

## ***How did life get here - by design or by chance?***

Read the newspaper article below. Then use the information to help you answer the following questions.

### **A design for life** (adapted from 'The Guardian' Sept. 12<sup>th</sup> 2005)

**John Sutherland meets Michael Behe, a leading proponent of intelligent design, the controversial theory that evolution alone cannot explain life's complexity**

**John Sutherland:** For Intelligent Design proponents such as yourself, isn't Darwinism just another theory?

**Michael Behe:** Well, yeah, sure. But the question is: exactly how did life get here? Was it by natural selection and random mutation or was it by something else? Everybody - even Richard Dawkins - sees design in biology. You see this design when you see co-ordinated parts coming together to perform a function - like in a hand. And so it's the appearance of design that everybody's trying to explain. So that if Darwin's theory doesn't explain it we're left with no other explanation than maybe it really was designed. That's essentially the design argument.

**JS:** Why do you think we should replay the Darwinian controversies of 1860 and the 1925 Scopes monkey trial?

**MB:** Because we have new data. It's because science has advanced since then. We now know what the very foundation of life looks like. It's made up of molecules. Not just molecules but sophisticated molecular machinery.

**JS:** This is your "irreducible complexity" thesis?

**MB:** Yeah. That's right. Irreducible complexity is a problem for Darwinian evolution. Whenever we see these complex functional systems we realise that they have to be designed.

**JS:** How is irreducible complexity different from plain old complexity?

**MB:** Well, think of it this way. If you take away a rock from a pile of rocks you haven't changed much. It's still a heap of rocks - just a rock or two smaller. Take away a component from the mousetrap and it isn't a mousetrap any more.

**JS:** You're fond of the mousetrap analogy, aren't you?

**MB:** Yes. It captures the point of irreducible complexity in a way that everybody can see. A mechanical mousetrap is made up of parts, all of which have to work together. You can't just have one part work a little bit then add another part and have it work a little bit better. And that's the sort of thing Darwinian evolution would have to do, if it was true.

**JS:** Is simultaneity [or existence at the same time] the key here?

**MB:** Well, sort of, yeah. The trap does not work until all the parts were there. The system itself doesn't work until you fit all of them together.

**JS:** When you look through your electron microscope, what precisely do you see that suggests to you Darwin with his eyeglass may have got it wrong?

**MB:** It's that you can see that there are quite literally machines in the cell. Machines made out of molecules. It's not just the intelligent design people who use this term. It's widely used in molecular biology. If you look in any of the science literature you will see that they talk about "machines".

**JS:** The bacterial flagellum comes up quite often in your discussions. What kind of "machine" is it?

**MB:** It's a little outboard motor. True! It's a rotary motor. A little group of proteins spins around this whip called the flagellum, which acts as the propeller. There's a flow of acid, which acts rather like water going over a turbine to turn it. There are drive shafts, there are bearings, there are all sorts of mechanical components.

**JS:** You're obviously a biochemist who accepts quite large chunks of Darwin.

**MB:** Yes, that's right. Common sense on the subject? Fine. Micro evolution, as they call it? Sure. It's just when you get to the level of "how do complex systems get there?" - that's the sticking point.

