

Goethe's Theory of Color

by

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translated by Ted Warren

Goethe's *Theory of Color* is one of the least accessible documents in the history of modern interpretations of nature. The writer considered it his main piece of work and his testament. At the same time he compared himself to a chess player who had merely made his introductory moves. He knew many years would pass before the general public would understand his distant goal. With bitter irony he stated that his theory would rest in a dormant state until the year 2000. What is the position it now holds in 2007? A renaissance for Goethe's *Theory of Color* has not taken place but many outstanding scientists have considered it necessary to take a position to it. From the highest, most responsible academic quarters it has been stated that Goethe's method holds the seed to a new approach to nature and that this approach is more encompassing than the natural scientific approach we have today. They add that Goethe's science is yet a distant, future possibility and that mankind must first follow its present course to the end.

One thing is certain: from an educational perspective Goethe's *Theory of Color* is an important and highly relevant document. Obviously one can never teach it as it is. That would be a misunderstanding, one reason being that his actual presentation was limited by knowledge available at the time and his conflict with Newton that was merely of local, historical interest. One aspect of the theory that we can learn a great deal from is that colors are treated as objective realities in nature. Nor is the traditional border drawn between so-called subjective and objective sensory qualities.

We can better understand the questions involved if we consider for a moment Goethe's "original phenomena" within the theory of color, which state that yellow and blue are the first colors; they are the qualities of the "partially transparent medium" in its relation to light and darkness. Through the atmosphere the universe tones towards us in the color blue, and, according to the thickness of the air, takes on every grade of blue until it goes over to black-violet on the high mountaintops. On the other hand, the sun represents light, it tones in yellow, and, according to the thickness of the air, takes on yellow-red values. On a cloudy, fall day the sun is ruby red.

We know Goethe's "original phenomena" from other relationships, for example smoke. From a Newtonian point of view the "original phenomena" are explained by the different wavelengths that are absorbed and spread to various degrees in the atmosphere. Goethe uses another language. He speaks of the "partially transparent medium," allowing the "media" to be the carrier of color in the same way that tones are carried by air. Goethe placed the same objective interest on colors as Pythagoras placed on the sound relationships of a monochord. Sound may also be reduced to vibrations in a medium, namely air. But for Goethe and Pythagoras sound and color were qualities of a corresponding medium, namely air and, "the partially transparent medium." The qualities of sound and color can be defined just as we otherwise define the qualities of weight and movement. Everyone can research the physical conditions of Goethe's and Pythagoras' qualities. Pythagoras found them in the monochord's physical dimensions; Goethe found them in the relationship between light and darkness.

The educational value of Goethe's *Theory of Color* is that it opens up a qualitative approach to optical phenomena. Let us take our study of Goethe's *Theory of Color* further and see what are its valuable aspects beyond the purely educational. How is light represented in Goethe's *Theory of Color*? Goethe said that "the colors are the deeds of the light" and that light itself is invisible. Light is also a quality, according to Goethe, but a quality of the higher order. Light is active in nature in the same way that a painter speaks about light in his paintings. Goethe's experience of nature is close to an artist's. For an artist color is a quality and his practical problem is to allow the quality to appear. Quality is always the expression of its own activity, certain obstinacy you might say. Artistic colors are not dead materials but active materials.

With the eye of an artist Goethe observed nature. In principle he saw the same things as his counterpart Newton. He even carried out many of the same experiments as Newton, but their methods of contemplation and their overall goals were quite different. Newton resolved all of his experiments to quantitative, physically measurable results, and so we have the spectral colors. Goethe's experiments were for the qualitative aspects, for process, and so we have the color hexagon and the study of contrasts, such as light and darkness.

In nature the same activities take place according to strict and eternal laws as they take place in every piece of art that is created. For Goethe art was of a higher nature. The artist allows a higher totality to speak through the qualitative polarities. In this way Goethe observed in nature a main principle that he defined as "polarity and elevation." Every natural process or event is a qualitative change, a metamorphosis. When we say that a change is "natural," we mean that it is not coincidental, but follows a characteristic, typical pattern. In metamorphosis, a change between opposite qualities, a higher totality always appears. Goethe called this idea or representation an "original phenomenon." In

his way the artist does the same as nature. But while nature's cycle is limited, its representation eternal and unchangeable, the artist in contrast is creative, he brings forth something new, something no one else has seen, though his materials are the same as nature's.

Let us observe how the Goethean principles of nature appear in his *Theory of Color*. The original colors, the main aspects of the medium, are yellow and blue. A change between the yellow and blue takes place, a metamorphosis, or an elevation as we defined above. The elevation of yellow and blue takes place through all of the variations of yellow-red, orange, and cinnabar on one side and blue-red, violet, red violet on the other side. But on the divide between the reddish-yellow and the reddish-blue values sits a color in which Goethe was very interested. It is purple, a bright red color that resolves the polarity between yellow and blue. Words can barely describe purple. It is often called "the color of peach blossoms." The question is whether purple is realized in nature and as a pigment color, or whether it is a theme that nature plays upon, a goal for which it strives. Purple is the zenith of Goethe's world of colors.

But there is another transition from between yellow to blue, namely green. It is not created by an elevation, but rather by a reduction, in that we can speak of two components, yellow and blue, and their mutual dominance in the color green. According to Goethe, color's variety can be summed up in a symbolic, geometric scheme, his color hexagon. Orange, violet and green are representatives for the three transitions in the kingdom of color, while yellow, blue and red present the primary qualities. It is curious that Newton, due to his method of contemplation, focused on the transitional colors. Here Newton found his measurable sizes and spectral colors while Goethe's colors of yellow, red and blue were considered by Newton as mixtures of spectral colors. In a strange way Goethe and Newton's interpretations stand diametrically opposed, and we must learn to understand that both theories are correct in their own ways and we can accept both theories. No doubt within Goethe's comprehensive materials there is not a single error that a Newtonian scientist can point to, and within Newton's comprehensive experiences there is no phenomena that Goethe did not come to know and consider in his own way.

Newton's doctrine has not been silent for four hundred years. It has seen significant practical consequences all this time, color photography and color television to name just two. His work has had not only logical worth but also practical application. What practical worth has Goethe's *Theory of Color* had? The technical applications, as far as I know, have as yet been insignificant, but its potential for education and human understanding is profound, for it casts light on the relationship between art and science. Goethe claimed that he who would follow his observations of nature would achieve inner freedom.

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Johann Wolfgang von Goethe 1749–1832