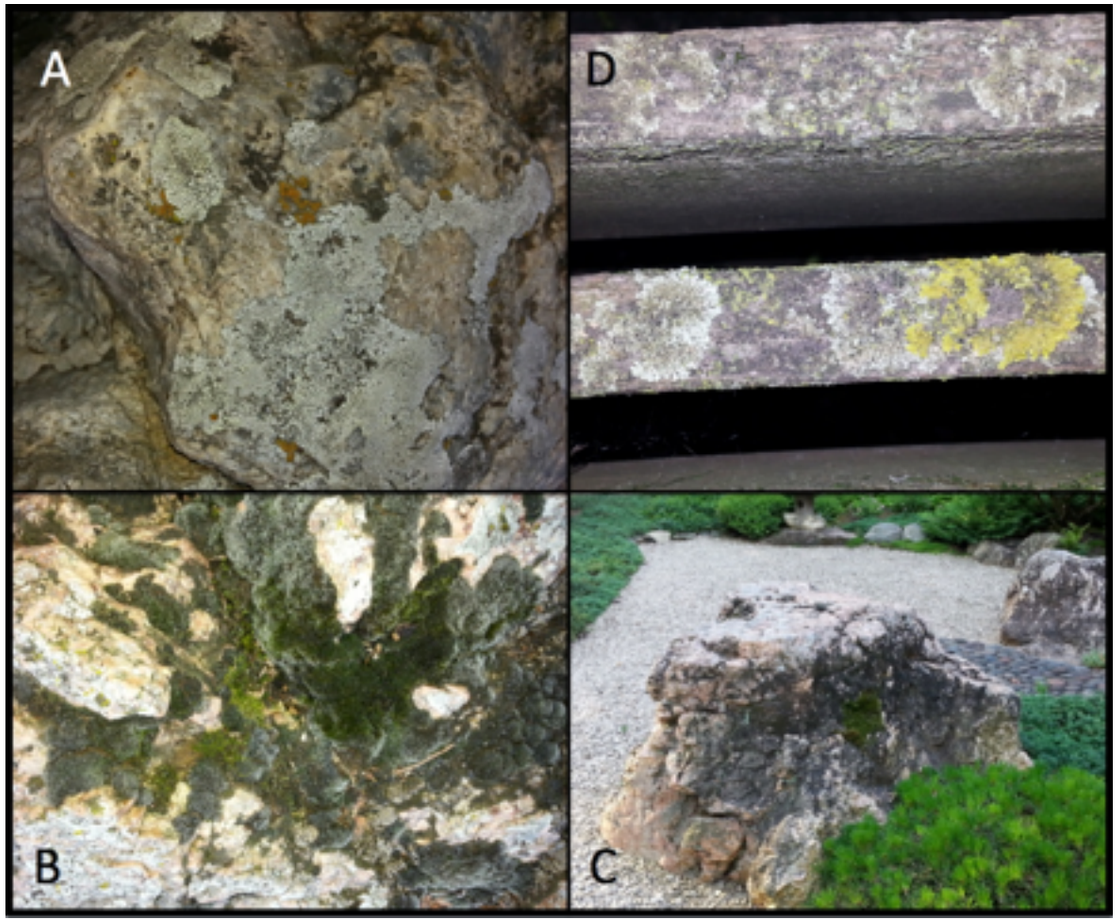


Figure: A. Crustose areolate lichen. B. The moss *Grimmia laevigata* some plants of which are moist and others dry depending upon their position on the rock. C. *G. laevigata* on the shady part of the rock. D. *Xanthomendoza fallax* and *Phaeophyscia adiastola* on slats of the bench.

Lichen Arrival and Establishment. Some lichens arrived as a fine powder (soredia) that is comprised of "baby lichens" (clumps of algae and fungi). Soredia are in effect extremely small lichen fragments, and lichens and are famed for their ability to break into pieces, each piece capable of growing into a new colony (fragmentation/asexual reproduction). Both soredia and fragments are starter lichens (symbiotic propagules), with fungal partner and algal partner together in one convenient package (although lacking skin or cortex in soredia). Lichen powder and larger fragments could enter the garden on the feathers of birds, fur of mammals, even bodies of mites or be deposited by wind and rain. Lichens also occasionally start from scratch: independent fungi and algae meet up and form a composite organism. This depends on separate dispersal and chance meeting of the two partners, fungus and alga, as described below for *X. fallax*.

Xanthomendoza (Xanthoria) fallax or the hooded sunburst lichen is named for its bright colors and for the abundant marginal soredial clusters that fill up hood-like spaces between upper and lower skins (cortices). It grew with the powder-tipped shadow lichen on the sunny side (upper surface) of bench slats in the Garden. *X. fallax* was bright yellow or orange due to a sunscreen unique to lichens. It also had beautiful orange splash cups (apothecia) from which spores could be splashed out by rain and then picked up by the wind. If a spore happened to land in a favorable microsite, it could germinate into a tiny fungal colony that rested and waited for the opportunity to capture wind-blown algae (of the correct species). Fungus and algae could potentially develop into a new lichen, with the fungus assuming the characteristic form and colors of *X. fallax*. Such de novo lichens benefit from genetic variation since the spores produced by the splash cups (apothecia) are sexual (produced by meiosis) rather than asexual (produced by mitosis).

Phaeophyscia adiastola, the powder-tipped shadow lichen in the Garden (boulders and benches), like the hooded sunburst lichen, displayed both soredia (asexual reproduction, based on mitotic cell division) and black apothecia (sexual reproduction of the lichen fungus, based on meiotic cell division). The species is named for the abundant soredia along its margins.

Dermatocarpon luridum or the common leatherback lichen was found on a granite boulder in the Garden. This species produces conidia, reproductive cells that can either behave as asexual spores, germinating into fungal filaments or as male gametes that fuse with female gametes, assuming a chance encounter of the sexual kind. The conidia are

released from sunken black flasks (perithecia) that are sprinkled all over the outer skin like pepper - or "stipples" - hence the lichen's alternate common name: brook stippleback. Stipplebacks (i.e., leatherbacks) are characteristically brown when dry (due to the sunscreen melanin, chemically distinct from human melanin) but this particular species (*D. luridum*) turns bright green when wet (a diagnostic feature). Fungal hyphae become transparent when wet, so that the green of the algal partner may shine through in some species.

Although it may seem surprising that brook stippleback occupies a boulder in the Garden's faux dry stream, the variety, D. luridum v. *xerophilum*, is a xerophyte (drought tolerant) and thrives on tombstones and isolated boulders, according to Brodo et al. (2001). With its brown, black-dotted, shell-like overlapping thalli, it is relatively easy to recognize.

A crustose sunken disk lichen (species not determined), found on top of granite boulders in the Garden, was abundantly fertile, with sunken black apothecia. This lichen's thallus (body) is comprised of little pieces (areolae) in a regular geometric pattern (resembling cracked mud) growing upon an underbelly (hypothallus) of lichen fungus. This areolate lichen with apothecia is well-equipped for both sexual reproduction (fungal spores are released from the disks sunken into the areolae) and asexual reproduction (Areolae can split off from the main colony and start new lichens). There are numerous species of lichens within the sunken disk crustose lichen category; microscopic examination and chemical tests would be needed to determine the species.

Moss Arrival and Establishment. The air is full of moss propagules, both fragments (asexual reproduction) and spores (sexual reproduction from spores produced by meiosis). Each moss spore capsule produces hundreds to thousands (and in some species millions) of spores, each spore a potential moss plant if dispersed to a favorable microsite.

Hedwigia ciliata, or the Medusa moss is common on sunlit exposed rocks and was found on a granite boulder in the Garden. Almost always fertile, with stalkless capsules hidden among the leaves, it releases abundant spores into the wind. Garden colonies showed immature reproductive buds at the time of collection. Like hoary Grimmia (*G. laevigata*), it is a dark when dry and bright green when wet, with white- frosted leaf tips.

Leskea gracilescens, the necklace chain moss, was found on the granite boulders and on the sides of the bench slats, which provide relatively cool and moist microsites compared to the lichen- supporting sunny bench slat tops. *L. gracilescens* is commonly a floodplain species, growing on trees along rivers. The faux dry streambed of the Garden provided a suitable equivalent habitat; colonies produced numerous stalked capsules.

Grimmia laevigata, hoary Grimmia, found on granite boulders in the Garden, typically occupies exposed rocks, often along streams. It commonly lacks spore capsules, as in the Garden colonies. Yet hoary Grimmia may have arrived as spores or fragments from distant colonies. Grimmia is often called black rock moss; it is black when dry (due to a sunscreen in the cell walls) and green when wet; the transformation can be almost instantaneous. The frosted white appearance of hoary Grimmia is due to long white hair-like leaf tips - a common feature of xeric (drought-adapted) mosses.

Entodon seductrix, the cord glaze moss (a.k.a. seductive Entodon), found on granite boulders in the Garden, also likely arrived by both fragments and spores. Sporophytes (spore capsules) are common in this species (although none were seen in the Garden colonies).

Ceratodon purpureus or the purple moss, was found growing by the faux moss called Irish moss (a flowering plant in the pink, carnation or Caryophyllaceae family) in the Garden. Typical of disturbed habitats,

it is characteristically highly fertile. Garden colonies displayed abundant old spore capsules.

Cyanobacteria and filamentous green algae formed a black crust on a shaded part of a granite boulder, indicating periodically wet conditions. Cyanobacteria (formerly called blue-green algae) are ubiquitous in soil, and are often carried by wind, water, and animals. Worldwide, such cryptobiotic crusts/biotic crusts help prevent erosion and contribute to nitrogen fixation (taking nitrogen out of the air and putting it into the soil).

OVERVIEW AND CONCLUSION. In natural communities, it is common to see a rich green moss layer below and a lighter, sometimes colorful lichen layer above, as on tree bases (moss green) versus tree trunks (lichen pale to bright). Throughout the Garden this classic zonation of lichens above and mosses below can be seen; lichens prefer brighter and slightly drier conditions than mosses.

The mosses that have "volunteered" in the Garden are perennials varying from slender green threads of Leskea to the robust black to green colonies of Grimmia; these species may endure for years while disturbance loving Ceratodon is often transient. Many mosses and lichens grow on rocks and trees by or in intermittent streams; the "dry stream" habitat of the Garden serves as home to the floodplain moss *Leskea gracilescens*, and a drought-tolerant variety of the otherwise aquatic foliose lichen *Dermatocarpon luridum*. Most lichens in the Garden, however, are unidentified crustose species that form intricate mosaics on the rocks. Foliose lichens in the Garden are more conspicuous and include the three readily identifiable species in my list (plus others that I could not identify in this brief survey). The hooded sunburst lichen (*X. fallax*) is especially noteworthy with colors ranging from gray to green to yellow to orange depending on sun exposure and whether wet or dry.

Overall mosses and lichens add subtle, delightful touches to the Japanese Garden, not only displaying diverse textures, forms, and colors but also enhancing the illusion of a flowing stream by the presence of actual denizens of intermittent streams - species that rest and revive as water disappears and reappears. All mosses and lichens, whether stream species or not, are similarly capable of alternate rest and revival, a life strategy that human visitors to the Japanese Garden may well be inspired to emulate!

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  We recommend that *Hedwigia ciliata* be used in Green Roofs.
- Studlar, Susan Moyle and JeriLynn Peck. 2007. Commercial moss harvest in the Appalachian Mountains of West Virginia: Targetted Species and Incidental Take. Bryologist 110 (4): 752-765.
  We consider commercial moss gathering (for sale in arts, crafts, and horticulture, and its potential ecological impact, notably harvest of non-target species.