

nium. Of course, this energy provides a constant background that is not available at our level under present conditions".<sup>13</sup>

Ultimately we know that, at any infinitesimal point in space, the infinite power of the Spirit of God is present. Bohm wrote of a "constant background" of energy that is not currently available. But beyond this energy we know that there is an even more powerful and even more constant background energy. Even so, as Brother Walker might have said, Bohm appears to have been drifting towards the Biblical view of the Spirit.

### Conclusion

The vacuity of which Epicurus wrote is increasingly being found to contain many strange phenomena. In writing of the vacuum, one scientist has written: "It is proving to be a wonderland of magical effects: force fields that emerge from nowhere, particles popping in and out of existence and energetic jitters with no apparent power source".<sup>14</sup> It is tempting to say that this power source is the Spirit. However, to say that would perhaps be to make the same mistake as

earlier generations. Nevertheless we can confidently assert that it is a signpost which points to the underlying infinite power of the Spirit of God.

As brethren and sisters in Christ, we are "in Him" not only in a natural sense but also in a spiritual sense. As John wrote: "hereby know we that we are [same Greek as "have our being"] in Him" (1 Jno. 2:5). Unlike the Epicureans and Stoics, "we know him" (v. 3). The Athenian philosophers were always looking for something new to consider. Having been baptized into Christ we now have "a new commandment" (v. 8) to obey, that is, that we should "love one another" (Jno. 13:34). Let us take heed to this instruction. For there is nowhere we can go from God's Spirit. Just as surely as God saw the light on the first day, so God sees us now. Truly, "in Him we live, and move, and have our being".

13. D. Bohm, *Causality and Chance in Modern Physics*, (2nd edition, Routledge and Kegan Paul, 1984), pp. 163-4.

14. R. Mathews, "Nothing like a vacuum", *New Scientist*, 25 Feb. 1995, p. 30.

## Order and chaos

Simon Collard

**W**HEN YOU walk down your street, what do you see? Houses, walls, cars, street lights, etc.? Does it ever occur to you to doubt that these things were actually designed and made by other people? Just imagine the intelligence and effort needed to make even the smallest of cars! Now turn the corner into your local park and consider the grass, shrubs and trees. Are these things any less complex? Each of them can do more than any car. They can grow in size, produce seeds that replicate themselves. They can repair themselves if damaged. In fact, they exist without the need for man to intervene at all.<sup>1</sup> These living things, we are told by evolutionists, have come about by the random forces of chance over enormous periods of time.

The stark reality is that countless intelligent people believe that life is the result of the chance collisions of atoms, that the amazingly detailed and organised phenomenon that we call life has arisen over thousands of millions of years from

disorganised chaos. This belief has been arrived at in the face of our common observation of life, namely, that order and complexity can come from disorder only through the application of thought (intelligence) and effort (energy). A jigsaw puzzle cannot make itself. You need careful observation, thought and manual dexterity to fit the pieces together correctly. If you were to put them into a cement mixer or shake them in the box, you would not expect to assemble the complete picture even if you shake for millions of years.

The Bible account of the Creation is in full accord with our observation. "The earth was without form and void" is a description of the chaotic state of things in the beginning. Then God spoke: "Let there be light". Here is the supreme intelligence, or wisdom of God. Then we read, "and there was light" (Gen. 1:2,3). The will

1. William Paley's *Natural Theology* (1802) has an excellent version of this argument.

of the Creator was carried out by the Elohim, and light was produced.<sup>2</sup> Genesis shows us that order resulted from thought and effort.

### Entropy

As you continue your walk along your street, you will notice how some properties and their gardens are well maintained, and others are not. We observe that to maintain order, further thought and effort is required. A new house will soon be ruined if it is not maintained. The gutters will block up, rainwater will begin to pour down the brickwork and roof tiles will eventually fall off.

We find a similar picture described in Scripture: "I went by the field of the slothful, and by the vineyard of the man void of understanding; and, lo, it was all grown over with thorns, and nettles had covered the face thereof, and the stone wall thereof was broken down" (Prov. 24:30,31).

In fact this illustrates an important scientific principle which is known as the Second Law of Thermodynamics. This states that: "In all processes the entropy or randomness of a system and its surroundings must increase until equilibrium is attained". This is seen in our example of the house. The randomness of the building materials decreases when the house is being built, although the randomness of the universe as a whole increases (the builder put in a great deal of effort, burning food and fuel in the process). But if the completed house is left to itself, it becomes gradually more disordered unless it is maintained.

It is the same with ourselves. When we are young, we are at the peak of our physical and mental powers, but if we make it to eighty or ninety our entropy has increased considerably, and eventually we "return unto the ground" (Gen. 3:19). We are more highly organised on the day of our birth than on the day of our death.

So where did this organisation come from? We conclude that our observation of life agrees with both the Bible and science: you cannot get order from chaos without the application of a greater degree of order (intelligence) to drive it. They also agree that, without that greater degree of order, a system will naturally tend to disorder. A disorganised system cannot produce order if left to itself. But the dilemma is that we are told by evolutionists that this is just the situation that has led to life. The random soup of chemicals in the primeval earth, when acted upon by energy (both from the sun and the earth itself)

has produced, over immense time periods, an increasingly complex series of molecules that have somehow managed to aggregate into life as we see it now. But where, in all of this, is the greater organisation or intelligence needed to drive the process?

### The origin of biochemistry

When Charles Darwin wrote his book *Origin of Species* he had no idea just how complex life is. He proposed that complex organisms slowly evolved from more simple ones by a series of gradual changes, each of which gave the creature an increased chance of survival. When confronted with the complexity of the human eye, for example, he proposed that simple eyes, as seen in other organisms, gradually improved with time.

This, however, was an argument based on ignorance. He treated the eye as a 'black box' whose workings at the molecular level were totally unknown. To quote the biochemist Michael Behe: "Now that the black box of the eye has been opened, it is no longer enough for an evolutionary explanation . . . to consider only the anatomical structures of whole eyes as Darwin did in the 19<sup>th</sup> century (and as popularisers of evolution continue to do today). Each of the anatomical steps and structures that Darwin thought were so simple actually involves staggeringly complicated biochemical processes that cannot be papered over with rhetoric. Darwin's metaphorical hops . . . are now revealed in many cases to be huge leaps between carefully tailored machines".<sup>3</sup>

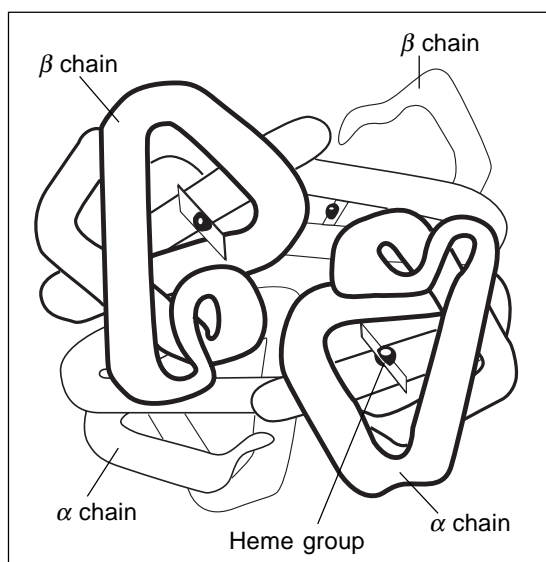
Since the 1950s scientists have uncovered in increasing detail the workings of the cell and the chemistry of life. Even the simplest organisms are complex structures containing tiny molecular 'machines' that are able to perform well-defined tasks. In fact, the more detailed our understanding of the chemistry of life gets, the less likely it appears that it could have come about by chance.

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2. Neither should it escape our notice that the order of the days of Creation is perfectly in keeping with a scientific understanding of the needs of living things. Light, water and dry ground are essential if plant life is to thrive. Plant life must be present if animal life is to survive.
  3. *Darwin's Black Box: The Biochemical Challenge to Evolution*, by Professor M. J. Behe. (See review in *The Testimony*, Mar. 2000, p. 93.)

Take, for example, the enzymes. These are the catalysts of life. They enable the chemical reactions in our cells to take place at body temperature and atmospheric pressure. Without them life would be impossible. An enzyme works by virtue of its precisely controlled shape. It consists of one or more chemicals called proteins that are folded into a unique structure with just the right dimensions to allow two chemicals to meet each other at the correct orientation and allow them to react together. Today's catalyst designers look with envy at the beautiful elegance of even the simplest enzyme. In fact many chemists have given up the laboratory and become farmers! They have learned how to grow organisms that produce the enzymes they need that they can then harvest for their own purposes.

### Proteins and genes

An enzyme is just one type of protein found in a living cell, and there are many others. They are made up of chains of sub-units called amino acids. (There are twenty common amino acids and a handful of rarer ones found in life.) The cell has to build these chains very carefully or they will not be fit for the purpose. A few missing or incorrect links can render the protein unusable. The chances of a given protein chain with, say, a hundred sub-units (haemoglobin in blood has four chains with about 139 units in each chain: see Figure 1) coming together by chance outside the cell, from the twenty available amino



**Figure 1: Diagram of the three-dimensional structure of Haemoglobin**

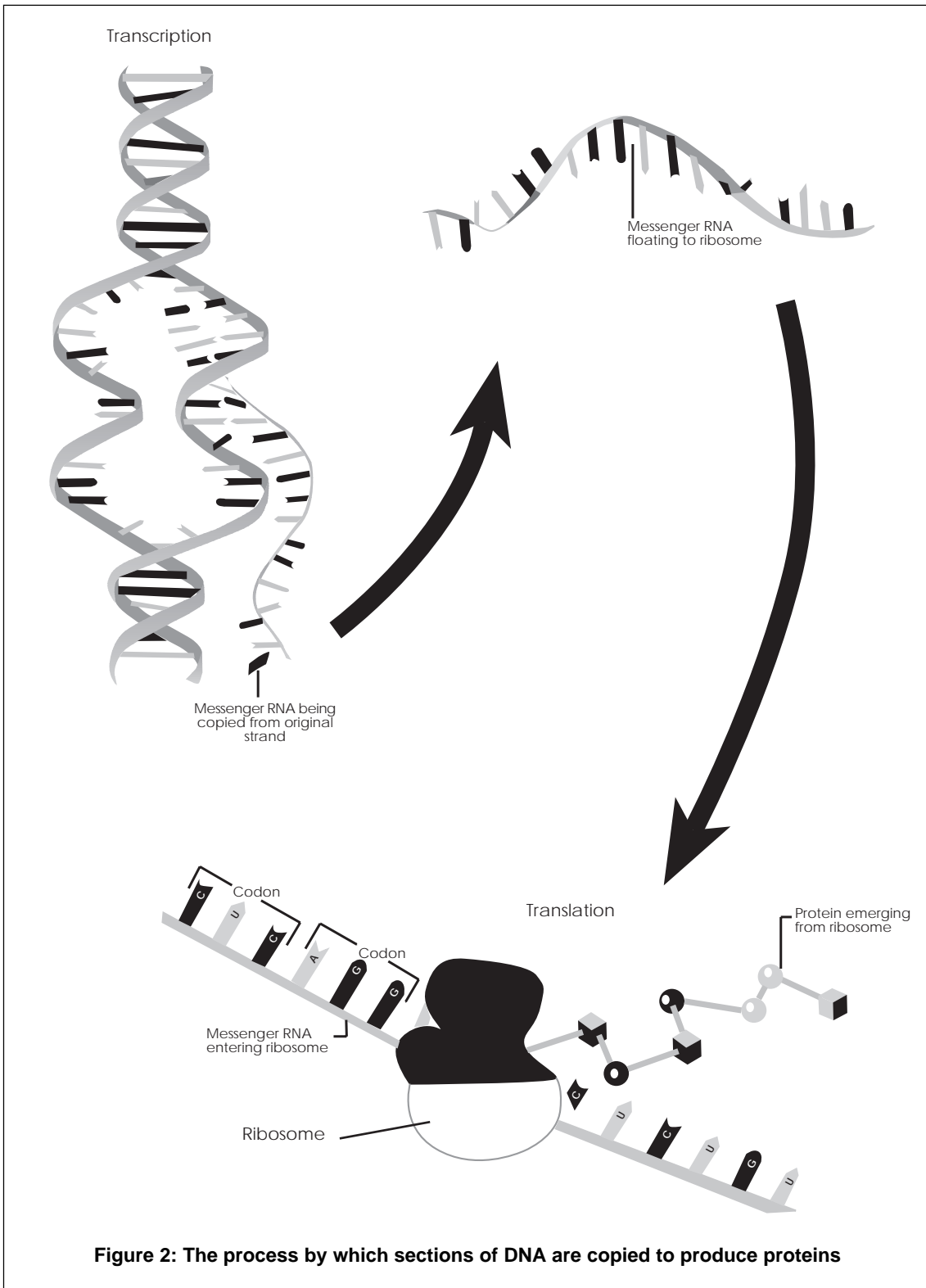
acids, is absolutely minuscule, far less likely than shuffling a random pack of cards and then finding them arranged in the correct order.

Furthermore, there are literally millions of amino acids possible; how is it that there are only twenty found in living things? Also, all but one of them have a property called **chirality**. This means that they can exist in mirror image forms (like our right and left hands). The amino acids found in our bodies have only one chiral form; you never find both right- and left-handed versions of the same amino acid in living cells. So somewhere in the past only one form of each of these amino acids was chosen. No one knows how this came about.

The amino acid sequences in our proteins are determined and controlled by our genes. Again, the way that this happens is amazing. Our genes are found in the nucleus of each cell, and consist of chains of a chemical called Deoxyribonucleic acid (DNA for short). In 1953 the Cambridge scientists Watson and Crick found that the DNA chains form a spiral called the double helix. This can be compared to a spiral staircase where each stair or rung is a pair of chemical entities called bases. There are four bases found in DNA (called Adenine, Guanine, Cytosine and Thymine, or A, G, C and T for short). Biochemists have discovered that these bases form a code for the production of the proteins (see the sequence in [Figure 2](#) overleaf).

Essentially, the DNA carries the information for the production, within the cell, of all the proteins needed for life. Certain enzymes are able to unwind and 'unzip' the DNA and read the sequence of bases. The enzyme (called RNA polymerase) acts rather like a knitting machine, and is able to replicate the base sequence in another molecule called RNA (Ribonucleic acid). This process is known as **transcription**.

Unlike DNA, the RNA is mobile and can pass out of the nucleus into the cell. Further enzymes then read the RNA base sequence in small structures in the cell called Ribosomes, and convert it into protein sequences—a process called **translation** (Figure 2). Every three bases give a code (called a **codon**) for a separate amino acid. The complexity of this process is breathtaking, and it is difficult to imagine how such closely coordinated operations could have developed by small steps over long periods of time. And we must ask the question, Which came first, the DNA with its code, or the proteins that are necessary to read the DNA? Of course you must have both



for life to function. The evolutionist has to argue that both came about by chance at the same time!

In June 2000 President Clinton and Prime Minister Blair announced jointly that scientists had succeeded in decoding the genetic code.<sup>4</sup> In effect this means that the sequence of DNA bases is now known for most of the length of the human genome (and there are approximately three billion bases in the sequence.) Is it not remarkable that no one in public life is prepared to ask where this code has come from? Decoding the human genome is, of course, a significant achievement, but it is somewhat dwarfed by the fact that only two per cent of this genetic information appears to be used in the cell; ninety-eight per cent is supposedly “junk”.<sup>5</sup> Whilst this could be excessive packaging, is it not more likely that the Creator’s handiwork has further surprises for us yet?

#### A familiar story

Do we need to go any further to show that life is more ordered and complex than anything else we can see in the universe, and that reason demands that it had a Designer in the beginning? “I am fearfully and wonderfully made: marvellous are Thy works; and that my soul knoweth right well. My substance was not hid from Thee, when I was made in secret, and curiously wrought in the lowest parts of the earth. Thine eyes did see my substance, yet being unperfect; and in Thy book all my members were written, which in continuance were fashioned, when as yet there was none of them” (Ps. 139:14-16).

So wrote David as he contemplated the formation of the babe in the womb of its mother. And so we marvel at that springing forth of life from the combination of two sets of tiny DNA strands from each parent. Although the psalmist did not know it, the inspired words of the Creator describe so well the chemistry of life. The ‘writing in the book (or scroll)’ is exactly what the scientists have found. For the genetic code is none other than God’s writing within each cell of our bodies. It is His handiwork!

But when we look further into this matter we discover that God has left even greater evidence of His handiwork within the living cell. Where have we seen this before:

- a central, separate location where the rules for life in their most ordered form are kept?
- a careful procedure for the faithful replication of the information, with as little error as possible?

- a means whereby the information can be disseminated throughout the whole of the organisation, which in turn is controlled by that information?

Surely we see within the living cell the pattern of the God of Israel recorded in the Bible. Firstly, the scroll of the Law kept within the separate place of the temple (2 Chron. 34:15); then the reading and transcription of that Law (Deut. 17:18,19) and its dissemination throughout the land (2 Chron. 17:7-9); and finally, the whole purpose of this Law was that the nation as a whole should live by it and have life because of it (Deut. 6:4-7; 8:11-14).

The Law was from God, and it represented His thinking, His order. It was intended to bring order to Israel, and dispel the chaos of sin (the word for shame in Greek is *entropel*). Had they lived by these commandments they would have been like a well-ordered vineyard, and brought forth fruit for God. But they slipped back into the idolatrous ways of their surrounding neighbours and became like the overgrown neglected vineyard.

This pattern is also true of ourselves. If we strive to avoid the chaos of sin, and try to adhere to the order of the Word of our God, seeking His righteousness, we can hope for life. This is not just the decaying life we have now, but eternal life in a perfectly ordered world: “Awake to righteousness and sin not; for some have not the knowledge of God: I speak this to your shame [*entropel*]. But some man will say, How are the dead raised up? and with what body do they come? Thou fool, that which thou sowest is not quickened except it die . . . So also is the resurrection of the dead. It is sown in corruption, it is raised in incorruption: it is sown in dishonour, it is raised in glory: it is sown in weakness; it is raised in power: it is sown a natural body; it is raised a spiritual body” (1 Cor. 15:34-44).

4. See, for example, the *Economist* survey, “The Human Genome”, dated July 2000. This gives a very clear outline of the structure and workings of DNA. The writer also makes a very significant comment: “Natural selection can work only by modifying what is already there” (p. 6). However, the writer is not able to explain where the complex molecules come from. Also of interest is a summary on pages 11 and 12 of the migration of humanity across the world, from a study of DNA found in human cells. This looks remarkably similar to our understanding of human migration in the world as recorded in Genesis.

5. *Ibid.*, p. 5.

And so the ultimate example of order will be the resurrection, when the wisdom and power of God will be used to recreate order from this chaotic world of sin and death: "Death is swal-

lowed up in victory. O death, where is thy sting? O grave, where is thy victory? . . . But thanks be to God, Which giveth us the victory through our Lord Jesus Christ" (vv. 54-57).

## What happened to the dinosaurs?

John Nicholls

**T**HE INTENTION of this article is to set before readers the evidence available about dinosaurs and to let them make up their own minds. No new theory or evidence will be produced, and the three broadly different viewpoints that believers in the Biblical account of Creation hold about dinosaurs will be presented. There are many questions about Creation that Bible believers would like answers to, and the significance and fate of the dinosaurs is one of them. We have to admit that there are many things we do not know about dinosaurs. We should therefore be prepared to think about such evidence as there is, and be content to wait for the day when, perhaps in discussion with one of the angels, we will be given the answers to our questions. Our God, and His angels, are witnesses to the whole story of the dinosaurs, and they alone can give the accurate, scientific answers that we seek.

Dinosaur fossils were found way back in the seventeenth century, but it was not until the nineteenth century that scholars publicly declared their belief that large reptiles once lived on the earth but were now extinct. By 1841 so many large fossilised reptilian bones had been found that Richard Owen proposed to the British Association for the Advancement of Science meeting at Plymouth that a new group of reptiles should be recognised, which he named 'dinosaurs' (meaning 'terrible lizards'). Since that time, dinosaur fossils have been found in all the continents of the world, and more than 800 species have been described, ranging from quite small ones, like *Compsognatus*, only sixty-five centimetres long, to the huge *Diplodocus*, twenty-seven metres long.

### The evidence for dinosaurs<sup>1</sup>

Where does information about dinosaurs come from? It comes from two sources, the first of which is fossils. These are traces of past life preserved in the rocks. Fossils are found in sedimentary rocks, and they are formed by the animal

being covered with some sort of sediment before the carcass is set upon by scavengers, or disintegrates. Once it had died, and the sediment had covered it, the flesh and other soft parts of the dinosaur rotted away, leaving the hard bones and teeth behind. Sediment would build up on top of the bones, compacting into rocklike limestone or sandstone. Minerals from water percolating through the surrounding rocks would seep into the bone structure, impregnating the tiny spaces and often altering the original mineral in the bone. These fossils, part original bone, and part rock, are described as 'petrified'.

Natural mould fossils develop where acidic water in the ground dissolved the bone away and left a hollow mould where it used to be. Rubber latex or plaster of Paris can be poured in to create the precise shape of the bone that used to be there. In some cases, these natural moulds fill up with sediments to build up a 'natural cast' fossil.

Very rarely, a dinosaur's body was covered in a dry environment, and some of the parts became mummified and then fossilised. The texture of the skin, and folds in it, can be clearly seen in these fossils. In addition to these fossilised remains, there are fossilised footprints ('trackways'), fossilised nests and eggs, scratches, tooth marks, fossilised dung and stomach stones.

The second source of information about dinosaurs comes from observations of animals alive today. Comparative anatomists are scientists who study animal structure to determine relationships between species. By comparing them with reptiles living today, such scientists suggest how dinosaurs stood and walked, how they behaved, communicated and hunted.

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1. The following publications have been used for this section: T. Gardom and A. Milner (2000), *The Natural History Museum Book of Dinosaurs*, Carlton; A. Charig (1979), *A New Look at the Dinosaurs*, Heinemann; L. R. Croft (1982), *The Last Dinosaurs*, Elmwood Books.