

Chapter 13 Apollo and Icarus

Daedalus warned his son not to fly too close to the sun, as it would melt his wings. They saw still other coasts recede and fade, when Icarus, emboldened by the ease of flight, darted out of his father's track and steered to higher zones with boyish daring. But the threatened punishment came swift and sure. The powerful rays of the sun melted the wax which held the feathers in place, and before Icarus was even aware of it, his wings dissolved and fell from his shoulders. The unhappy boy tried to fly with his bare arms, but these could not hold the air, and suddenly he plunged headlong through the sky.

-Gustav Schwab

Gods and Heroes, p. 84, Pantheon Books, 1946

The ferry in summer 1969 from the Belfast docks to Scotland departed before noon. It was a magnificent ship, taking us and our auto to Ardrossan, on the Firth of Clyde west of Glasgow. The duration was about eight hours, and the sun was low in the west when we drove away on Scottish soil, a bit the worse for wear and ready for the B&B that we quickly found.

Anticipation for the highlands escalated while we drove north past Loch Lomond. After just two previous visits, I loved Scotland; but the priceless opportunity of it was being there with Fred Hoyle and Willy Fowler. They stood on the pinnacle of nuclear astrophysics in 1969, and their output throughout the 1960s had been prodigious. I was, along with Al Cameron, the “new boy”, a fourth voice making a science from their ideas. I was Willy's protégé and becoming one of Fred's. Anyone who has ever been in a privileged relationship with the world's most important thinkers in the topic that dominates his life will know what I felt. I was impatient to rejoin them; and in the Highlands I had them almost to myself.

A highlight of the drive became an endearing image in my mind of the highlands in the 1960s. Approaching Fort William from the south one faced the problem of getting around Loch Leven, a spot of great beauty famous for Glencoe, site of an historical massacre by the hosting Clan Cameron of the visiting Clan McDonald. Loch Leven sticks its long finger ten miles eastward between the mountain ranges, and in those days one had either to ride its length eastward on the south side and return that same length on the northern side before continuing north or find the ferry to be operating across its mouth at Ballachulish. Luckily the ferry was operating on this day, which was fine and clear. I watched Donald and Devon throw stones into the water as the ferry returned across the narrow neck of Loch Leven to its southern side. This ferry was a small open barge, capable of parking six cars at most, but seldom full. What a romance for this American, awaiting a ferry to transport an automobile across a quarter mile of water so that a grand adventure could be consummated. These were still the days when the British Isles possessed adventurous scope, when distances seemed large and cultural pockets historic and understandable. I found this to be a precious aspect of many experiences, of which the Ballachulish ferry is but one. So many of them are now gone, destroyed by the capabilities of human engineering. Today a modern bridge reduces Loch Leven to no obstacle at all. Allowed by the ferry to resume our travel, we slept one night in Fort William, on the western foot of Ben Nevis, the highest point in the U. K., before

continuing along glorious Glen Shiel, past *The Saddle* and the *Five Sisters of Kintail* and other famous Munros² to The Loch Duich Hotel. This same hotel had been used during our first visit to the Highlands in 1967. I arrived in euphoria, again to be with the two most important friends of professional my life.

In addition to Fred Hoyle and Willy and Ardie Fowler, who were already settled in when we arrived, the party contained Wal and Anneila Sargent, Stewart Harrison, and Vahe Petrosian. All but the last two had been on our first visit two years earlier. All but Ardie Fowler and Stewart Harrison were astrophysicists of the highest order. Ardie, Anneila and Mary Lou amused themselves in other ways while we climbed a sequence of memorable peaks above 3000 ft. We climbed *Aonach Meadhoin* (3284 ft), rising above The Cluanie Inn on the western end of Loch Cluanie, and *Ciste Dubh* (3218 ft) in the Five Sisters, *The Saddle* (3317 ft) on the opposite, south side of Glen Shiel, and *Ben Sgritheall* (commonly *Sgriol*, 3196 ft)), each climb begun from loch level. This area provides some of the finest mountains in Scotland.



The author atop Liathach with Fred Hoyle

Conversation during these outings took on its own peculiar rhythm, returning without preamble to a topic from hours, or even years, earlier. Firstly, it must be understood that Fred Hoyle was our alpha. Soft spoken, modest, always contemplative, we all silenced our jabbering when Fred decided to speak. He was our leader, whether on Munros or in astrophysics. For this reason we spoke to Fred and to Fred's interests most of the time. Willy and I made several excursions into the synthesis of radioactive ^{56}Ni and its subsequent effects in supernovae, because our paper had just appeared in print at the year's beginning and because all of us shared a special fondness for the lengthy struggle toward a correct explanation of the high abundance of ^{56}Fe , the topic of Fred's 1946 initiating paper on nucleosynthesis in stars. But excursions into our favorite topics were usually short and terminated whenever Fred spoke what was on his mind. Vahe Petrosian had written an important paper with Salpeter about neutrino emission processes in stars, and it got some topical excursions because neutrino emission influenced the ^{56}Ni story. Fred had pointed out in his magnificent 1954 paper that neutrino emission would

dominate the penultimate epoch of the advanced evolution of the massive stars. But Vahe's interest had lately turned to cosmology and the information from the observed numbers of radio sources, where to some extent it was to remain throughout his distinguished career. And that topic happened also to be Fred's topic in 1969. Therefore the conversations during this week analyzed in various ways the convictions that Hoyle had reached in 1969: that radio sources and quasars were fed by a massive (ten billion solar masses) central object confined to no more than 10% of a light year from the galactic centers; that the observed red shifts in their light indicated causes that existed in them in addition to the Hubble expansion of the universe; that these central masses cause giant outbursts with very short durations for such massive astronomical objects; that we should follow Eddington's example by believing the astronomy and forcing the physics to adapt; that the creation of matter led to some version of a universal steady state by regulating that very creation of matter. It was a Hoylean vision, much of which is believed true and much of which is taken by most astronomers as heresy. We discussed these topics a good deal, and it was always exciting to do so.

We always took dinner in the hotel dining room, not only during this trip but also during all of the many Scotland trips with Hoyle. The hotel provided the best dinner around, and after a day on the tops one does not want to travel in search of an alternative. Donald and Devon ate at the earlier sitting, and Mary Lou would sit with them to be sure they did it all properly. Willy always ordered the wine for dinner. This was because he cared much more than anyone else. His great love was the white Burgundies, Chablis, Chardonnay, Montrachet, Pully Fuisse, so one of those usually got the call. Willy's other job was orchestrating things so that dinner was slowed down, lengthened, dwelled upon. This involved much discussion of the relative merits of Scottish fare, the merits of the wine list and the menu, the right timing for coffee and for desert, and a proper after-dinner drink. Fowler was a born master of ceremonies, and could usually stretch this out to almost two hours. This allowed time for the most wonderful experience of all, conversation among seekers of truth. Then, next day, we did it all again.

Donald's first Munro

On the eighth of June my son Donald achieved his first Munro. He was enthralled with our talk of the glamorous mountains and of our obvious enthusiasm for the strenuous hikes. He said to me, "Dad, I want to go along with you on the last day."

"Do you think you could keep going all day long?" I asked. He assured me that he could. "How have your boots been?" I asked him, although I had done so several times already. Good fit in boots is the most important requisite for Munros.

"They are great!" he replied. I knew they were up to the climb, and that Donald had experienced no blisters from hiking about with his mother. So it was settled. Donald went with us on the last climb of this memorable visit. He was 9 1/2 years old, beside himself with pride over my decision, not to mention the agreement of Fred Hoyle that Fred also thought he could do it. Our target was to be Ben Sgritheall near the mouth of Loch Hourn, where it empties into the Sound of Sleat opposite to the area known as Sleat at the southern tip of the Isle of Skye. Donald's going posed no envy problem for 8-year old Devon. Devon was too young for such a stress, and he did not evince the enthusiasm for it that would suggest that he could do it. Indeed, Devon loved to play about the shores of Loch Duich with two girls of similar age.

Fred's Lotus was full, but before I could offer to drive along in my car Willy, bless him for enthusiasm, said, "Donny will ride up here on my lap!" And he did. We had to drive southeast, around the entire northeastern perimeter (11 miles) of Loch Duich, where, just a way over the Shiel Bridge, a small one-lane road branched off to the west, through Glen More. I watched Donald looking up at every passing peak, wondering how it would be. After another dozen miles the road reached the sound at Glenelg, from which another five mile drive south along the sound reached the dry upward northern flank of this beautiful but gentle 3196 foot climb. The day was fine beyond all reasonable expectation, and the midday sun reflected glittering fireworks from the waters of the sound. After two hours of steady upward work our car looked a toy, as in the ascent of an airplane. Donald shot ahead, so full of energy and enthusiasm that he was willing to squander it on speedy maneuvers. I shot a role of color negatives with my 120 box camera in order to prove the heavenly wonders. Sweat poured down us all on the steep upward pulls. Donald began to flag; but the appearance of the summit, just 3/4 hour away, revived him to his glory. I was, and am, very proud. I jotted some lines of on a piece of paper, lines to become my poetic tribute to my son in later months when I could polish it. But first came lunch on the top. Then came communal gaiety. Then came more talk about massive objects in astrophysics. Finally, reluctantly, we began the fast walk down the long incline to the south ending in the small village of Corran. Afternoon tea was in a small guest house, after which Fred hitchhiked the ten miles back to his auto at our starting point. Even after three decades this day remains one of the bright moments of life, one by which others must be measured. Share my small verse to my son, Donald, on his first Munro:

DONALD'S FIRST MUNRO

*That look of pride at being asked
To his first climb with the men,
Garrulous exultations claiming
It really was a common thing.
Riding there on Willy's lap,
Studying each passing peak and
Hearing every comment, he
Made judgements of his chance.*

*Up the first one thousand feet
Deer-like, soaring, swift,
Launching rocks and shouting far
To hear the faint return.
Somewhat spent he straggled
Toward the rear so near the top,
But my disguised encouragement
Was superfluous to him.*

*That triumphant smile deserved
The cloudless sky and countless summits*

*Lying round our feet.
Oh bright sun! Brilliant son,
Ben Sgritheall could not hold down
The nine years of your waiting.*