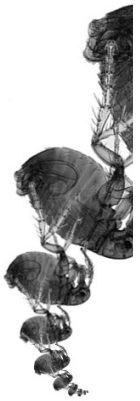
Worlds Within Worlds

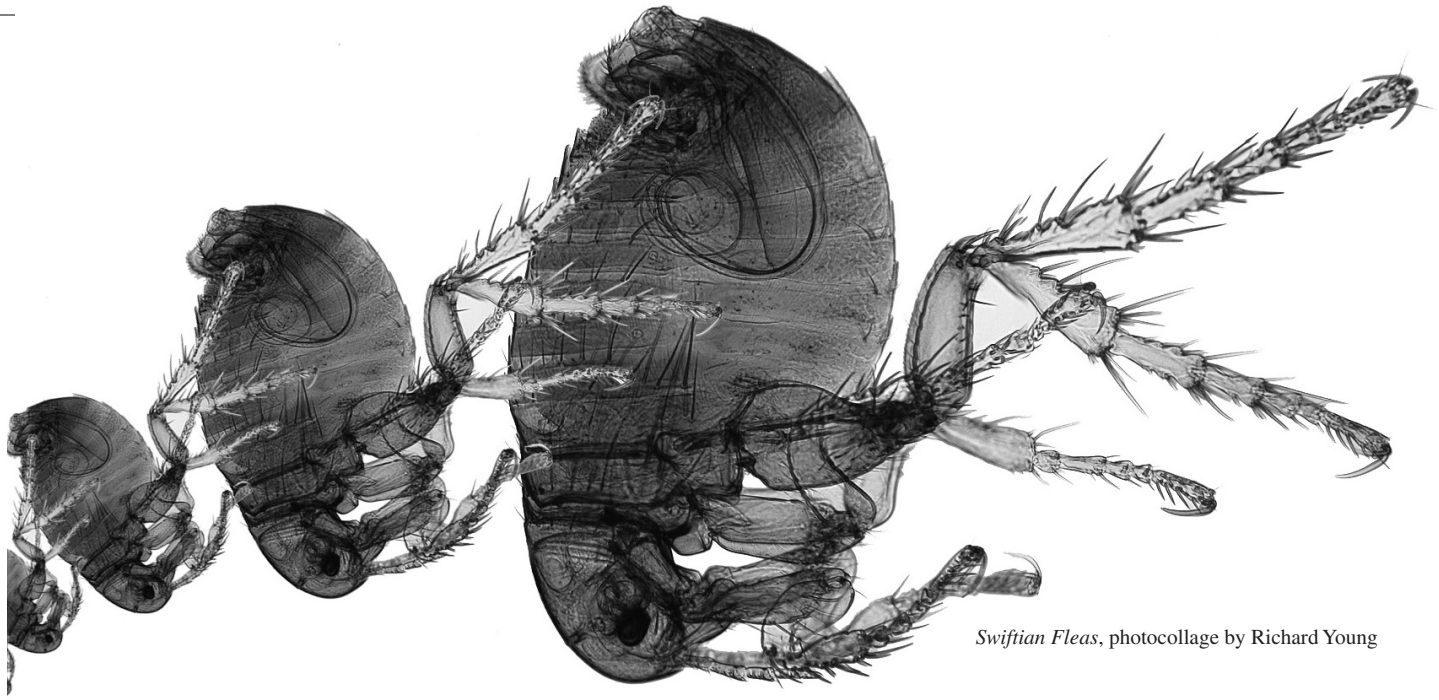
John K. Nixon



Hanging on a wall in my home is a reproduction of a painting by a Canadian artist, Dulcie Foo Fat. The painting has a prosaic title: "Kananaskis Autumn: Moss and Pine Needles – 1986" and was evidently painted in Kananaskis Country, Alberta. My late wife and I purchased the framed picture on the spur of the moment, after spotting it in an art framing shop. We were unfamiliar with the artist, but later learned that she had produced a number of similar style paintings that have been widely exhibited.

The original of the painting in question apparently measures 40" by 60", and depicts a small patch of Rocky Mountain forest floor, covering perhaps two and a half square feet in area. The result is that the multitude of tiny objects depicted is magnified in scale, revealing a stunning level of detail and complexity. Included in the mix, painstakingly detailed in photographic clarity, are dried grass stems, reddened pine needles, fallen leaves yellowing and beginning to curl, patches of grey weathered rock partially covered with moss and lichens, and, here and there, bright green shoots of seedlings poking their delicate leaves through the autumnal debris on the forest floor. It is precisely the kind of scene that most of us would pass without so much as a casual glance. Yet somehow the artist has rendered this panorama of disarray with such attention to detail, and with such contrasting textures and vibrant colours, that the effect, on me at least, can best be described as hypnotic. The more I study the painting, the more I am drawn into it, the more detail I discover, to the extent that I am expecting at any moment to see an ant or small beetle emerge from under a fallen leaf or tangle of dried grass. There before me is a microscopic world in teeming isolation.

Suppose that we were able progressively to blow up the scale of that painting, in the same way that we can zoom in on the map of an area, using MapQuest or Google Maps on a computer. Focusing on a grass stem, as we gradually magnify the object in our field of vision, we would start to see the outline of individual cells on the surface (stem cells, I am tempted to call them), which are invisible to the naked eye. Suppose we could penetrate the wall of a cell, what would we see? The cell wall encloses a microscopic constellation of various entities with bizarre and unfamiliar names. Names like Cytoplasm, Leukoplast, Chloroplast and Ribosome, to mention a few. Each of these entities plays its part in nourishing, repairing and reproducing the cell, as well as in photosynthesis, storage of starch, etc. All these varied and specialized activities are necessary for the continued function of the cell, and the grass stem of which this cell is a miniscule part. In fact, if I was a lowly little ribosome lodged in a plant cell, busy assembling protein molecules, I imagine it would be rather like living in a gigantic industrial park. Numerous factories of different shapes and sizes would be beavering away on all sides processing nutrients, guarding against unwanted visitors, communicating with adja-



Swiftian Fleas, photocollage by Richard Young

cent cells and performing a host of other tasks.

Let us continue to zoom in on an internal feature of our selected cell. Before long we see before us a complex and well ordered molecular structure, comprising atoms arranged in a particular pattern and sequence. Continue our quest and we suddenly home in on a single atom, randomly selected. Within that microscopic entity is another complete universe, comprising layers of electrons orbiting around a much larger nucleus containing protons and neutrons. Nobody has actually seen these tiny celestial bodies, but their existence and function have been painstakingly deduced from the behaviour of different chemical compounds at the atomic level. There are also still smaller bits of matter than the humble electrons, the so-called sub-atomic particles, which may, or may not be, the tiniest specks of matter in existence.

Now let us zoom out of this fascinating inner world, back to that little patch of forest floor in the Rocky Mountains. Press the Zoom Out button again and, before we know it, we can see the expanse of the Canadian Rockies spread out before us like a crumpled tablecloth. Keep on zooming out and the picture on the screen morphs into the outline of the North American continent, then the Northern Hemisphere appears and finally, as the camera recedes, our planet hangs, a shimmering blue sphere, in an apparently endless firmament that stretches away on all sides to a boundless horizon. In the middle of our zone of reference the Earth describes a precise elliptical orbit around the sun, in consort with seven other planets.

Well, here is a provocative thought! Could it just be that our threatened planet is in fact the equivalent of an electron orbiting around an atomic nucleus (our Sun)? As for all those other stars that we see out there, what if those are other atomic nuclei, each surrounded by orbiting planetary bodies? For all we know, these massive groupings of suns contained in gigantic galaxies are simply atoms arranged to form molecular structures in some other universe on a scale that we cannot begin to imagine. If this possibility exists, then where do we stop? Does our universe in fact inhabit an electron in a still larger universe that defies imagination to contemplate?

All of this brings to mind the following innocent ditty supposedly penned by the eighteenth century Irish satirist and essayist, Jonathan Swift,

Big fleas have little fleas upon their backs to bite 'em.
And little fleas have lesser fleas, and so ad infinitum.

Which reminds me, next time I find myself studying that Dulcie Foo Fat painting, just possibly I will spot a tiny flea, hiding behind a blade of grass, waiting to jump on the back of some unsuspecting passing flea!

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