

## *Testing Bloodhounds*

When I was at Los Alamos and would get a little time off, I would often go visit my wife, who was in a hospital in Albuquerque, a few hours away. One time I went to visit her and couldn't go in right away so I went to the hospital library to read.

I read an article in *Science* about bloodhounds, and how they could smell so very well. The authors described the various experiments that they did--the bloodhounds could identify which items had been touched by people, and so on--and I began to think: It *is* very remarkable how good bloodhounds are at smelling, being able to follow trails of people, and so forth, but how good are *we*, actually?

When the time came that I could visit my wife, I went to see her, and I said, "We're gonna do an experiment. Those Coke bottles over there (she had a six-pack of empty Coke bottles that she was saving to send out)--now you haven't touched them in a couple of days, right?"

"That's right."

I took the six-pack over to her without touching the bottles, and said, "OK. Now I'll go out, and you take out one of the bottles, handle it for about two minutes, and then put it back. Then I'll come in, and try to tell which bottle it was."

So I went out, and she took out one of the bottles and handled it for quite a while--lots of time, because I'm no bloodhound! According to the article, they could tell if you just touched it.

Then I came back, and it was absolutely obvious! I didn't even have to smell the damn thing, because, of course, the temperature was different. And it was also obvious from the smell. As soon as you put it up near your face, you could smell it was dampish and warmer. So that experiment didn't work because it was too obvious.

Then I looked at the bookshelf and said, "Those books you haven't looked at for a while, right? This time, when I go out, take one book off the shelf, and just open it--that's all--and close it again; then put it back."

So I went out again, she took a book, opened it and closed it, and put it back. I came in--and nothing *to* it! It was easy. You just smell the books. It's hard to explain, because we're not used to saying things about it. You put each book up to your nose and sniff a few times, and you can tell. It's very different. A book that's been standing there a while has a dry uninteresting kind of smell. But when a hand has touched it, there's a dampness and a smell that's very distinct.

We did a few more experiments, and I discovered that while bloodhounds are indeed quite capable, humans are not as incapable as they think they are: it's just that they carry their nose so high off the ground!

(I've noticed that my dog can correctly tell which way I've gone in the house, especially if I'm barefoot, by smelling my footprints. So I tried to do that: I crawled around the rug on my hands and knees, sniffing, to see if I could tell the difference between where I walked and where I didn't, and I found it impossible. So the dog *is* much better than I am.)

Many years later, when I was first at Caltech, there was a party at Professor Bacher's house, and there were a lot of people from Caltech. I don't know how it came up, but I was telling them this story about smelling the bottles and the books. They didn't believe a word, naturally because they always thought I was a faker. I had to demonstrate it.

We carefully took eight or nine books off the shelf without touching them directly with our hands, and then I went out. Three different people touched three different books: they picked one up, opened it, closed it, and put it back.

Then I came back, and smelled everybody's hands, and smelled all the books--I don't remember which I did first-- and found all three books correctly; I got one person wrong.

They still didn't believe me; they thought it was some sort of magic trick. They kept trying to figure out how I did it. There's a famous trick of this kind, where you have a confederate in the group who gives you signals as to what it is, and they were trying to figure out who the confederate was. Since then I've often thought that it would be a good card trick to take a deck of cards and tell someone to pick a card and put it back, while you're in the other room. *You say*, "Now I'm going to tell you which card it is, because I'm a bloodhound: I'm going to *smell* all these cards and tell you which card you picked." Of course, with that kind of patter, people wouldn't believe for a minute that that's what you were actually doing!

People's hands smell very different--that's why dogs can identify people; you have to *try* it! All hands have a sort of moist smell, and a person who smokes has a very different smell on his hands from a person who doesn't; ladies often have different kinds of perfumes, and so on. If somebody happened to have some coins in his pocket and happened to be handling them, you can smell that.