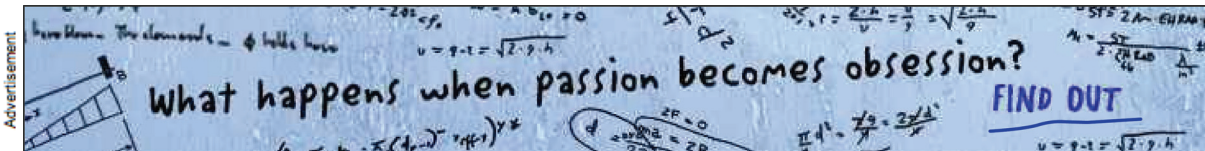


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Were letters inspired by nature?

Updated 4/30/2006 5:41 PM ET

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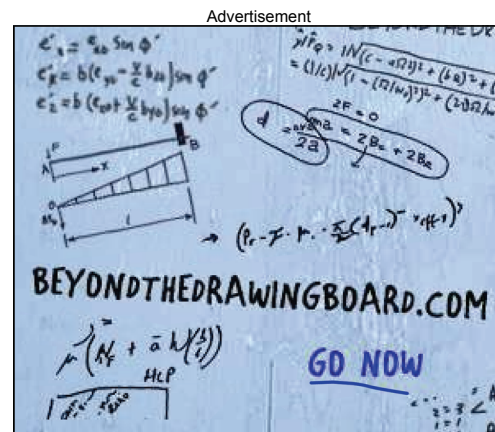
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Science Snapshot
Dan Vergano

Humming the alphabet song, A-B-C-D and so on, won't do you much good in much of the world, where the Latin alphabet doesn't correspond to the local language. Surrounded by unreadable signs in a new language, tenderfoot tourists may experience a Bizarro-World feeling of dislocation.

But a look at alphabets ranging from Chinese to Cyrillic to Arabic and beyond, suggests that their characters, and the Latin ones too, may have more in common than initially meets the eye.

Natural shapes, contours found outdoors, appear to be the inspiration for letters in most alphabets, concludes a study in *The American Naturalist* journal.

In the study, essentially a computer analysis of letter shapes led by theoretical neurobiologist Mark Changizi of the California Institute of Technology in Pasadena, Calif., the researchers sorted letters by their "topology," not their basic shape. Topology is the branch of math that classifies and characterizes shapes.

To a topologist, a donut is famously the same as a coffee cup. Fundamentally, they're both hoops. This leads to lots of jokes among mathematicians about topologists wrongly dunking their coffee into their donuts, but topology also lets researchers talk sensibly about statistical similarities between shapes.

In the study then, a letter like X equals any character written as two-slashes that meet anywhere, like a "+" sign. And an "L" is the same as a "V". The team concentrated its study on 36 two or three-segment shapes ("N" is an example of a three-segment shape) across 97 writing systems. Looking at 1,442 letters, the team checked the frequency of each shape, and measured how well they matched 4,759 Chinese characters and 3,538 "nonlinguistic" symbols, such as musical notation or traffic symbols. They ran the same analysis against random scratches and children's scribbles as a test of the method.

Among the letters, characters and symbols, shapes corresponded to one another in a statistical sense fairly often, from 70 to 80% of the shapes. Scribbles corresponded to the other shapes much less often, about 30% of the time, and random scratches, not at all.

For extra measure, the team checked the letters against "shorthand" notations, which are designed for writing ease rather than ease of viewing. They didn't correspond very well either.

So if letters are designed to be visual standouts across many alphabets, and not for ease of writing, where do they come from? the team asked. "We considered an ecological and visual explanation for why visual signs are shaped the way they are," the study says. Namely, that letters are shapes commonly seen in the natural environment, ones that human beings evolved to pick out easily over many generations.



Enlarge Courtesy: Website of Prof. Norbert Schoenauer

The study looked at pictures from anthropological studies to find the natural shapes that inspired letters. In this photo, one can see the inspiration for "L" and "V."

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The American Naturalist: The Structures of Letters and Symbols throughout Human History Are Selected to Match Those Found in Objects in Natural Scenes

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To test this idea, the team compiled 535 images drawn from anthropological studies from Africa, as well as National Geographic images of rural life and computer generated images of buildings. Modern-looking human beings seem to have first appeared on the African Savannah more than 150,000 years ago, according to fossil findings. They found the distribution of letter and character shapes "closely matches that of natural scenes," according to the study.

In other words, evolution has shaped our vision to be good at picking out the same shapes, those seen on the savannah many millennia ago, and modern-day cultures have selected those same shapes for letters and symbols today, the researchers conclude.

Each week, USA TODAY's Dan Vergano combs scholarly journals to present the Science Snapshot, a brief summary of some of the latest findings in scientific research. For past articles, visit [this index page](#).

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