Remeasuring Man

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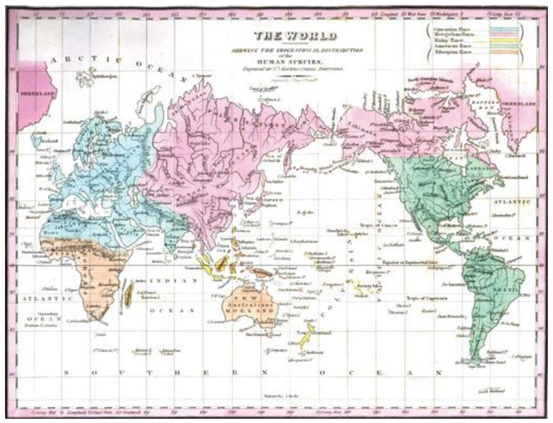
Morton's Cranial Collection

Samuel George Morton (1799 – 1851) was the greatest American scientist of the early 19th century. Thanks largely to Stephen Jay Gould, Morton's cranial capacity measurements of different races is now held up as a prime example of and cautionary tale against scientific racism. A team of anthropologists recently reevaluated Morton's work and argued that it was Gould, not Morton, who was biased in his analysis. They are mistaken.

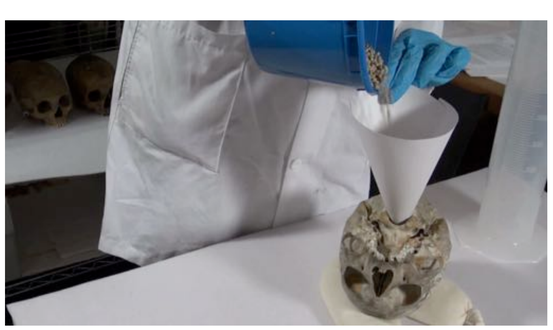
Human Diversity in Five Races

Morton's wanted to apply the methods of natural history to human variation. He categorized human diversity using racial types, dividing humans into five races: Caucasian, American, Malay, Mongolian, and Ethiopian (African). His map of racial distribution is shown below.



Measuring Man

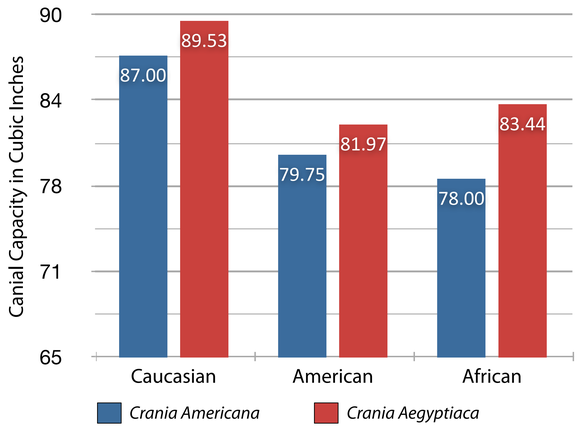
Morton believed that *cranial capacity*, the volume of the interior of the cranium, was a proxy for brain size and for intelligence. He assessed this capacity by filling skulls with peppercorns or lead shot, and then measured the resulting volume.

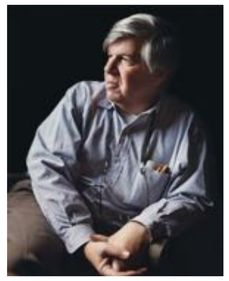


Were Morton's Measurements Racially Biased?

Samuel Morton used white peppercorns for the measurements reported in *Crania Americana*. He was unhappy with these measurements, which he took to be inaccurately small and of high variance. For subsequent work, he remeasured the original sample using lead shot. If Morton's errors were due to the peppercorns alone, the under-measurement should have been the same for each race — **but it wasn't!**

Mean Cranial Capacity Reported in *Crania Americana* (1839) and *Crania Aegyptiaca* (1844)





"[The Caucasian race] is distinguished for the facility with which it attains the highest intellectual endowments."
— Samuel Morton, 1839

"Plausible scenarios are easy to construct …[he] takes a distressingly small Caucasian skull, shakes hard, and pushes mightily at the foramen magnum with his thumb."
— Stephan Jay Gould, 1981

2011 Remeasurement of Morton's Crania

Lewis et al. remeasured 46% of Morton's collection with precision plastic balls. They found that only 2% of their measurements differed significantly from those reported in *Crania Americana.*

"These results falsify the claim that Morton physically mismeasured crania based on his a priori biases." — Lewis et al., 2011

Gould's Main Argument is Correct

Gould argued that the **differences between** the peppercorn-based and shot-based measurements reveal Morton's biases. Although Lewis et al. showed that Morton's shot-based measurements are reliable, this **cannot defeat Gould's argument**. They would have to show that Morton's peppercorn-based measurements were accurate. Systematic differences in the means is evidence of systematic measurement error. This systematic error could be the result of racial bias.

Gould's critique of Morton has been widely cited as an illustration of bias in science; it ought to remain so.

Gould correctly claimed:

- Morton selectively mismeasured with peppercorns, which gives evidence that Morton's measurements were racially biased.
- Sexual dimorphism is a source of bias that Morton didn't address.
- There is little difference in cranial capacity between Morton's races.

Gould mistakenly claimed:

- There are no differences at all between crania of different races.
- Native Americans have the largest crania in the collection.

Sexual Dimorphism

Despite labeling the crania by sex, Morton never computed different averages for males and females.

Ethnographic Division.	Locality.	No. of Crania.	Largest Brain.	Smallest Brain.	Mean.	
Pelasgic Form.	Memphis.	14	97	79	89	Mean, 88 C.I.
	Abydos.	1	89	89	89	
	Thebes.	5	92	82	86	
	Philæ.	1	74	74	74	
Semitic Form.	Memphis.	1	88	88	88	Mean, 82.
	Abydos.	1	69	69	69	
	Thebes.	3	85	79	79	
Egyptian Form.	Memphis.	7	83	73	79	Mean, 80.
	Abydos.	2	96	85	90	
	Thebes.	25	95	68	80	
	Ombos.	2	77	68	73	
	Debôd.	3	82	70	75	
Negroid Form.	Maabdeh.	1	71	71	71	Mean, 79.
	Thebes.	5	88	71	81	
Negro.	Philæ.	1	73	73	73	Mean, 73.

83.3 → M 86.5, F 77.2

79.0 → M 87.5, F 75.5

Morton's Negroid males are larger than his Caucasian males.

Notable Specimens

Morton had special interests in Native American Mound Builders, Americans with manipulated skull shapes, European notables, "Idiots," and criminals.

References

Gould, Stephen J. (1978). Morton's ranking of races by cranial capacity. *Science* 200(4341), 503-509.

Gould, Stephen J. (1996). *The mismeasure of man*. Second edition. New York: WW Norton & Company.

Lewis, J. E., DeGusta, D., Meyer, M. R., Monge, J. M., Mann, A. E., & Holloway, R. L. (2011). The mismeasure of science: Stephen Jay Gould versus Samuel George Morton on skulls and bias. *PLoS Biology* 9(6).

Morton, Samuel George (1839). *Crania Americana or, a Comparative View of the Skulls of Various Aboriginal Nations of North and South America*. Philadelphia: John Pennington.

Morton, Samuel George (1844). *Crania Aegyptiaca. Or, Observations on Egyptian Ethnography, Derived from Anatomy, History, and the Monuments.*

Morton, Samuel George (1849). *Catalogue of Skulls of Man and the Inferior Animals*. Philadelphia: Merrihew and Thompson.

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