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## ORIGINAL ARTICLES

### AMBROSE PARÉ, THE FATHER OF FRENCH SURGERY. 1509-1590.

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Great good sense, wonderful industry, remarkable opportunities, and an untiring and unconquerable ambition, have combined to render the name of Ambrose Paré celebrated in the annals of surgery. Born of humble parents, amid unfavorable surroundings, under circumstances which would have crushed a spirit less ambitious, Ambrose Paré, by his unaided efforts, made himself master of the surgical science of his day, commanded the confidence of emperors and peasants, of statesmen and soldiers, and left posterity the record of a life well spent. He marks the dividing line between the servile surgery of the ancients and the original, independent and progress-



FIG. 1.—Initial from Paré's book, A. D., 1594.

ive art of the moderns. Just as Vesalius, Eustachius and Fallopius dared to contradict the errors of thirteen hundred years, and correct the anatomic mistakes of Galen, so Paré brought about a new order of things in surgery. Firm in his convictions, honest in his statements, and accurate in his observations, this great man was far in advance of his age. The story of his life reads like a romance.

Paré was born at Laval, a small town in the province of Mayenne, in France, in the year 1509. His life was spent during a period of great and stirring scenes—a time remarkable in the history of the world. At the time of his birth the art of printing had been invented less than sixty years; the existence of a new

continent had been proclaimed by Columbus seventeen years; Martin Luther was delivering Biblical lectures in the University of Wittenberg, and preparing to shake the foundations of the theological world; Ariosto, of Italy, was writing immortal verse; Erasmus, residing in the same sunny clime, was delighting the world with his matchless scholarship and educating the young son of James IV. of Scotland; and Copernicus, while studying the revolutions of the heavenly bodies, had not dared to proclaim his views. Louis XII., of France, was engaged in war with Italy. Henry VIII. had just succeeded to the English throne. Maximilian I. ruled the land from the Danube to the Zuyder Zee.

The same year that Paré first saw the light of day, there was ushered into the world, one Michael Servetus, destined to discover the lesser circulation and die by slow torturing fires; and John Calvin, the theological bigot of Geneva. Paracelsus, that compound of science, eccentricity and charlatanism, was in his sixteenth year. Realdus Columbus, celebrated as an anatomist, was 15 years of age.

The early education of Paré was obtained from a priest. While yet in his teens he was apprenticed to a barber-surgeon who instructed him in minor surgery. While thus engaged, Laurent Colot, the celebrated lithotomist, chanced to visit the town for

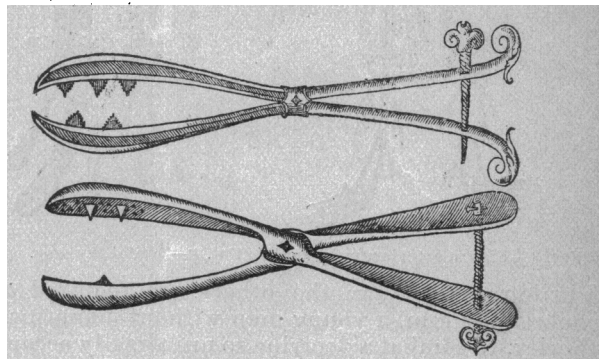


FIG. 2.—Stone crushers used by Paré.

the purpose of operating for stone. Paré was present, and was so struck with admiration at the result of the operation that he resolved to devote himself to the higher branches of surgery, an art which was then almost exclusively in the hands of the barbers. With this object he set off for Paris where Jacques Goupil, one of the professors in the College of France, acted as his preceptor. Here the masters explained to him the works of Lanfranc, Albucasis, Guido de Chauliac, and John de Vigo, the only surgical textbooks of the times. Soon Paré became interne to that famous hospital, the Hotel Dieu, where he remained for three years. During this time Paré was engaged in teaching anatomy. In 1536, in his twenty-seventh year, he received the appointment of military surgeon and was directed to accompany

René de Montjean to Italy. After the surrender of Turin, and the death of Montjean, Paré returned to Paris and began the practice of surgery.

The three years spent in campaigning were of great value to Paré and during this time he made some important observations. In the treatment of gun-shot wounds, the teachings of John de Vigo, physician to Pope Julius II. had been followed implicitly. Such injuries were regarded as poisoned wounds and the practice was to cauterize them with boiling oil, or the hot iron, while alexipharmics were administered internally. John de Vigo assures us that the danger of these wounds results from the round form of the balls, their degree of heat, and the poisonous qualities that the powder communicates to them. This theory, so destructive in its effect, received universal credence until Paré arose to combat it. After the battle of Pas-de-Suze, the supply of boiling oil having given out, it was observed on the following morning by Paré that those wounds looked best which had not been dressed with hot oil; and he also noticed that such patients showed less

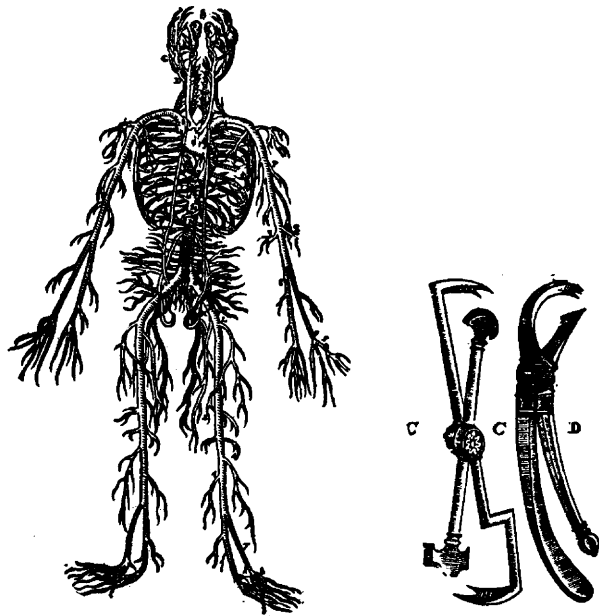


FIG. 3.—Figura arteriarum. (Paré.) FIG. 4.—Dental Forceps. (Paré.)

febrile reaction than the others. It required great courage for him, a young man without name or authority, to combat a doctrine so universally accepted; but Ambrose Paré was not the man to be overawed by weight of authority when his own sober judgment taught him differently.

In Paris, Paré was interviewed by Sylvius de la Bœe. Malgaigne says: "This interview was honorable in all respects to both." Sylvius, whose teachings attracted more auditors than those of Fernel, even invited the young surgeon to dinner, and heard with great attention, the observations and experiments on which Paré had established his doctrines on gun-shot wounds, and was so much struck with them that he besought him with great warmth, to write them out and make them public. Paré felt sensibly this encouragement, coming from so high a source, and prepared his text, drew the figures, and in the year 1545, at Virant Gaulterot's, sworn bookseller in the University of Paris, that little work which marked in a manner so glorious the revival of

French surgery, was published, with the following title: "The Manner of Treating Wounds made by Arquebuses and other Fire Arms, and those made by Arrows, Darts, and the like; and also of Burns, made especially by Gunpowder: Composed by Ambrose Paré, Master Barber-Surgeon, Paris."

In a few months a second edition was issued. In both editions the use of the actual cautery was advised to check hemorrhage. Paré, however, was thinking, day by day, of a plan by which hemorrhage could be controlled without the frightful torture of the hot iron. He resolved to test his theory and finally, at the siege of Dampvillier, in the year 1552, an amputation was made upon the person of M. de Rohan, and, for the first time in the history of surgical science, Ambrose Paré ligated the bleeding vessels. Fortunately the patient recovered and, full of joy at having escaped the red-hot iron, said that he had parted with his leg on very good terms.

The young surgeon had made two great discoveries: By the first he saved from cauterization all who had simple gun-shot wounds; by the second all who suffered an amputation were spared the tortures of the actual cautery. And, in the language of Malgaigne, "Military surgery, which till that time had been a torture, became a blessed art, and it was a barber-surgeon who produced the double marvel."

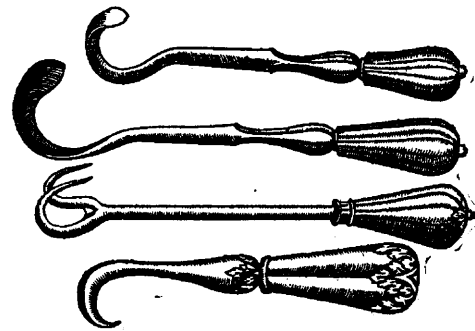


FIG. 5.—Obstetrical instruments, (Paré.)

The practice of ligating an artery was entirely new, but the idea was old. Galen, Celsus, Avicenna and Albucasis had all spoken of the tying of arteries and veins, but there is no evidence to show that they practiced it. For centuries the actual cautery had been the principal means of checking traumatic hemorrhage. Sometimes, by way of variety, hot oil or boiling pitch were applied to the bleeding surface. The discovery of Paré revolutionized the practice of surgery and brought on his devoted head a torrent of abuse. Like Harvey at a later date, Paré suffered in his practice for a time. Of all his enemies, Gourmelen, President of the College of France, was the most clamorous. At the present day he is remembered only for his opposition to the great surgeon. "It was then," said Gourmelen, "very forward, rash and presumptuous in a certain individual, to venture upon condemning the cauterization of bleeding vessels after cutting off a mortified limb, a method so highly and continually commended and approved by all the ancients, teaching in opposition to that, without any authority, without good sense, some new method of his own, of tying arteries and veins." He called Paré a bloodthirsty cruel rascal, while Paré, stung to the quick, sometimes lost his temper but generally conducted his defense with admirable coolness, as the following will show:

"You boast, M. Gourmelen, that you will teach me

my lessons in surgery, and my operations; but in that, I believe, you are a little mistaken, for my education has been quite after another fashion. I have learned my art, not in my closet; no, nor by hearing the discourses of physicians, though that also I have not despised; but in the Hotel Dieu, where I lived for three years, seeing many diseases, and practicing many operations upon the living body, and learning also much anatomy from the dissection of the dead. But," he continued, "I have yet more to boast of, for, being in the service of the King of France, I have, in my time, served four successive Kings, having followed them in battles, skirmishes, and assaults;

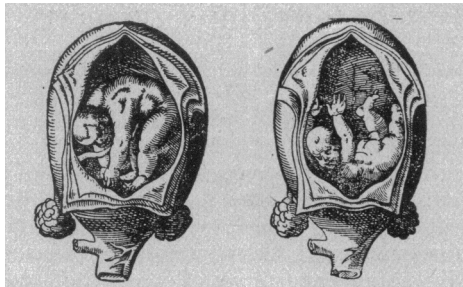


FIG. 6.—"De situ infantis in utero." (Paré.)

sometimes I have been in sieges, and sometimes shut up with the besieged, curing their wounds." . . . . "And last of all, I have lived in this great renowned city of Paris many long years, where, thank God, I have been held in some repute, and ranked at least equal to my peers, insomuch that there have been few difficult or celebrated cures in which my head and hand have not been employed. How, seeing these things, dare such a man as you, who has made surgery no part of your study, talk of teaching me?"

Paré, although proud of his discovery, arrogated nothing to himself, but with true piety ascribed it all to God. He says: "I think it was taught me

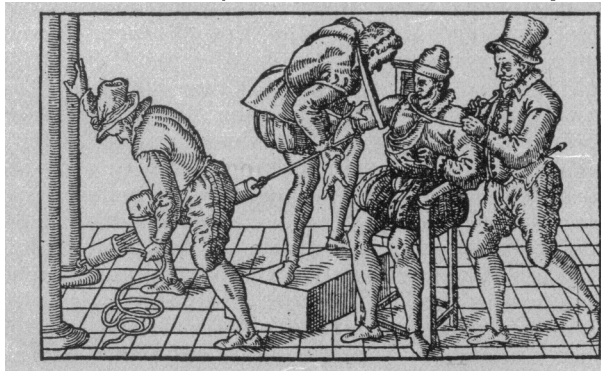


FIG. 7.—Reduction of a dislocation of the humerus. (Paré.)

by the special favor of the sacred Deitie; for I learnt it not of my masters, nor of any other, neither have I at any time found it used by any. Only I have read it in Galen, that there was no speedier remedy for staunching of blood than to bind the vessels through which it flowed towards their roots, to-wit, the liver and the heart."—(Johnson's translation, London, 1634.)

Nor was the use of the ligature the only discovery made by Paré. He was the first to employ the twisted suture in the operation for hare-lip; to extract cartilaginous bodies from the knee joint; and to perform podalic version in difficult labor. He was a man of great mechanical genius, as is evidenced by the large number of new instruments and appliances

found in his book. He gave the first account of what is now incorrectly described as Hey's saw, and the club-foot boot, claimed to have been devised by Mr. Syme, of Edinburgh. Among the many wood cuts of curios, one sees artificial eyes, ears, noses, teeth, arms, legs and hands.

Surgeon successively to Henry II., Francis II., Charles IX., and Henry III., it was said of Paré that "the Kings of France transmitted him to their suc-

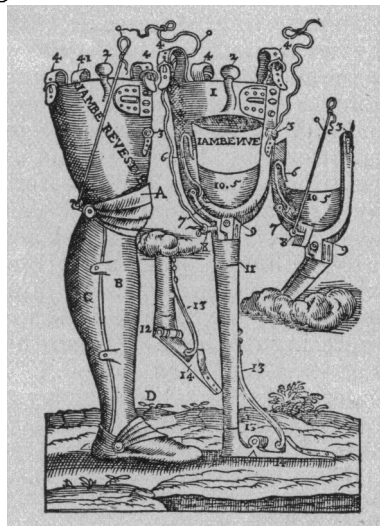


FIG. 8.—Artificial limbs. (Paré.)

cessors as a legacy of the crown." These monarchs were all warmly attached to Paré; he was at once their privy-councilor and trusted surgeon, and his influence over them was by no means small. Let it be said in his honor that this influence was never exerted in an unjust cause. So great was the power of this good man over Charles IX., that he was enabled to put a stop to the massacre of St. Bartholomew, (Aug. 24, 1572), when 70,000 Huguenots were murdered in Paris and various parts of France. The

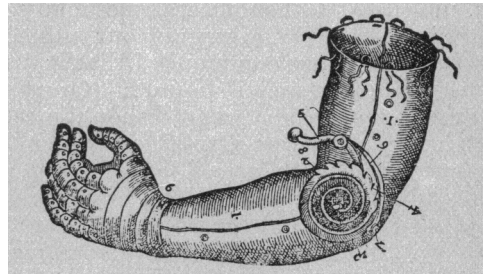


FIG. 9.—Artificial arm. (Paré.)

details of that horrible event are well known. For years, Huguenots and Catholics had been at enmity; and affairs had at last reached such a crisis that the bloodthirsty mother of Charles deemed it necessary to kill all the Huguenots. For three days and nights these unfortunates were hunted like the beasts of the field. Helpless infants, old men and women were slain by hired assassins. The streets of Paris were blocked by the bodies of the dead. How long the slaughter would have continued is impossible to say, had not one man, and he a Huguenot, done his duty. That man was Ambrose Paré. "It was not long," says the Duke of Sully, who has so graphically described the scene, "before Charles felt the most violent remorse for the barbarous action to which they had forced him to give the sanction of his name and authority. From the evening of the 24th of

August, he was observed to groan involuntarily at the recitation of a thousand acts of cruelty, which every one boasted of in his presence. Of all those who were about the person of this prince, none possessed so great a share of his confidence as Ambrose Paré, his surgeon. This man, although a Huguenot, lived with him in so great a degree of familiarity that, on the day of the massacre, Charles telling him the time was now come for him to turn a Catholic, he replied, without being alarmed: 'By the light of God, sire, you can not have forgotten your promise, never to command me to do four things, namely, to enter into my mother's womb, to be present in the day of battle, to quit your service, or to go to mass.' The king soon after took him aside, and disclosed to him freely the trouble of his soul. 'Ambrose,' said he, 'I know not what has happened these two or three days past, but I feel my mind and body as much at enmity with each other as if I were seized with a fever; sleeping or waking, the murdered Huguenots seem ever present to my eyes, with ghastly faces, and sweltering in blood. I wish the innocent and helpless at least had been spared.' The order which was published the following day, forbidding the continuance of the massacre, was the consequence of this conversation. At the time, Paré was 62 years of age, and of all his good deeds this was the greatest.

Nor was the influence of Paré over the populace less potent. Among the soldiers his presence was sufficient to inspire new courage. At the siege of Metz, when Charles V. had surrounded the town with an immense army, and the garrison, comprising the flower of French nobility, were reduced by hunger and sickness to the utmost extremity, Paré was introduced into the city by stealth, much to the joy of the besieged, who exclaimed: "We have no longer any fear of dying, even if we should be wounded; Paré, our friend, is among us." At this period Paré had already passed sixteen years as an army surgeon and was known to all the officers and many of the rank and file. In his "Chirurgia," our subject tells how the Duke de Guise commanded that he "should be well used, and bid mee I should not faile to be the next day upon the Breache, where I should meete with all the Princes and divers Capitaines, which I did; who receaved mee with great joy, and did me the honor to imbrace me, and tell me I was very welcome, adding withall that they did not feare to dye if they should chance to bee hurt." (Johnson's translation). The next day after his arrival, Paré successfully trephined M. de Bugend, who had been struck on the head by a piece of stone, and had remained insensible for fourteen days.

Paré became a member of the College of Surgeons in 1554, submitted to the examinations and received successively the degrees of Bachelor, Licentiate, and Master in Surgery. Although ignorant of Latin, Paré was received regardless of a statute which required that the candidate should know that language. He never wore the professor's cap and gown. He was tall in stature, with slender figure and a grave and dignified countenance. All his portraits represent him in his court dress, with the frilled collar characteristic of the age. No one can examine that grand old folio, "Opera Chirurgia," of Paré, without being overwhelmed with the thought that this work was penned by the intellect of a giant. Here we have nearly one thousand closely printed pages, over 300

illustrations—many of which contain numerous figures—which cost the author an almost fabulous sum. We find complete treatises on many subjects; on human anatomy; beasts, birds and fishes; monsters and prodigies; fractures and dislocations; tumors and wounds; artificial arms, legs and hands; amputations and ulcers; cauteries and ligatures; trephines and dental forceps, etc., etc.

So long as surgeons practice their beneficent art, the name of Ambrose Paré will be mentioned with reverence.

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## CONCUSSION OF THE BRAIN.

Read in the Section on Surgery and Anatomy at the Forty-fifth Annual Meeting of the American Medical Association, held at San Francisco, June 5-8, 1894.

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During the last forty years the subject of concussion or commotion, as the Germans and derivative Latin writers term it, has been a matter of careful study, observation and experimental research. It is caused by some external violence which communicates vibration, oscillation or minute movement to the anatomic elements of the parts acted upon. In the causation all observers agree; but what occurs in the constituent elements of the parts affected can not be said to be as yet satisfactorily settled. All the parts of the body may be the subject of such action: Bones, muscles, nerves, viscera; and some assert that the blood itself may be the subject of concussion. The study of the effects of concussion has been devoted chiefly to the brain; yet it seems certain that the same cause would be followed by like effects, no difference what part of the body might be the site; and hence that one common definition might be given of concussion, founded on physical and physiologic laws. In a classic article on this subject by Verneuil, the able French surgeon and writer, after revealing to the reader the difficulties which perplex him in his task, he offers us the following definition of concussion: It is a series of phenomena, occurring more or less suddenly, which result from a mechanical shaking or jarring movement of the anatomic elements, tissues and organs, characterized by temporary excitation or depression of the properties, offices or uses of the parts which are shaken; and as a result there are caused anatomic changes similar to those which are normally seen in the successive phases of functional excitation or functional repose. This definition is the embodiment of what its author has derived from his own observations and that of others, and especially from results which others have obtained in experiment on animals.

In the milder grades of concussion in the animal, the question has been whether there is any appreciable lesion to be discovered in the part subjected to experiment. The most admit that such lesion can not be discovered, and since in man, in case of concussion of the brain, the subject soon recovers, hence there is no opportunity of searching for the evidence of such lesion; for as Verneuil says, we derive our elements of the diagnosis of any disease from three sources, to-wit: The causation, the symptoms arising, and the direct inspection of the parts affected. But in the case of cerebral concussion one or more of these sources of information is often wanting.