

Could early man only see three colors?

A Straight Dope Classic from Cecil's Storehouse of Human Knowledge

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Dear Cecil:

I've been told that thousands of years ago mankind recognized the existence of only three colors. For obvious reasons I'm rather skeptical about this piece of historical wisdom. When were additional colors recognized? Did someone "discover" them — e.g., William of Orange? Eric the Red? You just can't find this out in the World Book.

— Cary C., Santa Monica, California

Cecil replies:

In the restaurant of knowledge, Cary, remember this: the *World Book* is a snack, the Straight Dope is a *meal*. But enough of this folderol. Anthropologists and classicists have been arguing about color terminology since the nineteenth century, and it's only recently that the situation has begun to clarify. The opening shot was fired by William Gladstone, the British politician and Homeric scholar. He pointed out that abstract color terminology was virtually absent from Homer's work, and claimed that the Greeks had no sense of color at all, having only the ability to distinguish light from dark. He believed " ... that the organ of color and its impressions were but partially developed among the Greeks of the heroic age" — i.e., the Greeks were physiologically incapable of perceiving color.

Lazarus Geiger, a naturalist, expanded on Gladstone's ideas. Based on his examination of Greek literature, the Vedic hymns, and other ancient writings, he claimed that man's color sense had developed only gradually, in fairly recent times. He thought that man had become aware of colors in the order that they appear in the spectrum, starting with the longest wavelengths. First, he said, people dimly realized that something was "colored," then they could distinguish black and red, then black and red plus yellow, then white, then green, and finally blue. (I realize white is not a "color" of the spectrum, but this is Geiger's theory, not mine.) He pointed out that "Democritus and the Pythagoreans assumed four fundamental colours, black, white, red, and yellow. ... Nay, ancient writers (Cicero, Pliny, and Quintilian) state it as a positive fact that the Greek painters, down to the time of Alexander, employed only these four colours."

Later writers conceded the relative poverty of color terminology among ancient peoples, but denied that it reflected a physical inability to distinguish color. A major breakthrough on the question occurred in 1880 when an ophthalmologist named Hugo Magnus organized a study involving missionaries working with primitive tribes around the world. Using standardized color samples and a rigorous testing procedure devised by Magnus, the missionaries found that primitive peoples with a limited color vocabulary nonetheless could distinguish colors every bit as well as persons from highly developed cultures — they just didn't have *names* for all the colors.

Not everybody bought this conclusion. As late as 1901 one researcher was arguing that the members of one primitive culture literally could not see any difference between blue and green because their retinas were more strongly pigmented than those of Europeans. But in general anthropologists came to accept the view that physiological differences did not explain the variations in color vocabulary among cultures.

So what does explain the variations? That's still a matter of dispute. The majority view, I would venture to say, is that the designation of colors in different cultures is totally arbitrary. For instance, H.A. Gleason notes, "There is a continuous gradation of color from one end of the spectrum to the other. Yet an American describing it will list the hues as red, orange, yellow, green, blue, purple, or something of the kind. There is nothing inherent either in the spectrum or the human perception of it which would compel its division in this way" (*An Introduction to Descriptive Linguistics*, 1961). Similarly, Verne Ray says "there is no such thing as a natural division of the spectrum. Each culture has taken the spectral continuum and has divided it up on a basis which is quite arbitrary" ("*Techniques and Problems in the Study of Human Color Perception*," *Southwestern Journal of Anthropology*, 1952).

More recent research, however, suggests that color terminology may not be so arbitrary after all. Brent Berlin and Paul Kay (*Basic Color Terms: Their Universality and Evolution*, 1969), to whom Cecil is indebted for much of the preceding discussion, suggest that there is a remarkable degree of uniformity in the way different cultures assign color names. In a study of 98 languages from a variety of linguistic families, they found the following "rules" seem to apply:

1. All languages contain terms for white and black.
2. If a language contains three terms, then it contains a term for red.
3. If a language contains four terms, then it contains a term for either green or yellow (but not both).
4. If a language contains five terms, then it contains terms for both green and yellow.
5. If a language contains six terms, then it contains a term for blue.
6. If a language contains seven terms, then it contains a term for brown.
7. If a language contains eight or more terms, then it contains a term for purple, pink, orange, grey, or some combination of these.

Berlin and Kay also found that the number of basic color terms tends to increase with the complexity of the civilization. They speculated that this explains the relative poverty of color terminology among the ancients — e.g., the Greeks had terms only for black, white, yellow, and red because theirs was a relatively uncomplicated culture, at least from a technological standpoint. But Berlin and Kay admit they don't know why the "rules" should operate as they do. For more detail, check out their book.

