



It's All Wet
(Showing fish with toilet)

Excessively squeamish vacationers who go to the lake this summer may be distressed to learn that fresh water fish urinate continuously. On the other hand, squeamish vacationers who go to the ocean will be pleased to learn that marine fish virtually never urinate.

While this little fish-related factoid may strike some as a strong contender for "not" were it to appear in Ripley's, it is indeed completely accurate. This essay will describe (a) why this interesting piece of piscine micturition (professor-speak for fish urination) trivia is completely accurate and factual and (b) its significant implications for **man-made global warming**.

But first, by way of introductory background a brief discussion of fish, the first vertebrate, is in order.

A Brief History of Fish

Fish first appeared in the oceans roughly 400 million years ago and exploded during the Devonian Age that began at around that time. The Devonian is indeed called the Age of Fishes. They began as rather unimpressive creatures who earned a living by sucking muck along the ocean floor, with mouths that had no jaws. These primitive jawless fish were successful, the first vertebrates to make a large imprint on life's great canvas. But now they are virtually all long-extinct, with the highly unpleasant ecto-parasitic lamprey and sea hag (not Popeye the Sailor's green female nemesis but an actual living thing) being the only living representatives of this once noble line. For millennia the jawless fish of the early Devonian enjoyed an absence of vertebrate predators, but that was soon to change.

Dunkleostus was the next major fish iteration of note, and it was a fearsome predator with no contemporaneous equal. Indeed, few marine predators that the seas have known in all the subsequent years could rival Dunkleostus for sheer ferocity of presence. It was somewhat larger than a great white shark, but it lacked actual teeth. Instead however its primitive jaws were edged with sharp and jagged bony ridges, almost like pruning shears or a short, thick pair of jagged-edged scissors. It was also armor plated all over its body. If you imagine a thick, very large great white shark with jagged pruning shears for jaws and armored like Sir Lancelot, you'll not be too far off the mark. It was the dominant predator of

its day, though it did not last too long. Other ancient, primitive fish such as sturgeons, paddlefish, sharks and rays, and the rare Coelacanth are still around after hundreds of millions of years, but the formidable armored titan Dunkleostus is long extinct.

Today's Fishy Hall of Fame

The seas today are filled with many noteworthy fish, the most spectacular of which are aggressive, athletic predators. Tuna are massive, weighing in at perhaps 1,000 lbs or thereabouts, and are so athletic, and with such endurance, as to be like long-distance sprinters who achieve endothermy (professor-speak for warm-bloodedness) by virtue of their muscular activity (more or less like the bumblebee noted in another essay here). The aptly named requiem sharks such as the mako are so athletic as to achieve warm-bloodedness as well, along with the great white who has a body temperature that may exceed that of the surrounding waters by perhaps as much as 10 degrees or so. The billfish are equally impressive, like Olympic sprinters who fence while they plunge through schools of herring, using their sword to stun and shatter the bodies of the desperately schooling prey.

Megalodon

But between 2 and 15 million years ago there lived a fish that made today's great white look like a minnow. It was Megalodon, unquestioned Master of the Miocene oceans. It was basically a great white shark the size of a city bus and the mass of a sperm whale, perhaps 50 tons or so and 50 feet long. Its teeth, which I have held in my hands, were much like a great white's except they are the size of a large fist and a man could stand up in its open jaws! By comparison the great white's teeth are the size of a large grape and a man's shoulder's would have difficulty fitting into its open jaws. (The author's massive shoulders would not fit at all). Why Megalodon became extinct we do not know, but anyone who spends time on or in the ocean can be most grateful for it. It would have made the great white in *Jaws* or the genetically engineered mako in *The Deep Blue Sea* seem like Charlie the Tuna in comparison.

The Nasty One

The fresh water fish cannot approach the size and sheer formidability of these marine brutes, but they have their strong contenders for noteworthiness

nevertheless. The fearsome Goliath Tiger Fish of the Congo River, for example, resembles a blend of giant salmon and barracuda with teeth like iron spikes, and is likely the only living thing powerful enough to swim about at will in the raging torrents of the Lower Congo. Likewise the Alligator Gar is aptly named, and while the risk of piranha eating careless people or cows alive is overblown, they have disfigured the faces and bodies of more than a handful of bathers in Amazon waters. But by far the most feared fish in the Amazon region is not the piranha (which is potentially dangerous mainly just in the dry season, when they're heavily concentrated).

No, the most feared of all fresh water fish is a small, thin inch-long and repellent member of the catfish family called a Candiru. This perverted little bugger is the only vertebrate internal parasite there is. It likes to swim up your urinary tract, where it may find the warmth and moisture conducive to comfort.* Indeed, to discourage removal it has little sharp dorsal spines which it erects at will, which function somewhat like barbs. It can only be removed by surgery, which is not in plentiful supply in the depths of the Amazon rain forest. Native bathers are careful to never urinate while in the water, since the Candiru detects the warmth and follows it to the source. Careful native bathers also cover the vulnerable orifice in question with devices I'll leave to the reader's imagination, particularly since, being liberal and open-minded, the Candiru is pleased to accommodate both sexes without prejudice.

* This may actually be an unintended mistake on the Candiru's part, since evidently it can easily confuse the scent of diluted human urine with the smell of the fluids emanating from its natural hosts' gills

Bodily Fluids and the Devonian Seas

Several hundred million years ago, the earth's oceans were less salty than now, roughly half as much in fact. Scientists speculate that the reason for this is that there has been much erosion of the land in the ensuing millennia, and that the run-off into the oceans has gradually made them saltier.

But, since fish began to arise at this time in less salty seas, the relative salinity of their internal fluids no longer matches that of the surrounding waters. Fish -- and people and other living things too -- have body fluid salinity that's closer to that

of the Devonian oceans' waters than to today's. So, there's a mismatch. The body fluids of marine fish are roughly half as salty as the waters they live in. Likewise the salinity of the internal body fluids of freshwater fish is more or less similar to that of their marine brethren, and as such is considerably saltier than the fresh water in which they live.

Like amphibians but unlike the reptiles, birds or mammals, fish have semi water-permeable skin. That means their skin is not water tight, it leaks somewhat. If one puts a semi-permeable bladder full of salt water into fresh water, the difference in relative salinity will cause the bladder to swell more and more as the salinity becomes slowly equalized. In effect, the difference in salinity causes the bladder to suck in fresh water, possibly even to the point of bursting. The reverse happens when a semi-permeable bladder full of fresh water is placed in surrounding salt water. The fresh water inside the bladder leaks out as the salinity levels equalize. In effect, in this reverse scenario the surrounding salty water sucks the fresh water out of the bladder to the point of depletion.

This process is called osmosis and in a nutshell is what happens with fish. The freshwater fish urinate continuously because water is constantly leaking into them, they have to urinate constantly in order to keep from swelling up like a goiter with fins, possibly even to the point of bursting if their urination was prevented. Fresh water fish almost never drink -- they don't have to, they already are getting too much water constantly flowing into them as it is. Marine fish have the opposite problem, for they are at constant risk of dehydration. Thus, salt water fish almost never urinate for that would compound the problem, and they drink almost continuously to offset their continuous water loss.

Fish Urination and Global Warming -- A *Modest Proposal* for Today's Hue and Cry

So, all of our rivers, streams and fresh water lakes are populated by perpetually pissing piscines.

And it's not just fresh water fish that are constantly and thoughtlessly turning our lakes and streams into urinals -- frogs, tadpoles, aquatic salamanders and other amphibians are subject to the same essential physical dynamics because their skin is not water-tight either. As such, they contribute to the problem of our lakes and streams being so rudely polluted with an unending, constant flow of urination by every fish and frog.

I seem to recall that Al Gore's huge mansion (which leaves a carbon footprint that's virtually brontosaurian in magnitude) is by a lake. As such, it is interesting to contemplate his perspective as to how his and all other pristine bodies of our sweet fresh water are actually being treated as open sewers by the fish and other aquatica that live in them. One wonders if by virtue of their natural processes, these fish and their fellow polluters are slowly sealing their own doom by this constant increase in urine levels -- after all, the water in the lake is not growing in proportion to the constant increase in fish urine continuously being pumped in.

We must start crafting Computer Projections to verify and measure this most dire development, and maybe round up to be on the safe side due to the obviously extreme danger. The author can provide the necessary Procrustean assumptions, and there are lots of scientists desperate for funding that will fight each other for the privilege of doing the math. Maybe we can likewise enlist Al Gore to create a market for **Fish Urination Offsets**, which he can conveniently buy from himself along with his purchases (also from himself) of Carbon Offsets.

Perhaps we should consider every trout as the urination-equivalent of an SUV, constantly adulterating its surrounding waters with untold volumes of its own urine just as humans, by virtue of their normal activities, are pumping untold volumes of CO₂ into the atmosphere. And moreover, each and every trout and bass and all the others are urinating all the time!!! Unthinkable!!!

We must forget the fact that fish urine does not comprise a meaningful percentage of the total lake. And forget the fact that we contribute only marginally to the atmosphere's total CO₂, which is in turn perhaps 1% or so of our total atmosphere. From the Calvinistic perspective of a purist like Al Gore, relativism is irrelevant. Just like the fish urinating thoughtlessly into the waters that surround them, so are we contributing comparably to the adulteration of the global atmosphere that surrounds us, likely to similar dire and detrimental impact.

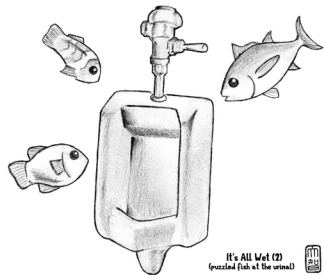
And while congress can (and most certainly does) restrict our economic and productive activities more readily than they can restrict the urinary processes of

fish, one can rest assured that if somehow these irresponsible fishy potty habits could be linked to human cause, congress would try.

Now, isn't that a pisser.....

Damocles

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It's All Wet (TM)
(quarantined fish at the urinal)

