

Comment

Jumping the shark

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Popular culture, I've long believed, is the best way of finding out what most people care about at any point in time. That's the reason I have no patience with those who disdain watching television and refuse to even have one in their homes. By ignoring such a pervasive cultural reference point, they are distancing themselves from much of the rest of humanity. I'm not demanding that they watch television constantly, or even very often, but if they never look at it at all, they will never understand what most of those around them are seeing and talking about. I think most television programs are drivel, but I try to know at least a little bit about the most popular ones so that I feel somewhat connected to my culture. The same goes for mass-market movies and 'popular' literature such as detective fiction.

Besides, without popular culture, where would we get some of our most useful metaphors? Speaking metaphorically can itself be distancing, of course, if the listener doesn't understand the reference, but when the metaphors are drawn from popular culture that tends to be less likely. The problem with such metaphors is that they rapidly become stale and hackneyed, but even the more clichéd ones have the benefit of making conversation and writing more colorful than it otherwise would be in this age of technobabble and political correctness. Examples include 'drink the Koolaid', meaning to accept something blindly that an authority figure tells you - a reference to the 1978 mass murder/suicide by poisoned fruit drink in Jonestown, Guyana.

My personal favorite is 'jumping the shark'. It was first used to describe that time when a long-running television program begins to decline in both creative energy and ratings, and then tries all manner of gimmicks in an increasingly desperate attempt to hold on to its viewers. In so doing, it strays even further from the qualities that made it successful in the first place. The specific reference is to the low-brow situation comedy *'Happy Days'*, which concerned a group of teenagers in a typical 1950s suburban American community. In addition to the stereotypical popular kid, goofy kid and musically talented kid, the show

featured one Arthur 'The Fonz' Fonzarelli, played by Henry Winkler: a leather-jacketed, tough-talking, basically kind-hearted, motorcycle-riding dropout - sort of a toned-down version of the Marlon Brando character in the movie *'The Wild One'*. For those of you not old enough to remember the thin, pre-Godfather Brando, virtually the same character type appears as the male lead in the musical *'Grease'* (in the film of which, the part is played by John Travolta). *'Happy Days'* ran for 11 years, far longer than its rather silly plots and thin characterizations could support, and as viewers dropped off the show turned to increasingly preposterous storylines, most of which featured The Fonz in bizarre, out-of-character situations. The apex - or perhaps nadir would be a better word - of this nonsense was the famous (infamous?) jumping the shark episode, in which The Fonz, still clad in his trademark leather jacket but wearing a swimsuit and lifebelt that even John Travolta would never be caught dead in, waterskied around a lagoon housing a man-eating shark, over which he jumped in the climax - if that word can be used to describe something like this - of the show. (If you don't believe me, and I don't blame you if you don't, you can watch the video clip online [<http://www.ifilm.com/ifilm/detail/2666632>]) The whole business was so monumentally stupid that it soon gave rise to the expression 'jumping the shark': that moment when a show, desperate for new ideas, tries ones that are so ridiculous that it fails to remain true to itself.

Over the years most long-running TV programs have jumped the shark in their quest to maintain their ratings. A precious few, in my opinion, never did, and so hold a special place in the annals of popular culture. (My list would include *'WKRP in Cincinnati'*, *'The Mary Tyler Moore Show'*, and *'The Phil Silvers Show'*; there's a website [<http://www.jumptheshark.com/>] in which fans of various programs debate - endlessly, it would seem - whether a particular program did or did not jump, and if so, exactly when and how it did.) Gradually, the phrase has crept - slithered? - into the lexicon as a general metaphor for losing one's core values in a quest for popularity or profits.

The recent proposal by the Bush Administration to send more US troops into Iraq could be cited as evidence that they, too, have jumped the shark, if the only 'new' idea they could think of was to repeat the old one that didn't work. In this case, it's votes, not ratings, that they are angling for, but the principle is the same. Personally, I think they actually jumped several years ago, when they decided to invade Iraq in the first place. And that unforgettable image of the President on the aircraft carrier, in full flight regalia, with the 'Mission Accomplished' sign behind him, reminds me a lot of The Fonz in his leather jacket and swimsuit.

Such pandering - or is it prostituting? - isn't the exclusive province of television and political leaders, of course, although they may have perfected it. For an example more familiar to the readers of this column, consider the journals *Nature* and *Cell*. Both were wildly successful, general-content scientific journals whose very names became synonymous with high-quality, high-impact papers. Then came *Nature Structural and Molecular Biology*, *Nature Medicine*, *Nature Immunology*, *Nature Genetics*, *Nature Chemical Biology*, *Mother Nature* - OK, I made that last one up, but give the folks at MacMillan publishers time. Not to be outdone, *Cell* rapidly metastasized into *Molecular Cell*, *Developmental Cell*, *Cancer Cell*, *Cell Metabolism*, *Cell Phone*, and so on. To be sure, these are all high-profile journals that still publish good papers (I'd like to publish in them someday, so I have to say that) but can there be any doubt that the brand has been diluted at least somewhat by this proliferation? And since both families of journal are published as for-profit enterprises, it's hard to escape the conclusion that the primary motive behind the fission was the profit motive, and, therefore, that they've jumped the shark. (Their main rival for the title of Most Important Place to Publish, *Science*, is published by a non-profit scientific society, which may explain why it hasn't jumped. At least not yet.)

Which brings me to the point of this column (I bet you were starting to wonder if it had one, weren't you?): with the advent of genomics, has biology jumped the shark? You could make the case that genomics was born on waterskis with a Great White swimming below, because its values seem to be so at odds with what were once considered the core values of the life sciences. Instead of emphasizing hypothesis-driven, investigator-initiated inquiry, genomics focuses on large scale data gathering and analysis, usually done by big teams. Biology used to be thought of as low-tech; genomics is technology-oriented. So does the advent of genomics mean that biology has run out of good ideas, and is desperately hoping that data mining will produce some?

Ostensibly, the answer is no. Genomics was sold to the scientific community as big science in the service of small science. The argument was that systematic data gathering would provide the bases for countless new, hypothesis-driven experiments. To some extent, it has done just that,

but there's a catch: the pool of available research dollars is relatively fixed, and money that funds genomics projects isn't available to fund those hypothesis-driven experiments, so their number is bound to go down. I think that tension between the two modes of biology research will work itself out, but until it does there will continue to be fears that genomics marks a transition away from the core values of the subject.

The real danger, it seems to me, is when some sub-discipline attempts to change its values to reflect those of genomics without considering the consequences to its intellectual health. That is exactly what has happened to structural biology. When a cadre of structural biologists sold the idea of structural genomics to the funding agencies, I think they jumped the shark. In the very early days of structural biology, when we had no idea what the universe of protein folds looked like, every new structure was interesting for its own sake, as a glimpse into a largely unknown world. It didn't matter what the protein did, if it was a 'new' structure it was important. But that excitement had largely faded at least 15 years ago, when it was pretty clear that we had seen most of the major fold classes and anyway they were all pretty much variations on similar themes. Then the function of the protein became the benchmark for the importance of its structure, and the best structural biology combined structure determination with functional insights and biological experiments. That was the core value of the discipline until, in an attempt to secure funding for routine structure determination, structural biologists tried to piggyback on the success of the Human Genome Project with a proposal to fund a set of consortia whose mission was to determine either the structures of a representative example of every protein fold, or the structures of all proteins in a particular genome. Such assembly-line crystallography (or nuclear magnetic resonance (NMR), in some cases) has started to produce a lot of structures, but I think almost no one cares. The goal of filling in the fold catalog was quickly abandoned, not only because it was too difficult but also because it was certainly true that no one except perhaps a few bioinformaticists cared. And the goal of determining all the structures in a genome also proved to be too difficult: the thing about high-throughput crank-turning is that it can't afford to stop to wrestle with difficult problems, and of course the most interesting proteins often seem to be the ones that are most difficult to express in a heterologous organism, then purify, and crystallize. Thus, the structural genomics initiative has, up to now, concentrated on the low-hanging fruit (one may say, in some cases, the fruit that has already fallen to the ground). And what do we have as a value system for the field now? Is it to churn out structures regardless of their importance? Is it to be a service for the drug companies and cell biologists, who will dictate what is important and reap the rewards from studying function and exploiting structure themselves? It certainly seems as though that's where things are heading, and if I'm right, I think future historians of

science will point to the structural genomics initiative as the moment when structural biology put on its life belt and swimsuit and headed out over the shark pool.

It doesn't have to be that way. Fields should be able to make use of genomic information without attempting to absorb the ethos of big, data-gathering-science. If they can do that, then genomics will be an enabling technological revolution, which helps propel a lot of non-data gathering science forward. But if a field tries to become like genomics when it really is something very different, then it jumps the shark. Like a television program past its prime, if it thinks - or fears - that it has run out of good ideas, it will try bad ones. It will go backwards, not forwards. And when that happens, like the shark itself, which must constantly swim forwards to survive, it will begin to die.