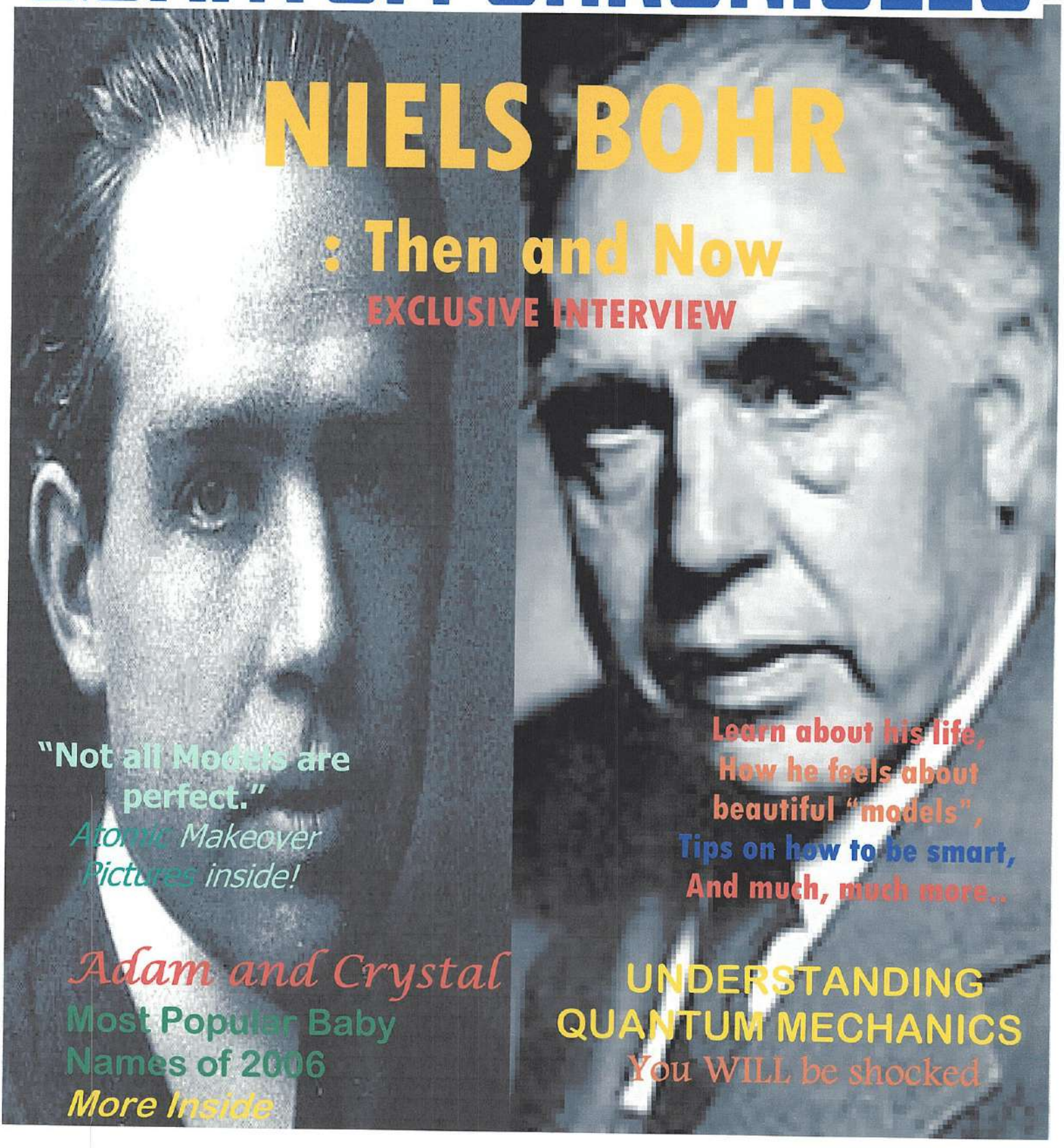
QUANTUM CHRONICLES



NIELS BOHR
: Then and Now
EXCLUSIVE INTERVIEW

Learn about his life,
How he feels about
beautiful "models",
Tips on how to be smart,
And much, much more..

"Not all Models are perfect."
Atomic Makeover Pictures inside!

Adam and Crystal
Most Popular Baby Names of 2006
More Inside

UNDERSTANDING QUANTUM MECHANICS
You WILL be shocked

My Interview With Niels Bohr

By Emily Kayser

The definition of an atom is the smallest component of an element having the chemical properties of that element. Atoms of different elements combine to make compounds and other new substances. Everything is made up of atoms, but how often do we think about them? Who discovered the secrets of the atom? How do we know so much about something so small? Because of research done by scientists, we've learned quite a bit. One very important physicist who brought us closer to the model of the atom as we know it today is Niels Henrik David Bohr. Born in the late 1800's, Bohr used Rutherford's discovery of the atomic nucleus and the Quantum Theory created by Max Planck to move toward his own concept of the model of the atom.

EK: How did you first become interested in Physics?

NB: I first became interested in Physics as a child. My father was a Professor of Physiology at the University of Copenhagen, and my mother came from a well-educated family. My parents instilled in me a good base for an education and as I grew, I became further attracted to the topic.

EK: Both you and your younger brother are both quite intelligent. Did your parents play a major part in your reasons for pursuing certain careers?

NB: Yes, I was very close to my father. He was the one who opened my eyes to the fascinating world of physics. To him I am ever grateful, as I would not have been so successful in my studies if he hadn't encouraged me.

EK: You attended Copenhagen University. How did your father feel about this?

NB: I attended Copenhagen University for many reasons. It is a strong school with a superior Physics program. My father was pleased with my decision, but he didn't coerce me. I graduated with my Master's degree in Physics in 1909 and my Doctorate in 1911.

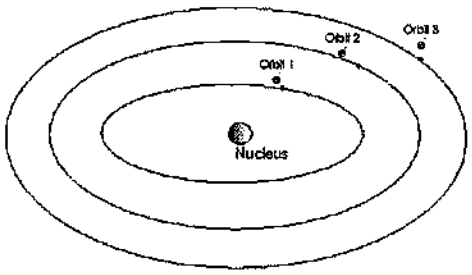
EK: As a student, you received a gold medal for an experiment using water jets to explain surface tension. This was the first major award that you received, and many of your works after this accomplishment were based mainly on theories. Why did you choose to conduct your experiments this way?

NB: Every Scientific Law must start with a theory. One must conduct many experiments to conclude that a theory may be correct. "We are all agreed that your theory is crazy. The question which divides us is whether it is crazy enough to have a chance of being correct. My own feeling is that it is not crazy enough."

EK: After receiving your Master's degree, who were some of the scientists you worked with and what was it like working with them?

NB: In the fall of 1911, I traveled to England to work under Sir J.J. Thomson. The next year, I traveled to Manchester and worked under Ernest Rutherford. Each man was a genius in his own, but I was also busy with my own theories and experiments. A few years before, I had come across Planck's quantum theory and I became captivated by it. When Rutherford discovered the atomic nucleus, I used Planck's theory to influence my own model of the atom. It was the furthest discovery that explained the way we see signature colors on the spectrum with each different element because of its electron configuration.

EK: How do you explain your model?



NB: My model of the atom has a positively charged nucleus surrounded by orbits. The electrons of the atom could only be in certain "special" orbits. They could not be contained on any other orbit, but could jump from special orbit to special orbit. As they jump, they would give off radiation.

EK: So you discovered another type of radiation?

NB: The "radiation" given off as the electrons jump is actually bursts of light called photons. A photon is electromagnetic energy. Since the electrons could only be in a certain orbit, this meant that only certain photons of light would be visible with each different element.

EK: Wasn't this view of the atom considered very radical?

NB: It was considered radical, but I believed that energy could only be changed through the jumps of the electrons, also known as quanta. Radical is good. As I stated before, it's just crazy enough to be true.

EK: As it turns out, your theory only worked for a hydrogen atom, but it helped influence other scientists such as Heisenberg to study further into this phenomenon of quantum mechanics. How do you feel about making such a big breakthrough?

NB: I try to stay modest about it, but I am grateful. I love my job, and becoming successful and making such a breakthrough was one of the most wonderful experiences that I think I could have ever felt in my life. It's satisfying, although I do wish I could have been able to discover how the theory works completely. Although it only worked for the Hydrogen, I was overjoyed that it at least worked for that.

EK: After you accomplished this, where did you move to do your work next?

NB: In 1916, I became the Professor of Theoretical Physics at Copenhagen University. I also became the head of the Institute for Theoretical Physics.

EK: Do you agree with the improvements made to your theories?

NB: Yes! As we continue to learn, scientific law changes. I may have been wrong, but what I did affected the history of the atom. I have a sense of pride knowing that I helped discover the configuration of an atom. I

don't mind at all that people critiqued and improved my theories on quantum numbers.

EK: How did it feel to receive a Nobel Prize?

NB: It felt like nothing I'd ever felt before. Just knowing that all of my hard work paid off and would affect generations to come was enough, but the Nobel Prize was a wonderful gift on top of it all.

EK: Yes, it's a fine accomplishment! How did your family feel about this?

NB: My wife, Mergerethe Norlund, was overjoyed and very proud of me. My children of course didn't really understand how great an accomplishment it was, but I hoped one day that they would be proud of their father.

EK: You continued your work for many years with many different scientists. Most liked to work with you. Why do you think that this is?

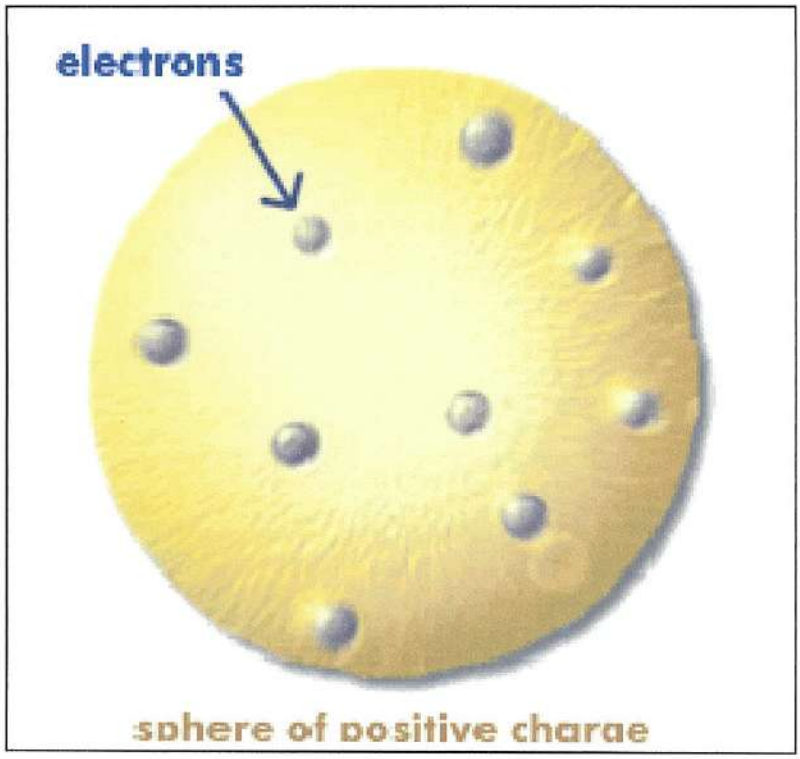
NB: I like to think that I have a good sense of humor. After all, "some things are so serious that you just have to laugh at them." And in this business, almost everything is serious.

EK: Does Element 107 [Bohrium] on the Periodic Table hold a place close to your heart?

NB: (laughs) Yes yes, its very flattering. At least I can have comfort in knowing that I will never be forgotten.

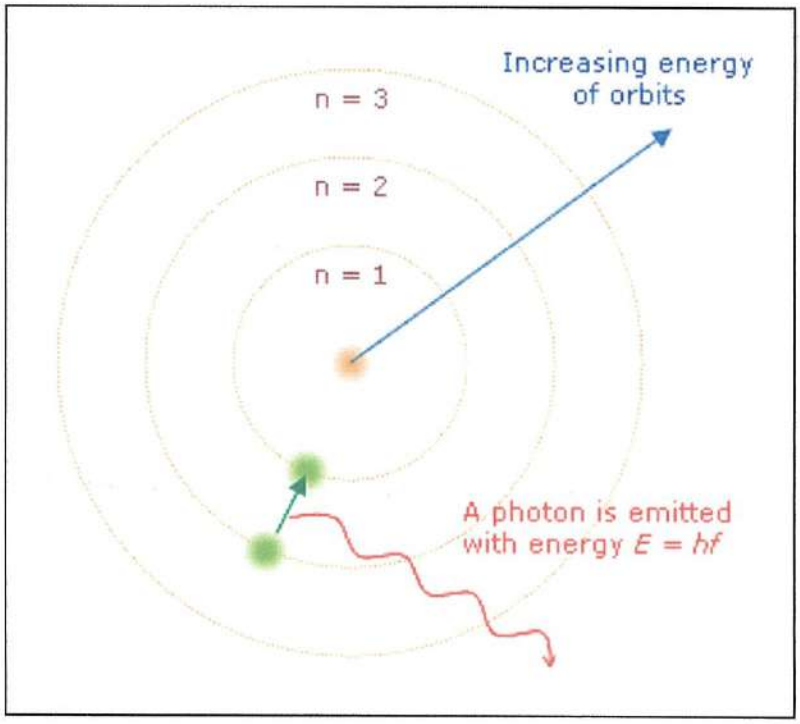
Model Makeovers!!

BEFORE



AFTER

New and Improved!!
Look how slimming
that style is!



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