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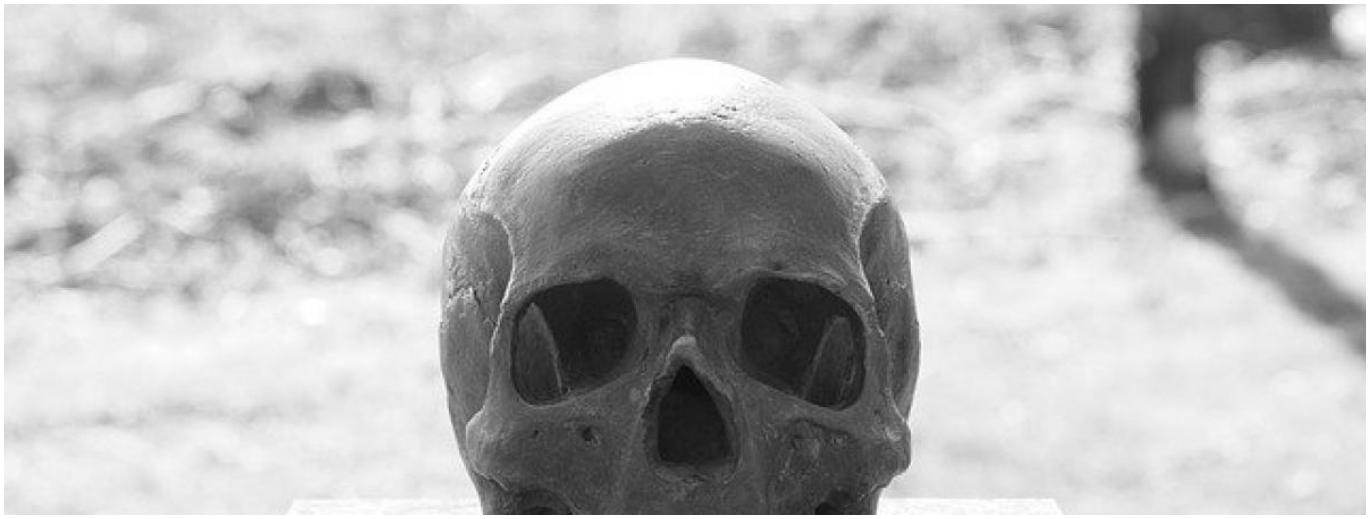

We take a look at the life and works of the genius whose drawings mapped out the human body.

“Successfully to build up the human figure in a drawing, painting or statue, the artist must be possessed of a keen sense of construction,” wrote the artist John H Vanderpoel [3]. Understanding the anatomy, or structure, of the human body certainly helps life drawing come alive and one 28-year-old anatomist, living just after Leonardo da Vinci, displayed his body of knowledge in one brilliant must-see work.

His forerunner

Just before Vesalius, came Leonardo da Vinci [4] (1452-1519). Both artist and anatomist, da Vinci conducted more than 30 human dissections to explore every aspect of the body, from bones and muscles to blood vessels, creating far-sighted artwork that came close to modern medical thinking. Had his work been published then, it would have transformed art and medicine.

Some years later (in 1543) Andreas Vesalius [5] published a masterpiece in anatomy that forever changed the lens through which we look inside the human body. Working alongside an artist of “very great ability but uncertain identity”, he enlightened doctors and artists alike. Now when they looked at the human form, they really did “see”.

His work

Vesalius’ vast book, entitled *De humani corporis fabrica* [6] (or *The Fabric of the Human Body*) is “elaborate in its descriptions and intricate in its illustrations”. At 663 pages long, with more than 250 illustrations, the book provides a visual record of virtually every aspect of the human body, inside and out, annotated in Latin.

The work is divided into seven sections covering in turn the bones and muscles, blood vessels, nerves, the abdomen, heart, lungs and the brain. One of the most iconic images is that of a skeleton leaning on a plinth, contemplating a skull (representing death) beneath its right hand. The gruesome “muscle men”, meanwhile, show their muscles peeled and hanging from the body, illustrating their points of attachment to the human frame.

Sadly destroyed in an air raid on Munich in 1944, the original work weighed seven kilograms with pages cut on pear wood; 16 mules were needed to carry it across the Alps into Switzerland, where it was printed. An English translation [7] of the work was published in 2014, to celebrate the 500th anniversary of Vesalius' birth.

His subjects

Professor Admir Ha?i?, founder of the New York School of Regional Anesthesia, describes in his academic paper [8] how Vesalius would "spend hours studying bones scattered on burial grounds by moonlight, risking being caught by the Church or attacked by hungry dogs likewise seeking human remains".

During a walk Vesalius came across the skeleton of a hanged highwayman, swinging from the gallows, returning at night to recover the body bit by bit. Further supply of cadavers came from local authorities, who would release bodies for dissection after execution. To study bones in particular, Vesalius would famously boil the bodies to remove the flesh and then articulate the bones using wire. Basel University [9] today houses one such skeleton, of executed criminal Jacob Karrar, thought to be the oldest of its type in Europe.

Invariably destroying one body part whilst dissecting another meant that several bodies were generally needed to delve deep into human anatomy. Animals were sometimes used as substitutes, and Vesalius championed hands-on dissection, supplanting the barber, or surgeon, traditionally assigned to the role.

His lessons

Vesalius shook the foundations of science, making contributions to medicine that prevail today. He compared, for example, and for the first time, the human skeleton to the poles of a tent—holding the structure together. Muscles, he correctly surmised, seemed to pull length-wise against a bone, since if they were cut lengthways they could still work, but not if they were cut across.

That nerves are simply hollow tubes and that the two main chambers of the heart are connected by visible pores were two myths dispelled by Vesalius; he also showed some fundamental differences between human and animal bodies, including in the structure of the jaw.

Put simply, he was the first to think of living bodies as wonderful examples of bioengineering [10]—being driven, in his words, to "marvel at the handiwork of the Almighty" in response.

His legacy

Vesalius died young, in 1564, at the age of 49, being shipwrecked on the Greek island of Zakynthos while returning from a pilgrimage to Jerusalem.

Less than 60 years later, scientist William Harvey [11] announced his discovery of the circulation of blood within the body; 100 years later, Thomas Willis [12] gave a ground-breaking, accurate description of the human nervous system. Doctors today [8] say how they stand on the shoulders of scientists such as Vesalius as they continue to explore human anatomy with ultrasound and other innovative and high-resolution imaging.

Vesalius is variously listed among geniuses such as Galileo, Descartes and Newton and his epitaph reads "Genius lives on; all else is mortal." His genius certainly does.

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