

THE VERY NEXT NEW THING

Gini Graham Scott

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New Thing

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The Very Next New Thing

COMMENTARIES ON THE LATEST
DEVELOPMENTS THAT WILL BE
CHANGING YOUR LIFE

Gini Graham Scott



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Introduction

While the past few decades have been a time of great upheaval—recession, terrorism, wars, foreclosures, bank failures, corruption on Wall Street, political scandals, the end of privacy, increasing crime, warnings of environmental collapse, spreading toxicity, and more—it has also been a time of tremendous breakthroughs in science, technology, business, and society. These breakthroughs are the stuff of everyday news, fueled by Web site postings, social media feeds, a 24/7 news cycle, and news aggregators like the *Drudge Report* and *Breitbart*, with their instant updates.

Moreover, since the beginning of 2010, as people have reflected on the past decade's trying, traumatic, or downright tragic times, most appear eager to put the past behind and look to what's new. In the weeks after the New Year began, people posted comments throughout the Internet wondering what might come next and hoping for something new. Things just had to get better—that was the recurring theme.

Interest in what's next is what inspired this book—as well as a TV pilot for an interview show, *The Very Next New Thing* monthly gathering through MeetUp, series of articles and blogs, and my monthly radio show on Changemakers Radio regularly featuring a guest involved in a breakthrough. As I noticed new trends and discoveries in the news, I began collecting information on them and thinking about the implications of these developments for society. Almost every day there was at

least one and sometimes two, three, or even more developments with the potential to change our everyday lives.

For example, when I read about the development of see-through goldfish by Japanese researchers looking for ways that biology students might avoid having to dissect animals to see their organs, I pondered where that development might lead. Might breeders eventually apply this technology to breed higher-order see-through animals, even trendy see-through pets? On the surface, this might seem far-fetched, but consider the experiments we've seen under way in cloning developments.

When I read about scientists creating the first synthetic cell by combining a genome sequenced on a computer and duplicating it using chemicals, I began considering how they might be able to create more than a small one-celled virus that infects bacteria. Might they eventually use computer software and chemicals to create even larger multi-celled organisms and essentially start the evolutionary process anew?

When I read about the way scientists could now identify and look at the memory traces of a particular memory in the brain, what came to mind was the potential for future technology to capture these memories onto software so that one could begin to plumb the depths of other people's memories. Or, could this somehow be developed as a means to "replace" memories after injuries or conditions that cause memory loss?

I read about how even poets were looking at creating poems using the very architecture of DNA—the letters ACGT—to tap out literature much like one might text a message on a cell phone. And I saw, too, how marketers were capturing these new breakthroughs in science and technology to come up with new products and services, such as using new developments in face recognition technology combined with database information to create ads that talk back to us, that could change our lives in the years ahead.

In short, it seems these breakthroughs in various fields—most notably science, technology, business, and society—may be changing our lives in the very near future, especially since one breakthrough will likely stimulate many more. In turn, by considering these breakthroughs, we might be able to direct and shape these changes as a society, as well as spur additional breakthroughs. In addition, those who are company owners, entrepreneurs, and marketers might be empowered to ride the wave and create exciting new products and services.

The Very Next New Thing is designed to explore these developments and suggest what kinds of changes in society might occur as a result. I

have grouped them by the type of breakthrough and the way they are changing, or could change, our lives:

- The Latest in Science and Technology
- The Transformation of Business and Work
- Changes in Lifestyles, Pop Culture, and Society

As I write, even more breakthroughs are occurring that will similarly impact our lives in the years ahead. So be on the alert for how these breakthroughs will be changing your own life in the next few years, and consider how you might get involved—whether to develop your own science and technology breakthroughs, jump on a trend as a businessperson or entrepreneur, use these ideas as an artist or visionary, or simply follow these trends as an interested reader, curious to see what will happen next.

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PART I

The Latest in Science and Technology

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Chapter 1

Scientific Breakthroughs Reshaping Our World

SEE-THROUGH ANIMALS AND WHAT'S NEXT

In a scientific breakthrough, Japanese researchers have developed see-through goldfish. According to a 2009 news report,¹ a team of researchers at Mie University and Nagoya University in Japan made this discovery by breeding mutant goldfish with pale skin until the goldfish had scales and skin with no pigments. Before then, a scientist team lead by Masayuki Sumida, a professor at the Institute for Amphibian Biology of Hiroshima University, was able to produce see-through tadpoles and adult frogs.

Why create transparent animals? The scientists wanted to reduce the need for dissections, in part because animal rights activists sought humane alternatives for killing animals. And what's even better than a computer simulation is a live animal. If you can see through the animal's skin, you can see the live heart and other organs, even the animal's brain, so you don't have to cut it open. In fact, as the animal grows, you can see how it develops. And soon, the see-through animals are going to be put on the market to be sold to laboratories and schools and marketed as pets, not only in Japan but worldwide.

To me, the idea of this development is amazing. Just consider the implications. If turning animals transparent can be done with fish and amphibians, why not with birds and mammals, too? Maybe that'll be coming next, just like cloning started lower down the evolutionary scale and worked its way up to cats and dogs, and then to stem cells for replacements for

damaged human organs. Eventually, this led to a controversy over whether it would be possible to clone a whole human.

So maybe in a few years, you might be able to get a see-through cat or dog at a pet store, while schools might find that transparent animals are a whole new way of teaching biology. Medical researchers and vets might also find this a breakthrough in using these animals to understand the internal processes from breathing to digestion to elimination. They could even see what happens when two transparent animals have sex.

Which brings me to humans. Certainly, creating transparent humans would be controversial. It raises the question of whether a transparent human should ever be created.

But if something can be done, some scientist somewhere is likely to do it. What are the implications for human privacy if we can see through one another? At least being transparent might make going through airport screening devices obsolete. People would merely have to go through a private disrobing room, remove their clothes, and the airport screeners could see everything.

Yes, I'm exaggerating. Transparent humans will probably be a long time in coming, if ever. But in the meantime, I can imagine this transparency could make a great Hollywood film—a sci-fi feature about a new generation of see-through humans. They meet, make love, have transparent kids, and live very transparent lives. I may even start writing the script myself.

BRINGING BACK THE DEAD

Can scientists bring back extinct species? It seems like they very well might, now that scientists in Canada have recovered DNA from the bones of a preserved woolly mammoth and have used it to make a living blood protein, according to a CBC article that appeared in the journal *Nature Genetics*.²

Led by biologist Kevin Campbell of the University of Manitoba, the scientists first extracted the DNA for hemoglobin, a blood protein that carries oxygen, from the bones of three mammoths they discovered in the permafrost. They converted this hemoglobin into RNA, which is used to create proteins, and then inserted that RNA into *E. coli* bacteria. These bacteria thus turned this RNA into the hemoglobin of a living woolly mammoth.

A key reason for this research is that the scientists were interested in discovering how the mammoths survived in the extremely cold conditions of the Arctic, since the ancestor of both mammoths and elephants

originally developed in Africa, which had a tropical climate. But the mammoths headed north about 2 million years ago, and hemoglobin has difficulty releasing the oxygen it carries when the temperature is very low. So the scientists were interested in discovering how these mammoths could survive in such a cold environment by looking at their hemoglobin and comparing it to that of modern-day elephants. Through this comparison, they found that there were three chemical changes making it possible for oxygen to be transported to cells at low temperatures.

Their discovery has major implications for the future, beyond just understanding how mammoths survived in the cold. For one thing, this technology might be used to turn the DNA for hemoglobin of any extinct animal into RNA and then into the hemoglobin of a living version of that extinct animal.

But why stop at hemoglobin? If it is possible to use DNA to re-create hemoglobin, maybe it would be possible to convert the DNA that creates other parts of the body for not only the mammoth, but for other extinct species for which paleontologists have discovered bones. Then, if that possibility exists for other body parts and other extinct species, maybe with further development, it might be possible to use the DNA to create egg and sperm cells, and then combine these cells to conceive a baby for an extinct species. Or alternatively, maybe scientists could use cloning technology to create a baby.

The possibilities are endless. Using this ancient DNA, scientists might have the power to bring back previously extinct species, and perhaps these species might thrive in a protected environment. Just think. There could be research parks or zoos devoted to working with these formerly extinct animals to learn more about them, as well as displaying them to an interested public. It would be as if the 1993 film *Jurassic Park* based on Michael Crichton's 1990 sci-fi novel has turned from a sci-fi thriller into real life, in which the extinct can come back to life. If it is possible to bring back long-extinct species, perhaps this technology could be used to bring back the recently extinct, so that endangered species have a new way to live forever.

In short, this ability to create a protein for a living woolly mammoth might be just the beginning as scientists go on to create other proteins from the bones of other extinct animals and eventually re-create formerly extinct animals. It would, in effect, be a way to go back into our distant past by bringing back the dead, so they are now among the living. It would also be a great theme for a series of sci-fi films about the return of the living dead—except now it's no longer science fiction. It has become the science of today.

JUST BREATHE

Oxygen and breathing are virtually synonymous, since everyone needs oxygen to breathe. Some manufacturers even sell small shots of oxygen so that some athletes or dancers in nightclubs or raves can give themselves an instant boost of energy. And tanks of oxygen are provided to patients with breathing problems at hospitals or as outpatients.

But now this notion that everyone needs oxygen is being challenged by the discovery in the Mediterranean Sea of the first species of animals that do not need oxygen to breathe. According to a 2009 article from the U.K. *Telegraph*,³ these very small creatures, named *Loriciferans* or *lorica* after their shell-like cover, are about 1-millimeter long and look like jellyfish inside a thin protective shell. They were found a little over 2 miles underwater in the sediment of the L'Atalante basin off the coast of Crete, after researchers led by Robert Danovaro of the Marche Polytechnic University in Ancona, Italy, spent a decade conducting three expeditions there.

This discovery opens the door to numerous other possibilities. For one thing, it suggests that other animals might exist underwater that don't need oxygen either. After all, if the *lorica* can live in this area with almost no oxygen, it seems likely that other organisms have evolved to live in this same space, and they can be discovered once researchers actively look for them.

Second, if these animals can live without oxygen, what makes this possible? Maybe researchers can find some mechanism or changes in their cell structure and functioning that permits them to live this way. This discovery might open the door to still other discoveries that could apply to humans working in low- or no-oxygen conditions. For instance, if humans are working in space where there is no oxygen, maybe this new knowledge might lead to finding a way that humans wouldn't need oxygen and could work without the cumbersome space gear that makes it difficult to move around.

This discovery of organisms that live without oxygen also opens the door to thinking about the possibility of life on other planets. To date, scientists have generally believed that having an oxygen atmosphere is necessary for life to exist anywhere, and they have excluded planets without such an atmosphere from consideration in their search for life. But if organisms can develop without oxygen, maybe there might be other planets with such organisms. And if these oxygen-less organisms are left free to develop on these planets, maybe they might evolve into more complex forms. Perhaps these forms on Earth—or more precisely,

under the water on Earth—didn't develop further because they had competition from the organisms that used oxygen. But without such competition on planets with little or no oxygen, such organisms might evolve into higher and higher forms, even paralleling the process of evolution on Earth.

Thus, when we are looking for animal life on other planets, perhaps scientists should look more closely at the existence of non-oxygen-using forms, and maybe over the millennia, higher forms akin to mammals evolved, and some of these higher forms might even be much like us.

In turn, as our own atmosphere becomes more and more polluted and overpopulated, causing the supply of oxygen to dip lower and lower, perhaps the discovery of an organism that doesn't need oxygen might provide the basis for transforming our society—not through some apocalypse with explosions, eruptions, and tsunamis as featured in Hollywood, but by the arrival of human-like creatures who can better breathe the air because they don't need oxygen. And so, instead of the popular image of aliens as creatures with big eyes and heads, who are often depicted as being green or gray, maybe what we most have to fear taking control of our planet are aliens who don't need to breathe oxygen, so they are more adapted to our polluted, overpopulated world.

LET THERE BE LIFE

Creating life has become possible without combining male and female gametes or cloning cells from another organism. That's because scientists have built the first synthetic cell by combining a genome sequenced on a computer, and then they duplicated it using chemicals, as announced in a 2010 article in *Time*⁴ and described in an overview by the J. Craig Venter Institute.⁵

How did the research team led by Venter, who previously co-mapped the human genome, accomplish this? Basically, according to Venter, the process has become possible because scientists have been able to routinely sequence genomes by converting the As, Cs, Ts, and Gs of the chemical makeup of DNA into the 1s and 0s in a computer. Then, the scientists sought to reverse the process by starting in 2003 with the 1s and 0s on a computer to determine the characteristics of a living cell.

They began by synthesizing a small virus that infects bacteria, and by 2008, they were able to synthesize a small bacterial genome, though they weren't yet able to use that to activate a cell. Now they have achieved the third step by synthesizing 1.08 million base pairs for the *Mycoplasma*