

The Warped World of Mental Maps

Students worldwide share a skewed vision of the continents

By RICHARD MONASTERSKY



Saarinen

Your mission is to draw a map of the world. You have a sheet of plain paper, a pencil, and a half hour. Now start scribbling.

If you are like most people on this planet, you will soon make some whopping errors, especially in the way you sketch the continents. That's precisely what Thomas F. Saarinen found when he examined maps drawn by first-year college students in 20 cities around the world. Saarinen, a geographer at the University of Arizona in Tucson, believes these map-making mistakes reveal some deep-seated misconceptions shared by people across the globe.

Indeed, his work and that of others suggest that the maps people carry in their minds reflect, in part, their ignorance and biases about other lands and may adversely influence the way countries interact.

When he embarked on his study, Saarinen thought he knew the direction the results would take. He assumed that students would naturally tend to exaggerate the size of their home turf. He calls this the "New Yorker's view of the USA syndrome," after the well-known poster showing New York City in great detail, with the rest of the country reduced to comical proportions. Saarinen reasoned that someone from Argentina would unconsciously enhance the size of South America, while a native of Rwanda would naturally draw Africa a little larger than its proper size.

That pattern did indeed emerge on the student maps. But the home-turf exaggeration paled in comparison with an even stronger tendency that Saarinen had not foreseen. No matter where they lived, students from every continent (except Antarctica, which has no university or indigenous population) greatly enlarged the size of Europe and shrank the dimensions of Africa, Saarinen reported in August at the International Geographi-

cal Congress in Washington, D.C.

"The results were astounding," he says. "In some cases, Europe is even bigger than Africa."

Saarinen's study on the size of continents is only part of a long-term project that he calls "Parochial Views of the World," which he started in 1986 while visiting universities in 30 countries in the span of a year. In each geography class, Saarinen gave students the same instructions, asking them to sketch a map of the world and label countries or features they considered important.

He also sent an assistant to South America and got in touch with geography professors in 25 other universities that he could not visit, giving them the same instructions for the student maps. All told, Saarinen and his colleagues obtained 3,568 maps from 75 universities in 52 countries.

After collecting the sketches, Saarinen's group first examined a basic aspect of anyone's mental map: what appears in the center. The results showed that most people have a Eurocentric image of the world. A full 80 percent of the maps collected featured Europe in the middle, with the Americas on the left and Asia on the right. Eleven percent placed eastern Asia center stage, while 7 percent put the Americas in the middle. The researchers could not classify the rest.

At the time, Saarinen suggested that the Eurocentric maps appeared most often because the prime, or 0°, meridian passes through Greenwich, England, making this a natural centering point. But the recent study on continent size suggests that other factors also nudged Europe into the center.

In the continent study, Saarinen and his co-workers selected 400 maps from 20 countries spread out across all the conti-

nents save Antarctica. To measure continent size, they traced around the perimeter of the landmasses with an electronic planimeter, a device that measures area. For most continents, their easily defined boundaries made this a simple procedure.

For Europe and Asia, however, Saarinen's group needed to establish objective criteria to locate the boundary. They relied on physical features such as the Ural Mountains and the Caspian Sea when analyzing maps that included these geographic features. On less detailed maps, the researchers used a procedure that estimated the European boundaries from the relative positions of the Baltic Sea, the Mediterranean Sea, and Siberia.

Saarinen suggests several factors that may explain why students across the globe share a mental map that exaggerates Europe while diminishing Africa. For starters, he says, much of the blame rests on the shoulders of professional cartographers, who until recently used the badly skewed Mercator projection.

This style of map is made by projecting the spherical globe onto a cylindrical sheet of paper — a process that greatly exaggerates the size of regions closest to the pole. Infamous for making Greenland look huge, the Mercator projection benefits Europe because that continent lies more than halfway to the North Pole; the equator-straddling continent of Africa gets short-changed.

Although different projections have since come into fashion, Saarinen reasons that many of the older Mercator projection maps still cover the walls of classrooms around the world, quietly passing on an incorrect view of the continents to students.

"We don't get our image of the world from running around and looking at the world. We get it from some diagram or map," he says.

There must be more to the story,

though. If the Mercator projection alone caused the size bias, then North America and Asia should also appear larger than life, as these continents contain a significant amount of land close to the pole. But that did not happen: Europe was the only continent consistently exaggerated.

Saarinen suggests that his findings highlight a long-standing, worldwide bias that focuses attention on Europe while ignoring Africa. "We tend to know a lot about Europe and draw it larger than it is; we know less about Africa and draw it smaller than it is," he says.

Geographer Thomas J. Bassett agrees with that assessment. "Notions of relative and absolute distance are filtered by our cultural biases," says Bassett, who specializes in African studies at the University of Illinois at Urbana-

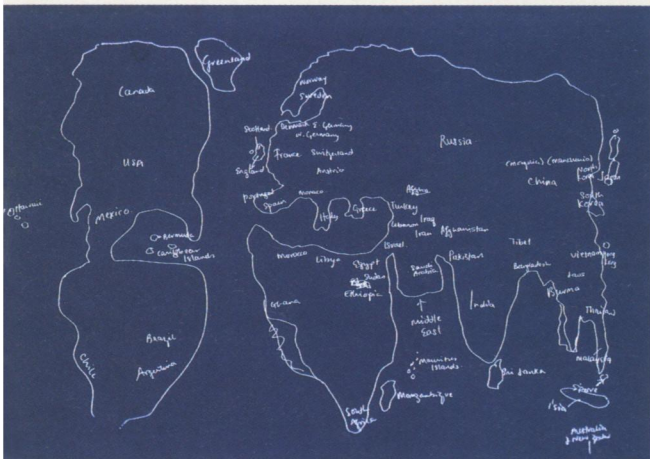
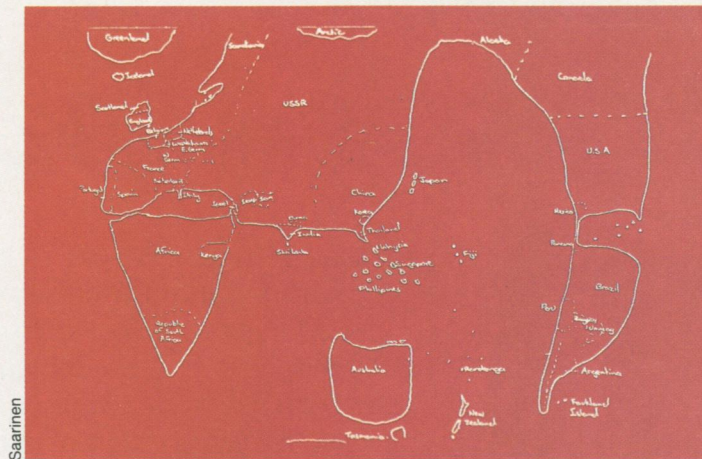
expanded the dimensions of the fictitious range, so much so that it began to appear on various maps as a dominant feature in Africa. In a study of 99 maps made between 1789 and 1890, Bassett and Porter found that the Kong Mountains or an unnamed range appeared on 91.

A French military officer named Louis-

Gustave Binger finally wiped the Kong Mountains off the maps after his well-publicized expedition to this region in the late 1880s.

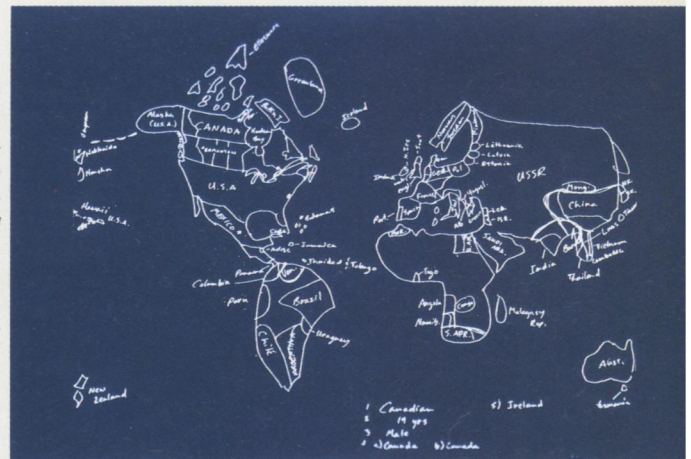
During their century of existence, the Kong Mountains influenced European economic interests in the African continent because traders believed that the range barred transport between the coast and the interior. Binger removed that obstacle and opened up this part of West Africa to French colonization, Bassett and Porter say.

Does the modern skewed image of African geography have any political or economic impact today? Saarinen's study doesn't address that question. But geographer Reginald G. Golledge at the University of California, Santa Barbara, says it is quite possible. "What I would sug-



Saarinen

Students around the world enlarge Europe and shrink Africa. Maps come from Singapore (left), New Zealand (above), and Canada (right). Portion of Japanese map appears on facing page.



Saarinen

Champaign. Because many people think of Africa as insignificant, its physical dimensions shrink in their mental maps, he says.

Of course, ignorance about the African continent did not appear overnight. Bassett and colleague Philip W. Porter of the University of Minnesota in Minneapolis recorded an extraordinary example of long-standing misconceptions about African geography in the *JOURNAL OF AFRICAN HISTORY* (vol. 32, no. 3), published late last year.

Bassett and Porter recount the rise and fall of a fictitious mountain range in West Africa during the 19th century. Called the Kong Mountains, this range sprang into existence when a misinformed explorer from Europe reported seeing mountains in southern Mali during an expedition in the latter years of the 18th century.

An inventive cartographer who mapped the territory explored by the expedition



Bassett

Stretching across half of Africa, the fictitious Kong Mountain range (arrow) appears as one of the most prominent geographic features on this 1802 map, the first commercial map to depict the mountains. Cartographers mistakenly thought the Kong Mountains blocked the Niger from flowing into the Gulf of Guinea.

gest is that your view of the world is going to influence things like who your closest trading partners are," he says.

Aside from illustrating a widespread ignorance about African geography, both the Kong Mountain episode and Saarinen's world map project highlight the tremendous authority that maps hold. In the 18th century, some explorers and Africans expressed doubts about the existence of the Kong Mountains, yet the fictitious range continued to loom in the minds of Europeans until new maps based on Binger's expedition appeared and established themselves as the cartographic authority.

Two hundred years later, people still regard published maps as a true representation of the world. In an era when astronauts have successfully journeyed to the moon, who would think to question whether a map on the wall depicts Earth's continents as they truly are? □