

field and the fowls of the heaven hath He given into thine hand, and hath made thee ruler over them all. Thou art this head of gold" (v. 38). In the latter days the head of gold represents the way that spiritual Babylon, the Roman Catholic Church, will be at the head of the nations.

It seems that one of the key ways it will establish this position is by increasing its influence at the UN. The UN appears to look favourably towards the Catholic Church. When Antonio Maria Costa met with the pope, the UN News site re-

ported that he "thanked the Pope for his Message of Peace delivered on New Year's Day, which stressed the importance of justice, the universal principle of UN work, and the contribution of the Catholic Church towards building peace". The mutual appreciation between the UN and the Catholic Church is a sign that Babylon is tightening its hold on "all nations". However, all nations, including the UN, will eventually have to drink "of the wine of the wrath of her fornication" (Rev. 18:3).

## Science and the Creator

### The secret chemistry of life

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**A**RGUABLY THE most important chemical process in nature, upon which all life on earth depends, is photosynthesis, the operation by which plants, algae and certain bacteria capture energy from sunlight and use it to convert carbon dioxide into carbohydrates. These are the food molecules of cells, and so ultimately the source of all that we eat. Photosynthesis is still the most efficient known mechanism for capturing solar energy, in spite of the many decades of scientific research to develop artificial solar cells.

Like so many other features of the living world, the actual chemistry of photosynthesis is extremely complex, involving two complementary mechanisms.<sup>1</sup> In the first, chlorophyll<sup>2</sup> utilises the energy of sunlight to split water into hydrogen ions and oxygen, at the same time liberating high energy electrons. In the second, the energetic electrons derived from stage one are used to reduce carbon dioxide, converting it to carbohydrates.<sup>3</sup> Thus, in the course of this process, oxygen is released to the atmosphere and carbon dioxide is removed, maintaining the atmosphere of the planet and making life possible for us.

#### The heart of the process

Biologists talk glibly about the supposed steps by which this amazing life-supporting process evolved, about 'nature' *inventing* such a successful system. Yet, although many years of research have revealed the main details of the biochemical pathways of photosynthesis, it still remains a

mystery how the fundamental step of the splitting of water by sunlight in plants actually takes place. Scientists dream of reproducing this reaction in order to make it possible to harness sunlight to produce, cleanly and cheaply from water, limitless quantities of hydrogen for use as fuel.

The problem is that, theoretically, the amount of energy required to split water is so great that it should destroy the biological molecules involved in the reaction. Yet plants do it all the time without harm. The secret seems to lie with an extraordinary structure associated with the chlorophyll molecules within the cell, which operates as a catalyst<sup>4</sup> for the process. New research has for the first time revealed the design and composition of this structure, referred to as the 'catalytic core'. In what has been described as a major breakthrough, scientists at Imperial College, London, used X-ray techniques to discover the precise layout of the atoms within the molecule.<sup>5</sup>

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1. Alberts et al., *Molecular Biology of the Cell*, New York, 1983.
  2. Chlorophyll is the green pigment of plants, which is contained in minute, lens-shaped bodies called chloroplasts within the outer layer of the leaves.
  3. Carbohydrates are a group of compounds that includes sugars and starch.
  4. A catalyst is a molecule which acts like scaffolding for a chemical reaction to take place on, speeding it up without itself being consumed.
  5. P. Hunter, "Flower power", *New Scientist*, 1 May 2004, pp. 28-31.

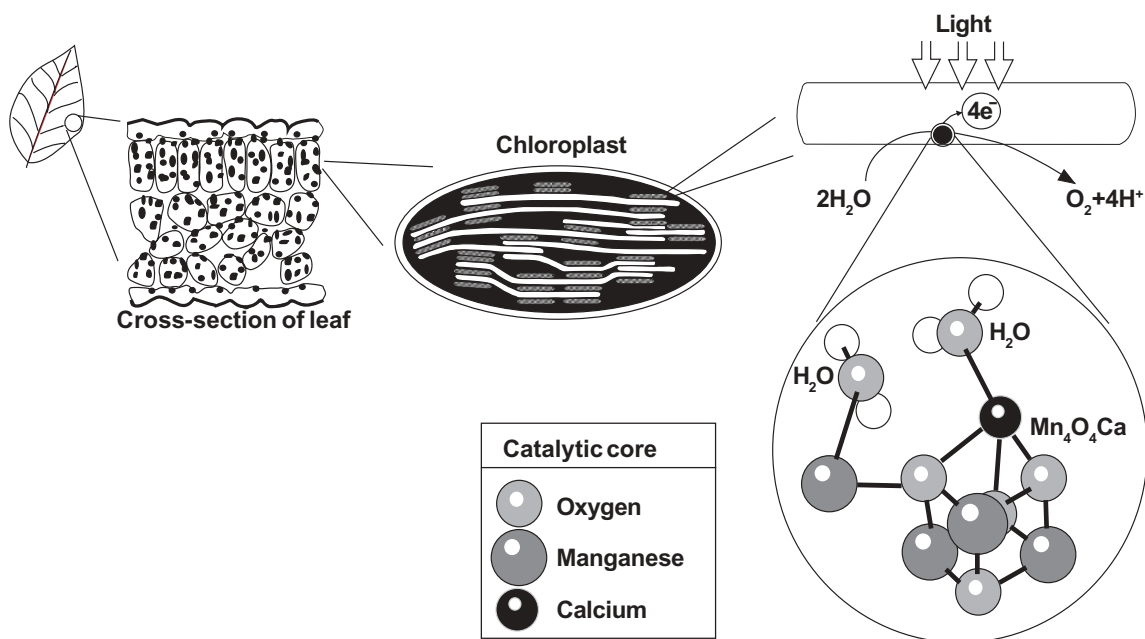


Fig. 1 The structure of the light-capturing system within a plant leaf

It is worth describing this briefly, in order to demonstrate its extraordinary intricacy. This catalytic core has proved to have three atoms of the element manganese, four of oxygen and one of calcium, arranged at the corners of a distorted cube, with a fourth manganese atom sitting outside the cube (see Fig. 1). It is thought that molecules of water constantly attach themselves to the external manganese atom and the calcium atom, and are split as described above.

Scientists believe that all plants and algae employ exactly the same mechanism to perform photosynthesis, and this suggests that the precise structure is vitally important, which is why the latest discoveries are deemed so important. Yet even now the detailed chemistry of the sequence of reactions that splits the water to release oxygen and the energetic electron remain unknown. It is worth remembering, too, that this remarkable molecule is assembled *automatically* in vast numbers by every living plant as its cells divide and grow.

#### 'Nature' or the Creator?

It seems remarkable that decades of research by some of the world's leading biochemists have still not fully revealed the details of one of the most fundamental chemical reactions of life. The development of photosynthesis is, of course, attributed by biologists to evolution; 'nature' is said to have *invented* catalysts and processes so

advanced that mankind still cannot replicate them. This would have demanded the biochemical assembly of the catalytic molecule, the structure of which, it seems, must be exactly right to work, *by pure chance*, as well as the writing of the genetic code to synthesise it within the living cell, also *by pure chance!*

Contrary to this, Scripture informs us, by inference, that chlorophyll, the green pigment of plants, and consequently the whole apparatus of photosynthesis, was the invention of God the Creator, Who has said: "And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth, wherein there is life, I have given *every green herb* for meat" (Gen. 1:30). In fact, every aspect of this system, with its amazing complexity and intricacy of design and outstanding biochemical efficiency, speaks of intelligent design by a Master Chemist.

How sad that so many scientists decline to give the honour due to the God of heaven! But we can and should marvel at the genius of our heavenly Father, the great Creator. As we look at a plant in the garden or in the field, may we see not just its external beauty but also the secret wonder of those hidden processes that sustain all life. Let us give Him the glory, for "He causeth the grass to grow for the cattle, and herb for the service of man: that He may bring forth food out of the earth" (Ps. 104:14).