# THE INFLUENCE OF CORIOLIS FORCE ON THE GROWTH OF BODY HAIR

*By*

*John W. Wood, Jr.*

*Watertown, Massachusetts*

The effect of Coriolis force on the formation of weather patterns is well known. Recent research indicates that this phenomenon further exerts itself in previously undiscovered manners.

Any body moving over the surface of the earth is subject to an apparent force which deflects its path to the right in the northern hemisphere and to the left in the southern hemisphere. Its motion in space is a combination of its motion relative to the earth and the motion of the earth. Because of the rotation of the earth, principally, the path is a curved one.

The apparent force and the resulting acceleration were first discussed before the middle of the nineteenth century by Gaspard Gustave de Coriolis, a French Civil Engineer. Because of Coriolis force, wind blowing from an area of high atmospheric pressure does not flow directly toward a low pressure area, but is deflected to the right, in the northern hemisphere, and circulates counter-clockwise around the low. Related phenomena occur in the drift of ice at sea and the erosion of river banks.(1)

Current investigation has shown that certain biological phenomena, previously not understood, are caused by Coriolis force. The pieces of a long-unsolved puzzle in biokinetics first began to fall into place when this researcher

noted that his mustache consistently curled up on the right side of his face and down on the left side. Simple deduction shows that the direction of hair growth conforms to a body under the influence of Coriolis force in the northern hemisphere. Photographic documentation is illustrated in Figure 1.

The first insight led to a generalized investigation of the growth patterns of body hair. The direction of growth from the well-known "cow lick" is of particular interest. The fact that the spiral pattern emanating from the cow lick origin can occur in both clockwise and counter-clockwise orientations was known to the ancients.(2) However, no relationships in frequency of occurrence have previously been established.

Through the examination of a large sample of human and bovine cow licks, it may be stated that an almost perfect correlation exists between the direction of rotation and the effect of Coriolis force. Subjects born in the northern hemisphere invariably exhibit a clockwise spiral rotation, the reverse being true in the southern latitudes. Figure 2 illustrates the clockwise rotation in a North American steer cowlick.

Let us briefly examine the mathematics of the process. Coriolis force manifests itself as a deflection in the motion of a body in an amount given by:

$$Z = 2.62\ V\sin L + 0.146\ V^2 \sin T \tan L - 5.2\ VT'$$

where Z is deflection in minutes of arc, V is speed in knots, L is latitude in degrees, and T' is rate of change of true course in degrees per minute.(3) Since the rate of hair growth is relatively slow and the true course is random, the equation may be reduced to the first term through the use of Cassini's Division. We may conclude that Coriolis force increases from zero at the equator to a maximum at the poles, and increases with growth rate.

The properties of hair growth in a spiral pattern have been extensively studied in the mathematics of topology. In the early 1930s three Italian researchers, Capelli, Ricciuto and Pelato proposed the Sbaglio Theorem. The concept is now well accepted in spite of early criticism.(4) The principle describes the volume which hair occupies on the head as a function of the degree of spiral. When no spiral is

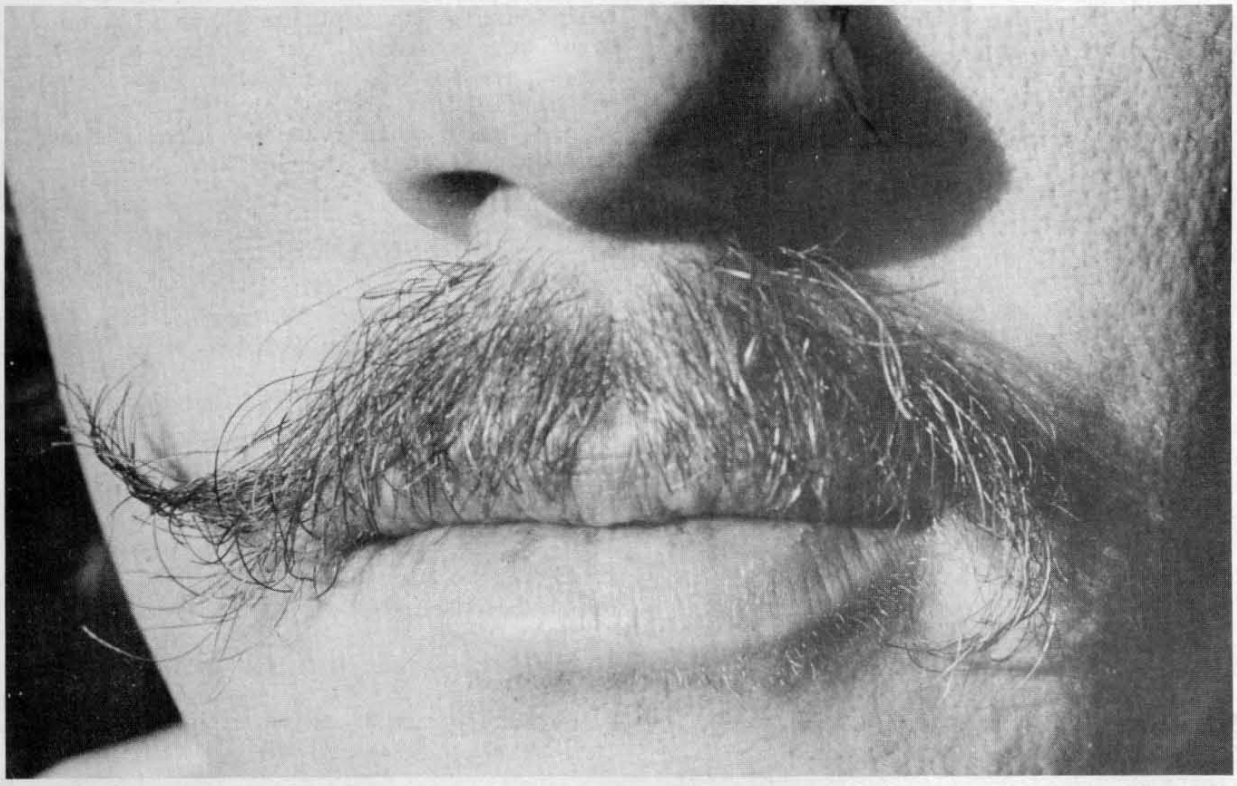

Figure 1. Mustache curl caused by Coriolis force in the Northern Hemisphere.

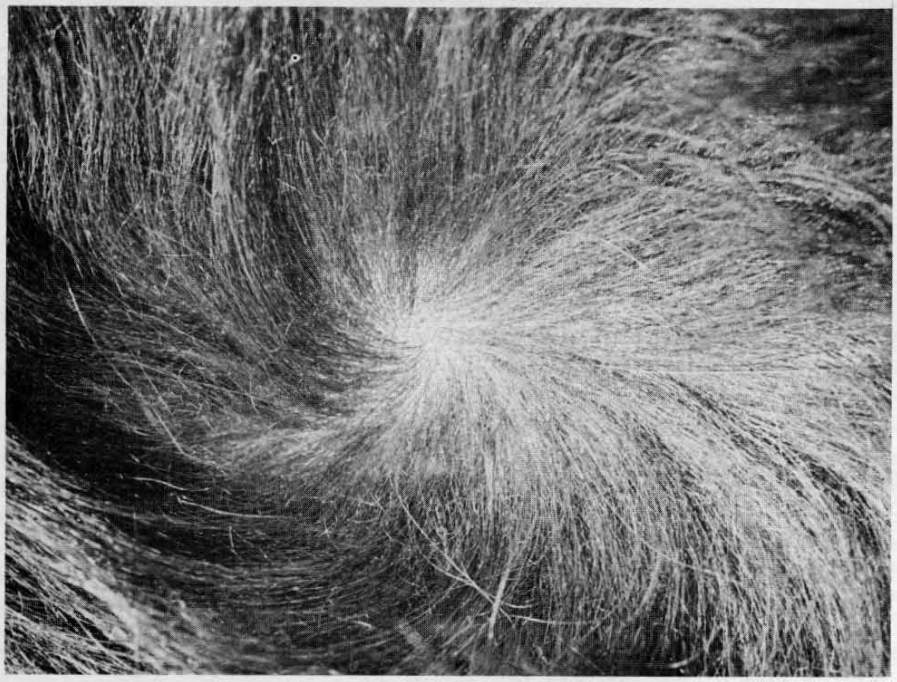

Figure 2. Clockwise spiral pattern in the cowlick of a North American steer. Note the polysyncloidal symmetry about the center.

present, the hair grows straight out of the head and occupies maximum volume. As the degree of spiral increases, the volume decreases as the hair forms an orderly matted pattern. Some assymmetry does, however, exist between clockwise and counter-clockwise spiral volumes due to anisotropic hysteresis of the hair follicle. Attempt by the authors of the Sbaglio Theorem to correlate population hair volume with the 11-year sun spot cycle were inconclusive, and no further research was conducted.

After conducting the effects of Coriolis force, two relationships concerning the volume occupied by the hair on a person's head are immediately obvious. The volume depends almost solely on the latitude of the subject and his rate of hair growth. It has been widely observed that aborigine tribes in the equatorial latitudes have large hair volume, commonly known as "bushyheadedness."(5) This phenomenon is due to the lack of Coriolis influence required to start the hair into a spiral pattern. Conversely, there have been no reports of bushyheaded Eskimos.(6) The high Coriolis force associated with high latitudes insures a strong spiral growth pattern.

An outgrowth of this research has been the discovery of the cause of a rare disease, previously unexplained by the medical profession. Rapid hair growth rates accompanied by high Coriolis force leads to hyperspiralosis, a condition in which three to six stranded rope is produced on the patient's head. The heavy loxodrome can cause severe diamethesis.

As research is continued through additional funding, other phenomenological relationships to Coriolis force will no doubt be discovered. Of particular interest are several unanswered questions in the field of archaeology.(7) For instance, was the left-handed screw thread developed first in the southern hemisphere?

## REFERENCES


1. *American Practical Navigator*, U.S Naval Oceanographic Office, (1966).
2.
2. *Journal of Pre-Cambian Hieroglyphic Graffiti*. V MDCCLXXVI, pp 347-352.

3. de Valsecqua Cabriel, *Tabula Peutingeriana*, 1953

4. Letter to the Editor, *Popular Topology*. (August 1945), p 16.

5. *The Hardy Boys Go To Australia*, 1936.

6. Personal communication with Dicaerchus of Messina, Sicily, (1257-1261).

7. Wood J.W., *Anatomical Implications of the Cardiff Giant*, Pinot Noir Press, 1972