Introductory address in the Faculty of Medicine at University College : London, October, 1889 / by Rickman John Godlee.

Tindall Lucas.

INTRODUCTORY ADDRESS

IN THE

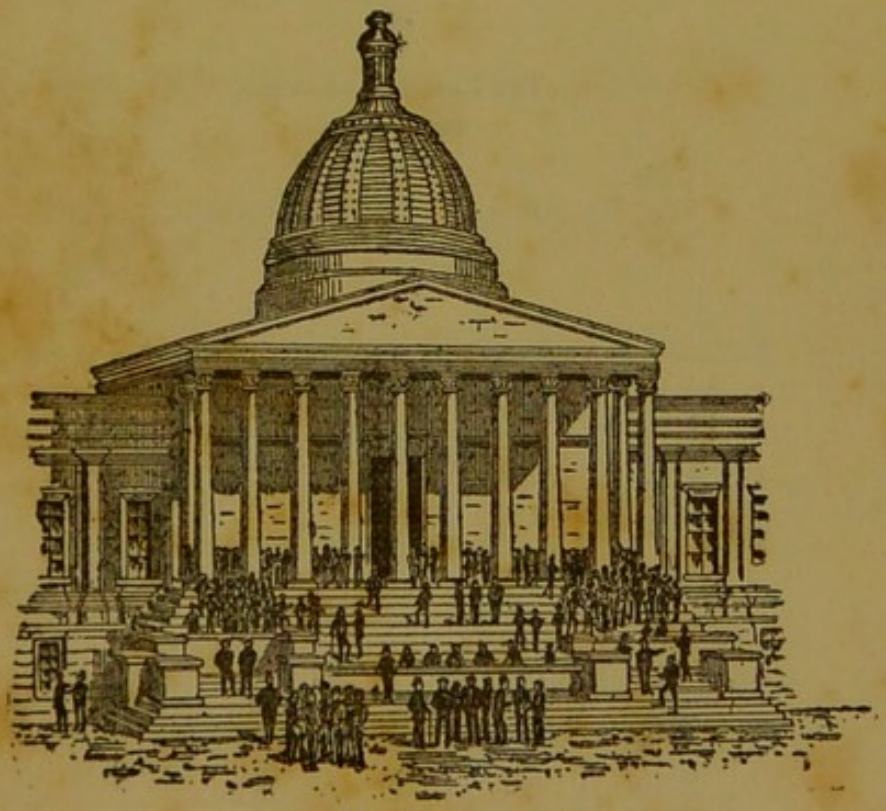
FACULTY OF MEDICINE

AT

UNIVERSITY COLLEGE, LONDON.

OCTOBER, 1889.

By RICKMAN JOHN GODLEE.



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TO

JOHN ERIC ERICHSEN,

MY MUCH HONOURED TEACHER

AND NOW

THE PRESIDENT OF OUR COLLEGE,

I VENTURE TO DEDICATE

THIS SHORT HISTORICAL COMPARISON

AND

COLLECTION OF SMALL THOUGHTS.

"Children of men! not that your age excel
In pride of life the ages of your sires,
But that *ye* think clear, feel deep, bear fruit well,
The Friend of man desires."

BY WAY OF APOLOGY.

I HAVE printed this address almost in the words in which it was delivered, but with a few additional notes and explanations, hoping that it may be of some interest to those who heard it and perhaps to a few others—possibly also animated by the futile desire to save from sudden oblivion the result of a good deal of thought and labour. Some valued and candid friends have urged the elimination of one part, some of another, alleging, amongst other suggestions, that one section deals with facts of too recent occurrence to be wisely treated as matters of history, and that certain of the hints which are offered are perhaps too broadly stated. I have, however, been reminded of Æsop's Fable of a man with two wives. "They took Mighty Care of him to All manner of Purposes, and still as they were Combing the Good Man's Head, they'd be

Picking out here and there a Hair to make it all of a Colour. The Matronly Wife, she Plucked out All the Brown *hairs, and the Younger the* White," *so that in the conclusion it fell out that he could only present to the public gaze a bald and inexpressive, if a highly polished, pate. I therefore leave the essay as it stood at first, with all its faults, and trust that any observations which appear like criticisms may be taken kindly, as they are certainly kindly intended.*

I cannot let this opportunity pass without thanking my friend, Dr. F. W. Cock, for much and valuable assistance in the performance of my task.

R. J. G.

81, Wimpole Street,
October, 1889.

ADDRESS.

THIS, Gentlemen, is, if not the most uncomfortable, one of the most uncomfortable moments of my life. It is strictly orthodox to begin an address of this kind by saying that it is the proudest period of the speaker's existence ; but that, you know, like many other conventional expressions, is mostly untrue : proud and uncomfortable being in this, as in many other instances, almost interchangeable terms.

The orator on these occasions is, as it were, placed between the Hero of Paradise Lost and the mighty ocean. He must try to say something to interest, it may be to amuse—he can hardly hope to instruct — that part of his audience which he is looking in the face, and to guard against letting slip any word that may shock the susceptibilities of his other friendly critics who are metaphorically, if not actually, observing him from the rear. This surely is an anxious task—and, when he feels that he stands as the representative of an effete custom which is gradually dying out, he knows that he deserves pity and hopes that he will meet, at

least with sympathy. I should indeed be glad if these words, or those which are to follow had any effect in hastening the final disappearance of this useless relic.

But, gentlemen, it seems that we are ordained to spend the next hour together, and must do our best to get what we can out of it. I will accordingly plunge at once (and crave your indulgence if it opens in a tedious manner) into my first chapter, which is one of *Ancient History*.

* * * * * *

Between 1535 and 1540 Europe must have been rather a lively place to live in. Spain, enriched by its barbarous conquests in Mexico and Peru, was governed by Charles V., who had been elected to preside over the Holy Roman Empire. He was occupied in constant warfare with Solyman the Magnificent in Austria, and Muley Hassan and Barbarossa, the piratical princes of Tunis and Algeria. Francis I. of France was constantly patching-up treaties with him, made only to be broken again ; and our own King Henry VIII. was siding, now with one and now with the other in pursuit of that time-honoured phantom the maintenance of the balance of power in Europe. In the meantime the Reformation, though in its early days, was in full swing ; and, whilst the Anabaptists were starting their wild creed and

advocating polygamy and other strange doctrines under their kings, Matthias and John of Leyden, who proposed to lead them from Munster, which they called Mount Sion, on a crusade which was to subdue the whole world, Francis was burning six heretics publicly in the streets of Paris, and the Massacre of St. Bartholomew was looming near at hand.

About 1539, Marshal Monte-Jan was commanding the French army at Turin, then, as now, and as it has been from time immemorial, a square-built town lying exposed to all the winds that blow, in the bleak plains of Piedmont; and the season (for it was winter) was of the coldest.

I have only introduced these mighty potentates and blustering heroes in order, as the Germans say, to *orientiren* ourselves; but now I want to fix your attention upon a miserable common soldier, whose name has long since been forgotten, but whose story remains for the instruction of us upon whom "the ends of the world are come."

He, poor man, in one of the encounters about Turin, received a wound on his wrist with a musket bullet, by which (to quote from the account we have of his case*) "The bones and tendons being much broken and the nervous

* The works of that famous Chirurgeon, Ambrose Parey, translated out of Latin and compared with the French by Thomas Johnson, London, 1665. Lib. xii., Chap. XXV.

bodies cruelly torn, there followed a Gangrene, and at length a mortification even to the Elbow ; besides also an inflammation seized upon the middle of his Chest, and there was as it were a disposition to a Gangrene, whereby it followed that he was painfully and dangerously troubled with belchings, hicketings, watchings, unquietnesse, and frequent swoundings, which occasioned many Chirurgeons to leave him as desperate." In fact, I suppose, if we translate this account into our own language, we should say that he had traumatic gangrene of the forearm, and phlegmonous erysipelas extending up on to the chest. Nor is this to be wondered at, considering that he was being treated in an unwholesome and draughty barn in the middle of winter ; for an Italian barn, at the best of times, would make but a sorry sick room.

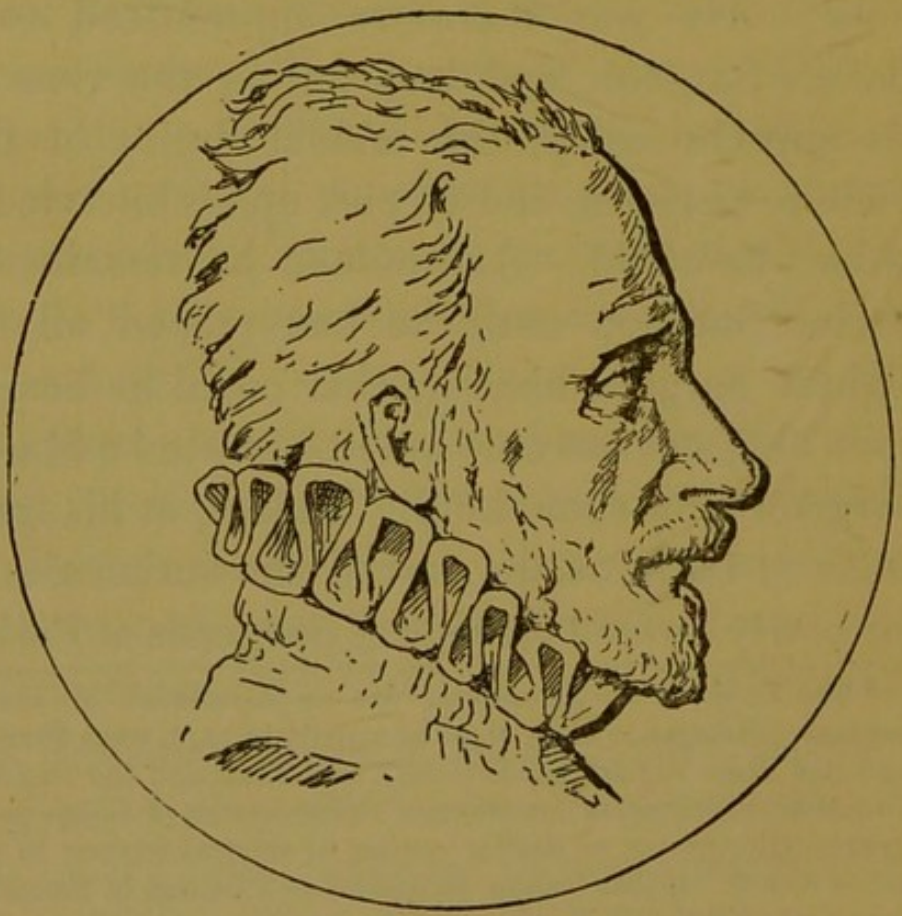
His chance was therefore of the very flimsiest, but fortunately there came to his relief a surgeon, then pretty young (though whether he was really only nineteen as some maintain or about twenty seven as is more likely I am unable to say), to whom I will try to introduce you.

This was no other than the renowned Ambrose Paré, who shared with Vesalius the honour of being the most distinguished men in the medical world at this time. He had started life in a very humble way, so that his know-

ledge of Latin even was sadly deficient, and this was then a much greater defect than it fortunately is at the present day—or what a dreadful ordeal our preliminary examinations would be to many of us! He soon shewed a great taste for surgery: it is said—though this is doubtful—from helping at an operation for stone. He was therefore apprenticed to a Barber-Surgeon, and had, during the time of his apprenticeship, the menial duties of this trade to perform, and to pick up his knowledge as best he could. And indeed he remained a Barber-Surgeon until he had reaped all the highest surgical honours that could he heaped upon him, and was only at last admitted a Master Surgeon after some kindly winking at his ignorance of Latin on the part of the authorities of the newly formed College of Surgeons at Paris.*

* The Confrérie de Saint-Côme was an Association of Barber-Surgeons. It began to shew signs of activity in 1542, when Francis I appointed Vidus-Vidius (Guido-Guidi), an Italian, and the translator of some important greek manuscripts, Commentaries of Galen on the works of Hippocrates, to deliver courses of surgical lectures in connection with it. It then became recognised as a College of Surgery in connection with the University of Paris, taking rank with the other Colleges affiliated with this body. But it had to struggle against the Faculty of Medicine, and was thus well pleased to enrol amongst its members a man so high in court favour, and of such wide renown as Ambrose Paré. He was nominated Bachelor, August 18th, 1554; Licentiate, October 18th, and took the "Bonnet de Maître," December, 18th of the same year. What was the subject of his thesis and how he got through the performance we do not know. They appear to have been somewhat perfunctuary performances: here are examples of the titles: "An vesicæ vulnera lethalia" by Raoul-le-Fort, 1564; "An scolopetorum vulnerum communis cum aliis curatio," by Jérôme de la Noue, 1574.

When he was out of his time, he became a scholar at the Hôtél Dieu, and there he evidently instructed himself for three years, for there was little or no teaching provided; and when this period was over, he started in the capacity of surgeon on the expedition to Turin, at which we are now assisting.



Humanam AMBROSII *vere hæc pictura* PARÆI
Effigiem ſed Opus continet Ambroſiam

I like to fancy him a tall, well-fashioned, man, but as his portraits do not go below the waist we are really ignorant on this point. We know that he had a broad and intellectual forehead, deep set eyes, a close cropped head,

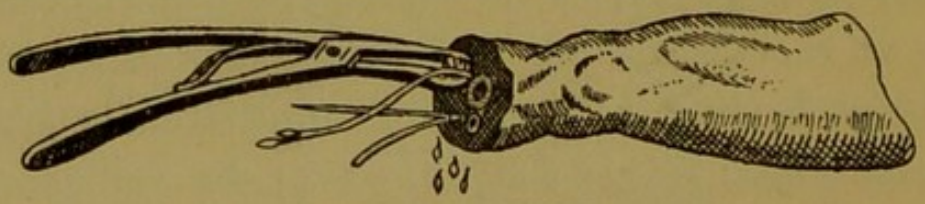
a full moustache and a pointed beard, and we may safely dress him in a high crowned hat, a mantle of fine cloth of a dark colour, a satin doublet, bulging slashed breeches, long tight hose reaching up his thighs, and shoes with long pointed toes ; around his neck was a deep frilled collar, and at his side, no doubt, a sword.

He was undergoing at this time great searchings of heart, because he was in the very act of introducing (and that partly by accident) one of the reforms which chiefly made his reputation ; and it is worth while to dwell for a moment upon this, because it shews us the sort of steps that surgery was taking at that time. He found that it was the invariable custom to apply, by means of tents and setons to all recent wounds made by weapons, oil of elders *boiling hot*, to which some treacle had been added. One day, however, he fell short of this soothing application, and thinking something must be put in, and, I fancy, having an idea that the orthodox treatment was irrational as well as barbarous he * "was constrained instead thereof to apply a *digestive* of yelks of eggs, oyl of roses and turpentine. But in the night," he says, "I could not sleep in quiet, fearing some default in not cauterizing, that I should find those to whom I had not used the

* Ambrose Parey, Lib. XI., 1st Discourse.

boiling oyl, dead empoysoned; which made me rise very early to visit them; when, beyond my expectation I found them to whom I had applied my digestive medicine to feel little pain, and their wounds without inflammation or tumour, having rested reasonable well that night; the other to whom I had used the said boiling oyl, I found them feverish with great pain and tumour about the edges of their wounds. And then I resolved with myself never so cruelly to burn poor men wounded with gunshot" :—the true-spirited, sensitive surgeon that he was.

This and the introduction, or rather the revival of the use of the ligature,* instead of



LE BEC DE CORBIN.

the cautery for the arrest of hæmorrhage in amputation, were, perhaps, the two most important innovations introduced by him; though there is, of course, an enormous amount of good work besides upon which his title to fame rests.

Now let us see what this (the most advanced)

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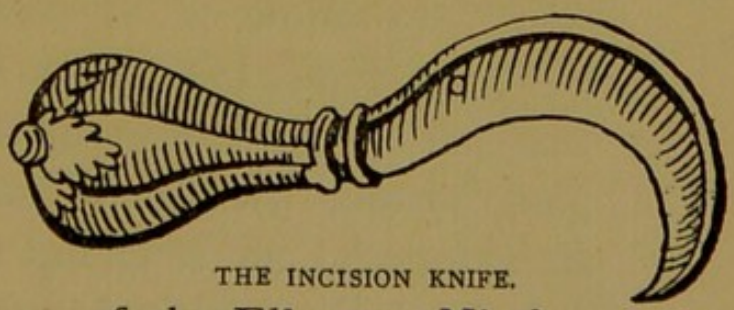
* The artery forceps employed were large and cumbrous; the figure shews a pair applied to the bleeding vessel. They were called "le bec de corbin," or crow's beak.

surgeon of his age does to his patient in the middle of the sixteenth century. The description is so graphic, and the language of our English translation by Johnson so quaint, that I think I may safely give it in full without fear of being tedious.

"It so fell out, that I (o'ercome by his friends' intreaty) undertook the cure of this wretched person, destitute of all humane help. Wherefore, knowing the mortification by its signs, I cut off the arm by the Elbow as speedily as I could, making first the ligature, whereof I made mention." [This was a strong and broad fillet, like that which "women usually bind up their hair withal," and had three purposes :—1st, to draw up the muscles so that they might afterwards fall down over the stump—2nd, to prevent hæmorrhage—3rd, to render the parts numb and so diminish pain. It was, in fact, a simple but efficient tourniquet.] "I say I took it not off with a saw, but only with an incision knife, cutting in sunder the ligaments which held the bones together, because the sphacell was not passed the joynt of the Elbow. Niether ought this section to be counted strange, which is



THE INCISION KNIFE.

made in a joynt; for Hippocrates much commends it, and saith that it is easily healed; and that there is nothing to be feared therin besides swounding, by reason of the pain caused by cutting the common tendons and ligaments. But such incision being made, the former ligature could not hinder, but much blood must flow from thence, by reason of the large vessels that run that way; Wherefore I let the blood to flow plentifully, so to disburden the part, and so afterwards to free it from the danger and fear of inflammation and a Gangrene; then presently I stanched the blood with an hot Iron, for as yet I knew no other course."

Just picture to yourselves, gentlemen, this poor wretch; no doubt his green wound had been previously cauterized with boiling oil, and now—without the help of an anæsthetic—he has his arm lopped off at the elbow, and—reduced as he is—the "blood is allowed to flow plentifully" for reasons given, and then he is rubbed down with a hot iron. But mark what is to follow.

"Then gently loosing the ligature, I scarified that part of the brawn of the arm which was gangrenated, with many and deep incisions, shunning and not touching the inner part by reason of the multitude of large vessels and Nerves which run that way; then, I presently

applyed a cautery to some of the incisions, both to stanch the bleeding, and draw forth the virulent *sanies* which remained in the part, and then I assailed and overcame the spreading putrefaction, by putting and applying the formerly prescribed medicins."

So you see he had an inkling of antiseptics; his favourite one was the so called Ægyptiacum, which was made as follows: * Take of roche alum (a triple sulphate of alumina and potash), verdigris, Roman vitriol (that is blue vitriol or sulphate of copper) and rose honey (made of rosebuds water and honey) of each ℥ 2; of good vinegar *quantum sufficit*; let them all be boiled together *secundum artem*, and from them let there be made a medicament of the consistence of honey. This was to be dissolved in vinegar or *aqua vitæ*, and put into the wound with tents or pledgets, or injected. Truly, a somewhat tart application! but it might be mollified by the admixture of oil of Turpentine and St. John's wort.

But his grand remedy †:—An emollient and linitive medicine, which he took two years to learn by cajolery and bribes and vows of secrecy (which, by the way, he did not keep) from its inventor, and by which he swore to the end of his days, was the famous "oil of

* Ambrose Parey, Lib. XI., Chap. V.

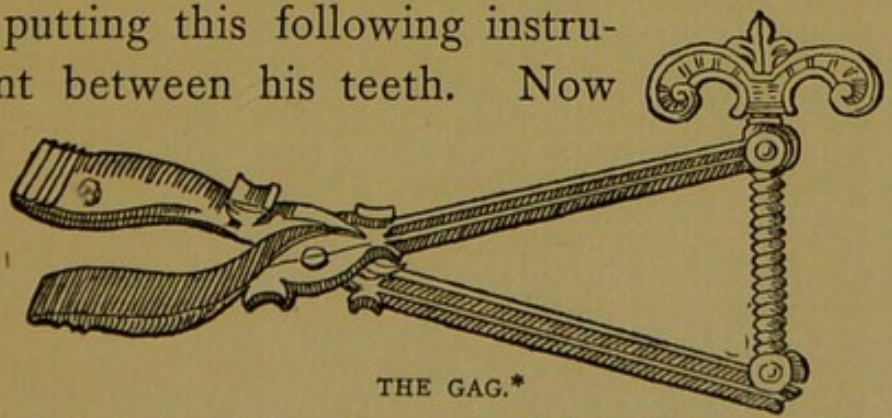
† (*Loc : cit :*)

whelps." What a strange superstition it seems now! "Take of oil of violets four pounds, in which are to be boiled two newly born puppies until the bones are dissolved; to this are to be added one pound of earthworms, properly prepared; and let them be boiled together over a slow fire; and then let the oil be pressed out and three ounces of Venice turpentine* and one ounce of *aqua vitæ* be added."

"I used all sorts of restrictive medecins to stay the inflammation of the chest; I also applied Epithemæs" (an epithema was something between a fomentation and an embrocation) "to the region of the heart, and gave him cordiall potions and boles, niether did I desist untill such time as his belching, hicketting, and swoundings had left him. Whilst I more attentively intended these things, another mischief assails my Patient, to wit, Convulsions, and that not through any fault of him or me, but by the naughtiness of the place wherein he lay, which was in a Barn everywhere full of chinks, and open on every side; and then also it was in the midst of Winter, raging with frost and snow, and all sorts of cold; niether had he any fire or other thing necessary for the preservation of life, to lessen these injuries of the air or place: Now his joints were

* The Venice turpentine was, no doubt, the most valuable ingredient, being a potent antiseptic.

contracted, his teeth set, and his mouth and face were drawn awry, when as I pitying his case, made him to be carried into the neighbouring Stable, which smoaked with much horse-dung; and bringing in fire of two chafen-dishes, I presently anointed his neck and all the spine of his back, shunning the parts of the Chest, with liniments formerly described for convulsions" (these were apparently what we should call counter-irritants) "then straightway I wrapped him in a warm linen cloth, and buried him even to the neck in hot dung, putting a little fresh straw about him; when he had stayed there some three dayes, having at length a gentle scouring or flux of his belly, and plentiful sweat, he began by little and little to open his mouth and teeth, which before were set and close shut. Having got by this means some opportunity better to do my business, I opened his mouth as much as I pleased by putting this following instrument between his teeth. Now



THE GAG.*

drawing out the Instrument, I kept his mouth

* A dilator made for to open the mouth and teeth by the means of a screw in the end thereof.

open by putting in a willow stick on each side thereof, that so I might the more easily feed him with meats soon made, as with Cow's milk and rear eggs untill he had recovered power to eat, the convulsions having left him. He, by this means freed from the Convulsion, I then again begun the cure of his arm, and with an actual cautery seared the end of the bone, so to dry up the perpetual afflux of corrupt matter. It is not altogether unworthy of your knowledg, that he said, how that he was wondrously delighted by the application of such actual cauteries, a certain tickling running the whole length of the arm, by reason of the gentle diffusion of the heat by the applying of the caustick; which same thing I have observed in many others; especially in such as lay upon the like occasion in the Hospital of Paris. After this cauterizing, there fell away many and large scales of the bone, the freer appulse of the air than was fit making much thereto; besides when there was place for fomentation, with the decoction of red Rose leaves, Wormwood, Sage, Bayleaves, flowers of Camomil, Melilote, Dill, I so comforted the part, that I also (at the same time by the same means) drew and took away the virulent *Sanies*, which firmly adhered to the flesh and bones. Lastly it came to pass that by God's assistance,

these means I used, and my careful diligence, he at length recovered. Wherefore I would admonish the young Chirurgeon, that he never account any so desperate, as to give him for lost, content to have let him go with prognosticks; for, as an ancient Doctor writes, 'that as in Nature so in diseases there are also Monsters.'"

A shrewd enough observation, and one well worthy of taking to heart! The whole performance, however, strikes one as very primitive, and the account of it fixes the attention, not only on the crudities of practice, but on the crudities of belief which are appropriate to a superstitious age. The superstitious reverence for the sayings of Galen and Hippocrates; the explanation of occurrences without attempt at proof, and the supposed necessity for assigning a reason, however vague, for everything that took place, stimulated an almost childish faith in the efficacy of innumerable drugs and all sorts of complicated surgical manipulations. And these traditions lingered and lingered—many of them almost to our own day. It takes a long time to upset a practice, and even more to undermine a creed, and thus, even in this present age of rationalism and scepticism, there are, I believe, quite a number of orthodox remedies to be applied, and orthodox methods to pursue which are unsupported by evidence

or experience. We adopt some of them without a thought, some of them with a shrug of the shoulders and a cynical reference to "the traditions of the elders," till one by one they are wiped away by some enquiring person who does not possess the bump of veneration, with the best result as regards the exactness of our own knowledge and the well-being of our patients; for there is much caustic truth as well as satire in the saying of Voltaire's: A doctor is a person who puts drugs of which he knows little into a body of which he knows still less.

But now let us listen to Ambrose Paré's self satisfied words, written towards the end of his long and active life. I can imagine him leaning back in his round elbowed chair, settling down his grey beard in his faultless ruffle, while he holds over the page a great quill pen,* shorn of its plume, or possibly a reed, ready to trace the following lines.

"† For God is my witness, and all good men

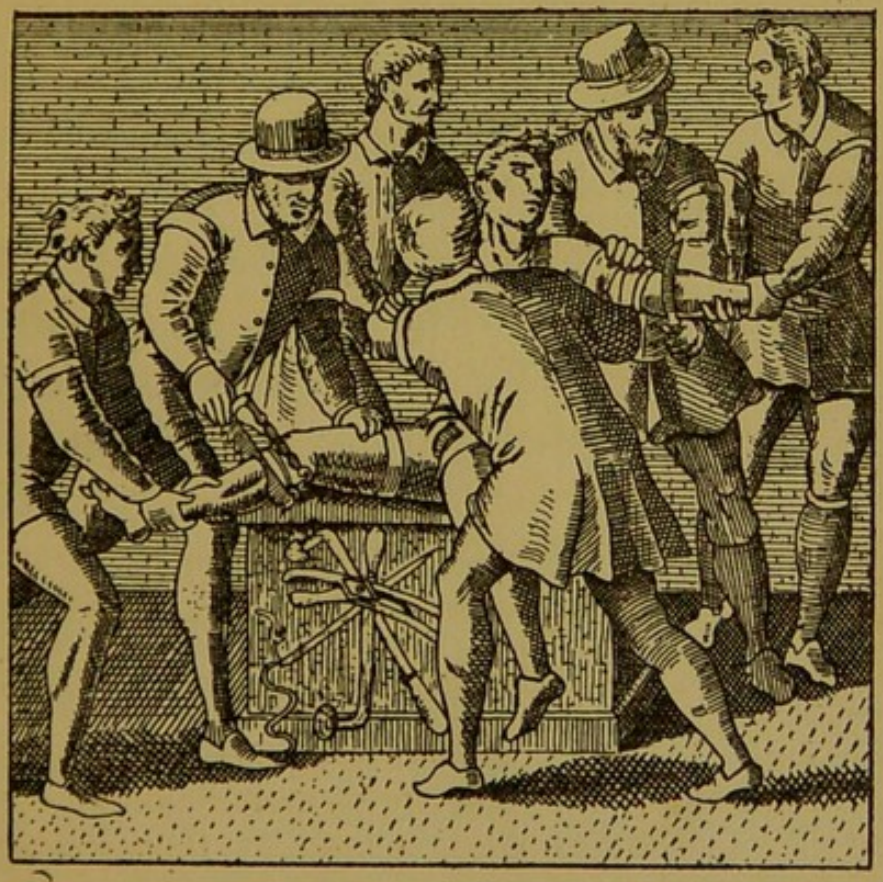
* See the famous picture by Marinus Van Romerswael of the Money Changers in the National Gallery.

† In Justice to Ambrose Paré it is only right to give his actual words, as he altered them in the later editions, *e.g.*, in the 5th.

"Car (Dieu m'est témorin, Sire, et les hommes ne l'ignorent point) il y a plus de quarante ans que ie trauaille et me peine à l'esclaircissement et perfection de la Chirurgie; et m'ose vanter de ces deux poincts, qui i'ay donné di si viues atteintes à ce que ie pretendois empoigner, que les anciens (la trace desquels i'ay suiuy pas à pas) seront par-cy mieux entendus en ce qu'ils ont trauaillé et escrit de l'intention des preceptes, et que la posterité ne pourra justement nous blasmer de paresse."

Johnson's translation is from the text of the 1st edition.

know that I have now laboured fifty years with all care and pains in the illustration and amplification of Chirurgery ; and that I have so certainly touched the mark whereat I aimed, that Antiquity may seem to have nothing wherein it may exceed us, beside the glory of invention ; nor posterity anything left but a certain small hope to add some things, as it is easie to add to former inventions."



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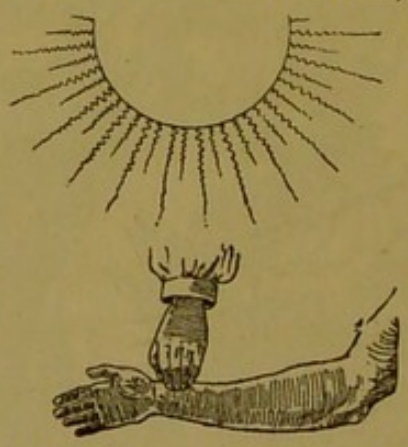
Could Ambrose Paré have revisited the scene at the time which forms the subject of my next chapter, he would, probably, have

been somewhat taken aback. I was at first tempted to call it a chapter of *mediæval* history, but the term mediæval carries with it the idea of decadence, and the period to which I am now coming was one of great perfection of the manipulative part of our art; and not only so, but it boasted of enormous recent improvements. And if, in speaking of it I refer chiefly to what now seem to be its shortcomings, it is not that I wish to slur over its merits, but because they are so obvious and well known, and because, as all of you have seen or will see in that temple of wisdom on the Embankment, beneath the sign manual of the College of Physicians, which always suggests to me the well-known trade mark of the purveyors of a certain wholesome and bitter tonic.



"O'. BI'OC . BPAXYC . H'. DE\. TE'XNH . MAKPH'."*

Somewhere about the year of grace 1868, I first had the privilege of listening to an introductory address from one of the top benches of this theatre:—who delivered it, I cannot say—it made no more lasting impression upon my youthful mind than mine is likely to make upon yours.

* The beginning of the first aphorism of Hippocrates.

I have, however, many very vivid recollections in connection with that period of my life, for it seems but as yesterday. I remember the sense of awe and admiration with which I used to look down on the grey and bald heads of those who used to sit upon this platform or occupy that arena. It is scarcely possible to imagine that a similar feeling can animate any of you to-day. I shall never forget the smell of Matthews's back room, when our late Dean took me down—a raw boy from school—to buy my skeleton, and the sick feeling which a butcher's shop inspired in me on the way home and for some time afterwards. The solemn horrors of the dissecting room—for they were real horrors to me at first—come back again as if they had only just been overcome, and I can see myself taking up a position at the very top of the operating theatre—close to the exit—lest I should be seized with that faintness of which I had heard, and be obliged to retire amidst the sympathetic jeers of my fellows. These little difficulties which appear to most to be merely sentimental are, I believe, only felt by a very few, but to them they are at the time very genuine troubles. They are, however, quite certain to disappear; so if there is anyone here who is dreading them, I trust

that he will feel encouraged by my experience.

I do not wish however, to dwell upon this particular period but to pass on a few years to the time when I was in the full enjoyment of my House Surgeoncy, perhaps the happiest time of a surgeon's life: the pleasant companionship, the sense of acquiring knowledge and the first experience of responsibility which has the great advantage of being shared by a superior officer, all tend to make the time pass agreeably. It is a green oasis to look back upon in our journey across the desert.

Well, I am going to try to describe to you, not the method of performing an operation then, for about that I should have nothing to say except in the way of unqualified praise; but rather to draw your attention to the accessories, or, to use a logical phrase, the accidents of an operation as it used to be performed at that comparatively recent period.

Let us then suppose that a patient has been admitted with a compound fracture of the leg and some comminution of the bones, so that the ankle-joint is opened; there is not much injury to the soft parts, but the accident is considered too severe to attempt to save the limb, and justly so, for at that time, though deaths from pyæmia following amputation

were not uncommon, the chances of escaping this plague when a compound fracture of the leg or thigh had been sustained were not very good. I will not weary you with statistics which are notoriously misleading and malleable, but will merely state the fact that the deaths recognized as due to septic diseases in 1871 and 1872 were numerous; thus in the Reports of Surgical Cases, we find the following recorded:

1871—Pyæmia 11, Septicæmia 1, Erysipelas 5, Tetanus 2.

1872—Pyæmia 6, Septicæmia 3, Erysipelas 2, Tetanus 1, Traumatic fever 3.

and it is no exaggeration to say that there were many others which *we* should call septic, but which then went by more euphonious appellations.

You hardly ever have the chance of seeing a post mortem on a case of embolic pyæmia, but at that time we were only too familiar with them. This is the palpable sign of a difference, and a very great difference as everyone must allow; for a limb like the one I am describing would certainly not be condemned now, but on the contrary would almost certainly be saved; and my present object is to indicate to you some of the apparently trifling details with regard to the principal actors in the performance, which have since

been modified ; and the modification of which, trivial though they may appear, has been the most important factor in bringing about this great change ; only premising that I am describing the performance of no single individual, but referring to the usual course of procedure at University College Hospital about 1870.

1st. About the surgeon it has only to be said, that his hands were only purified by washing with soap and water, though he had to manipulate many more suppurating wounds than he would meet with at the present day. "*A good old surgical stink*" was a common phrase and did not excite a feeling of disgust, scarcely even a smile, and "*laudable pus*" was greeted as a friend ; to day we count it an enemy, and the saintliest of us would be excused if he applied to it the very opposite highly appropriate if somewhat unparliamentary epithet. Another marked feature of the scene, was an antique hospital coat, or a well worn robe of black alpacca, and several of my hearers will, no doubt, recollect a certain brown surtout which had braved the "battle and the breeze" of many a lithotomy, and which had carried the "stains of onset" from top to bottom from a time "beyond which the memory of man runneth not to the contrary."

2nd. The house surgeon was certainly always clad in a black coat, which he would no more have thought of removing at an operation than of going round with his surgeon in his slippers. By the end of his six months, indeed, this also was none too clean, but it was set off by an array of common pins and a pair of scissors in one lappel, and a wisp of whip-cord, gracefully twisted in the button-hole of the other, which whip-cord was destined to be applied, dry and unpurified, to any bleeding vessel that came in his way ; and his hands were, to say the least of it, no cleaner than were those of the surgeon.

3rd. Nor was the patient himself in any better plight. A dash of soap and water applied by the nurse in the ward, was all that was considered necessary for dealing with the organisms lurking in his epidermis.

And 4th. It only remains to add that the instruments were taken straight out of the cupboard and placed upon a decent towel spread upon a table to receive them ; and last, but not least, they, as well as the sponges—those most fertile sources of mischief—were absolutely ignorant of the cleansing properties of carbolic acid or sublimate.

Well, a Petit's tourniquet was applied, without any previous bandaging or elevation of the

limb, and as the main vessel only was compressed, much more blood was lost than is the case now—a loud patter on the floor always accompanying the first incision. The limb was removed *secundum artem*, and then those poisonous bits of whip cord were applied to the bleeding points on the face of the stump; one end of each was left long, and that on the main vessel had a knot placed upon it to distinguish it from the others. Abundance of tap water was soused over the wound, and then it was sutured (perhaps with whip cord perhaps with silk or silver) half a dozen stitches only being employed, with wide intervals between them. The long ends of the ligatures were brought out at one corner of the incision, so that they might be removed at a later period, and, in the meantime, act as a drain. A piece of ordinary white lint, moistened with ordinary water and covered with common oiled silk, was placed over the stump, and the whole was bandaged with the utmost precision. But when the patient was put to bed, he had, according to our present ideas, and considering the sanitary (or unsanitary) state of the hospital, a very fair chance for the development of some septic disease. Upon my word, I think that Ambrose Paré's soldier, with his Ægyptiacum and oil of whelps, had almost as

good a look-out as our patient; notwithstanding the stable and the winter winds, and the smoking horse dung piled around!

And what became of him? Now, I am not going to say that none of these amputations healed up rapidly, for that would not be true. Some of them did heal very rapidly indeed; and this has been one of the greatest stumbling blocks in preventing the acceptance of the new ideas. But I will say, without fear of contradiction, that they mostly had a very considerable rise of temperature, which we called "*traumatic fever*," so that we always kept them upon slop diet, till the "*period of granulation*" had arrived; that they, all of them, suppurated to a smaller or greater extent, and that it was more often the latter than the former, and that a considerable proportion of the major amputations died of pyæmia, and others of exhaustion, which is another name for septicæmia. It was fine work, no doubt, for the dressers to have to dress all their cases every day; and the house surgeon experienced a sense of importance and a certain amount of excitement as he gave his daily pull (this was his special function) to the ligatures, wondering whether the pull might not be followed by a gush of blood; and let me interpose that secondary hæmorrhage was quite common. But the squeezing

of the stump, and the daily syringing out of the pus, and the counter-openings for burrowings of matter, were not at all appreciated by the patient. And oh! it was a sad, sad thing to see a fine strong man, with his first ominous rigor, followed by a second and a third, to smell his sweet breath, and to watch him emaciate, turn yellow, and gradually pass away into the limbo of number 8, as I have done many and many a time.

But gentlemen, what did my master say about this time? I will give you his very words.*

"An art may be modified—it may be varied—but it cannot be perfected beyond certain attainable limits. And so it is and indeed must be, with that of surgery. There cannot always be fresh fields for conquest by the knife. There must always be portions of the human frame that will ever remain sacred from its intrusion, at least in the surgeon's hand."

And then, after setting out the then most recent triumphs of surgery (and very great triumphs, as I have said, they were), and hinting that some of them might be scarcely more than bold experiments, he goes on to say:

"To my mind it appears as if we had already reached something like finality in the mere manipulative art of surgery: though I hesitate

* Erichsen, Science and Art of Surgery, 1877, Chap. 1, p. 2.

much to use the word 'finality,' for I know well how apt a man is to suppose that art, to the prosecution of which he has devoted his life, to have obtained its final limit of perfection. Yet, looking at the question as dispassionately as possible, we cannot but come to the conclusion, that we can scarcely hope to pass far beyond the line at which we have arrived in the direction of extreme precision and almost absolute certainty in the mechanical performance of the operations of surgery, and that in this direction the progress of modern surgery is nearly barred. At the same time we may reasonably expect that the details of the methods of practising operations, may be, from time to time, materially modified and improved by the skill of individual operators, by the ingenuity of surgical mechanisms, or possibly by the introduction of new agents as aids to our art."

Ten years later* Mr. Erichsen owned that much of the force of these remarks was lost, and I think we shall find that the single factor is not far to seek, which chiefly helped to take their force away.

For it will have to be granted, that just as the introduction of anæsthetics had paved the way for the great strides that surgery had made during the period to which these words referred;

* Edition of 1884, p. 3.

so the appreciation of the importance of micro-organisms in frustrating the efforts of the surgeon, and the discovery of means for combating their malign influence, have made the last twenty years the most interesting, during which it has yet been possible for a surgeon to live. It will have to be granted that, in the surgery of the present day, there is not only a gradual approximation to uniformly good results, owing to the employment of more and more trustworthy means of excluding septic diseases, but that the confidence thus gained has enabled us to attain to far greater precision even in the "*mechanical performance of the operations of surgery*." It has, of course, very much increased the personal responsibility of the surgeon, and thus, while it has diminished his anxiety in one direction, it has increased it in the other. He cannot now attribute a mishap, as the lawyers do, to "the act of God," but he must search and find if he can in his own imperfections for the cause of the disaster.

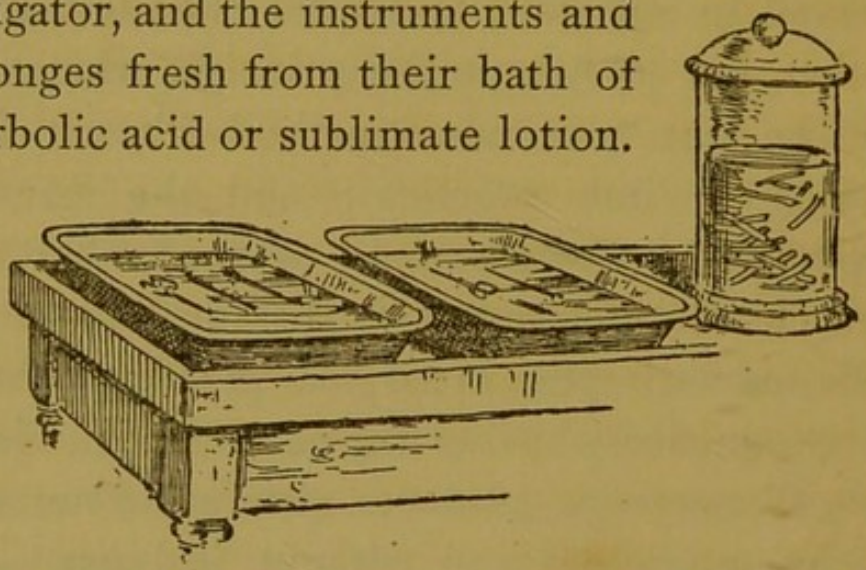
Quite recently our results have been more satisfactory than they were even a few years ago, and I think that the reason for this is not so much because we have substituted the use of one antiseptic agent for another, nor because we have used the spray or given up its employment, but because a change has come over the

feeling of the school (as it has in the opinion of the world) with regard to these matters, which we who have observed the change can appreciate, but which you cannot be expected to do. It is not now a question of what is believed in one ward and what is believed in another, but all accept the principle whatever may be the particular method chosen for carrying it into practice ; and the house-surgeon and dressers have no excuse for halting between two opinions as to the importance of sepsis and antiseptics in surgical practice. And in consequence—having the same end in view —we all, surgeons, students, sisters and nurses, without misgivings and without jealousy, are doing our best to pull together, with the result that the boat travels more smoothly, with less splashing and rocking, without catching of crabs or shipping of seas, or the imminent peril of fouls or shipwrecks.

* * * * * *

Now, gentlemen, if I were to describe to you an operation as it would be performed at the present day, it might, perhaps, appear to smack too much of conceit, and, besides, you can observe for yourselves over the way, the various things which I have called the accidents or accessories, but which are really so essential to

success, and you can judge of the value of the modifications that time has introduced. You will notice the turned up sleeves and the purified hands and forearms, the antiseptic towels surrounding the part, the ponderous irrigator, and the instruments and sponges fresh from their bath of carbolic acid or sublimate lotion.



These things are now so much matters of everyday experience, that it is difficult to imagine that we were ever without them ; and yet, believe me, there have been a good deal of opposition to be endured, a good many difficulties to be overcome, and a number of misgivings to be felt as to the truth of their creed by the preachers of this new evangel. "Not as though we had already attained, either were already perfect" ; far from it (I blush to own that an amputation of mine suppurated this very summer). But yet you may see things done every day now, and done safely too, which would sadly have scandalized the surgeons of

twenty years ago. I speak of incisions into the peritoneum, and into joints, of the opening up of great cellular spaces like that of the axilla and the pelvis, of the surgery of the kidney and of the surgery of the brain ; and yet, when all is said I am sure it behoves us to add with all humility :—"I am no better than my fathers." By which, I mean, that it is not our manipulative skill, nor our own individual attainments which have so immeasurably widened our surgical field ; but it is the general advance of knowledge, of course vastly aided by the efforts of two or three specially gifted pioneers. It is the steady march of an army, the way for which is opened up and made clear by the occasional dash of a reconnoitering party into the heart of the enemy's country ; and the name of the enemy is *Prejudice*, and he inhabits the still half-explored dark continent of *Ignorance*.

There is no doubt that vast strides have been made and are still making ; but as I was walking with one of my colleagues the other day and talking over these things, he said : "I am not sure that we have not really reached the limit at last, and that some of the recent advances are real advances after all, and that we shan't have to go back a bit." And, to tell you the truth, I am half inclined, "In spite of myself,"

as Corney Grain says, I am half disposed to agree with him—although I know quite well that the conclusion would be a wrong one. No doubt we are no better than our fathers; and the chances, gentlemen, are very great that you will be no better than we who stand in "loco parentum" to you,* but my prophetic eye can see that twenty years hence you will be talking about us much in the same way as we speak about the last generation. I can see a noble pile of buildings on the other side of the road, erected after the most approved plans of Dr. Poore, with ventilation and drainage of more perfect, though less complicated type than has yet been suggested by the cunning craftiness of the devil or man. And high above the top of this structure, in order to escape the mephitic vapours of our town, at an elevation that perhaps will emulate that of the Eiffel tower,† will be a large and well lighted theatre, in the centre of which will be found a smaller transparent antiseptic operating chamber of glass, into which no one but the surgeon and his assistants and the patient will be admitted:

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* The latin poet took a still more pessimistic view—

Damnosa quid non imminuit dies?
Ætas parentum pejor avis tulit
Nos nequiores, mox daturos
Progeniem vitiosiorem.

Horace. Carmen: iii. 6.

† Well-known to all visitors to the Paris Exhibition of 1889.

clad in antiseptic armour and purified from top to toe. A new member of the staff, the *hypnotizer*, will then appear upon the scene, who, with a few passes will send the patient to sleep and rouse him again at the end of the operation, for the use of chloroform and ether will be looked back upon as the make-shifts of a barbarous age. We shall be living under a democratic, but paternal government which will have enacted that all surgeons must be clean shaved; no more flowing beards nor ambrosial locks—not even scrubby side whiskers nor the useless moustache, and the close-cropped hair will have to be anointed with carbolized vaseline or its future equivalent. A black flannel sister's gown and a serge operating coat, and, for the matter of that, very likely one of our much-vaunted white aprons will have been hung up alongside Mr. Liston's ancient instruments and other relics of antiquity in the museum; and inquests will be held upon all cases dying of pyæmia or other septic diseases. What further strides surgery will have made I may not predict. Whether you will be able to supply a new set of mitral valves, or to remove the centres of mendacity or kleptomania I cannot guess; but, though the physicians grumble that we have poached on almost all of their preserves, I feel

sure that there are some pretty stiff fences still for us to scale.

And one of you, gentlemen, perhaps, will be standing where I stand, and observing, with just a suspicion of cynical pity at our ignorance, that twenty years ago, people did so-and-so, applied 1 @ 500 sublimate solution to their wounds, used drainage tubes and other barbarities, and, what is more, boasted themselves that they did so. Which brings me almost naturally to what ought to be the most important part of my address, and that is *the student* as he was, as he is, and as he ought to be.

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Shall I let you into a secret, gentlemen? I hope you will not be puffed up if I do. You are in many respects (or you ought to be) much better off than we were. You are vastly better informed upon a variety of subjects than we are now, because you have presented to you in a peptonized form, by a whole army of patent digesters, the results of a great deal of recently acquired knowledge, which we, individually have really not had the time to master, and these you can absorb, at the most receptive age, instead of (observe) a great deal of the rubbish which we exhausted many of our precious brain-cells in the effort to assimi-

late. I do not attempt to disguise from myself the fact that, especially in points of physiological chemistry, bacteriology, and cerebral localization, I am often much behind the intelligent student (until I have had time to refer to the authorities), and I sincerely hope the day may be far distant when I fail to recognise this truth. It is not a thing for you to be proud of, but to be thankful for, and it is one for us to regret, but not to be too much humiliated about. For it is a necessary condition of things, where a science is wide and many-sided, and the teachers devote themselves to one branch, whilst the students are skimming the cream of all.

Suppose, as we are rather on the historical tack, we devote a moment to the consideration of the changes that have taken place for good or evil in the possibilities for a medical student. Just before my time, the old fashioned plan of apprenticing a youth to a medical man before he began his studies at a hospital, was very common, and many of my fellow students had been thus apprenticed. That is, they had lived for some years (it was five, about 1825, but generally, I believe, was supposed to be seven, some of which were always omitted) with a doctor, helping him in his practice, making up his pills, and seeing an

odd patient now and then. By which they learned chiefly two things which were not (in my opinion) good for them :—1st. How to make up medicines before they knew anything of disease ; and 2nd. A sort of confidence in treating diseases when they were totally ignorant of what was inside a patient's skin. Still there are not wanting very sensible people, at the present day, who loudly regret the lapse of this ancient custom.* Ancient it was : poor Ambrose Paré was, as I told you, apprenticed to a barber-surgeon, and here is a description of what such an apprentice had to do, in France, at all events, written in 1726 :—

" Hardly has the cock done crowing before the boy rises to sweep out the shop, so that the small fee may not be lost which an artisan might pay for a clean shave on his way to work. From this time till two in the afternoon he calls on fifty private individuals, combing wigs, waiting the convenience of the customers on the staircase or in the antechamber, putting the hair of some in curl papers, applying the

* It is maintained, by some, that one of the great advantages of the apprenticeship system was that the student learned to recognize the business side of the profession ; this, at the best, is the paltriest aspect of our vocation, and, alas, is often only too keenly appreciated. By others it is held that the proper way of behaving in a sick room, and a suitable demeanour towards patients, was thus acquired. I am convinced that the right time for this instruction is not when a boy has just left school ; it is mostly gained fast enough at a later period, and was surely not worth the expenditure of five precious years.

curling irons to others and clipping them all. If he be studiously inclined he gets to his books towards evening, but the fatigue and disgust that, to those who are not accustomed to such an occupation, comes of necessity from reading soon sends him into a profound sleep, from which he is aroused from time to time by the tinkling of a small bell on the door calling him to cut some peasant's hair. * * * * Never did master expect so much from his servant, nor, in the Indies did a white man seek so greedily to obtain a percentage on the money laid out upon a negro slave as a master surgeon used to strive to get value for the bread and water supplied to his apprentice. Except on the recognized holidays, no leave was given to attend the public lectures for fear of losing the price of a shave, though perhaps no customer would turn in after all, and so the doctors, *animated by the spirit of charity*, used to give the poor boys lessons on surgery at four o'clock in the morning." Think of that my luxurious, nine o'clock friends of the nineteenth century! yet which of us will make as good a man as Ambrose Paré?

Not of course that the apprenticeships of recent times were anything like this; but there was a rough and ready, superficial way of imparting the rudiments which one can well

imagine might lead up to the sort of life a medical student entered upon when he was "walking the hospitals." Can you fancy him (I am speaking of an actual old gentlemen who only died three years ago) "walking the hospitals" in his yellow buckskin breeches, top boots, a blue coat with gilt buttons, and yellow kerseymere waistcoat with frilled shirt and a well-brushed black beaver hat. If there were time I would read you a copy of his articles* to shew you what had been expected of him during the

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*ARTICLES OF APPRENTICESHIP.

This Indenture Witnesseth that A B being of the age of fourteen years and upwards of his own free will and accord and by and with the consent of his father C D of the town of &c. in the county of &c. grazier doth put himself APPRENTICE to E F of the town of &c. in the county of &c. Surgeon and Apothecary to learn his arts and with him after the manner of an apprentice to serve unto the full end and term of FIVE YEARS from thence next following to be fully complete and ended. DURING which term the said apprentice his master faithfully shall serve his secrets keep his lawful commands everywhere gladly do. He shall do no damage to his said master nor see it be done of others but to his power shall tell or forthwith give warning to his said master of the same he shall not waste the goods of his said master nor lend them unlawfully to any. He shall not commit fornication nor contract matrimony within the said term. He shall not play at cards or dice tables or any other unlawful games whereby his said master may have any loss with his own goods or others during the said term without license of his said master. He shall neither buy nor sell. He shall not haunt taverns or playhouses nor absent himself from his said master's service day or night unlawfully. But in all things as a faithful apprentice he shall behave himself towards his said master and all his family during the said term. And the said E F in consideration of the sum of ninety pounds in lawful money of Great Britain to him in hand paid by the said C D at or before the execution of these presents the receipt whereof is hereby acknowledged and of the true and faithful services of the said apprentice to be done and performed doth hereby for himself his heirs executors and administrators covenant promise and agree to and with the said C D that he the said E F the said A B his said apprentice the Arts of a

five years between the ages of 14 and 19 that he had been apprenticed. No doubt he found the life of his fellow students characterized by a looseness and a want of respectability that was notorious; it has been painted for us by Dickens, Albert Smith, and others, in colours which are perhaps too strong, but I have myself met some not so very unlike Bob Sawyer in 1869* (was not one of my fellow students rusticated for playing catchball with the baby when he was doing his midwifery !) and even now one some-

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Surgeon and Apothecary which he useth by the best means that he can shall teach and instruct or cause to be taught and instructed. Finding unto the said apprentice sufficient meat drink and lodging during the said term and the said C D hereby for himself his heirs executors and administrators in covenant promise and agree to and with the said E F his executors administrators and assigns that he the said C D his executors and administrators shall and will from time to time and at all times during the said term at his and their own proper costs find and provide the said apprentice with all and all manner of necessary and becoming wearing apparel washing and mending thereof physic and surgery in case of sickness and all other things fit and requisite for an apprentice.

A B
3rd October, 1822. C D
E F

Copy of Testimonial from E F master of A B on his term of apprenticeship being over and A B coming to town.

"I have much pleasure in introducing Mr. A B to the notice of his professional examiners and others as a gentleman whose apprenticeship has been spent in faithful conduct to myself as his master and high decorum as becomes his moral character and consider him to be in every respect an honour to the profession in which he has embarked.

N R E F
1st January, 1827."

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* *Vide* Roderick Random, Chapters vii and xvii, Smollett, 1748.
The Medical Student, Albert Smith, 1861.
Pickwick Papers, Dickens.

times sees a face that with proper environments might have served Dickens for his model. But on the whole I do not suppose the student of my time differed very much from the student of to-day. He used, indeed, always (or almost always) to wear a chimney-pot hat and a coat with tails, but that is a very superficial distinction. No doubt there were a barn at Highbury and gardens at Cremorne which have been happily improved away; but the Pavilion did not exist and the Aquarium was not thought of and I daresay other attractions, of which I know nothing have replaced the old ones. The average student has, however, become, I suppose, more respectable, and there are year by year fewer and fewer of the disreputable class who gave the term "Medical Student" a bad signification. For which let us be thankful.

Very great changes have, however, been made in the manner of imparting instruction, whether altogether to the advantage of the student or not is perhaps open to doubt. Up to 1868 there were no *demonstrations* of any kind in the college or hospital, except a class given by the resident medical officer, on physical signs to the third year's men. I believe that Dr. F. T. Roberts gave the first anatomical demonstrations on the *convolutions of the brain*, in the session 1869-70; and some of us were too

proudly conservative to attend them. Before that, the two demonstrators used to go once round between two and four in the afternoon, and, after that the dissecting room was given up to athletic sports: such as the long jump upon the boarded floor, or cricket with such bats and balls as the shelves provided. Well, of course, things are better now—if only they are not too good—too much demonstrating is apt to leave no room for individual enquiry. It no doubt raises the *average* capacity for passing examinations, but it tends to bring every one up (or down) to a dead level of mediocrity and to make the mere acquirement of a licence to practice appear to be the one thing needful.

But taking it for granted that you are, as I said, much the same as we were, only rather more respectable, there are just two or three things which may be said, though I will promise they shall not be many, for a sermon with many headings is not likely to strike home to anybody.

First as to work.—I am now addressing perhaps six of you—probably fewer—Do not attempt to read fourteen hours a day. It is the greatest possible mistake. It will lead to addling of the brains, to the acquirement of undigested and impractical knowledge and probably to failure in your examinations and in life. The maximum number of hours I

personally ever attempted to read was nine, in spells of three hours with two hours intervals; and this only for a few weeks when I was hard pressed for my degree. But having said this to the half-dozen, I have now to say to the rest of you, that, if you are not prepared to work hard, you had much better have nothing to do with our overstocked, underpaid, laborious and somewhat dangerous profession. In fact, if there be any here who is just starting and is not disposed to "make the pace," I would urge him, even now to reconsider his position. For the life of me, I cannot understand anyone taking up medicine unless he is really fond of it, except under pressure of parental authority, or in prospect of a fat family practice. As a business, it is not, as a rule, good, though of course there are worse; but, as an occupation, if you choose the branch you like, it is most attractive.

It is not my business to tell you (even if I could) exactly how to apportion your time, else why are you provided with a philospher and friend in the shape of a sub-dean, and such a sub-dean as my friend Professor Thane. I hardly know whether it is worth while to give you my simple creed as to the best manner of work, which is that a man should spend all his first two years on this side of the road, and use

all methods of persuasion (short of personal violence) with his father to give him three years over the way. That third year makes all the difference. I am perfectly appalled in looking back at my state of ignorance at the end of my fourth year ; and when I think that I have been working at a hospital at one part only of the profession for seventeen years, and am still constantly (between ourselves, gentlemen) being brought up against a brick wall, I stand aghast at the thought of the men, who secrete themselves behind a brass plate in the wilds of the country, away from "all humane help" at the end of three years and a half, and as for the miserable public I can only say "God help them." Just two words more to those who are coming to the hospital : Do not read your text books straight through at first, but read them with your cases ; and take notes of your cases for they will be very useful afterwards ; and lastly let me urge anyone who is able to draw, to cultivate his talent to the utmost, even though his productions may sometimes seem scarcely worthy of the Royal Academy.

So having done with work, let us devote the few remaining minutes to play. You will think I am joking when the first form of recreation I recommend you is to attend the

meetings of the Medical Society ; and you will say it is sarcastic when I add that this is not so much for the sake of the knowledge that you will gain or are likely to impart, but for the sake of becoming accustomed to get upon your legs and speak. It is useful for everyone to be able to make a speech, and for many the power is simply invaluable ; and if this has to be acquired afterwards, it has mostly to be done with much self-abasement, and with frequent failure, while the process is often accompanied by severe palpitation of the heart and great epigastric discomfort. No more unpleasant sensation can be endured than that of standing staring into space, with the consciousness that you have emitted your penultimate sentence, but have forgotton your peroration. You stand and stand, and at last, bathed in a flood of perspiration, you ejaculate "I think, sir, I have no more to add," and sit down.

Amongst recreations there are some that are to be highly commended and others that, I think, should be deprecated. I am a strong advocate for athletic sports, and think it a great pity for any Englishman to allow himself to give them up altogether. Of these the most suitable, it seems to me, for a medical student, are those which give the maximum of exercise iu the minimum of time. There was a rowing

club in my day, which had its boats at Hammersmith, but it came to grief, as I think was best for it, because the time required for getting there was too great to allow of sufficient practice for anything like proficiency. But this is no argument against an occasional day on the river. In the same way it is doubtful whether we can hope often to have a first-rate cricket eleven, who will play well together, because we have not the means, unfortunately, of acquiring a ground near at hand. This is of course a pity. On the other hand, racquets, tennis, football and the like, can only merit praise. But there is one form of sport, perfectly harmless, nay admirable in itself, which I have always felt was unsuitable for us in our student days, and I have seen quite a number of men who appear to have gone to the dogs because of their devotion to it—I mean billiards. I will tell you why it seems to me that it is unsuitable. It is an *expensive* game, at least it seems almost impossible to indulge in it without making it expensive. It is expensive of time and expensive of money, and the medical student is seldom too well supplied with either of these commodities. I therefore hereby solemnly enter my protest against *billiards in public rooms.*

I might of course read a homily against other

so-called amusements, but you would probably treat me as Carlyle says the dwellers by the Dead Sea treated the prophet Moses : "They listened with real tedium to Moses, with light grinning, or with splenetic sniffs and sneers, affecting even to yawn ; and signified, in short, that they found him a humbug, and even a bore. Such was the candid theory these men of the Asphalt Lake formed to themselves of Moses, That probably he was a humbug, that certainly he was a bore."* These so-called amusements everyone knows and everyone confesses are follies—like the "foolish woman" of old, they "sit on a seat in the high places of the city to call passengers who go right on their ways," and I suppose that to the end of time "he that is simple will turn in thither," and as for "him that wanteth understanding," it is really not worth while to waste one's breath upon him.

Let me therefore hasten to the end of my theme.

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It would hardly be right to conclude without a moral, and scarcely artistic not to give you one poetical quotation : so let me try to wrap up the simplest possible of morals in some grand but rather difficult verses. Not long

* Past and Present, Book iii, Chap. iii.

before the time of Ambrose Paré, there lived a man named Paracelsus (Philippus Aureolus Theophrastus Bombastus ab Hohenheim). He has been described as the father of modern chemistry; and he was reputed at one time the most clever of physicians, at another the most arrant of quacks. Certain, it is, that after travelling round the world in search of knowledge, he was made *Professor of Physic and Surgery* (!) at the University of Basil, and that within the year he was ignominously expelled from his chair. Certain it is also, that he took to drink and other excesses, and died in poverty thirteen years later (1540) in a hospital at Salzburg. One of his first acts, when he was made Professor, was, publicly, to burn the works of Galen * and Avicenna, † assuring his auditors "that the latchets of his shoes were more instructed than these two physicians; that all Universities, all writers put together, were less gifted than the hairs of his beard and of the crown of his head."

Mr. Browning has written a very pretty poem about Paracelcus; and he makes him regret, at the end of his life the foolish manner in which he had despised the attainments of those who had gone before him, and recognize the fact

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* *Galen*, 4th Century, A.D.

† *Avicenna the Arabian*, 10th Century, A.D.

that he would be far surpassed by his successors. He puts into his mouth these splendid lines:

"Not so, dear child
Of after days, wilt thou reject the past
Big with deep warnings of the proper tenure
By which thou hast the earth: for thee the present
Shall have distinct and trembling beauty, seen
Beside that past's own shade when, in relief,
Its brightness shall stand out: nor yet on thee
Shall burst the future, as successive zones
Of several wonder open on some spirit
Flying secure and glad from heaven to heaven:
But thou shalt painfully attain to joy,
While hope and fear and love shall keep thee man!"