For this third in a series of talks about our University’s second century, I’ll talk about “insights,” which Webster’s Collegiate Dictionary defines as seeing beneath surface appearances into the nature of something. Insights are sometimes regarded as intuitive, like revelations. Thus an insight may resemble “epiphany,” or an eye-opening event.

An insight as instantaneous flash may be memorable. Or, a single insight may come on slowly, as part of a cluster or train of linkages among obscure observations—harder to remember.

Cheer up: I can only remember a dozen insights that I’ve had in all, spanning 50 years. Moreover, I’ll explore only a small sample of those insights here today.
Confession: I am partial to books written by Bill Bryson. He is a gifted writer and interpreter of history for amateur analysts of history like me. Bryson’s (2010) *At Home*, for example, alerted me to the hectic pace of social, technological, and scientific change that England experienced in the mid 1800s, when that nation was in the grips of its industrial revolution.

Bryson’s skill as an interpreter of special material for non-specialists has been recognized by publishers. And by historians. And by some scientists. One such recognition was the invitation for Bryson to edit a volume of contributed chapters to celebrate the occasion of the 350th anniversary of one of the world’s most outstanding and respected “clubs.” In 2010, the Royal Society of London celebrated the achievements and highlights since its founding in 1660, as well as forward to what the RS might experience by the time of its 400th anniversary in 2060.
Here’s the cover of that remarkable book, “edited” by Bill Bryson. He did write the overview chapter, which is perceptive, and conveys the thrills he experienced while visiting and residing at RSL’s London headquarters.

There have only been a relatively small number of Fs of the RS in its first 350 years: about 8,200.

Bryson may well have chosen the book’s title. I recognized it as a key fragment of the quote attributed to Sir Isaac Newton, one of the early Fs of the RS. It always seemed to me to be a clear declaration of modesty by Newton, to say that his insights should be credited to scientific giants on whose shoulders he figuratively stood to see farther than those giants could.
Historic reality may not support notions of Newton’s scientific modesty, however.

Orion, the Greek god whose name graces the constellation, was a physical giant in mythological accounts. And Orion was equally characteristically invested by Greek humans with human appetites, shortcomings and sins. Zeus had punished Orion with blindness for consorting with, and impregnating, a goddess. Zeus was not mean-spirited, so Orion was to have his sight restored in return for finding where the sun rose (dawn). Guided by the sighted “dwarf” human (= Cedalion) Orion did find the dawn, and his sight was restored.

The Renaissance artist, Poussin in 1658, painted this scene celebrating the story of Cedalion guiding the blind Orion in his search for where the sun rises. I suspect that this painting inspired Newton’s quote as much as did the just-so story of his modesty.
This artifact is in the archives of the Royal Society. Anybody know what it is? I’d have guessed a medieval mousetrap. Or a thumbscrew. The builder and owner of this item spent 50 years after the age of 40 as an F of the RSL, highly productively: His portrait; His name. Now?

**Leeuwenhoek illustrates two key attributes of the RSL that Bryson highlights.**

1. The RSL has always been international, to a fault. Antoni van Leeuwenhoek was a Dutchman. When British Captain James Cook FRS circumnavigated the globe in the 18th century, he bore papers from RSL that immunized him and his ships from impoundment by upstart, rebellious American colonists. Sir Humphrey Davy, likewise travelled through Europe during the Napoleonic wars, with a letter of dispensation from Bonaparte himself, and was treated to a toast to the Society in Paris (but not to Britain) in his honour.

2. The RSL has been scrupulously open to all classes of citizens. Leeuwenhoek had no Latin, Greek, or English, scarcely any formal education, and even wrote his reports (~200 of them) in a low-class dialect of Dutch. Bryson goes on…

3. The RSL is one of few organizations anywhere to have lasted 350 years with its original charter, purpose, and importance.

4. Characterized by its constant, multiple meetings among scholars, all specialties.

5. Infinite Breadth of interests, and democratic;

6. Articulate: RLS has always honoured not only the best of scientists, but the best of scientific writers, or articulators of science (film, art, instruction).
A further characteristic of the RSL has been its uncanny ability to recognize and honour talent that most people would consider still unproven or latent. Charles Darwin was elected a FRS in 1839, two years after returning from the second voyage of HMS Beagle, before he even started his work on Cirripedia or barnacles, and 21 years before the publication of his treatise, Origin of Species.

RSL was quartered at Gresham College in central London for its first 50 years. Gresham College still exists, within the University of London, now 421 years after its founding in 1597. The College still has faculty, but students do not enroll there. Instead, its chief activities are invited celebrated scholars’ public and free lectures. A forerunner, perhaps, of certain free public UAF-OLLI lecture series?
Our University had a modest enough start, as far as its physical plant. One building, Old Main. But it grew.

There are four buildings in the 1938 photo that are still standing on campus, two of which are easy to see; two of which have moved since 1938.
Our University happens to have selected 1917 as its date of founding (from among a number of at least as logical choices, ranging from 1914 to 1922). In 1917 there were neither students enrolled, nor buildings erected, humble or great.

Never mind: no reason not to honour the institution and to wish it well.
Truth be known, my first “insights” during my graduate degree research came about—not by design—but snuck up on me, almost completely by a series of accidents.

After classes at UA in 1967-68 I headed to the Arctic to compare the thermal and metabolic adaptations of an Arctic-nesting species of bird with those of a closely related species NOT adapted to breed in the Arctic. A nice, straightforward exercise in comparative physiology (a young synthetic field of biology bridging disciplines of evolutionary biology, physiology, and ecology). I chose the Pomarine Jaeger, *Stercorarius pomarinus* for comparison with the Herring Gull, *Larus argentatus*, a species recently well-studied in the temperate Netherlands by Rudi H. Drent.

The jaeger is basically a gull that specializes in preying upon microtine rodents on tundra near Utqiagvik (Barrow) when lemming populations are abundant.

The predicted 1968 lemming population peak did not materialize; jaegers did not arrive to breed, and I was marooned with my equipment to determine the incubation schedules of jaegers nesting in the Arctic, compared to gulls in the Temperate latitudes of the Netherlands.
The very person who had predicted a peak lemming population soon arrived for his summer field season at Barrow, and promptly invited me into his stable of colleagues. Dr. Frank Pitelka, of UC Berkeley envisioned me in his field team of ecologists: students, assistants, and visiting scientists from other countries.

He and they suggested that I could contribute some useful observations on comparative physiology of incubation and growth of young birds to his team’s efforts.
Pitelka, his colleagues and students graciously adopted me into their fascination with the sandpiper genus *Calidris*. These species and the other members of the subfamily were anomalous, because there were abundant representatives breeding together on tundra in northern Alaska.

Birds are favorite objects of study by naturalists. We humans relate to them comfortably because they are visual animals like ourselves, all but a few groups, like owls, being day-active. Their biggest drawback as objects of biological and biogeographic study?

They do not preserve well as fossils. Their bones are too frail to permineralize well. So old-school biologists like John James Audubon, Charles Darwin and my major faculty advisors inferred phylogenetic relationships, constructed evolutionary histories and so on before the advent of DNA analyses, such as this recent DNA-based cladogram for the group of calidridine sandpipers. Remarkably, the older morphology-based inferences about bird relationships and phylogeny have held up very well at the level of genera and species. (Not so well at higher levels of classification, such as birds’ belonging to a group of vertebrates that includes dinosaurs—another story).
Besides not leaving a good fossil record with their delicate bones, some groups pose a second challenge to visual observers: How can we tell one species from another!

Unless you are a particularly keen birdwatcher in prime coastal areas, these species of sandpipers are devilishly hard to tell apart.

Fortunately, that problem of visual similarities is mostly overcome in the Arctic by the species’ distinctive habitats, specialized vocalizations, differing migration and breeding schedules, and other characteristics that are accentuated during their short, hectic Arctic breeding season. Even I managed reliably to identify which species I was observing.