Bloodhounds are biologically adapted to trailing their prey.

The process by which the nose recognizes an odor is not fully understood, but there are apparently specific receptor sites for specific odors.

In one explanation, recognition occurs when a scent molecule fits into its corresponding receptor site, like a key into a lock, causing a mechanical or chemical change in the cell.

Bloodhounds apparently have denser concentrations of receptor sites tuned to human scents.

When a bloodhound trails a human being, what does it actually smell? The human body, which consists of about 60 trillion living cells, sheds exposed skin at a rate of 50 million cells a day.

So even a trail that has been dispersed by breezes may still seem rich to a bloodhound.

The body also produces about 31 to 50 ounces of sweat a day.

Neither this fluid nor the shed skin cells have much odor by themselves, but the bacteria working on both substances is another matter.

One microbiologist estimates the resident bacteria population of a clean square centimeter of skin on the human shoulder at "multiples of a million.

" As they go about their daily business breaking down lipids, or fatty substances, on the skin, these bacteria release volatile substances that usually strike the bloodhound's nose as an entire constellation of distinctive scents.