In 2003, Kenyan-born Ory Okolloh was a young law student studying in the US but still obsessed with Kenyan politics. There was plenty to obsess over. Kenya was a cesspool of government corruption: Transparency International ranked it as one of the most corrupt public sectors in the world. Okolloh spent hours talking to her classmates and law professors about politics, until eventually one suggested the obvious: Why don’t you start a blog?

Outside of her fellow academics, she’d never written anything for a general audience. But on this subject, she had a lot to say. Over the next seven years—some of which she spent back in Kenya—she unleashed a river of posts, everything from snapshots of dilapidated infrastructure to the details of the “Anglo-leasing scandal,” in which the government paid hundreds of millions for services that were never delivered. After a few years, she’d built a devoted readership, including many Kenyans living in and out of the country. In 2007, the ruling party was accused of rigging the national election and the country exploded in violence. Okolloh wrote anguished posts, incorporating as much hard information as she could get.

The government imposed a media blackout, and her blog quickly became a clearinghouse for information on the crisis.

Publishers took notice of her work and approached Okolloh to write a book about her life. She turned them down, not wanting the...
pressure of “having a whole book hanging over” her, as she put it. But one day a documentary team showed up to interview her for a film they were producing about female bloggers. They’d printed up all her blog posts on paper. When they handed her the stack of posts, it was the size of two telephone books. Okolloh may not have thought she wanted to write a book, but in a sense, she already had.

And her output was just a drop in the ocean. Every day, we collectively produce millions of books’ worth of writing. Globally we send 154.6 billion emails, more than 400 million tweets, and over 1 million blog posts and around 2 million blog comments on WordPress. On Facebook, we post about 16 billion words. Altogether, we compose some 3.6 trillion words every day on email and social media — the equivalent of 36 million books.* (The entire US Library of Congress, by comparison, holds around 23 million books.)

And what makes this explosion truly remarkable is what came before: comparatively little. Before the Internet, most people rarely wrote for pleasure or intellectual satisfaction after graduating from high school or college.

Is any of this writing any good? Certainly, measured against the prose of an Austen, Orwell, or Tolstoy, the majority of online publishing pales. This isn’t surprising. The science fiction writer Theodore Sturgeon famously said something like, “Ninety percent of everything is crap,” a formulation that geeks now refer to as Sturgeon’s Law. Anyone who has spent time slogging through the swamp of books, journalism, TV, and movies knows that this holds pretty well even for edited and curated culture. So a global eruption of unedited, everyday self-expression is even more likely to produce this 90-10 split — an ocean of dreck, dotted sporadically by islands of genius.

But focusing on the individual writers and thinkers misses the point. The fact that so many of us are writing — sharing our ideas, good and bad, for the world to see — has changed the way we think. Just as we now live in public, so do we think in public. And that is accelerating the creation of new ideas and the advancement of global knowledge.

Literacy in North America has historically been focused mainly on reading, not writing; consumption, not production. While many parents worked hard to ensure their children were regular readers, they rarely pushed them to become regular writers. But according to
Deborah Brandt, a scholar who has researched American literacy in the 20th and 21st centuries, the advent of digital communications has helped change that notion.

We are now a global culture of avid writers, one almost always writing for an audience. When you write something online—whether it’s a one-sentence status update, a comment on someone’s photo, or a thousand-word post—you’re doing it with the expectation that someone might read it, even if you’re doing it anonymously.

Having an audience can clarify thinking. It’s easy to win an argument inside your head. But when you face a real audience, you have to be truly convincing.

Social scientists have identified something called the audience effect—the shift in our performance when we know people are watching. It isn’t always positive. In live, face-to-face situations, like sports or concerts, the audience effect can make athletes or musicians perform better—but it can sometimes psych them out and make them choke, too.

Yet studies have found that the effort of communicating to someone else forces you to pay more attention and learn more.

You can see this audience effect even in small children. In one of my favorite experiments, a group of Vanderbilt University researchers in 2008 published a study in which several dozen 4- and 5-year-olds were shown patterns of colored bugs and asked to predict which would be next in the sequence. In one group, the children simply repeated the puzzle answers into a tape recorder. In a second group, they were asked to record an explanation of how they were solving each puzzle. And in the third group, the kids had an audience: They had to explain their reasoning to their mothers, who sat near them, listening but not offering any help. Then each group was given puzzles that were more complicated and harder to predict.

The results? The children who didn’t explain their thinking performed worst. The ones who recorded their explanations did better—the mere act of articulating their thinking process aloud seemed to help them identify the patterns more clearly. But the ones who were talking to a meaningful audience—Mom—did best of all. When presented with the more complicated puzzles, on average they solved more than the kids who’d explained to themselves and about twice as many as the ones who’d simply repeated their answers.

Researchers have found similar effects with adolescents and adults. When students were asked to write for a real audience in another country, their essays had better organization and content than when they were writing for their teacher. When asked to contribute to a wiki—a space that’s highly public and where the audience can respond by deleting or changing your words—college students snapped to

GOING FROM AN AUDIENCE OF ZERO TO AN AUDIENCE OF 10 IS SO BIG THAT IT’S ACTUALLY HUGER THAN GOING FROM 10 PEOPLE TO A MILLION.
attention, carefully checking sources and including more of them to back up their work. Brenna Clarke Gray, an instructor at Douglas College in British Columbia, had her English students create Wikipedia entries on Canadian writers, to see if it would get them to take the assignment more seriously. She was stunned at how well it worked. “Often they’re handing in these essays without any citations, but with Wikipedia they suddenly were staying up till 2 am, honing and rewriting the entries and carefully sourcing everything,” she tells me. The reason, the students explained to her, was that their audience—the Wikipedia community—was quite gimlet-eyed and critical. They were harder “graders” than Gray herself.

Interestingly, the audience effect doesn’t necessarily require a big audience. This seems particularly true online.

Many people have told me that they feel the dynamic kick in with even a tiny handful of viewers. I’d argue that the cognitive shift in going from an audience of zero (talking to yourself) to an audience of 10 (a few friends or random strangers checking out your online post) is so big that it’s actually huger than going from 10 people to a million.

This is something that traditional thinkers of the pre-Internet age—particularly print and broadcast journalists — have trouble grasping. For them, an audience doesn’t mean anything unless it’s massive. If you’re writing specifically to make money, you need to draw a large crowd. This is part of the thinking that causes traditional media executives to scoff at the spectacle of the “guy sitting in his living room in his pajamas writing what he thinks.” But for the rest of the people in the world, who probably never did much nonwork writing in the first place—and who almost never did it for an audience—even a handful of readers can have a vertiginous, catalytic impact.

Once thinking is public, connections take over. Anyone who’s Googled a favorite hobby, food, or political subject has discovered some teeming site devoted to servicing the infinitesimal fraction of the public that shares their otherwise wildly obscure obsession. (Mine: guitar pedals, modular origami, and the 1970s anime show Battle of the Planets.)

Propelled by the hyperlink, the Internet is a connection-making machine.

And making connections is a big deal in the history of thought—and its future. That’s because of a curious fact: If you look at the world’s biggest breakthrough ideas, they often occur simultaneously to different people.

This is known as the theory of multiples, and it was famously documented in 1922 by sociologists William Ogburn and Dorothy Thomas. When they surveyed the history of major modern inventions and scientific
The fact that so many of us are writing has changed the way we think. Just as we now live in public, so do we think in public.

discoveries, they found that many of the big ones had been hit upon by different people, usually within a few years of each other and sometimes within a few weeks. They cataloged 148 examples: Oxygen was discovered in 1774 by Joseph Priestley in England and Carl Wilhelm Scheele in Sweden. In 1610 and 1611, at least four different astronomers—including Galileo—independently discovered sunspots. John Napier and Henry Briggs developed logarithms in Britain, while Joost Bürgi did it independently in Germany. The law of the conservation of energy was laid claim to by four separate people in 1847. Ogburn and Thomas didn’t mention another multiple: Radio was invented around 1900 by two different engineers, working independently—Guglielmo Marconi and Nikola Tesla.

Why would the same ideas have occurred to different people at the same time? Ogburn and Thomas argued that it was because our ideas are, in a crucial way, partly products of our environment. They’re “inevitable.” When they’re ready to emerge, they do. This is because we do not work in a sealed-off, Rodin Thinker fashion.

The things we think about are deeply influenced by the state of the art around us: the conversations taking place among educated folk, the shared information, tools, and technologies at hand. If four astronomers discovered sunspots at the same time, it’s partly because the quality of lenses in telescopes in 1611 had matured to the point where it was finally possible to pick out small details on the sun and partly because the question of the sun’s role in the universe had become newly interesting in the wake of Copernicus’ heliocentric theory. If radio was developed at the same time by two people, that’s because the basic principles that underpin the technology were also becoming known to disparate thinkers. Inventors knew that electricity moved through wires, that electrical currents created fields, and that these seemed to be able to jump distances through the air. With that base of knowledge, curious minds were liable to start wondering: How could you use those signals to communicate? And as Ogburn and Thomas note, there are a lot of curious minds. Even if you assume the occurrence of true genius is pretty low (they estimate that one person in 100 is on the “upper tenth” of the scale for smarts), when you multiply it across the entirety of humanity, that’s still a heck of a lot of geniuses.

When you think of it that way, what’s strange is not that big ideas occurred to different people in different places. What’s strange is that this didn’t happen all the time, constantly.

But maybe it did—and the thinkers just weren’t yet in contact.

Thirty-nine years after Ogburn and Thomas, sociologist Robert Merton took up the question of multiples. Merton hints at an interesting corollary, which is that when inventive people aren’t aware of what others are working on, the
pace of innovation slows. One survey of mathematicians, for example, found that 31 percent of the most productive complained that the slow pace of publication led to duplicated work. If they had better visibility into one another's work, one suspects, they could collaborate more effectively or work more quickly or with greater insight.

As an example, there's the tragic story of Ernest Duchesne, the earliest documented discoverer of penicillin. As legend has it, Duchesne was a student at a French military medical school in the 1890s when he noticed that the hospital's stable boys who tended the horses did something peculiar: They stored their saddles in a damp, dark room so that mold would grow on their undersurfaces. They did this, they explained, because the mold helped heal the horses' saddle sores. Duchesne was fascinated and conducted an experiment in which he treated sick guinea pigs with a solution made from mold—a rough form of what we'd now call penicillin. The guinea pigs healed completely. Duchesne wrote up his findings in a thesis, but because he was unknown and young—only 23 at the time—the French Institut Pasteur wouldn't acknowledge it. His research vanished, and Duchesne died 15 years later of tuberculosis (a disease that would someday be treatable with antibiotics). It would take 31 years for the Scottish scientist Alexander Fleming to rediscover penicillin, independently and with no idea that Duchesne had already done it. In those three decades, untold millions of people died of diseases that could have been cured. Failed networks kill ideas.

When you can resolve multiples and connect people with similar obsessions, ideas flourish and multiply. Scientists have for centuries intuited the power of resolving multiples, and it's part of the reason that in the 17th century, they began publishing scientific journals and eventually setting standards for citing the work of other scientists. Scientific journals and citation were a successful attempt to create a worldwide network, a mechanism for not just thinking in public but doing so in a connected way.

Today we have something that works in the same way but for everyday people: the Internet, which encourages public thinking and resolves multiples on a much larger scale and at a pace more dementedly rapid. It's now the world's most powerful engine for putting heads together.

Failed networks kill ideas, but successful ones trigger them.

As an example of this, consider what happened next to Ory Okolloh. During the upheaval after the contentious Kenyan elections of 2007, her blog started carrying reports of related violence. People called and emailed her with tips, and she posted as many as she could. She wished there was a tool to do this automatically—to let anyone post an incident to a shared map. So she wrote about that: "Google Earth supposedly shows in great detail where the damage is being done on the ground. It occurs to me that it will be useful to keep a record of this, if one is thinking long-term. For the reconciliation process to occur at the local level the truth of what happened will first have
to come out. Guys looking to do something—any techies out there willing to do a mashup of where the violence and destruction is occurring using Google Maps?”

One of the people who saw Okolloh’s post was Erik Hersman, a friend and technologist who’d been raised in Kenya. When Hersman read it, he realized he knew someone who could make the idea a reality. He called his friend David Kobia, a Kenyan programmer who was working in Birmingham, Alabama. Much like Okolloh, Kobia was interested in connecting Kenyans to talk about the country’s crisis, and he had created a discussion site devoted to it. Alas, it had descended into political toxicity and calls for violence, so he’d shut it down. He was driving out of town to visit some friends when he got a call from Hersman. Hearing Okolloh’s idea—a map-based tool for reporting violence—Kobia immediately knew how to make it happen. The three of them built a team and started collaborating, Kobia began coding frantically, and within a few days they were done.

The tool allowed anyone to send an incident report in text, email, or web form, which they then pinned to a Google map. They called it Ushahidi—the Swahili word for “testimony.”

Within days, Kenyans had input thousands of incidents of electoral violence. Soon after, Ushahidi attracted $200,000 in nonprofit funds and the team began refining it to accept reports via everything from SMS to Twitter. Within a few years, Ushahidi had become an indispensable tool worldwide, with governments and nonprofits relying on it to help determine where to send assistance. Just hours after a massive earthquake hit Haiti in 2010, an Ushahidi map was set up, and over the following month it cataloged 25,000 text messages and more than 4 million tweets. It has become what Ethan Zuckerman, head of MIT’s Center for Civic Media, calls “one of the most globally significant technology projects.”

The birth of Ushahidi is a perfect example of the power of public thinking and multiples. Okolloh could have simply wandered around wishing such a tool existed. Kobia could have wandered around wishing he could use his skills to help Kenya. But because Okolloh was thinking out loud, and because she had an audience of like-minded people, serendipity happened.

Contributing editor Clive Thompson (clive@clivethompson.net) profiled artist Doug Aitken in issue 21.09. This article is excerpted from his new book, Smarter Than You Think.

*Correction appended [9/17/1:34 P.M. PST]: Globally, we compose 3.6 trillion words every day on email and social media, the equivalent of 36 million books, not 52 trillion words and 520 million books.