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THE ATOMS FAMILY — OR — IONIC MAN

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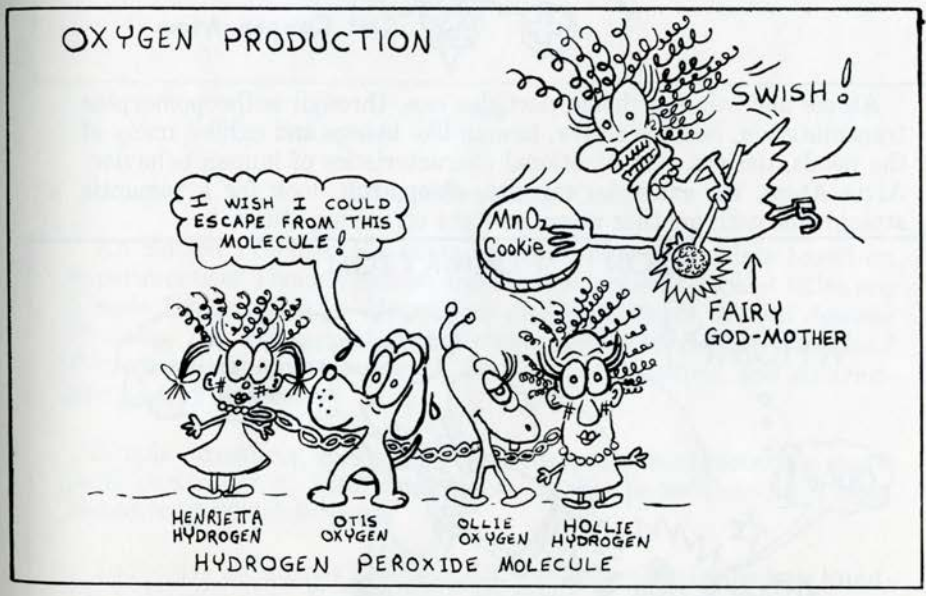
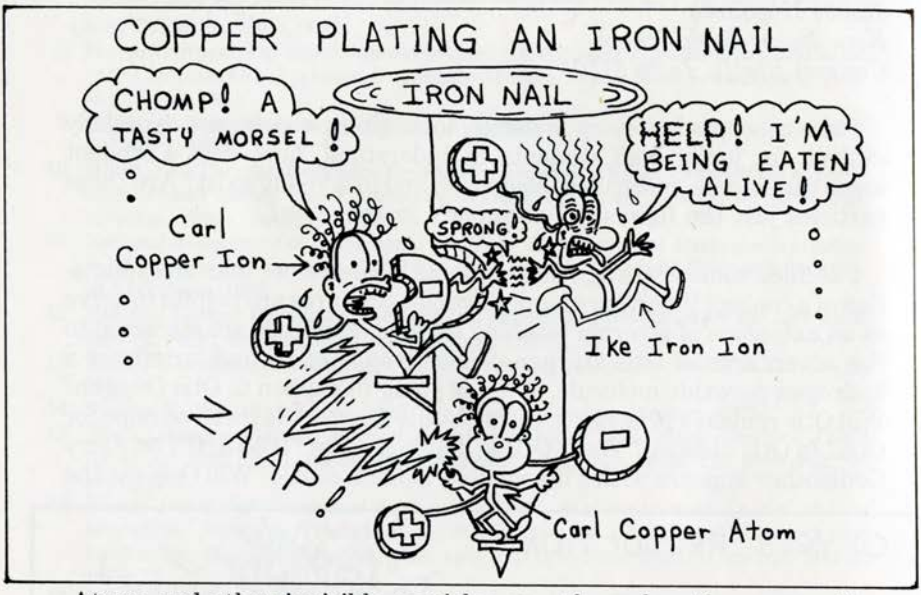
Since concepts involving invisible, intangible particles are especially difficult for junior high students to understand, how does a student know that atoms, molecules, electrons, and ions really exist? Are these particles just the figment of someone's imagination?

I decided some years ago that students needed more than an explanation of a concept involving atomic particles. Pictures are helpful to serve as an extension of a verbal teaching method. Students are attracted to the adventures of Otis Oxygen or Ike Iron. Let us look briefly at a hydrogen peroxide molecule. What is going to happen to Otis Oxygen? Will Otis remain a prisoner in the molecule forever? Is there no hope for Otis? Is Otis doomed? Wait! Otis is making a wish! SWISH! The Fairy Godmother appears with a manganese dioxide cookie! Will Otis eat the

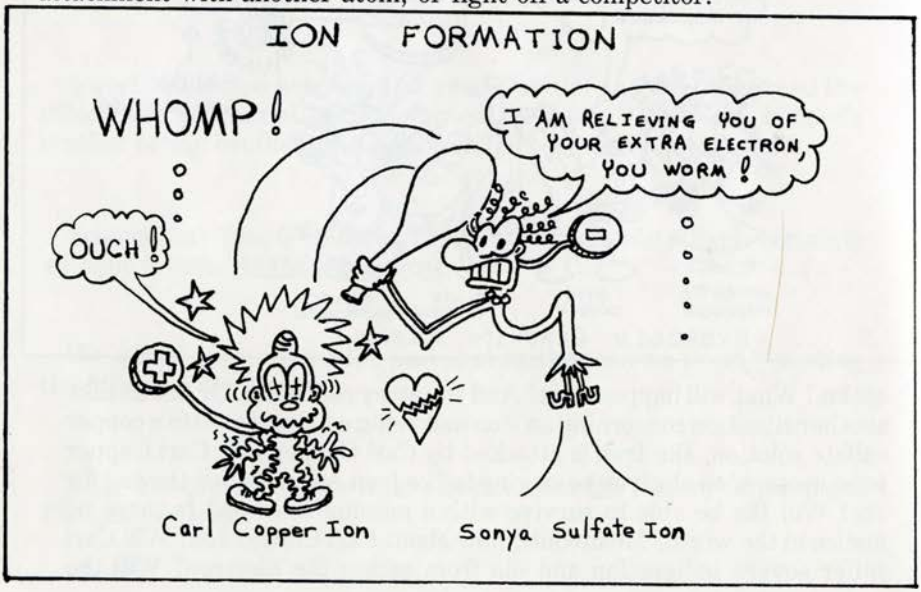


cookie? What will happen next? And the story continues. Or, let us take another situation concerning an iron nail being copper plated in a copper sulfate solution. Ike Iron is attacked by Carl Copper Ion. Carl Copper Ion consumes an electron belonging to Ike Iron Atom. Is this the end for Ike? Will Ike be able to survive with a missing electron? Is there no justice in the world? Meanwhile, how about Carl Copper Ion? Will Carl suffer severe indigestion and die from eating the electron? Will the

Electron Potion change Carl into a new person? Do we dare to look at the next picture to find out?



Atoms and other invisible particles can, through anthropomorphic transmutation, become active, human-like beings and exhibit many of the needs, desires, and emotional characteristics of human behavior. Alvin Atom, for example, can eat, sleep, run, look for a romantic attachment with another atom, or fight off a competitor.



As in humans, the exact behavior of each atom depends on its heredity and environment. The heredity of the atom refers to its physical properties. For example, atoms are not created equal in relation to its number and location of electrons. This, in turn will determine the behavior of an atom in a particular environment. The environment of the atom is also important as a behavioral determinant. In the copper plating of iron, the copper ion is attracted more to the loosely held electron of the iron rather than attracted to the negative sulfate ion of the copper sulfate solution. These behavioral characteristics give life to small, invisible particles.

It seems that cartooning is a worthy contribution to science education. Students are amused, and yet they learn how science performs its miracles. The comic-type pictures have been favorably critiqued by the students at the end of the course in the past. If student recall can also be used as an evaluation technique for cartoons in the classroom, then the future looks promising for this type of educational methodology. Students come back years later and almost invariably ask a question such as: "How is Willy Water Molecule doing?"

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