‘Elegant’ Surgery: The Beauty of Clinical Expertise

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Introduction: Elegance and Surgery

Reflecting on his life as a neurosurgeon, Henry Marsh describes the experience that set him out on his career: observing an operation on an aneurysm in the brain. ‘The operation was elegant, dangerous and full of profound meaning. What could be finer, I thought, than to be a neurosurgeon?’[1] Approaching the theme of this collection – beauty in relation to notions of recovery – from my perspective as a clinician, I kept coming back to the word that is, as here, surprisingly in common use by surgeons to refer to technical work that they admire: ‘elegance’. I wondered where it came from, what it means for surgery to be ‘elegant’, why the language of aesthetics is used for technical processes? I was also interested in what this word says about the doctor who is described as exercising ‘elegant’ skills, and about the implications of this descriptor for the relationship between clinician and the patient. There is a coolness about the word ‘elegance’, and I have previously written with others about the idea of ‘cool intimacy’ in relation to clinical examination.[2] Elegance may be important to the surgeon but not necessarily to the patient. For the patient what matters for recovery is that the surgery is effective. I wondered whether, in using this word in relation to surgical procedures, most surgeons were not necessarily thinking of effectiveness but more of a certain knacky skill or ingenious way of doing something.

I want, therefore, to consider this idea of elegance in surgical practice. This is potentially a huge topic and it opens many disciplinary doors. No-one has charted the origins of the use of the word ‘elegance’ in this context, and it would require more extended historical research to do it justice. However, in the context of this collection and with the focus of a number of essays on the work of Henry Tonks, it seems fitting to explore a further

theme on which these pastel drawings allow us to reflect: the surgical expertise of Harold Gillies, the pioneer of plastic surgery on the face.

Historical Context 1: Tonks, Gillies and the Beginnings of Plastic Surgery

The works of Henry Tonks feature in this volume in both Anne Whitehead's exploration of the idea of the facial mask in recent historical fiction and Ludmilla Jordanova's reflection on the portraiture of suffering. My focus will be the relationship between Tonks's art and the 'art' of the surgeon whose work he was recording, Harold Gillies. During the First World War Tonks worked with Gillies, who was later known as the 'father of plastic surgery', making pastel drawings of young soldiers in Gillies's care who were being treated for facial injuries. The pictures illustrate the nature of these injuries and stages in the reconstruction process.[3]

These images are difficult to look at: Tonks himself considered them 'rather dreadful subjects for public view'.[4] Yet the original drawings have a delicate, tender beauty. Illustration 9.1 shows an injury sustained by Private E. Moss, and the line drawing (9.2) indicates the structure and position of the upper palate prosthesis; illustrations 9.3 and 9.4 are the record of the remarkable reconstruction of Private Frank Boorman's upper lip, and illustrations 9.5, 9.6 and 9.7 show the stages of repair of the lower face of Private Walter Ashworth. Wounded in France on 1 July 1916, he was eventually discharged from care after three operations (two by Gillies) in September 1917. The studies have a delicacy of line and luminosity of colour that makes them superb works of art, but at the same time they are part of the case record, charting accurate depictions of injuries to guide planning and execution of surgical procedures. They are also respectful and dignified records of the suffering and stoicism of the soldiers. Tonks, who as well as being a surgeon taught at the Slade School of Fine Art and became Slade Professor there in 1918, specifically chose pastel as the medium for his works for its freedom to 'suggest form rather than to elaborate' it, as a technical

medical illustrator might do.[5] As Emma Chambers suggests, Tonks's motivations for the portraits were many: they conflate case recording with the conventions and aesthetic aims of portraiture. He wrote to his friend Dugald MacColl:

> I have done some … rather fine pastel *fragments!* One I did the other day of a young fellow with rather a classical face was exactly like a living damaged Greek head as his nose had been cut clean off just where the noses of antiques are generally cut off …. It is capital practice, and I feel I am having excellent practice in drawing. I am pleased to say we are getting some excellent results and no cases of wounded in the war deserve more attention than these real heroes.[6]

What is amazing about these pictures is how the beauty of these young men still seems to project through the injuries. Tonks could represent the accuracy of a surgical repair and the wistful beauty of a young man with a hole in the middle of his face, as in his portrait of the young soldier, Private W. H. Fry, who sadly contracted erysipelas (a skin infection) and died after his fourth operation in December 1916 (illustration 9.8).

Tonks worked with Gillies at first as a lieutenant in the RAMC at the Cambridge Hospital at Aldershot, and later at a specialist hospital which opened at Frognal near Sidcup in August 1917 under Gillies's direction.[7] This hospital facilitated the physical and social isolation of its patients while their injuries were dealt with and while they themselves came to terms with the changes in their appearances. As Suzannah Biernoff notes, the establishment of this new hospital was greeted in the press with sympathy and with optimism. There was sympathy for the plight of the men: the *Morning Post* commented on 'the beauty and privacy of the place' making it perfectly suited 'for the purpose to which it has been put', for the patients 'are almost condemned to isolation unless surgery can repair the damage'.[8] The *Daily Sketch* noted the advantages of this isolation, as to be in an ordinary military hospital meant 'braving the streets, and the pitying stares or shocked averted looks of passers-by'. But there was optimism too in the expression of confidence that 'soon the scientist will rival Nature

herself in creating and rebuilding' the faces of the soldiers. The public (who of course included the families of soldiers who might have to deal with such injuries) were unrealistically encouraged to believe that through plastic surgery 'terrible facial injuries can be so patched up as to remove all horror and grotesqueness and make the sufferer quite normal again.'[9]

These contemporary responses (clearly influenced by the need to maintain morale during a long, hard war) highlight the difficult fates awaiting these young men. As Biernoff notes, it was often more difficult for soldiers to re-enter life with a facial injury than with a leg prosthesis.[10] The idea that these soldiers needed to be isolated for their own and the public's sake leads us to reflect upon the importance of the face as our interlocutor with the world and, even more, how the identity of the person themselves is altered by a change in their facial anatomy. In his study of aesthetic surgery, Sander Gilman quotes the pioneering German plastic surgeon, Karl Ferdinand von Graefe, writing in 1818:

> We have compassion when we see people on crutches; being crippled does not stop them from being happy and pleasant in society …. [But those] who have suffered a deformation of the face even if it is partially disguised by a mask, create disgust in our imaginations.[11]

Gilman goes on to reflect that these young soldiers, 'the best and brightest of their generation, were also the "handsomest" of their generation' (a characteristic we can still see in the Tonks portraits), but that during World War I 'both sides rejected from the service "men who were badly disfigured for the reason that the psychological effect on other soldiers interfered with discipline"'.

These injured soldiers were therefore in a sense doubly disadvantaged. Surgery might restore function, in that they might be able to chew, swallow, or breathe again through their noses, but it would not restore their identity for them or for the society around them. Of this

the surgeons were well aware. Fred Albee, an American surgeon active during World War I, wrote in his autobiography:

> the psychological effect on a man who must go through life, an object of horror to himself as well as to others, is beyond description …. It is a fairly common experience for the maladjusted person to feel like a stranger to his world. It must be unmitigated hell to feel like a stranger to yourself.[12]

For Gillies, the response to this great need was to focus on honing and developing his skills as a reconstructive surgeon. When establishing the Queen's Hospital at Sidcup he appreciated the optimistic outlook in the press about the success of the new 'science' of plastic surgery – (and it helped to raise support for the hospital's establishment); but he famously described plastic surgery as a 'strange new art'. He felt that the activities of the plastic surgeon were essentially creative, and that they 'demanded the vision and insight of the artist'.[13] His artistic tools, however, unlike those of Tonks, were not brushes but scalpels and sutures, and his palette was the flesh, cartilage, skin and bone of his patients.

Gillies' surgeon's eye and approach to his art are in some ways similar to Tonks's practice. Both coolly appraised the subjects in front of them. While Tonks wrote of 'excellent practice in drawing', Gillies recommended at least a week assessing and examining the anatomy of the injury and planning the repair after admission: 'the time so lost is regained a hundredfold' in the quality of the anatomical repair.[14] Both had a deep understanding of the underlying anatomy of their subjects, and an awareness of the importance of this in the exercise of their different arts. Gillies valued Tonks's paintings as contributions to the case record and acknowledges this in the preface to his *Plastic Surgery of the Face*. Gillies' own art aimed at restoring anatomical structure, with a close eye to function as well as aesthetic results. He writes: 'It is indeed fortunate that the best cosmetic results are to be obtained where function has been restored.'[15]

But apart from this kinship with art, what was it about Gillies' surgical work that might be regarded as elegant? As a young army doctor on leave in 1915 he met the reconstructive surgeon, Hippolyte Morestin, at the Val-de-Grâce Hospital in Paris. An army surgeon writing more recently about this encounter describes Gillies as 'inspired by the extreme elegance of his [Morestin's] surgery' to do something other than what his biographer called 'the surgery of destruction'.[16] What had inspired Gillies was Morestin's technique of raising flaps of skin and other tissue (with their blood and nerve supply intact) to rebuild defects in faces that had been partly blown away by the devastating machine gun and sniper fire many soldiers faced in the trenches. Morestin was to die in the influenza pandemic in 1919, but Gillies extended his work and went on to develop the tubed pedicle flap.[17]

In October 1917, Gillies was presented with a survivor of the Battle of Jutland, Walter Yeo, whose face was badly burned while manning the guns on the *HMS Warspite.* His eyelids and lower lip were turned out and his nose almost completely burnt off. Deploying the pedicle graft technique learned from Morestin, Gillies fashioned a complete cover for Yeo's nose and cheeks using skin from his chest, leaving one edge connected to ensure a blood supply and cutting a hole for his mouth (illustration 9.9). He then realized that when such a large flap of tissue was cut away from its original site, it curled into a tube, which meant he could use the thick living tube of tissue to protect the graft from infection and degeneration, thus allowing for greater distances between recipient and donor sites on the body. The graft was very successful (illustration 9.10): Yeo was certified fit for active service in 1919, and lived until 1960 with minimal further surgery.

As can be seen from the pictures of Yeo this was a simple idea, but complex and difficult to undertake. A junior colleague of Gillies described his technique:

> In many hundreds of hours in the theatre, assisting or watching Sir Harold Gillies at operations, I never saw a hurried or rough movement. He was consistently gentle and

> accurate, the movements of his hands with instruments being deft and beautiful. …Absolute accuracy of suture and complete gentleness in the handling of tissues were the two things that were always taught.[18]

While Gillies himself did not refer to his surgical techniques as 'elegant', in this obituary his work is described as 'beautiful', and there are a number of references in the current literature to the 'elegance' of the pedicle graft as a solution to difficult graft situations.[19]

In this account of Gillies' work on Yeo and the description of his surgical skill, we can begin to discern what that word might mean in this context. One aspect is innovation. The term elegance (as we shall see later) is often used when surgeons speak of solving a problem: an 'elegant solution' to an awkward surgical approach. Another aspect is simplicity. There is a sense in these descriptions of Gillies' work that the viewers were asking, 'why did I not think of that?'; it took a man of Gillies' imagination and ingenuity to realise the possibilities. A third aspect is the skill and deftness applied to the surgery itself. Gillies is described as having consummate patience: as an obituarist commented, he was 'ready to undo twenty or more scrupulously inserted sutures if, in the final stages of an operation, he saw some more advantageous way of approximating the skin edges concerned.'[20] In *Plastic Surgery of the Face* Gillies amazingly asserts that 'the insertion of sutures occupies about half the time taken by one of these long operations'.[21] He is also described as 'gentle' with the tissues, since too much rough handling would be liable to reduce the chances of the graft taking. As he wrote: 'dexterity and smooth technique in this particular are of outstanding importance for the sake of the patient.'[22]

The quality of this kind of work was clearly a long way from what had been a certain brutality in the surgery of warfare. War was ugly and surgery in warfare often involved quick decision-making and fast work in harsh conditions, with less than delicate results. Facial injuries, because of the nature of trench warfare (where the soldiers felt the need to peer above the parapet and survey the enemy across no-man's-land) were, though not new, a more

frequent and challenging concern than before, and the advent of effective anaesthesia meant that Gillies' slow, careful, refined techniques were now feasible.

Contemporary Context: 'Elegance' as a Descriptor in Surgical Practice

In relation to the work of Harold Gillies, I have teased out some characteristics of the idea of elegance in surgical practice: innovation, simplicity of approach, neatness, ingenuity, delicacy, and infinite care in execution, requiring the eye and patience of the master draftsman to imagine and concoct a functional and aesthetic repair, and the skills and dexterity of an expert craftsman to carry it out. I want now to examine these characteristics in the context of the current writing on surgery.

To understand what surgeons think they mean by elegance I have explored the contemporary contexts in which this word is used. A standard Medline search for 'elegant surgery' revealed 305 papers. Plastic and reconstructive surgery is the main subspecialty in which the term is used (about 20% of the citations), followed by neurosurgery (10%) and cardiothoracic surgery (9%).[23] The papers all describe specific surgical techniques in their several specialties, but it is possible to decipher common aspects in the use of the descriptor, 'elegant'. The title of one article provides an example:

> Interpectoral approach to the dissection of the axillary apex: an elegant and effective approach.[24]

This paper describes a new method of approaching axillary lymph nodes affected by cancer of the breast through the interpectoral plane rather than via the axilla itself. The advantages described are that this method requires a 'short learning curve' for operators (therefore fairly

simple) with effective results: a better harvest of nodes despite a small excision. A similar use of the term can be seen in a paper on a rarely used but useful approach to hysterectomy in gynaecology:

> Vaginal subtotal hysterectomy and vaginal myomectomy are elegant procedures rarely carried out by the average gynaecologist.[25]

These techniques are described as 'easily learned' and as giving optimal results in some specific conditions. Elegance is also frequently coupled with 'solution', as in 'Elegant solutions for complex paramedian forehead flap reconstruction' in the 'challenging' context of plastic surgery on the nose;[26] or, again, in the case of breast reconstruction:

> The use of the latissimus dorsi musculocutaneous flap and a silicone breast implant to simulate the breast mound was the first truly elegant solution to a problem that had perplexed reconstructive surgeons for centuries.[27]

And in the case of aortic valve disease, the 'Ross' operation, which does not use prosthetic valves, is described as 'an elegant alternative' in the context of developing countries.[28]

In these papers we can identify some of the features discussed in relation to Gillies' work. Elegance is used as a descriptor in the context of innovation in surgical technique providing solutions to problems such as accessing potentially cancerous lymph nodes, or reconstructing the breast; and it is often coupled with simplicity, implying an ease of learning but also an approach that causes the least damage to surrounding tissues and minimises scarring for the patient. The papers do not give us any information about the skills and technique of individual surgeons, but a search through the online catalogue of *Plarr's Lives of the Fellows of the Royal College of Surgeons* yields a number of references to 'elegance' in technique. Peter Forbes Philip (1922-2009) is described as being good with his hands even outside the operating theatre: 'a skilled cabinet maker [who] enjoyed rebuilding old Alfa

Romeo cars'. At work, he displayed 'no histrionics, no prima donna acting to the gallery to impress the students … just elegant surgery performed in an atmosphere of friendly co-operation for the benefit of the patient.'[29]

This examination of current references to 'elegance' in the surgical literature confirms some of the features I identified in relation to Gillies and adds some others. Elegance is used to describe innovation in surgical technique, especially if the new approach is particularly ingenious. The elegant technique is simple to learn or has a more straightforward anatomical approach than before; the elegant surgeon is one who is particularly good with (usually) his hands, displays delicacy of movement and gentleness in the handling of tissues. Finally, elegance in medical literature is strongly associated with a characteristically 'scientific' approach, either tried and tested through a series of operations displaying successful results (as in Gillies' case and in more recent instances) or in the wider clinical context, in the design of clinical trials, also often referred to as 'elegant'.[30]

Historical Context 2: Development of Modern Surgical Practice

To chart fully the evolution of 'elegance' as an epithet in surgical practice is beyond the scope of an essay, but the themes identified above suggest that the use of this term may reflect a move to reposition surgery on a footing equal to if not more elevated than the practice of gentlemanly physicians, thus distancing the craft from its butcherly or tradesmanly early modern 'barber surgeon' context and placing it as a modern refined craft informed by science. The work of historians of medicine and surgery (notably Christopher Lawrence and Malcolm Nicolson) allows us to examine this shift in more detail.[31]

Lawrence charts the evolution of the ideas of surgery as a practice and surgeons as practitioners alongside notions of the physician from the seventeenth century to the present, noting that the language of aesthetics starts to make its appearance in descriptions particularly of physicians. Harold Cook, writing of the early modern period, notes that 'the physician now strove to become a polished ornament to society'.[32] Lawrence starts his account with two characteristic images of the physician and surgeon, still prevalent in 1930. He describes the image of the physician as 'lean, aquiline, bookish, inscrutable, solitary, and given to deep musing on medical problems'. The surgeon by contrast is 'muscular, bluff, practical, theatrical, gregarious and ever ready for dramatic intervention.'[33] His spectacles are more likely to be associated by the viewer with close attention to detail than with scholarship.

The image of the surgeon as a 'doer not a thinker' is a persistent one that has figured in a competitive dialogue between physicians and surgeons from the seventeenth century onwards. In attempting to distinguish their profession from that of more lowly surgeons and apothecaries, physicians identified themselves as the 'head' as opposed to the 'hands' of healing.[34] They regarded surgeons as manual labourers, the instruments of medicine, who should be ruled and led by the head, the physicians. That being a physician requires deep learning, reason and understanding, is a refrain that spans the seventeenth to the twentieth centuries. John Singer Sargent's portrait 'The Four Doctors' (1905), which portrays the physician Sir William Osler and the co-founders of the Johns Hopkins Hospital clearly shows the doctors as scholars, clothed in academic dress surrounded by indicators of wide academic interest. As well as portraying themselves as scholars, however, physicians during this period increasingly aspired to the roles of gentlemen. Lawrence argues that as well as wanting to be revered for their learning and good judgement, physicians wished to present themselves as trustworthy (especially by the higher classes): as people of gravity who could be consulted on how to live a fitting life.

The difficultly for physicians about this strong identification with scholarship and gentlemanliness was that they were expected to *practise* medicine; in other words, to *do* something that would assist their patients to get better. Neither scholars nor gentlemen, of course, worked with their hands, but if physicians did not act, their competitors (surgeons and apothecaries, whom they considered their inferiors) might overtake them. Another problem was that gentlemen scholars, as Steven Shapin has argued, were also seen as reclusive melancholics, not caring for their own health, never mind anyone else's, and hampered by pedantry.[35] Shapin argues that this idea of the gentleman scholar was redeemed in the late seventeenth and eighteenth centuries by the rise of experimental knowledge as part of the great revolution of thinking seen as the Enlightenment.[36] This point is emphasised by the cleric Thomas Sprat, writing about the early Royal Society of London in 1667:

> The common Accusations against *Learning* are such as these; That it inclines men to be unsetled, and *contentious*; ….That is makes them *Romantic*, and subject to frame more perfect images of things, than the things themselves will bear; That it renders them overweening, unchangeable, and obstinat; That thereby men become averse from a practical cours, and unable to bear the difficulties of action; That it emploies them about things, which are no where in use in the world; and, That it draws them to neglect and contemn their own present times, by doting on the past. But now I will maintain, that in every one of these dangers *Experimental Knowledge* is less to be suspected than any other; that in most of them (if not all) it is absolutely innocent; nay, That it contains the best remedies for the distempers which some other sorts of Learning are thought to bring with them. [Original emphasis].[37]

Physicians began to embrace this new learning, and slowly (as Roy Porter has pointed out), physical examination and the dispensing of medicine became part of their practice, but this new experimental approach was also embraced by surgeons seeking to enhance their status, and escape their brutish image. [38]

As an illustration of the early signs of this change Porter recounts the telling story of the final illness of the Scottish Enlightenment philosopher, David Hume.[39] In 1775 Hume

began to suffer severe abdominal pains and consulted a number of leading physicians, who gave multiple conflicting opinions of his disorder:

> Dr Black [Hume writes in a letter to a friend]… told me that … my disorder was a Haemorrhage. … But Sir John Pringle says, that I have no Haemorrhage, but a Spincture in the Colon, which it will be easy to cure. . . .
>
> Dr Gusthart tells me that he sees no Symptoms of the former Disorder, and as to the latter, he never met with it and scarcely ever heard of it. He assures me that my Case is … a bilious Complaint, which the Waters scarcely ever fail of curing; and he never had a Patient of whose Recovery he had better hopes.

All this turned out to be completely false and a correct diagnosis was made only when, by chance, in 1776, Hume was visiting Bath to take the waters at the same time as the surgeon John Hunter. Hunter's biographer Wendy Moore describes the encounter:

> Hunter laid his hands on the suffering man's abdomen and could plainly feel a tumour, which he suspected was cancerous, in the liver.[40]

Surgery was not a realistic option and Hume returned to Scotland where he died two months later, still under the care of physicians who did not accept Hunter's diagnosis. For Hume, 'the great empiricist', however, the case was clear, and when his physicians eventually revealed Hunter's diagnosis to him he concluded:

> this fact [Hunter's finding], not drawn by Reasoning, but obvious to the Senses, and perceived by the greatest Anatomist in Europe, must be admitted as unquestionable, and will alone account for my Situation.[41]

From this account, it is clear that the physicians were attempting to diagnose Hume's condition without examining their patient. The greater efficacy of the surgeon's approach was obvious. It is significant that John Hunter is the hero of this account, as he is acclaimed as the

founder of scientific surgery and played a central part in the attempt by surgeons to enhance the status of their craft.[42] Illustration 9.11 shows him as portrayed in a painting by Sir Joshua Reynolds. The similarities with the images of physicians mentioned above are apparent. He is thin and scholarly-looking, with books and subjects relating to his study of anatomy around him. Hunter became a surgeon after first perfecting his study of anatomy, and it was not until the relatively advanced age of forty that he took the examination for the Diploma of the Company of Surgeons, and was admitted. That same year he was elected to the position of surgeon at St George's Hospital and was well on his way to establishing a large and lucrative practice as the one of the foremost surgeons in London.[43]

Hunter's approach and appearance reflect the attempt by surgeons of his time to challenge the image of their craft as associated with trades such as barbering and butchery, and as subservient to physicians – the hand rather than the head of physic. But at the same time surgeons wished to retain the idea that they were men of action. Robert Campbell in the London Tradesman in 1747 noted that

> a Surgeon should have a Lion's heart, a Hawk's eye, and a Lady's Hand; womanish Tenderness is very improper for a Surgeon.[44]

In attempting, then, to elevate their status, like the physicians but in opposition to them, surgeons also portrayed their profession as based on learning, the learning of experimental science. In parallel to this, and in association with it, they also adopted the trappings of gentility and sought (in Lawrence's words) to 'redefine gentlemanliness in professional terms'.[45] In his Hunterian Oration (1877), James Paget attributed this change to John Hunter:

> From Hunter's time a marked change may be seen. Physicians worthily maintained their rank, as they do now, and surgeons rose to it …. Yes, more than any man that ever lived, Hunter helped to make us gentlemen …. Surely, that if we are to maintain

> the rank of gentlemen …. It must be by the highest scientific culture to which we can attain.[46]

In remaking their profession in this way, surgeons were, like physicians, aware of how they projected their distinctive moral qualities. Physicians wished to portray intellectual virtues of learning and wise judgement, but also humane qualities of the kind described by the physician John Gregory, Professor of Physic in Edinburgh, writing in 1772:

> Chief of these [qualities] is humanity; that sensibility of heart which makes use feel for the distresses of our fellow-creatures, and which of consequence incites us in the most powerful manner to relieve them.[47]

Wishing to be seen as men of learning but also of action, surgeons valued the virtues of physical endurance, courage, solidity, honesty –the very embodiment of manliness and heroism.[48] While these qualities were important for facing the often unpleasant sights and smells surgeons had to deal with – there was no room for feminine sensibility at an operation – increasingly, with the introduction of anaesthesia in the nineteenth century, it became possible to work with greater delicacy and finesse. Feminine tenderness might be unacceptable, but the daintiness and subtlety of the 'ladylike hand' was increasingly valued.

Science (Process) and a 'Ladylike Hand' (Technique)

In this account of a shift in the character of surgical practice, I have argued (with Lawrence) that in attempting to raise their status to rival that of physicians from the seventeenth century onwards, surgeons took on the mantle of professional gentlemen. Their professionalism was based on empirical scientific knowledge (especially anatomy), rather than the more rarefied

cultural learning that physicians revered for educating their judgement. They thus retained the image of men of action: heroes able to act decisively in moments of crisis, and without the tender sensibility that shunned physical contact with their patients. But delicacy of touch was valued increasingly as the advent of anaesthesia allowed more time within operations for surgeons to carry out more intricate work.

It is in this shift, I suggest, that we find a possible explanation of why 'elegance' is so consistently employed in the twentieth and twenty-first centuries as an epithet in describing surgical procedures and surgical technique. First, elegance is deliberately associated with empirically-derived scientific knowledge, and second, it invokes the 'ladylike' hand of the refined gentleman, contrasting with the off-putting butcherly brutality of the tradesman.

1 Empirically Informed Process

We are used to the idea of elegance in science, particularly in mathematics, where the word has a recognised special sense, 'pleasing by ingenious simplicity and effectiveness' (*OED*, adj., 7.a., from 1615). Ian Glyn, a physiologist and Fellow of the Royal Society, characterises elegant proofs or experiments as 'simple, ingenious, concise and persuasive', often with an 'unexpected quality', and also 'very satisfying'.[49] As an example from medicine, Glyn chooses Harvey's experiment demonstrating the circulation of the blood As can be seen in illustration 9.12, you put a cuff round the arm just above the elbow to allow the veins to fill out with blood and demonstrate occasional 'knots and risings' showing where the valves are (see C, D, D in fig. 1). If you then put a finger over the lower part of the vein (nearest the hand) and clear the blood proximally (towards the elbow) beyond the next valve, the vein behind the lower finger remains empty even after removal of the upper finger (fig. 2). As soon as the lower finger is removed, the vein fills again from below. For Harvey, this demonstrated that blood in veins flows and only flows in one direction – towards the heart. What is

remarkable, as Glyn comments, is that such a simple and easy experiment was not performed until Harvey thought of it in the seventeenth century.

This experiment encapsulates the elegance that Glyn writes about: it is simple, concise and persuasive, but also deeply satisfying. The Enlightenment philosopher, Adam Smith, discusses a similar process of discovery in his *History of Astronomy.* He writes that in assessing scientific explanations we should not have regard to 'their absurdity or probability, their agreement or inconsistency with truth or reality'. Instead we should:

> content ourselves with inquiring how far each [of the explanations] was fitted to soothe the imagination, and to render the theatre of nature a more coherent, and therefore a more magnificent spectacle.[50]

Adam Smith here captures that elusive aspect of a scientific experiment or surgical procedure that makes the word 'elegant' so apt: the idea that it 'soothes the imagination'; that there is something unexpected about an elegant solution to a problematic case, but at the same time something so right and fitting that is it amazing no-one has thought of it before. Gillies's tubed pedicle, making use of the regenerative processes of the patient's own body, is part of the same tradition of scientific elegance.

2 Technique: The Refinement of a 'Ladylike Hand'

The second aspect of elegance is the elegance of technique. In aspiring to the status of gentlemanly professionals, surgeons from the seventeenth century onwards began literally to embody refinement and delicacy (as paintings from the time suggest), but in temperament to retain the qualities of decisiveness, courage and strength: to be men of action, able to make

quick decisions and act upon them. Harold Gillies, described in one obituary as 'Of slight stature, … a quiet man of unfailing courteous demeanour … [whose] originality and versatility of mind were based upon quite extraordinary strength of mind and of body', seems to personify this vision.[51] A literary example is offered by Ian McEwan's breathlessly admiring account of the work of a neurosurgeon, Guy Perowne (surely for us in the twenty-first century the very type of the elite doctor). Perowne is presented as in his element, running his Friday operating list:

> While Sally closed up a patient, Perowne went next door to relieve an elderly lady of her trigeminal neuralgia …. These minor operations can still give him pleasure – he likes to be fast and accurate. He slipped a gloved forefinger into the back of her mouth to feel the route, then, with barely a glance at the image intensifier, slid a long needle through the inside of her cheek all the way up to the trigeminal ganglion. Jay came in from next door to watch Gita bringing the lady to brief consciousness. Electrical stimulation of the needle's tip caused a tingling in her face, and once she had drowsily confirmed the position was correct – Perowne had it right first time – she was put down again while the nerve was 'cooked' by radiofrequency thermocoagulation. The delicate trick was to eliminate her pain while leaving her an awareness of light touch – all done in fifteen minutes; three years' misery, of sharp, stabbing pain, ended.[52]

Here is the surgeon as hero, unfailingly accurate, able to work with extreme delicacy amongst the most sensitive of tissues where the slightest roughness might cause terrible injury and disability to the patient.

Conclusion: Surgeon and Patient

I have argued that 'elegance' has contemporary currency as an almost technical term in use by surgeons to describe innovative, ingenious procedures exhibiting a simplicity and directness

of anatomical approach with the consequence of minimal damage to surrounding structures. It also describes superlative technique, deftness and economy of movement, precision in cutting and accuracy of finish to leave the neatest, smallest scar. These contemporary meanings, I have suggested, have historical resonances, contextualising the development of today's surgical profession, in its reliance on a scientific knowledge base and the personification of its proponents as 'gentlemen' with the hands of ladies and the hearts of heroes.

In modern medical education, surgeons are often the butt of semi-humorous jibes about their lack of communications skills. The word 'elegant' is not warm and cuddly; it is standoffish and slightly forbidding, cool in fact. I suspect that for many patients, this is the image they have of their surgeons, and this is the way that surgeons like to see their work. For patients and for surgeons this emotional distance is necessary. Most patients awaiting the knife do not like to reflect too closely on the nature of the operation, and find it helpful to regard the surgeon as an infallible genius who can deal coolly with any crisis that may arise. Surgeons in turn may themselves find it easier not to be too emotionally aware of the individual, with whose flesh they must become intimately, and elegantly, entangled.

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