

Chapter from *The Body and the Arts*, London, Palgrave, 2009.

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Chapter 5: Flesh Revealed: Medicine, Art and Anatomy (pp. 72-83.)

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It has always been a bit of a joke – but with serious intent amongst medical educational reformers - that the first patient that medical students meet is a dead one : the body freely given to ‘medical science’ by a kind benefactor for students to dissect system by system, often over the course of their first two years in medical school. The fact of anatomy’s place as the Senior Service discipline in medical education was secured by the terms of the Anatomy Act of 1832, which provided a legal secure supply of corpses for dissection.¹ Until that time, bodies had been scarce and supplied at times by criminal activities such as that of the notorious body snatchers and murderers Burke and Hare in early nineteenth century Edinburgh.² During these uncertain and sometimes dangerous times for the fledgling science of anatomy, the distinguished surgeon, John Abernethy had declared in his Hunterian Oration at the Royal College of Surgeons:

Anatomical knowledge is the only foundation on which the structure of medical science can be built. Without this we should but increase the sufferings of those afflicted with diseases, and endanger their lives.³

The Anatomy Act marked a significant shift in the way in which knowledge of the human body by dissection was disseminated. Since the Renaissance, the teaching of dissection had been through observation and students would attend to watch anatomical displays in anatomy theatres. These public anatomies were open to medical students and members of the public alike, and were attended by both men and women.⁴ After the Anatomy Act corpses were in more plentiful supply from patients who had died in hospital and there was no longer any need for one dissection to be viewed by many. Students now had the opportunity to wield the knife

themselves. With the move from observation to active dissection came a greater professionalisation of anatomy. Public dissections were no longer performed and the study of anatomy became the exclusive preserve and distinguishing feature of the student of medicine.⁵

This distinction has continued in medical education until very recently. At the time when I and most of my clinical colleagues came to study medicine (in the late 1980s), the anatomy course was considered as something of a rite of passage for medical students. We gathered at the doors of the dissecting room where we were given a solemn lecture on appropriate behaviour within it. This was our first brush with professionalism and the body was our first client. We were marked out from other students by the smell of formalin that hung around us and our dissection kits. Now, however, approaches to the teaching of anatomy are changing and this change is being assisted by the insights and practical input of artists. There is also some evidence of a re-democratisation of the teaching of anatomy in that the knowledge that has been until recently confined to the medical and other health professions is now being shared with the laity. Public dissections are once again being held ‘in the flesh’ and in the glare of television cameras.⁶ In this chapter I will reflect on some of the influences that have led to this change and discuss the role artists are playing in it.

One stimulus to change has been the negative effects of dissection on developing doctors. The need to overcome natural fears and inhibitions about viewing the dead and cutting them up contributed to the characteristic hard humour that medical students often adopt in stressful situations. In the absence of a relationship with real patients it seems also that some medical students went quite far in developing relationships with their cadavers. The historian of medicine, John Harley Warner, has examined an extraordinary series of images of medical students with their cadavers in anatomy classes which are in a collection at the Dittrick Medical History Centre at Case Western Reserve University.⁷ According to Warner, this series of images

were characteristic of US medical schools at the turn of the 20th century.⁸ The images (an example of which is shown in fig. 1) show groups of medical students gathered around cadavers at various stages of dissection. Many of these images were intended to be humorous. In one the students have scribbled the caption ‘the Lord giveth, we taketh away’ on a chalk board beside the dissecting table on which their partially stripped corpse lies. In another, a student lies moribund under a white sheet surrounded by cadavers which have been seated on dissecting stools while a skeleton rears above him, a knife held loosely in between its bony fingers. These images are shocking today in that they appear disrespectful to the bodies. But Warner – while admitting being perplexed at the tone of these photographs - argues that the students might, in fact, be indicating their gratitude for the gift of the body by presenting the cadaver as part of their group, as in figure 1. Note that the reclining student and the ‘student’ corpse both seem to be enjoying a last cigarette! One would assume that these images were circulated only within the medical school but it is extraordinary to find that some students also sent them as postcards to girlfriends and as Christmas cards.

For a modern audience, of course, these images induce feelings of repugnance and horror that the human body should be subjected to what appears to us to be such indignities just to amuse a group of medical students. In Ian Rankin’s crime thriller, *Fleshmarket Close*, when two medical students steal a skeleton from the anatomy department for a prank, there is no doubt what our view should be of their characters.⁹ Such behaviour, and these images, suggest some of the negative aspects that may have derived from the activity of dissection: desensitisation towards death and the dying and the development of inappropriate attitudes towards human remains in students struggling to cope with the stress of so much time spent in the company of a dead body.¹⁰

Two poet doctors have recorded their thoughts on the experience of dissection. Dannie Abse, who studied medicine at Kings College during the Second World War writes:

You, dead man, Thing, each day, each week,
each month, you slowly decreasing Thing,
visibly losing Divine proportions,
you residue, mere trunk of a man's body,
you, X, legless, armless, headless Thing,
that I dissected so casually.

Then went downstairs to drink wartime coffee.¹¹

The cadaver is 'Thing' with a capital T, (ghoulish, and reminiscent of some B horror movie title) and 'X', as it slowly loses its parts under Abse and his colleagues' knives, even losing its Divinity as it begins to look less and less human. Frank Hulyer, an emergency room physician in the US, describes more recent experiences of dissecting his cadaver. Before the first class he 'was trembling just a little, the fine hair on my arms rising in the air-conditioned cold of the room.'¹² But he soon became familiar with his body:

Our cadaver was sixty-two years old, and after a while, when we had gotten used to it, we cut around his tattoos and saved them, like a little pile of photographs which we left by his intact head. Mother. A red rose, and a woman's silhouette. The United States Navy.¹³

The removal of the tattoos is an ambiguous act. On the one hand Hulyer's group recognised this man's uniqueness and wished to preserve it but the method seems ghoulish and almost cruel. Hulyer acknowledged this ambiguity but recognised that it helped them to preserve a necessary distance:

...even as we reduced him to pieces I knew that he was real, that he had stories to tell, that he had looked out at the sea from the decks of ships. I could feel it when I chose to. Mostly I chose not to. Mostly it was anatomy.¹⁴

Formal studies on medical students' reactions to dissection reflect these vivid accounts and suggest that at least a quarter find starting dissection a highly stressful experience.¹⁵ Some students experience anxiety and distress, but for others the detachment described by Hulyer as necessary to the act of dissection can have negative consequences for their professional development.¹⁶ Sinclair in his ethnography of medical students at a London medical school comments on the attitude to the body encouraged by the experience of the dissecting room. The demonstrators – usually doctors studying for the first part of their Fellowship of the Royal Colleges of Surgeons – are described as 'models of emotional detachment'. This attitude was not taught to the students but was nevertheless learnt as part of what is called in medicine 'the hidden curriculum' – that part of medical education that is implicitly passed on through observing and copying the actions and demeanour of doctors.¹⁷ The reactions described by Sinclair of students to their bodies ('It's gross! It's disgusting! ...I don't want to go anywhere near it!') reflect those of Hulyer and Abse. The response is not one of wonder at what dissection might reveal but one of attempted or strived for detachment and (at times) barely concealed horror at what they are doing.

In 1992, Sinclair reported that dissection of the whole body was still an important part of most medical schools pre-clinical curriculum, but that situation is now far from the case in most medical schools in the UK.¹⁸ Peninsula Medical School (PMS), in the South West of England, has pioneered an approach to anatomy teaching without the use of cadaver dissection. There are many reasons for this change to non-cadaver anatomy teaching, including practical ones: there are potential health hazards now recognised in the handling of cadavers, including HIV; since gross anatomy is no longer a field in which academics can develop a research career, lecturers in whole body anatomy are difficult to come by; and maintaining a wet anatomy facility is very expensive for universities.¹⁹ However, there are also positive benefits from the PMS approach in

that students still learn from the real human body, but from a living, breathing, feeling and responding body rather than a corpse. Classes involve examination and visualisation of the body using a variety of methods, including medical imaging (such as ultrasound scanning); so-called ‘surface anatomy’, which involves the examination of the appearance on the outside of the body of the deep underlying structures; and also, interestingly for our purpose, techniques borrowed from fine art and art education. Life models from the local Art college have been used to demonstrate surface anatomy and artists have been employed to paint underlying anatomical structures onto the bodies of the models.²⁰

Recent work by John McLachlan with colleagues from the University of Ulster have led to the design of the *Operations Tee-shirt* (fig. 2).²¹ This extraordinary garment hangs upon a life model displaying the names of surgical incisions and scars over their actual sites. Zips can be slid open over these sites in parody of the cut itself and it has been suggested that the interior of the garment might be coloured red to improve upon the metaphor. There are practical advantages to this for the student in that it not only provides a striking visual image of the sites and effects of surgery, but also allows the student to insert a hand and to examine the actual parts that may be removed from the living body. The *Tee-shirt* is at a teaching tool as well as a work of art, reminding the viewer of the importance of clothing for our self worth and image of ourselves, and the potential effects of losing a breast (for example) on the way in which clothes hang about a woman’s body. The viewer at one and the same time thinks of fashionable clothing and of operating theatre garb while suppressing a shiver at the ghoulish thought of what might be revealed if the ‘skin’ were unzipped and the flesh underlying the ‘cuts’ was revealed. Here, metaphor and teaching aid are working synergistically reminding students of technical terminology but suggesting the importance of clothing as covering and adornment, while using the slashing openings of the zips to suggest the violent nature of surgical operations, however sensitively performed.

These new methods, painting on the body, the use of ultrasound on living subjects in the classroom and imaginative body coverings such as the *Operations Tee-shirt*, can be used at the same time as learning clinical examination techniques – and, unlike the cadaver, the real ‘patient’ will certainly let the students know if they are insensitive or clumsy in their approach. This move away from cadaveric dissection and towards examination, visualisation and imaging of the living body reflects a wider change in the approach to early years medical education where students, instead of being closeted with the dead for two years, get out to meet the living people in hospitals and communities who will eventually be their patients. This trend has, I think, emerged from a cultural change in ideas about the role of medicine, and how medicine views the human body. This change took place during the later decades of the 20th century and might be characterised as a shift from a biomedical perspective to a biopsychosocial one.²² In the biomedical conception the body is passive; a mechanism that is diseased and needs fixing by medical experts and which can also be learned about by the dissection of its inert remains. The biopsychosocial perspective sees the body as active; regards patients as responsible and involved in their own well being; and views medicine as engaged in health maintenance in co-operation with patients rather than in eliminating disease by the imposition of treatments. It is more appropriate to this perspective that modern medical students observe, touch and learn about the body in life; a body that is moving about with ease – or otherwise - in its environment, responding to touch or to pain; and with views about treatment and lifestyle choices.

It is ironic that this change seems to be happening at a time when doctors are required to touch patients *less* frequently; and when the traditional clinical examination skills of observation, palpation, percussion and auscultation are being rendered virtually obsolete by advances in medical imaging. However, such advances are also allowing physicians greater knowledge – and indeed wonder – at the function of the body in life. PET scans (positron emission topography

scans) of the brain, for example, show for the first time - through mapping blood flow - how the brain affected by Alzheimer's differs from normal. Through this means, the radiologist is able to visualise directly the markedly decreased activity in the cerebral cortex of the affected brain.

Learning from the living is key in modern medical education and, as we have seen already, the skills of artists are already being employed to assist with new approaches to learning anatomy. Some medical schools (PMS, University College London and Southampton) have even offered students the opportunity to take part in life drawing classes to augment their understanding and to improve their observational skills.²³ As with most innovations in medicine, such courses have been the subject of considerable scrutiny and studies have indicated that the use of artists as tutors, and of artistic skills as a learning tool have improved students' knowledge of anatomy and increased their manual skills. Less obviously, these classes also enhanced the students appreciation of the beauty and intricacy of the human form. The Glasgow artist, Christine Borland, has worked with medical students taking them into the Glasgow School of Art to learn alongside art students and develop creative projects using various media. In her work, such as *To Be Set Down in the Garden* (2002) situated in the grounds of Glasgow University's Reading Room, she has often collaborated with medical scientists. In this commission she worked with staff from Glasgow's Departments of Anatomy and of Biomedical Life Sciences to produce a work that would mark the discovery of a 1555 list of plants for a proposed physic garden to be planted at the University's original pre-Victorian site. The benches are topped with head-rests whose shape is based on the blocks used in the anatomy dissection room as 'pillows' to support the head of the corpse. The blocks are engraved with adaptations of the original illustrations of each plant from the 16th century herbal.

Christine Borland's work has frequently engaged with anatomical themes and exhibits to reveal the beauty of the human body as well as to challenge medicine for its sometimes unethical

practices in gathering human ‘material’ for study. Her winter 2006-7 exhibition at the Fruitmarket Gallery in Edinburgh brought together a number of such works. While working on one of the exhibits she wanted to get hold of an artificial skeleton and was surprised to find not only that she was able to obtain a real one but that it could be sent in the post all neatly wrapped in a cardboard box. This shocking discovery that human parts were so easily available stimulated her to try to discover the identities of the individuals ‘sold’ in this way and with the help of an expert in facial reconstruction she created busts of the original inhabitants of the skulls she had purchased. The work in exhibition comprises two elegant bronze busts situated on tall white plinths, in the manner of the busts in classical sculpture. The work is entitled *First Class Male, Second Class Female* (1996). The ‘first class’ and ‘second class’ are, of course, ironical in that they are applied to the work of classical beauty that we actually see. These standards are in fact those set by the osteological supplier and refer to his categorisation of the quality of the bones as medical specimens. There is, of course, a further layer of irony that gives the work an additional poignancy: that if these individuals had really been regarded as ‘first class’ their bones would not have been bought and sold like commodities. Borland’s work restores dignity and identity to these individuals, although they remain unknown. This challenging exhibit was complemented in the exhibition by another work of extraordinary technical skill entitled *Bullet Proof Breath* (2001) (fig 3). This is a hand blown glass representation of the branching bronchi of the human lung which are partially wrapped in silk extracted from a golden orb spider. The work hangs from the closed lid of a perspex box by a single thread of the silk and the delicate glass shivers precariously if the viewer accidentally bumps the box. The idea of using the silk from this spider came to Borland when she read that the American military had researched spider silk as a potentially bullet proof material. What strikes the viewer is that the silk is destructive and constrictive to the lung, binding and holding it back from efficient working. But more than this, the exhibit reveals the delicate and intricate beauty of the lung seen here in a way that could not be demonstrated even by dissection.

Doctors and other health professionals, therefore, can learn a great deal from the engagement of artists with the concerns of medicine, including anatomy. Borland's work raises ethical and moral issues but the work of other artists can explore the emotions and feelings that are part of what is it like to inhabit a particular body. At the same time as painting what something looks like, artists can paint what it feels like. The artist Francis Bacon bought a medical textbook in 1928 containing a photograph of horrific mouth disease. He used it to create his series of 'Screaming Pope' pictures, which focus on the mouth. In one of these, *Head VI* (1949), the earliest of his series of Pope paintings, the mouth is the only part of the face that is clearly depicted while the rest rushes upwards as if the face is dissolving into dust and being blown skyward by a brisk wind. Bacon is here painting the feeling of the scream, not what causes the scream. It is a shocking painting, and the viewer recoils in horror at witnessing such pain represented by the waves of sound that emanate up from the already dissolving figure. Disability has, of course, been most famously explored in the statue that now occupies the fourth plinth in London's Trafalgar Square, Marc Quinn's *Alison Lapper Pregnant* (2005). Quinn first came to prominence in 1991 after exhibiting a work called 'Self' in which he cast his own head entirely out of his frozen blood – in an ironic reference to cryogenics. The sculpture of Lapper is one of a series started by Quinn in 1999 of portraits of amputees, in classical style, showing them as contemporary heroes, rather than objects of pity and disgust. His *Map of the Human Heart* (1999) reveals the extraordinary complexity and beauty of the vasculature surrounding the human heart. It was made by filling a real heart with red and blue resin and burning off the flesh with acid. Quinn conceived the work as revealing both the wonder of this piece of human anatomy but also its significance as symbol. He says:

It is about the power of the heart to transform in the sense that it's a real piece of transformation [the deoxygenated blue blood to oxygenated red blood] as well as a metaphorical one.²⁴

Quinn used real human tissue in the creation of this work but that tissue did not remain as part of the work of art. And here his methods differed from those of the controversial anatomist, Gunther von Hagens. Von Hagens' exhibition, *Body Worlds*, uses human bodies in which the decomposition process has been halted by removing water and fats and replacing them with polymers in a process he calls 'plastination'. The resulting exhibits allow the general public – not just the medical profession – access to the details of what the human body is like beneath the skin. There seems to be no doubt that people are in need of education about their own bodies. A recent Norwegian study of young men revealed that while 49% knew the location of their appendix, only 9% could locate the spleen and a mere 4% their liver.²⁵ The stated aim of the 'Body Worlds' exhibition may be the 'education and enlightenment' of the lay public but it is also a sensational piece of showmanship and as such has generally been condemned by the art world who do not consider these pieces to have any aesthetic value..²⁶ There is certainly beauty to be seen in some of the exhibits, particularly those in which the skill of the dissector has painstakingly teased out the complex web of blood vessels supplying the leg. But I find myself unable to look with impartiality upon exhibits such as that of a woman whose pregnant womb is opened to reveal the tiny figure of her never-born child without feeling great sadness for the human tragedy behind it. Whatever our views on the ethics of this, it is clear that exhibitions such as this and the work of some modern artists are helping to restore to those studying medicine a feeling of excitement in the discovery of the animated human form and the anatomy that underlies it.

Conclusion[

Body Worlds is only one of a number of recent exhibitions exploring the links between art and anatomy (another was the marvellous 'Spectacular Bodies' at the Hayward Gallery in 2001) but it is the only one to use real human flesh. Such exhibitions, and the work of artists such as Borland and Quinn, are contributing to this renewal of the democratisation of anatomical knowledge.

I started this chapter with the observation that the Anatomy Act of 1832 closed down that field of knowledge to the lay person by concentrating the supply of corpses for dissection within medical schools and banning the opportunity to view public autopsies. Now the general public are once again being allowed to see what lies beneath their own skin. As a result both layman and doctor alike are wondering anew at the extraordinary intricacy and beauty of our own human form.

Roy Porter, in his magisterial history, *The Greatest Benefit to Mankind*, says that

..Renaissance man showed an insatiable curiosity for the here and now, a Faustian itch to explore....no wonder they became inquisitive about human bodies, which were judged to occupy a privileged position.²⁷

Echoing this passage, and with recent medical scandals in mind (such as that at Alder Hey Hospital involving the removal of children's organs without consent) Martyn Evans suggests that 'one source of both moral and intellectual renaissance for the contemporary physician lies in recapturing a sense of wonder at the human body'²⁸. There are signs in medical education at least of a revival of that 'sense of wonder' and that contemporary art is playing a part in that renaissance.

¹ Simon Sinclair, *Making Doctors: An Institutional Apprenticeship* (Oxford, 1997) p.43.

²Roy Porter, *The Greatest Benefit to Mankind: a Medical History of Humanity from Antiquity to the Present* (London, 1997) p. 317.

³ Tim Marshall, *Murdering to Dissect: grave-robbing, Frankenstein and the anatomy literature* (Manchester, 1995) p. 9.

⁴ *Making Doctors*, p. 48.

⁵ John McLachlan, Debra Patten, Anatomy teaching: ghosts of the past, present and future, *Medical Education* 40 (2006), pp. 243-253.

⁶ The first public dissection in the UK for 170 years was carried out on 20th November 2002 by the German anatomist, Gunther von Hagens.

⁷ <http://www.case.edu/artsci/dittrick/site2/museum/online/haunting/index.htm> [accessed 4th December 2004].

⁸ John Harley Warner, [ref to find].

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- ⁹ Ian Rankin, *Fleshmarket Close* (London, 2004), pp. 145-149.
- ¹⁰ John McLachlan *et. al.*, Teaching anatomy without cadavers, *Medical Education* 38 (2004), pp. 418-424.
- ¹¹ Dannie Abse, *Selected Poems* (Harmondsworth, 1994), p. 196.
- ¹² Frank Hulyer, *The Blood of Strangers: true stories from the emergency room*, (London, 2000), p. 11.
- ¹³ *Ibid.*, p. 11.
- ¹⁴ *Ibid.*
- ¹⁵ J. C. Penney, Reactions of medical students to dissection, *Journal of Medical Education*, 63 (1985), p. 62-3.
- ¹⁶ McLachlan and Patten, p. 247.
- ¹⁷ Sinclair, p. 195.
- ¹⁸ *Ibid.*, p. 171.
- ¹⁹ McLachlan *et. al.*, p. 421.
- ²⁰ John McLachlan, Sam Regan De Bere, How we teach anatomy without cadavers, *The Clinical Teacher*, 1 (2004), pp. 49-52.
- ²¹ Work to design and create this shirt was supported by a grant from the Wellcome Trust.
- ²² B. Hughes, 'Medicalized bodies', *The Body, Culture and Society*, ed. Philip Hancock *et. al.* (Buckingham, 2000), pp. 13-14.
- ²³ P. S. Phillips, Running a life drawing class for pre-clinical medical students, *Medical Education*, 34 (2000). pp. 1020-5.
- ²⁴ www.artnet.com/ag/FineArtDetail.asp..... [Accessed 15th October 2005].
- ²⁵ T. R. Melling, *et. al.*, Young males have scant knowledge of anatomy and physiology, *Tidsskr Nor Laegeforen*, 119 (1999), 1080-3.
- ²⁶ A. Miah, The public autopsy: somewhere between art, education, and entertainment, *Journal of Medical Ethics*, 30 (2004), p. 576-579.
- ²⁷ Roy Porter, *The Greatest Benefit to Mankind*, p. 196.
- ²⁸ H. M. Evans and David Greaves, A renaissance for the 'sense of wonder', *Journal of Medical Ethics: Medical Humanities*, 27 (2001), p. 1.