# Who and What did Horton Hear?

As a child, I missed Theodore Geisel's book *Horton Hears a Who.* (You may know Geisel by his pen name, Dr Seuss.) I'm not certain why no one ever read this story to me or why I had not read it myself but, through some other readings, I recently came across a description of the community of Whos that Horton met. This story made me think of implant dentistry, which is probably not surprising, since much of what I do makes me think of this topic.

First, let me describe the land of the Whos. Horton is an elephant who hears a speck of dust speaking to him. He discovers that the dust is actually a world unto itself called "Who-ville." Because the residents of Who-ville are quite small, they feel threatened by their environment. As Horton acts as a champion to the Whos, he becomes an outcast in the jungle because of his belief in something others cannot see. In the end it all works out, but there are some twists and turns in the story that make it interesting.

About now, you are probably wondering how any of this could apply to implant dentistry. Actually, I look at the world of the Who as something akin to the microscopic world of the bone-implant interface. There are many similarities.

Historically, dental care has been performed on relatively large structures. Results were evaluated through surrogate assessments of the soft and hard tissue responses. When dentists looked more closely, they were still using nothing more than magnification of macroscopic structures. It was assumed that if tissue appeared healthy, margins were clinically closed, and fit demonstrated stability, long-term clinical survival of dental restorations was likely.

Osseointegration changed the rules, as it demanded closer scrutiny. Early descriptions of osseointegration included information about bone-to-implant contact, which was assessed at a microscopic level. In some cases, the tissue under examination had been magnified hundreds or thousands of times with the aid of electron microscopy. Eventually the issue of bone-to-implant contact was relegated to a research assessment, while the definition of osseointegration has become a clinical assessment of maintainable immobility. Although close adaptation of living bone to an implant surface remains important, the ability to distinguish a successful implant from a failing implant has become the critical clinical target.

Clinicians must recognize clinical success, but also must understand that success is ultimately determined at the cellular or even the molecular level. Surface chemistry, surface configuration, and biologic enhancements hold the promise of increasingly predictable treatment. However, the search for improvement is being conducted in a field that already has enviable success.

Investigation of genetic factors related to implant survival has already begun, and a few researchers are well along in the process. Nanotechnology is being used to establish more biologically receptive implant surfaces and to assist in carrying biochemical materials to enhance bone development. The idea of a true biologic tooth replacement is no longer science fiction; it is a clinical reality and will be commercially available within the next few years. The world of implant dentistry has become very small as the applications for implant procedures continue to grow.

Horton saw this also. There was life in the jungle and there was life in Who-ville. Both worlds coexist. It was, and is, a meshing of the large and the small, and it occurs in children's fiction from Dr Seuss as well as in the practice of implant dentistry. Our charge is to recognize the Whos when we see them. Although the microscopic world remains invisible to the naked eye, we need to know that it continues to work for all of us.

Steven E. Eckert, DDS, MS
Editor-in-Chief