

Dynamite Brains

By Dr. E. Kirsten Peters

People are unusual animals. We spend a lot of time watching mediocre T.V., but we also describe our thoughts in written language. We pour beer on our heads at football games, but we also study the whole history of life on Earth preserved in fossils.

It's not our biceps that make us people special, but our thoughts. What makes our thinking so complex, able to soar with the poets and solve problems with an engineer?

In the 1800s, a number of scientists spent considerable effort trying to determine a biological basis that they assumed made some people "smarter" and "more civilized" than others. We can learn something of vital importance about science and scientists from the history of their projects.

Craniology, as the science of head size and brain structure was called, had two basic ideas: bigger brains were smarter brains, and any structures that were toward the front of the brain were more developed in smarter or more civilized people.

The first major craniologist was an American named Samuel George Morton. Skulls give a good measure of brain volume, and they keep much better on a shelf over time than brains do. So Morton collected over 1,000 skulls from all over the world. He examined them in the best scientific and objective spirit of the day. In one of his techniques, he poured shot into skulls, then poured the shot out to measure its volume.

Morton's published papers argued that the skulls of whites were larger than those from subjects with red, yellow, brown or black skin. Women, Morton simply assumed, were so intellectually ungifted he barely mentioned the fact that their brains were smallest of all in his measurements.

Morton was confident enough of his work he published his raw data – the measurement of each skull or set of skulls. And that made possible a "double check" of his work more than a century later.

Stephen Jay Gould, the famous professor of geology and paleontology at Harvard University, for whom I once worked as a teaching assistant, plowed through all of Morton's measurements and the arithmetic he published. (You can find a forceful treatment of the story in Gould's, *The Mismeasure of Man*, available at libraries everywhere in the nation.) Gould found that Morton – and other scientists who followed in his footsteps such as Robert B. Bean – consciously or unconsciously fudged their data to support the conclusions they fully expected to find.

Just as one example, women of every race are, on average, of smaller stature than men of that race. I'm a woman 5 foot 6 inches tall. My friend Peter is of my race, and he is 6 foot 6 inches tall. Guess who has a larger hat size, Peter or me?

Here's the kicker: Morton's tables sometimes had only women's skulls for races he viewed as

inferior. He didn't view that as a problem. But for "Englishmen" (whom he viewed as a category worthy of separate record-keeping even from other whites), he measured only male skulls – no female skulls allowed in the data!

Morton cooked the books in many other ways, too. His arithmetic is wrong in several places where he computed averages – and his errors elevate the brain size of white males and depress the brain size of non-whites.

It's easy to mock craniology now, but it was a serious pursuit in its day. The point of remembering it is that we should always be on guard for the errors any of us professionals can make, due to the climate of the times. Science is a profession pursued by human beings, not objective robots.

As readers of this column know well, I'm a committed believer in science and all around us the evidence is clear that scientists make great discoveries each day. But, it's worth remembering, we scientists also make some real mistakes.

After all, if craniologists had thought clearly for even a moment, they would have abandoned their work. Brain size cannot explain much, if anything, about intelligence. Neanderthals had modestly bigger brains than we do. And what about elephants and blue whales?

As my fourth grade teacher used to say, "Put your thinking caps on!"

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