

Our most underrated organ

David Burges

A FEATURE of modern life is the proliferation of fad diets and programmes offering to 'detox' the body, that is, to remove toxins and leave us feeling 'purified' and healthy. One such plan, requiring purchase of an expensive herbal preparation, promises that participants will have more energy, boost their immune systems, improve their complexion and lose weight!

Yet our marvellous bodies, "fearfully and wonderfully made" according to the design of God the Creator, already possess their own detox system, incorporating the largest, yet most underrated, internal organ, the liver. Located behind the ribs, in the upper right-hand side of the abdominal cavity, below the diaphragm, a healthy liver cannot be felt and so tends to be taken for granted unless or until disease intervenes. As is well known, one of the main causes of liver failure is cirrhosis, a condition that is often caused by excessive alcohol consumption, since alcohol is directly toxic to the liver,¹ though it should not be a problem for servants of the Lord Jesus Christ (Prov. 23:29-35; Eph. 5:18, etc.).

Intricate plumbing

The liver is a roughly cone-shaped organ, weighing about 1.5 kilograms in a normal adult, which performs an amazing array of functions that are essential for life.² It is one of the few organs of the body able to regenerate itself if it suffers damage or partial loss by surgery. It can double its weight in three days and regenerate its original mass in about two weeks. The liver is strategically placed next to the stomach and overlies the gall bladder (which stores bile).

The liver receives blood from two sources. The **hepatic³ portal vein** supplies nutrient-rich blood draining from the capillaries of the intestines, while the **hepatic artery** provides oxygenated blood directly from the heart. Each of these divides within the liver into a multitude of capillaries, in a precise pattern so that their branches always remain paired with each other. The two

streams eventually mingle, bringing nutrients and oxygen to the liver cells, known as hepatocytes. In total a remarkable twenty-five-per-cent output of the heart goes to the liver. Having been processed, the blood flow is collected by a series of vessels that combine in the hepatic vein, and is returned to the general circulation.

However, the flow of blood is only half of the liver's interaction with the intestines. It is cleverly constructed so that another fluid can flow in the opposite direction at the same time. Another set of minute tubes draws bile fluid from the liver cells and forms a network which converges on the bile duct, sending bile to the intestines and storing it in the gall bladder. This amazingly intricate plumbing allows the liver simultaneously to filter the blood and secrete bile.

A versatile organ

The detailed structure of the liver and the complexity of its many vital functions are beyond the scope of a short article. But it is possible to summarise some of its more important roles:

- It produces a range of important proteins for blood plasma, including those which: regulate the exchange of water between blood and tissues; form part of the immune system; contribute to the blood-clotting system; and produce a precursor of haemoglobin.
- It manufactures cholesterol and special proteins that carry fats around the body.
- It takes up glucose that is not immediately required by the body's cells and stores it as glycogen. When more energy and heat is needed, the liver, stimulated by hormones, converts the glycogen back to glucose and releases it into the bloodstream.
- It regulates the levels of amino acids in the blood, which are the building blocks of proteins. When the levels rise too high (as after a meal) the liver converts some into glucose, some into proteins or other amino acids and some into urea, which is passed to the kidneys for excretion in the urine.
- It stores and regulates levels of vitamins and minerals that have been processed by the intestines and bound to special proteins. Animal and fish livers have long been known to be a rich source of oils and vitamins.

1. *British Medical Association Encyclopaedia of Family Health*, 1998, pp. 641,643.

2. John Lee, "Metabolic Powerhouse", *New Scientist*, 'Inside Science' supplement, 11 Nov. 2000.

3. From Greek *hepar*, liver.

- It acts to filter from the blood drugs and poisonous substances that would otherwise accumulate in the bloodstream. The liver contains over seventy special enzymes that can recognise and deal with a huge range of potentially dangerous chemicals (unfortunately excluding alcohol!). They react with the toxins to make them soluble in water, so that they can be excreted in the bile; bile fluid carries waste products away from the liver and also helps in the breakdown of fats in the intestine.

The liver is thus seen to be the ultimate 'detox' agent, as well as accomplishing so many more vital functions for our bodies.

Amazing design

The bland-looking liver is an organ of extraordinary complexity, performing a large number of essential roles in the maintenance and regulation of our bodies. Sober scientific descriptions even include words like 'clever' and 'amazing', and yet attribute these features to the blind process

of natural selection! Because lower animals have themselves similarly complex organs, biologists convince themselves that evolution over billions of years is capable of explaining these remarkable features.

But this is simply absurd. Biochemical processes of this order of complexity and 'cleverness' would be difficult enough to perform individually in the laboratory by highly intelligent, trained chemists. Yet in the liver they are executed automatically and continuously in a living, self-sustaining organ, part of an even more complex network of processes in the whole body. Here is design of an awesome degree, assuredly the handiwork of the Divine Creator. Similarities with lower animals are evidence not of common descent but of the same Originator.

The scientific unravelling of the complex operations of the liver and similar organs testifies to the wonderful works of the God of heaven, the God Who has called us to His glorious Kingdom.