

# The origin of antithetical expressions

**Abstract:** An explanation is offered for the puzzling phenomenon, discovered by Darwin, of reversal of expressions.

## 1. Antithesis

There was a clearly defined trend in the evolution of Darwin's publications. Gradually there emerged in them a more and more materialistic understanding of man. The 1859 "Origin of Species" grasped the animal kingdom in materialistic terms. The deliberately publication-delayed "The Descent of Man" from 1872 included man in this approach, but still only from physiological aspects. The 1873 "The Expression of Emotions in Man and Animals" went still one step further: the behavior, and even emotions of man and animal alike, are part of the physical world, and evolved by physical-world rules.

The idea of "The Expression of Emotions" was that behavior patterns are like physical ones. They evolved from motions that had some purpose, and only later acquired communicational value. The origin of expressions, says Darwin, is functional.

But the beauty of the book is not only in this idea. Its main strength is in the very clever explanations of individual expressions. For example, the explanation of the raised brows in sorrow as the result of an attempt to refrain from closing the eyes, a tendency to which is induced by the wish to cry. Or the explanation (proposed also by others, before Darwin) of the lowering of the brows in anger as intended to protect the eyes in case of a struggle.

Perhaps the most ingenious explanation is that for the expression of helplessness. The components of this expression are the shrug, spreading the hands to the sides, opening the palms, raising the brows and pulling down the ends of the mouth. This is an enigmatic expression, until one (and this one was Darwin) notices that it is opposed, in each of the components, to the expression assumed in preparation for attack, or for dealing with adversity. The opening of the palms is opposed to clenching the fists; the raised brows are the opposite of the lowered brows in preparation for attack (originating in the need to protect the eyes in such situations); the shrug is the opposite of the raised head and the erect neck in preparation for attack; the spread out hands are reverse to the arms

drawn towards the body for protection; the lowering of the ends of the mouth is reversal of the baring of the teeth.

Darwin named “antithesis” this phenomenon, that one expression can be the opposite of another. He found it also in animals. For example, a dog preparing for attack bristles his hair, so as to appear larger. For the same purpose he raises his ears, and stands upright. He also bares his teeth, and lowers his eyebrows. In contrast, a fawning dog has his hair drawn back, ears drawn down, and he cowers on his front legs. His brows are raised, and the corners of the mouth drawn down. Darwin describes a similar phenomenon also in cats.

## 2. . The origin of antithesis – Darwin’s explanation

What was the origin of the phenomenon of antithesis? A surprise awaits here the reader of “The Expression of Emotions”. Whereas all other expressions received functional explanations, antithesis is explained along different lines: disloyal to his general principles, Darwin claims that the origin is in appearance. An antithetical expression is opposed in *look* to of the original expression, and the aim of the animal, or human, is to generate an impression as opposed as possible to the original one.

One problem with this explanation is that it deviates from the general framework. It breaks away from the basic principle of the book, which was later to become the cornerstone of the science of ethology – functional origins for behavior patterns. But there is an even more serious flaw. The antithetical expression is not opposed in appearance to the original one. The real reversal is in the muscles operating the expression: the antithetical movements are performed by the antagonistic muscles to those of the original expression. For example, the stretching open of the palms in helplessness is done by the antagonistic muscles to those clenching the fists in preparation for attack.

## 3. Inhibition

What is the reason for the arrangement of muscles in the body in antagonistic pairs? One aim is *inhibition*. When a muscle is operated, its antagonistic mate is inhibited. And this goes also in the other direction: when one wishes to inhibit a tendency to perform a certain action, one way for doing it is by operating the antagonistic muscles.

This principle, of reversal for the purpose of inhibition, is known also in psychology. The “reaction formation” defense mechanism is based on it:

the inhibition and denial of a certain tendency may be manifest in an action in the opposite direction. For example, an ambivalent mother may be over-protective.

This suggests a functional explanation for the principle of antithesis, that unlike the “appearance” explanation conforms with the explanation of all other expressions. It is that antithetical expressions originated from an attempt to inhibit the original tendency. For example, the expression of helplessness results from the inhibition of the tendency to prepare for attack. One realizes that the task in question is beyond one’s powers, or that the opponent faced is too strong, in which case it is beneficial to avoid action. To make sure that the original tendency is inhibited, the antithetical muscles to those used in preparation for attack are operated.

Like in all other expressions, the functional purpose developed into a communicational one. This explains the way that reversal of aggressive expressions evolved into expressions of submission. If one side in a confrontation realizes its weakness and inhibits its aggression, the other will benefit from perceiving this and avoiding attack as well, getting the upper hand without risk.

What support is there for this theory? The main evidence is in that reversal of expressions occurs only in expressions of aggression. Situations involving aggression are precisely those that may demand inhibition, since they entail a measure of danger. And indeed, in man antithesis is known to apply only to the expression of preparation for attack. The antithetical expressions described above in dogs and in cats are also related to aggression.