Diabologic: The Encyclopedia of Life
by Frank Dolinar

> "All things are connected.
> Whatever befalls the earth befalls the sons of the earth.
> Man did not weave the web of life. He is merely a strand on it.
> Whatever he does to the web he does to himself."
>
> -- Chief Seattle

Different human cultures have a myriad of medical practices. These practices often contradict each other or, at the very least, fail to correlate with each other. Nor is such diversity – if that's the right word – limited to medicine. It ranges from belief systems, philosophies, politics, human rights, science, to the underpinnings of the culture itself.

You might think this is just a matter of human nature and that humans are always going to disagree with each other. Perhaps. But it seems to me that the practice of medicine and, more fundamentally, our understanding of biology isn't a cultural issue and it doesn't make sense for human cultures to have so many uncorrelated medical practices.

The first step to resolve the dilemma appears to have been taken. I'll tell you about it shortly.

In my last column, I discussed the revision of math, chemistry, and physics texts that took place between 1957 – following the launch of Sputnik I – and the early 1960s. I mentioned that had taken another decade for the equivalent revision to take place in the biological sciences.

About 1970, biology made the transition from cataloging the things found in a cell to the beginnings of understanding what those things do. This transition could be described as change from taxonomy (the practice and science of classification) to molecular chemistry. Indeed, chemistry at the molecular level is exactly what biologists found when they got inside the cell, a biochemical soup in which reactions were occurring at the molecular scale and at great speed.

There are estimated to be about 100,000 discrete biochemical reactions going on in each cell of a human body every second. That's an astonishingly large amount of activity for one cell, but when multiplied by the trillions of cells in our bodies it becomes utterly mind-boggling. To get some understanding of what this means, look at the animation "The Inner Life of the Cell" on Harvard University's website at http://multimedia.mcb.harvard.edu/media.html.

In light of these discoveries, taxonomy pretty much got left behind as irrelevant. This left us with a problem that has at least two major parts:
(1) not everyone is a molecular biologist (for everyone else taxonomy still works pretty well);
(2) not all cells on the planet are human (we're a distinct minority).

If humans really are such a minority (and they are!) we need to know more about the other inhabitants of our planet. If we're to understand our place among them, we need to know who they are. This problem complicated by taxonomic dissonance. There are many examples of a single species that exists in different places around the world and are referred to with different names and classifications in those geographically dispersed places as if they had no relation to each other. There are also closely related species that do not particularly resemble each other and are, therefore, identified as completely separate entities. Finally there are species that bear no relation to each other except that they look alike and have long been confused as cousins.

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The only way to deal with these issues of taxonomy is to correlate species based on DNA.

Enter Edward O. Wilson, Pellegrino University Professor at Harvard University.

After decades as an evolutionary biologist, his studies led him to a realization that human activity is largely responsible for a dramatic decrease in biological diversity on the Earth. Wilson began a campaign to defend what he refers to as his constituents – the 10^{18} insects and other small creatures of the planet. He asserts that, "Humans would not survive more than a few months if all the insects and other land-dwelling arthropods were all to disappear."

Edward Wilson is possibly the most decorated biologist and ecologist of the late 20th and early 21st century, with two Pulitzer prizes for his writings, dozens of awards, and approximately two dozen honorary degrees from educational institutions all over the world.

In 2007, Wilson was one of three recipients of the prestigious TED Prize (TED is owned by the Sapling Foundation whose goal is to foster the spread of great ideas). [By the way, the other two TED award recipients in 2007 were: 1) photojournalist James Nachtwey; and 2) activist and former U.S. President Bill Clinton.]

See Wilson's acceptance speech at http://www.ted.com/talks/view/id/83 Look at some of the other presentations from the annual TED conferences. They are well worth the time you spend with them.

With his prize money Edward Wilson has launched The Encyclopedia of Life, an ambitious web project that will transform the science of biology, and inspire a new generation of scientists.

The Encyclopedia of Life (EOL) – hosted by the Marine Biological Laboratory at Woods Hole, Massachusetts – is an ambitious project. There are an estimated 1.8 million species on Earth and the mission of the EOL is nothing short of the aggregation of all knowledge about every living species on Earth – with entries provided by scientists and amateurs from around the world on every aspect of the biosphere.

This aggregate of data will correlate every reference to an individual species so the referenced page on the website will include photos, all known names, and eventually a DNA key to each species (which I've heard referred to as a DNA barcode). Before such data is published on the website, however, it will undergo a multi-level evaluation and verification process.

The demonstration site is up (http://www.eol.org) and you can see some examples of what the data will ultimately look like, but it doesn't go live until February 2008. At that time, it – and all of its information – will be available, at no cost, to everyone in the world with access to the Internet and a web browser.

As a result of this, taxonomy has become relevant again, although at a new level of complexity. As the correlation of all this data about all the species on earth continues, there are profound implications for biological science in general and human medicine in particular.

Meanwhile, Craig Venter (of Human Genome Project fame) is out sailing the world's oceans looking for new species.

I'm sure he's going to find some.

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