



Handy 3D form cuts problems out of anatomy

JULIE HARE

PAUL McMenemy's flash of inspiration was simple: bring together CT scans, three-dimensional printing and colouration software, and you have a hyper-real facsimile of a human body part.

The invention holds the promise of revolutionising the teaching of anatomy to medical and health students, and could put a brake on demand for human body parts. The 3D body part is cheap to create, easy to replicate and devoid of complex ethical and legal issues governing the use of cadavers.

The Monash University professor's technology is so new, he created his first 3D body part only a week ago. Since then he's been busy at the scanner recreating a hand, a shoulder, a crocodile skull and, while he is speaking to *The Australian*, an orang-utan skull.

Professor McMenemy says there is nothing new in printing 3D bones, but his idea takes it a step further by reproducing in intricate detail all the elements of the body part: skin, bone, tissue, blood vessels, tendon, muscle.

Professor McMenemy and colleague Colin McHenry came up with the idea while hunting for a substitute for the human cadavers and body parts that are used by medical students to learn anatomy.

About 170 bodies are donated for such purposes in Victoria each year, but there are multiple complex issues governing the use of cadavers: they are expensive and difficult to maintain; there are extensive ethical and legal obligations; and, because of the way they are stored, "they stink and ooze goo and gunk", Professor McMenemy says — enough to turn the stomach of many a rookie medical student.

To overcome these issues, many overseas medical schools have adopted the use of plastinated bodies, a process developed in Germany in the 1970s and popularised by the sensational *Body Worlds* exhibitions.

Professor McMenemy originally came to Monash's Centre for Human Anatomy Education three years ago with the goal of building a plastinated cadaver

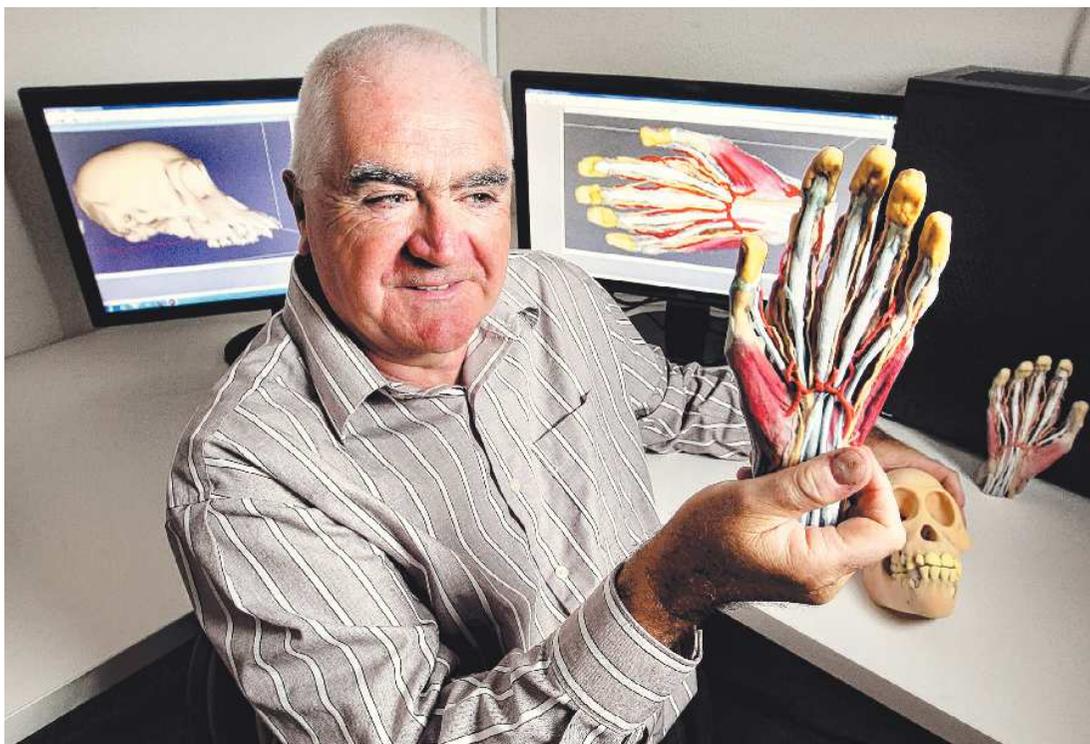
laboratory, but he ran into financial and OH&S issues arising from the vast amounts of toxic chemicals needed to create a plasticised body part.

That's when the epiphany happened. Watching a colleague at Newcastle University print 3D fossil bones from CT scans, he wondered what would happen if he scanned an entire body part.

"All the best ideas are really simple," Professor McMenemy says. "The novelty in this is bringing the CT scan, the 3D printing and the colouration all together."

While cadavers or "wet specimens" will never be totally replaced in teaching anatomy, Professor McMenemy says 3D body parts are cheap, superior to alternatives and because there are no ethical issues, can be "printed" many times over.

He also notes that in countries where dealing with human remains is frowned on, including much of Asia, it would provide medical schools in developing countries "a near-identical alternative to the real thing".



Paul McMenemy, from the School of Biomedical Science at Monash University, Melbourne, shows off his facsimile of a human hand yesterday