[Reprint from the BUFFALO MEDICAL JOURNAL, February, 1903.]

Henry de Mondeville, the Man and His Writings.

With Translation of Several Chapters of his Works.

BY CHARLES GREENE CUMSTON, M. D., Boston, Mass.

DURING the first half of the middle ages, both medicine and surgery had fallen to a very low level in France, and during this period there is not a single name of any surgeon of note that has been handed down to us. But the traditions of antiquity had been preserved in Italy, where, during the 12th and 13th centuries flourished a number of celebrated schools.

Obliged to leave his country on account of the triumph of a rival political faction, Lanfranc, of Milan, established himself at first in Lyons, where he practised for a certain time, and afterward went to Paris, where his practice and his lectures made him celebrated. He had for a disciple the famous Pitard, surgeon of the King St. Louis, who in his turn was first master and the friend of de Mondeville.

Thus, the traditions of the Italian schools became perpetuated in France by men of genius, and also it must be remembered that de Mondeville went to Bologna, where he studied under the celebrated surgeon Theodoric, Bishop of Cervia, the new methods of dressings which the famous Italian surgeon had been promulgating.

The work of de Mondeville may be considered as a true and complete treatise of general surgical pathology, filled with interesting detail for those desirous of studying the progress and the

development of surgery during the middle ages. It is, however, far from my intention to weary the reader with a complete résumé of such a vast work, and I am only desirous of here giving those parts having the most importance for the history of surgery, those where at a glance it will be seen in what way the present is united to the past and how the most magnificent discoveries often in reality have their origin in former times.

The chapter which de Mondeville has written on questions relating to the profession is of particular interest, because it comprises teachings which were totally unknown up to the time of his writing. At the epoch when de Mondeville flourished, there existed several types of surgeons. In the first place, there were the physician-surgeon clerks, which were created by the Schools of Medicine, and among this number may be mentioned William de Salicet, Lanfranc, de Mondeville, and Guy de Chauliac. On this point the old documents are absolutely positive.

Then there was the corporation of laity surgeons, founded after the model of those of other trades, having its masters and its "prudhommes," absolutely independent of the faculty of medicine. The master "chirurgiens jures" on the convocation and presidence of the first surgeon to the King, conferred a license to practise after the candidate had been examined. And, lastly, there were the barbers who practised blood-letting and other small operations which were turned over to them by surgeons belonging to the second class, and who had become physicians. At the commencement of the 16th century they formed the corporation of barber surgeons, which in the 17th century became transformed into the college of "chirurgiens jures."

In de Mondeville's time the physician-surgeons were the only ones possessing an adequate instruction, and for this reason he strongly advises those who wished to practise surgery to first study medicine. If, as it occasionally happened, the practitioners belonging to the second class above mentioned were in possession of a certain skill in operating, their absolute want of rudimentary education and general instruction prevented them from rising above a certain social level. This was much regretted by de Mondeville, and he directed many attacks and sarcasms, accompanied by anecdotes, confirming his very unflattering statements regarding this class of practitioners. And for

all this he certainly loved his profession passionately, and placed surgery above all other branches.

De Mondeville says that just as God ordains that surgeons should be honored like other men, so it shows from the acts and the chronicles that the Roman emperors, and the sovereigns who succeeded them, held surgeons in great honor and exempted them from taxation and common servitudes. In these bygone times the surgeons of the palace of the prince were called aliorum examinatores or archiatres.

De Mondeville says that the surgeon desirous of learning his profession should study, listen, discuss, read, and operate, that he should have a subtle intelligence, an excellent natural genius, and strong and agile hands. Since he gives himself up to a very hard and hazardous work, his salary should be greater than other artisans. Unfortunately, in these bygone days bad debts were far greater in number than good ones, just as it exists at the present time, and our author says in this respect that he has not as yet found a man rich enough, or rather sufficiently honest, no matter what his condition might be, to pay what he had promised without being pressed or forced to do so, from which arises the necessity of making arrangements and all kinds of concessions most disagreeable for the surgeon, who as long as he is not paid cannot stop demanding his reward, and should accept neither promise nor guarantee from the patient, but simply a bond or the money.

From these and other remarks that he makes we should not be led to believe that de Mondeville was avaricious or interested. He is of the opinion that a fee or a fixed sum should not be accepted from a friend, but in place of these he accepted victuals and jewelry, cloths, and cups as a sign of old friendship and not as a salary.

As to the poor, the true poor, because already at this epoch rich people came to consult the surgeon arrayed in old clothes in order to pay a smaller fee, de Mondeville never desired a retribution, he operated conscientiously for charity. But he is of the opinion that our art should not be lowered by demanding ridiculously small fees, and he believes that it is better to ask nothing than to allow one's self to be guided by the wish of the client.

In those days the practice of operating was particularly ungrateful, and even dangerous, not alone for the patient. The

surgeon was legally responsible for the results he obtained, and in order to cover himself he obliged the patient to give his word that he would in no way do him harm in case the operation was unsuccessful, or else he would obtain the assent of people of rank who possessed authority in the city where he practised.

It was, however, in some cases exposing one's self to death in case of an unsuccessful result, and it is well known how King John, of Bohemia, had a French physician sewed up in a sack and thrown into the Oder because he could not restore his sight to him. And, lastly, at the time when de Mondeville practised everybody undertook the healing art, and this is why he says that ignorant and deceitful persons make fortunes and acquire brilliant reputations, while men of knowledge and who are frank and ripe in experience, miserably live. But it is more than astonishing, it is absurd, not only that these quacks and empirics, but kings, princes, dukes, prelates, and other authorities of the Church, nobles and bourgeois, mix themselves up in the science of dangerous surgical cures, and more especially in the treatment of diseases of the eye, which is very difficult and deceiving, to such a point that it is rarely that one finds a surgeon who is really an expert in these matters.

During the last few years the history of military surgery in the middle ages has interested the curiosity of medical historians, and has been the source of many researches in this direction, but unfortunately the documents left us are few in number and Guy de Chauliac, who gives a résumé of the writings of most of his predecessors, was never present at a single battle. The appearance of de Mondeville's book has thrown much new light on this very interesting subject, because as he says himself he was for a long time attached as surgeon to the person of the king, and to Count Charles de Valois in their expeditions against the English and the Flamands, and was thus able to write a very curious chapter on the extraction of missiles founded on his own experience, and which may be considered as a manual of military surgery of the time in which he lived. Darts, arrows, javelins, lances, and many other weapons were in use in those days, and the wounds produced by them were extremely varied, likewise the operative indications in different cases.

Towards the end of the 13th and at the commencement of the 14th centuries, the cavaliers wore thick armor covering them from their head to their feet, which protected them quite

efficiently against blows from swords and many other arms, but the armor was inefficient against sharp arrows which were fired with considerable precision by the archers. The armor was not proof against lances, and the wounds produced by them were very numerous and varied in nature according to whether the point did or did not adhere to the armor which it had pierced through, and likewise that part of the body which it entered.

The surgeon with the aid of a blacksmith was first obliged to remove the armor and employed very ingenious instruments for the extraction of these foreign bodies, usually in the form of pincers. Here is the operative technique as described by de Mondeville. The member which had been wounded by the arrow was tightly bound to a strong bit of timber and then the cord of a strong bow was put on the stretch as if to fire an arrow. The projecting end of the foreign body to be withdrawn was solidly fixed to the cord, which was then released, and de Mondeville says that he has seen this method fail but once. He also relates the case of a wounded man in whom an arrow had completely traversed the lower end of the femur at the level of the condyles. The foreign body could only be removed by hitting one of its extremities with an iron hammer after the limb had been firmly held on a column of wood, which had been hewn out so as to leave a space under the point where the instrument was driven out.

Usually speaking, the foreign bodies were removed by the opening through which they entered, but when they penetrated through the entire limb, or very deeply into it, they were withdrawn at the opposite side from which they entered after an incision had been made over them. The arrows used by the English were small and barbed, which rendered their extraction extremely difficult.

As I have already said, the work of de Mondeville contains many personal ideas and original thought on numerous points that he preached, and opinions are even found which would seem to belong to writers who had lived at a much later date. Thus the famous saying of Ambroise Pare, "Je le pansai, Dieu le guerit," is to be found almost textually when speaking of the extraction of foreign bodies plunged in the various viscera, which may be followed by immediate death, and also where abstaining from their removal will occasionally bring about unexpected cures.

But it is certainly by his method of dressing wounds that de Mondeville is deserving of a special place in the history of surgical science, because he may be considered as the true precursor of the modern antiseptic methods. Contrary to the doctrines taught in the schools of medicine, de Mondeville far from considering suppuration as a necessity, or a salutary vent, believes on the contrary that it is a very dangerous complication and one to be avoided at any cost. The method of dressing wounds that he advises, and which his former master, Theodoric, had inspired in him, may be summed up in the six following propositions: (1) sounds should not be inserted into wounds; (2) bones which compress or wound the surrounding structures must be removed and with violence if necessary, and likewise all foreign bodies which are found between the borders of the wound; (3) the borders of the wound should be united as far as possible; (4) the use of sutures is indicated for this purpose; (5) the wound should be fomented with hot wine and dried with sponges; (6) a plaster of his own invention should then be applied, spread out on a piece of cloth and covered with ordinary compresses wrung out in hot wine over which a bandage is applied. De Mondeville also advises the use of linen compresses in the dressing of wounds, which should not be renewed too often. We have here the practice of antiseptics of the first order, and also the occlusion of wounds as done at the present time. Abstain from passing sounds into the wounds, to wash them with hot wine, and then endeavor to obtain immediate union by sutures, and dressed so as to avoid the contact of the air, is certainly most extraordinary when we realise that these precepts were taught in 1306.

Unfortunately, these wise counsels were quickly forgotten, and fifty years later Guy de Chauliac, who held the scepter of surgery in the Occident, brought back the use of the old methods and the useful part played by the suppuration of wounds was again proclaimed. Shortly after de Chauliac, a very bold and practically unknown Italian surgeon, by name Petri de Largelata, gave distinct rules for the use of the drainage of wounds which he obtained by using the quills of the goose, and which was a sure proof of the fear inspired in him by the presence of pus in the tissues.

Nevertheless the use of antiseptic materials, which far antedated the writings of de Mondeville, still remained in practice and it is quite sufficient to read the works published at this

epoch in order to convince one's self of many substances used for dressing wounds.

Although abandoning the precepts given by Theodoric, a certain amount of surgical antisepsis was practised without the knowledge of those who used it, and up to the time of the great wars of the Revolution, and of the Empire, when the simple dressing was advocated, that is to say, an infectious dressing of the highest quality, the use of balsams and aromatics were had recourse to for the greater number of wounds and operations. At the commencement of the 19th century the precepts of the school of Broussais enriched still more those of the surgeons of the "grande armee" and of the Faculty of Medicine. The dressings with serate and charpie reigned without contest, and since this time and up to our days purulent infection and septicemia have raged.

The surgeons of the middle ages attached very great importance to the virtues of compound wines, tinctures, balsams and plasters, in the dressing of wounds, and consequently all their treatises on surgery contain what was then termed an antidotarian, which was simply a manual of materia medica destined to indicate the composition and preparation of these substances. The one contained in de Mondeville's works is particularly interesting concerning the history of drugs and plants of this epoch, and on account of its great exactitude and the detail I will further on in this article give a literal translation of two chapters from it.

The surgeons of the middle ages also gave potions which they considered very useful for the cicatrisation of operative or other wounds, and their formulæ were usually very complicated. De Mondeville was one of the first to doubt their efficacy and advised against their use.

Embalming entered into the attributes of the surgeon and appears to have been a means of considerable emolument for them. De Mondeville enters into very curious details concerning this subject, which aptly demonstrates to what a degree the endeavor was made at this time to preserve bodies. The ordinary methods were essentially defective because with few exceptions the abdomen was not open and the viscera were not disinfected, and it is not at all surprising that bodies thus prepared were not preserved like the Egyptian mummies, and that the tombs of the middle ages now only contain dust and débris of bones.

It is a fact that de Mondeville only enjoyed a relative celebrity among medical writers in the following centuries, and it is only by the work of Gui de Chauliac, who was his disciple, that de Mondeville's name has been handed down to us.

When printing was invented the writings of the older surgeons were published with a kind of passion, Gui de Chauliac in 1478, Lanfranc in 1490, William de Salicet in 1492, Bernard de Gordon in 1495, etc., most of which were published at Lyons. Alone, Henri de Mondeville remained in the dust of the libraries, and his name from this time was hidden in the most profound obscurity.

What we know of de Mondeville has only been obtained by what he has said of himself in his writings. His name is even written in varied manners in the different manuscripts. The French translation from the Latin, which is to be found in the National Library at Paris, calls him Mondeville in one paragraph, while in another it is Esmondeville. The Latin manuscripts give it as Mondavilla, or Mundavilla, Esmondavilla or Esmundavilla, Amondavilla or Amundavilla, Amandavilla, Mandavilla, Armandavilla, Hermondavilla etc., in which the termination of villa or ville, which is so frequently met with in the names of towns in Normandy, would lead to the natural conclusion that the subject of this sketch was a Norman. The greater part of these localities are to be found in Normandy.

The names most frequently met with in the manuscripts are Mondavalla, Mondeville, Esmondavilla and Esmondeville, at the present time called Emondaville. The Dictionnaire geographique et administratif de la France gives an Emondeville in la Manche in the arrondissement of Valognes, and a Mondeville in Calvados, arrondissement of Caen.

Master Henri de Mondeville was in all probability from one of these Norman villages, and he often mentions Normandy in his writings, either for the purpose of recalling names given to certain diseases in the language of this province, or for the purpose of recalling facts that he had himself seen, as for example, the cure of hydrophobia by plunging the patient into the sea. In some instances he gives the Norman form to the French words that he employs.

The date of birth of de Mondeville is unknown, but he died at Paris between 1317 and 1320. After having visited the celebrated cities of Italy, de Mondeville came to study medicine at Montpellier and surgery at Paris, and he made such progress

in both these sciences that he soon received the degree of Master.[1]

He professed in both universities with such success that the lecture rooms were crowded with students, the nobility and foreigners from all parts of Europe.

Quesnay says that in order to better introduce himself to the world, de Mondeville appeared to walk in the footsteps of Theodoric and Lanfranc, but that his taste was not that of a simple imitator. Being entirely free from the prejudices which so often lower the mind from authority, he himself judged of his masters, or at least he submitted them to a single judge who could decide their true merit, that is to say, to reason enlightened by experience. Those precepts which had been written and regarded as laws he brought down to their proper principles; he looked for the truth or for the confirmation in the diseases themselves, and not in the works and reputations of writers. The public, which is not always blind to medicine and surgery, was carried away, so to speak, by his singular merit, and Mondeville found in this public confidence an unusual reward. After his death his teachings remained for a long time as a guide to practice, and Gui de Chauliac, who quotes Mondeville 96 times in his works, places him among the greatest masters of his art.

Nicaise says that Mondeville appears to him to have an ardent mind, well nourished by much reading in letters and philosophy, as well as surgery. His honesty is evident, he speaks frankly, and no one escapes his criticism, not even the king.

Mondeville was the surgeon to two kings of France, Philippe le Bel (1285-1314), and his son Louis le Hutin (1314-1316), whose body he embalmed. He professed both at Montpellier and at Paris, and as I have already indicated, his lectures were given with great éclat. He was in France, with his master, Jean Pitard, the surgeon to St. Louis and of Philippe le Bel, the most illustrious representative of surgery at the end of the 13th and the commencement of the 14th century.

For the time in which he lived de Mondeville was a sage, occupying a high position, the highest that could be attained in surgery at that time. He was also a distinguished professor and up

1. NOTE.—Since he professed surgery in the Faculty of Montpellier and later was in Paris as physician to Philippe le Bel, he consequently must have practised both physic and surgery. He must have received the degree of M. D., otherwise he could not have professed in the University of Montpellier, and there is no doubt but that he practised surgery at Paris, since his name appears in the Index Funebreus Chirurgorum Parisiensinum, ab anno 1315 ad annum 1529.

to the epoch of Gui de Chauliac in 1365, his surgery was the best compilation, the best manual, and the best regulated of any that had existed. It should also be remembered that it was the first work written by a French surgeon.

De Mondeville's style is not as dry as might be expected in a didactic work. Although using scholastic Latin, the universal tongue of the middle ages, he gives from time to time specimens of his caustic humor, especially directed against women in his quality of a bachelor, and he does not use them lightly. For example, he reproaches the ladies of Montpellier of lacing their breasts too tightly, and not enough the rest of their body, and even in the study of anatomy he finds the opportunity of maliciously attacking them, an example of which I extract from his treatise:

Et fuit huic membro hoc nomen veretrum impositum ab hominibus sicut patet per modum loquendi Haly supra tegni tract. De causis cap. 37 dicentis: vidi virum qui habebat veretium, testiculos et vulvam. Sed virga et membrum sunt nomina imposita huic membro a mulieribus per excellentiam sicut patet per modum loquendi earum et causa.

In spite of his professional gravity, he occasionally found a time for jesting, as will be seen by these quotations, as well as other paragraphs in his writings.

Mondeville had a high idea of his profession and placed it even above medicine. His desire was that the surgeon should be at the same time a physician.

Surgery in the 14th century was only a manual avocation, and the surgeons were merely at the beck and call of the physicians, and it must be admitted that the large proportion of the former were ignorant and illiterate. Surgeons cultivated in letters, as was de Mondeville, were the exception, and although they endeavored to suppress charlatans and other quacks, the people and even the nobility continued to place their confidence in the latter class of practitioner. I here give a short extract regarding this matter from the French translation of the Latin of de Mondeville's works, the manuscript of which is preserved in the National Library at Paris:

Toutevoies je me met pas hors du tout en tout ceux qui ne sont pas letrés (que ceste oeuvre profite) ou non. Je di que il est aucuns d'iceus, aussi comme ydiotes, simples et ignorans, et sont merveilleusement orgueilleus et despiteux en cuer, disans que il ont l'oeuvre de cyrurgie, malgre les clers cyrurgiens, de lor parens et de leur predecesseurs et de si lonc temps que il

n'en est memoire et dient que il ont d'oir en oir, aussi comme de heritage et de nature; et les croient les lais de ce que il dient, aussi conne parchonniers et compaignons de lor folie; et ensurquetout es jours d'ore les nobles et les princes les croient et par eulz tot le pueple, dont il avient mout de fois griès et maladies perilleuses et aucune fois mort; pour la quel chose a tieux orgueillous qui ne sont pas letrés et se dient cyrurgiens nostre devant dite doctrine ne soit de rien aidant ne a leur paciens, ne a ceux qui les croient, tout aussi comme Dieu ne secourt pas ceux qui l'ont en desdaing.

Or sont autres cyrurgiens, qui ne sont pas letrés qui ne sont pas rebelles et sont plus familiers et se duellent outre maniere que il n'ont conneu la science des letrés en l'art de cyrurgie et recognoissent bien que tel petit de science que il puent avoir aquis, que il l'ont eue des mires et des cyrurgiens letrés. A ceus nostre doctrine soit otroiee et soit profitable a lor salut tant pour eulz comme pour leur paciens en leur maladies; tout aussi comme Dieu ne deneieroit pas pardon a cil qui li requerroit humblement.

The state of surgical science was quite as miserable as its practice, and the Arabs and the Arabists were the principal sources of instruction. Experience was a thing then unknown and was replaced by syllogism to the extreme, and where observation should have come in play all that was done was to quote other writers. The subtilities of dialectic took the place of observation and the most unheard of reasonings explained the natural phenomena.

Surgery had, however, been raised out of this miserable condition in Italy, first by the School of Salerno, and then in the 13th century by that of Bologna. Such treatises on surgery from the pen of Brunus Longobardicus (1252), Theodoric de Lucques, Archbishop of Cervia (1265), Guillaume de Salicet (1275) and that of Lanfranc, of Milan (1296), all of the School of Bologna, served de Mondeville as models for his work, especially that of Theodoric for his treatise on wounds and ulcers and that of Lanfranc for the remainder.

In point of fact de Mondeville was not an original writer, nor was he one of these imitators which advance science. As he himself says in his preface he proposes to write his work on surgery in five treatises, the first of which taken from Avicenna comprised anatomy for the use of surgeons. The second treatise takes up wounds and ulcers after Theodoric; the three other treatises were borrowed from Lanfranc.

The third treatise comprised all diseases *a capite ad calcem*, excepting fractures and dislocations which were to form a fourth

treatise. This fourth treatise was never written by de Mondeville because death overtook him before he had even finished the third treatise. But before this he had had time to write the fifth treatise, called the Antidotarium, that is to say, a collection of medicines and remedies such as would be called in later years a surgical pharmacopeia. This division is about the same as that found in the preceding surgeries; among others the one by Lanfranc, and sixty years later Gui de Chauliac adopted no other.

The first two treatises on surgery by de Mondeville were in the first place published from 1306 to 1312, and they form, so to speak, the first edition; the first only differs from the later editions by a few unimportant corrections. This first edition is represented by three manuscripts, one of which is to be found at the National Library at Paris.

The second edition comprises all that de Mondeville had written of his surgery—namely, the first treatise is on anatomy, the second on wounds and ulcers, the third on special diseases, while the fifth, the antidotarium, is represented by four manuscripts, all of which are preserved at the National Library at Paris.

As this latter work of de Mondeville's is a very excellent specimen of its kind in those days, I will here give a literal translation of the second and third chapters of this work, which I believe to be the first ever produced in English. The second treats of the "Repercussiva," while the third deals with the "Resolutiva."

Chapter II.

This chapter is divided into three parts: (1) special preliminary remarks to introduce the student to the subject; (2) the medicines; (3) explanations.

(1) Avicenna in his Treatise on the Effects of the Different Medicines (Book 2, Section 1, Chapter IV.) says: The repercutive medicine acts in a directly opposite manner to that of an attracting medicine. It cools and densifies the member to which it is applied from its coldness, blunts its attracting heat, contracts its pores, hardens and densifies in one respect the humors which are flowing to the member so that they are not received into it, in the other respect it hardens and densifies the member itself, so that it prevents the humors from entering into the limb. This, for instance, is the effect of solatrum, and Serapio agrees on this point, saying in his Aggregationes, in the fourth sermon: On the

Division of the Effect of said Remedies, "the repercussiva must be cold, of a dense or styptic quality, in order that they may energetically repel." He says also, that besides that there are several kinds of repercussiva, the cold and moist, the non-styptic, the cold styptic, the tonifying, the densifying, the contracting, the expressive, and the opilative. The properties of the various repercussiva are described by Avicenna and Serapio, in the chapters referred to. The cold and moist repercussivum is designated in the above extract from the latter mentioned author, as "inspissative," in contrast to the "rarifying." It contracts the ducts and small pores, but not in every direction as due to these styptic repercussiva. The styptic forms contract the openings of the veins, they are earthy, dense, cold, and have an acrid, but not pungent taste; owing to their density they remain adherent on the outside and cannot penetrate within the contracted pores, and therefore are excluded from the depth of the tissues, but contract the structures by means of their coldness and densify and tonify them.

Serapio calls them impulsive, because they propel humors which they encounter into the interior of the body. The tonifying remedies have the property of toning up the composition and condition of the anatomical structures and modify them in such a manner that the limb will not receive the excessive affluent matter or injurious substance. Some of them effect this by the virtue of an inherent property, such as seal earth and theriac; others, like oil of rose, by virtue of their composition. The densifying remedies condense the humor which they encounter by hardening and densifying it. The contractiva contract the member and render it dense. The expressiva compress the member and thus expel the humors, just as the wine is pressed out of the grape by the press. The opilativa block up the pores and ducts in the member to which they are applied because of the siccative and coagulating properties they possess.

The attractiva act in a directly opposite manner from that of the repercussiva, and since this latter class of remedies have not as yet been treated, I will mention on account of their importance, that they by means of their heat and their subtle qualities attract the humors from the depth of the tissues to the point of application of the remedy. This quality proves to be of great use in ischias, after a purgative has been administered. In the same manner on account of their qualities the remedies remove thorns, arrows, etc., thus castoreum, for example, acts.

From what has here been stated it plainly emanates that all true repercussiva are cold, and it also emanates at the same time how and where they act, that is, only in hot materiæ, for a cold materia is never actually in the true meaning of the word repercussed (driven back), even if it is devoured and destroyed by those remedies which possess some heat, so that the hot remedies, because of that similarity are also called in a certain sense, but only because of a certain misnomer in the expression, repercussiva, which however does not correspond to facts and to the actual condition, therefore only the cold remedies are designated as actual and true repercussiva in contrast to the hot ones. The cold remedies only act against the circulating hot materiæ, and all flow of the humors from limb to limb.

The hot remedies are indicated when cold materia is circulating.

The cold repercussiva are of two kinds; one kind represents the repercussiva in the true and strict meaning of the word, the other in a less strict, wider and incorrect sense.

The former force the approaching materia from the outside inwardly and are appropriately prescribed where the amount and quality of the matter create danger rather than any sharp heat produced by the matter, as is the case with bloody materia, which the experienced surgeon will be able to diagnosticate by palpating with the hand, inspecting it with the eye, as well as from the history obtained from the patient. Now these remedies are in part moist and in part dry, but all of them are styptic in nature.

The second kind, those incorrectly termed repercussiva, are all moist, they never drive back within the tissues any matter which is being discharged outwardly, they merely cool and densify this matter which is flowing to the limb and the member itself, so that after a time no matter is absorbed. They are only indicated when the burning and intense heat are of more danger to the patient than the quantity of the matter present. Such for instance is the case when the matter is purely of bile.

(2) Of these two kinds of remedies, the true and the improperly called repercussiva, some are simple while others are compound. The true styptic repercussiva are the following: solatrum, crassula major et minor, portulao, virga pastoris, psilium, hyoscyamus, hedera, acedula, scariola, the water lily, plantago major et minor domestica et silvestris, the leaves and buds of the unripe fruit of the oak, pear tree, quince, ash, cherry, plum tree, the grape

vine, the wild rose, the willow, the poplar, the reed, the asp, rushes and similar things, barley, wheat, oats, lolium, sumach (an Arabian name for a kind of bark used for tanning), barberries blueberries, sour grapes, thorn apple, psidia balaustea, roses, anthera, Armenian clay, cacyimia (a late Latin expression for cadmia and other impure zinc oxydes), potter's clay, nerda ferri, coral, antimony, mandrake, verbena, hepatica, corrigiola, pepper, umbilicus Veneris, maidenhair, sempeviva, hypocisten-grass, bean juice, gratia dei, and also all juices, waters, and oils, as well as the substances themselves and all other extracts that can be made therefrom.

The simple hot repercussiva, as they are usually called, although incorrectly, are the following: spica nardi, absinth, cabbage leaves, fruits of the cypress, both kinds of hoarhound, fumitory, cimolith, white lead, seal earth, all kinds of putty, clay, acacia, and all juices, water, oils, flours or powders, that may be made from these substances and also to the whole substance itself, either alone or in combination with others.

Repercussiva in a wider sense of the word, not actually the genuine ones, but such as, with respect to the hot remedies, must still be designated under this term, are the following: atriplex, mercurialis, malve, violet, cold water, vinegar, radish, squash, cucumbers, the seed of the malve, the so-called four cold seeds, manopilium montanum, both kinds of lavender, myrrhs, incense, mastiche, alum, salt, sulphur, oil of rose, squinantum (a kind of perfumed rush), abrotanum, corn flour, both kinds of aristolochia, all simple bitter medicines which do not exceed the second degree of heat, again all such remedies that can be made separately or mixed from the above mentioned substances, such as oils, waters, juices, powders, flours, and the substances themselves.

Regarding the manner of forming compound remedies from the single ones, and as regards the method of their application, three general rules are here given for the three classes referred to.

(*a*) The surgeon takes from one or several juices of one, or several herbs, or of leaves, or of similar drugs, as above mentioned, and such as may be suitable for his purpose, and adds them to three parts of oil of roses or any similar oil, one part vinegar and one-half part of seal earth or clay, so that a mass having the consistency of honey is obtained.

(*b*) For all compound materia, such as may be composed of blood or other cold and warm humors, the surgeon should apply

compound local remedies in accordance to the composition of the materiæ, taking more of the above mentioned cold moist, repercussiva, when bile prevails, and in the same manner is he to proceed with the single materiæ of other types, such as the sanguinous, the phlegmatic, and others that may predominate in the composition, and if such materiæ be present in equal parts he is to prescribe the suitable repercussivum for each materia present.

(*c*) Before applying any local remedy, the surgeon should ascertain whether the materia upon which he proposes to operate is hot or cold, and if it be hot whether of a sanguinous or bilious composition, and if it be the former only styptic repercussiva, either alone or in combination, are to be used continually. When the surgeon is dealing with a bilious condition he should apply moist repercussiva which are devoid of styptic properties, either alone or in combination. If the matter is cold he is to apply simple or compound hot comforting repercussiva. In each of the above mentioned cases the above indicated remedies should be continually applied without confounding those which should be used in one case and those that are indicated in other conditions.

He (the surgeon) must never abandon the usual remedy until the desired effect is obtained unless this effect should be delayed beyond measure; then it is quite permissible or even advised to resort to one of several others (drugs) that have the same power and effect, while the condition of the patient remains the same.

The repercussiva which are composed of the above or similar simple drugs, are salves or quasi-salves, numbering twelve in all.

No. 1. Unguentum de fensivum commune, which has been often mentioned in the foregoing pages, is composed as follows:

Rp. Boli armenici unc. 1, olei ros. drachm 3, aceti drachm ½.

If there is fear of a general affection arising, or that it should increase in extent, such for example, as in erysipelas, then a half drachm of seal earth should be added to the above formula. This unguentum when spread around wounds will prevent the formation of acute abscess, erysipelas and hermes, and prevents the spread of general infection and aborts acute tumors wherever it may be applied.

No. 2 is for the same purpose, and is composed as follows:

Rp. Succorum solatri; sempervivæ ana lb. ½, boli unc, 1, ol. ros. unc. 1, aceti unc. ½, are to be mixed together.

No. 3. The same uses. Rp. Sandali albi, spovii acaciæ, ana drachm 2, camphoræ drachm 1, opii drachm ½, mix with the juice of any suitable herb and white violets, and a little vinegar.

No. 4. Sandali rubei unc. 1, camphoræ drachms 2, solatri, sempervivæ, ana a handful; rub up and mix with two ounces of oil of roses and one drachm of rose water. This unguentum checks all flow of the heating materiæ, and also contributes to the protection of the heart against all poisonous matter.

But all the above local remedies and other similar ones, must be smeared around the site of the affection and not upon it, until a phlebotomy has been done, or until some other evacuation has been made, except in such cases where the last mentioned plaster is to be directly applied to the heart in order to protect this organ from the poisonous matter.

No. 5. Warm bran with strong vinegar.

No. 6. An ointment made of white wax and oil of roses, Galen's cerate, will warm the lower temperature and cools overheated matter, (or regions?), it never harms and usually does much good. If it be dissolved and frequently spread on cold water or snow, it will then repercute the bilious matter most excellently. This ointment is prescribed by Galen (IX. de ingenio, Chap. V.), where he discusses the cure of priapism.

The following preparations are valuable, especially for pains in the joints.

No. 7. Starch and camphor in equal parts are pounded together and mixed with rose water, and then applied.

No. 8. White bread crumbs unc. 1, opii unc. ½, mixed with cow's milk.

No. 9. Ol. ros. unc. 1, ceræ unc. ½, to be melted and washed in rose water, then add croci drachm 1, opii drachms ½.

No. 10. Apply lana succida soaked in plain lukewarm vinegar.

No. 11. Lana succida moistened with vinegar to which has been added a decoction of red roses.

No. 12. Flour mixed with the juice of solatrum and a little vinegar.

(3) In this section are given the explanations of which there are five.

(1) Do not be amazed that I have given so many remedies for a single purpose, for as has been seen the same medicine does not help in each and every example of the same disease; besides, all these remedies are not to be found everywhere, and

if they are to be obtained they cannot be procured in all seasons, and even if they are found everywhere and in every season, the poor are unable to purchase the more expensive ones.

(2) If the surgeon repercusses in such matter for a considerable length of time, until the region commences to take on a dark discoloration, he must avoid continuing the use of the purely cooling remedies, and he should add some resolutiva or compound local remedies from the juice of solatrum, coriander and cabbage, mixed with barley, bean or other flour.

(3) If an abscess be not repercussed, nor commences to take on a pale blue color, nor is absorbed, but remains the same, becoming neither larger nor smaller, and if the heat and burning present in the diseased structures decreases in intensity, then the surgeon should add resolutiva to the repercussiva, diminishing the latter continually until he does away with them altogether, using only the resolutiva. And although the latter are now applied for the continued treatment of the abscess, they are not to be applied to the abscess itself, but the surgeon is to spread them around the abscess, more especially at that part through which the humors are conducted from the body to the diseased spot.

(4) The most generally accepted opinion is that no abscess can be repercussed or dissolved, and that it is better if it is drawn out and made to suppurate in order that nature may by its means purge the body of the deleterious humors. If, however, the surgeon endeavors to increase the growth and the suppuration, then some say that he does it for malice. If, on the other hand, he repercusses the materia in a rational way and prevents the formation of an abscess, and if after some time the patient should be ill with some other malady, others, or perchance the same people, will accuse the surgeon because he drove away the abscess for personal motives. What is the surgeon to do since he cannot escape criticism, since there is no middle way to be found and since for all that he must act nolens volens? One may say the surgeon should leave the choice to the patient and then proceed to act. If, however, the patient does not select and forces the surgeon to choose, then he must do so, and if he can prevent the formation of pus according to the existing rules, he is to follow what has been explained in Notabel, Chap. III., doctrine 1, treatise 1, having for title the treatment of head injuries and of fractures of the skull, that is, in that part having the following title: "Which is the Better and Most Healthy

Treatment of Wounds, and Similar Injuries, that, Where as far as is Possible the Formation of Pus is Prevented, or that where it is Fostered?"

(5) Now as opium and other narcotics and stupefactives enter into the composition of certain repercussiva, it should be noted that all of these remedies cool on account of their styptic property, whether given internally or applied externally. If they are given internally, in small quantity and diluted by combining with other remedies, they quiet and narcotise, by blunting the sensibility. But when they are applied in large quantities and undiluted, they have a lethal effect and produce the same symptoms on the member to which they are applied in excess. If given in small amounts they only dull its sensibility, they destroy the composition of the member if given in large quantities and thus actually stop the pain, as it is said that the pain is stopped for good in a dead person, since he no longer feels it. Such remedies are opium, mandrake, solatrum, all kinds of henbane, except the white, and all kinds of poppy except the white one. The action of these remedies is more pronounced if they are dry, and amongst the dry ones the following are the most effective: the bark and root of mandrake, the seed of henbane, and of the white and not of the black kinds of poppy. We must warn our disciples against the strong narcotics, and they must be used in small doses and are to be proscribed if death threatens.

Chapter III.

Resolutiva and the Manner of Using Them.

Like the previous chapter this one is also divided into three divisions:

The first part has two subdivisions:

(1) Avicenna in Canon II., Div. I., Chapter 4, and Serapio in his Aggregetiones, sermon 4, de divisione duarum medicinarum, both say: The resolutiva distribute humors, convert them into vapor and gradually draw them from the depths of the tissues, until by their continued application all humor has been withdrawn. They must be dry, distributing, opening and not drying; hot, in order that they may draw the distributed humor from the member; distributive, in order that they may distribute the substance of the humor which we seek to dissolve; opening in order that they may open the pores of the skin sufficiently and can dilate them so that the dissolved materia

may make its exit; nonciccative, so that they do not absorb the moisture by their dispelling and drying qualities, which softens the entire materia which is to be resorbed. In the chapters of Avicenna and Serapio, it will be seen what constitutes a warming, distributive, opening and drying medicine.

(2) When treating an abscess we must, shall and can, if proceeding correctly, apply resolutiva in two cases: firstly, when we do not dare to repercuss, as in this case, we are confronted with one of the nineteen cases mentioned in another rule of the chapter on generalities; secondly, when we try to repercuss and are unsuccessful, because the body is full and cannot absorb anything or because the materia does not obey. Here, also, resolutiva are contraindicated (provided, of course, that the abscess is produced by some internal cause), unless before a proper purge has been administered. This we have already demonstrated in the chapter dealing with the general treatment of abscess. The resolutiva agree with the maturativa in two points, and they deviate from them in one point, at least for the time being. Firstly, they resemble each other in that they relieve pain; and, secondly, in that they sometimes can be substituted one for the other; for example, when a resolutivum is applied to such a large quantity of materia that the pores are inadequate for the exit of the matter, then the resolutivum has a maturing effect at the same time. If, on the other hand, a maturing remedy is applied to a subtle quantity of matter, it dissolves it. Thus, it frequently happens that one and the same remedy, like the plaster of common juice, sometimes matures, sometimes loosens up the process. The difference between these remedies consists in that the resolutiva will produce an opening in hot materia, and the maturativa with their hot quality will block up. From what has been said two facts are obtained: (1) the resolutivum is capable of dissolving the subtlety of any materia, and densifies its residuum; (2) it is capable of dissolving the subtlety in the abscess and of maturing the dense part.

II. The resolutiva are either simple or compound.

The simple ones are as follows: camomile, which alone is of any value, since it does not attract more than it dissolves, honey clover, paritaria, the white or forest malva, fumatory, anetum, cabbage, the nettle, enula, borrage, buglossa, sambucus, ebulus, valerian, the seeds of cabbage, anetum, nettle, malva, parsley, apium, fennel, furfur hordei, fabæ, (fabarum?), cicer (?),

orobus, (bran of barley, beans, peas, forest pea), thick bread crumbs, the fat of the goose, duck, fowl and pig, all kinds of marrow, mastix, incense, myrrhs, gum ammoniac, separium, galbanum, apoponax, and all kinds of fine gum, lapdanum, ysopus humida, turpentine, wax, the sediment of wax, butter and similar substances.

The composite resolutiva made from the above and similar drugs are oils, unguentums, plasters, poultices, pastes and ferments.

There are six oils: (1) a mixture of equal parts of anetum oil and the common ripe oil; (2) oil of camomile (from the blossoms), with common ripe oil; (3) oil of costos root, composed as follows: rp. costi unc., 1; pepper, pyrethri, euphorbii ana unc., 1-3; castor oil unc., 1, must be pounded together, passed through a sieve and dissolved in ½ pound of either lily or spicanard oil; it dissolves the cold humor and tensifies the nerves; (4) oil of the large camomile: rp. freshly dried camomile blossoms, buckthorn, linseed ana unc., 2, are placed in a glass jar containing 20 ounces of ripe oil. The oil may be allowed to stand in the sun or near a fire, in a well, or in a pot placed under the earth; it dissolves, warms, and relieves cold pain; (5) oil of lily, compounded as follows: rp. oil unc., 2; lily blossoms, without the lower saffron yellow colored parts, No. 30, cassia, radix costi, mastix, balm of Mecca, saffron, ana unc., 1; cloves, cinnamon, ana unc., ½, are all pounded together and placed in a glass jar in a shady place, excepting the lilies which are put separately in a little sack and which is hung into the mixture and then removed after a month, so that they shall not spoil and thus spoil all the oil. When warmed this oil warms, stops the cold pain, especially of the kidneys and uterus, and has no irritating effect; (6) oil of mastix: rp. moderately ripe olive oil unc., 3; mastix drachm, 6; to be boiled in a very large receptacle until the mastix is dissolved. This remedy has a marked dissolving effect and is excellent in cases of abscess in the neighborhood of the stomach, liver or spleen, relieves the pain and prevents fits, especially arising from the cold materia.

Ointments can be made from any one of the above mentioned oils by mixing them with the aforesaid powders and with wax, observing the quantities alluded to. We will here give five of them: (1) rp. oil of camomile unc., 3; wax unc., ½; buck's horn in powder, linseed ana unc., ½; are boiled and passed through a sieve; this dissolves and matures without

attraction; (2) rp. oil of lilies unc., 3; wax unc., ½; seed of malva ana unc., ½, are mixed—dissolves like the preceding formula and matures hot materiæ; (3) rp. bdellium, sagapegum ana unc., ½; turpentine unc., 2, dissolve in vinegar until a saturated solution is obtained, then mix with turpentine, after a solution is obtained add two ounces of oil of lilies and pass through a sieve—absorbs cold abscesses; (4) rp. oil of camomile or anetum, drachms 6; wax, drachms 2; fat of the duck and fowl ana, drachms 2; seed of anetum and camomile flowers ana, drachms 2,—the same process as above. (5) This is neither an ointment, properly speaking, nor a plaster, but is between the two and is termed moist ysop. Rp. fat wool, such as is found between the ribs and mammæ of sheep, over this rain water in desired amount is poured, so that it completely covers the wool and is allowed to stand twenty-four hours. It is then boiled over a moderate fire, cooled and passed through a sieve, then it is again boiled over a moderate fire in a metal vessel, being stirred with a wooden spoon until it becomes thick. This absorbs and softens like an ointment and can be used like an oil for making resolutive salves, plasters and any kind of resolutive preparations.

We have three resolutive plasters: (1) the diachylon plaster of Rhazes: rp. ripe oil unc., 5; litharge finely powdered unc., 1; buck's horn and linseed ana unc., 2; marshmallow unc., 1. Same preparation as given before. But if it is to be employed for dissolving scrofula, 1 ounce of dried powdered violet root should be added; but it will not dissolve scrofulous cysts and similar things; carbuncles are matured with the addition of the violet root; (2) lead plaster, according to Mesue: rp. pounded and sifted litharge unc., 12; oil of camomile, oil of anetum, and oil of violet root ana unc., 8; mucilage of marshmallow, powdered buck's horn, linseed, dried greasy figs, stoned grapes, juice of the violet root and squill, moist ysop, fish glue ana unc., 12; turpentine unc., 3; white resin, yellow wax ana unc., 2. These are boiled until a consistency between ointment and plaster is obtained. This ointment dissolves cold materia and softens a hard one; (3) common lead plaster, as described in the Antidotarius of Nicolaus: rp. old oil unc., 4; spumæ argenti unc., 36; malva and marshmallow root, buck's horn, linseed ana unc., 12, until a mucilaginous decoction is obtained, put one ounce on plaster. Regarding the manner of compounding this, we have already spoken of it in the introduction to this

Antidotarium. The plaster is used for boils and for dissolution of small hot abscesses, when it is indicated to dissolve the matter. In the other case it digests, draws out, cleanses, regenerates, heals and has a good effect in curing from the beginning. In large hot abscesses its effect is favorable if in spite of the opening (incision?) they do not become healthy, and where the apostematic dyscrasia still remains. It is also indicated in cold abscess; it must therefore be removed twice daily and dried by means of wiping; after being dried it is freshened up by friction with the thumb and then the ointment is replaced. It has a similar efficaciousness in pains and chronic swellings of the joints, and in pains of the intestine; dissolved in oil of mastix and placed on cut nerves, which are contracted by plethora; it is also applied to wounds of bad blooded patients.

We have four poultices: (1) rp. camomile flowers, seed of anetum unc., 2; powdered buck's horn, linseed and barley seed ana unc., 8; oil of camomile and anetum ana unc., 1, are to be boiled in a sufficient quantity of water and then pounded together and applied after repercussion and discharges. It absorbs abscesses and hot humors, and prepares hot abscesses for maturing; (2) rp. forest malva, cabbage leaves, camomile flowers ana, part 1, or one handful of each are boiled with the water and pounded in boiled water, and then add anetum or cabbage seed ana, part 1, powdered sulphur, parts 2; (3) rp. fennel, anis seed, anetum seed ana unc., 2; lupine, powdered buck's horn and linseed ana unc., 3; oil of lilies unc., 1, to be boiled in water, then pounded and afterwards add a little oil or vinegar; (4) our poultice or plaster of malva seed, as already described in Chapter II., Doctrine 2, Tract 2, in the seventh section of said chapter, which treats of the prevention and treatment of hot abscess, in the fifth introductory Notabel, in which we have also discussed its numerous well-confirmed excellent properties.

Paste poultices which the older surgeons used as resolutiva of hot wounds appear to me rather more relieving remedies in cases which call for suppuration (and the ancients liked these especially), are made of four parts of water to which is added a sufficient quantity of flour. After this is mixed, one part oil is added and then the whole is boiled to the consistency of a soft paste and applied lukewarm.

Fomentations are made from the decoctions of the above simple remedies. They must always be applied immediately

before the application of the above mentioned compound local remedies.

III. Explanations, of which there are four: (1) if simple medicines are boiled for resolution, one part of the hot decoction is to be laid aside and therewith poultice the affected part until it begins to redden and swell, then the proper local remedies are at once applied; (2) if during the process of resolution the subtle (matter) absorbs itself from materia and if the residuum hardens, then maturing remedies are combined with the loosening ones, and they are alternatively applied until the desired condition is obtained. Maturing remedies, as much as is necessary, are considered later (3) if in the process of resolution all is not loosened, what one proposes to have loosened, and if the materia [on the contrary, appears to be thick and gluey, therewith appearing to proceed towards maturing, then the maturing should be favored by local remedies which we have yet to consider, because the surgeon must always imitate nature, which later will always correctly operate; (4) the local resolutiva, maturativa, and mundificativa must not be of hard consistency, so that they will not injure the affected parts by their harshness, and will not, owing to the violence of the pain, attract the humors from some other part.

As these two chapters are taken from de Mondeville's treatise on drugs used in the treatment of wounds and abscesses, I think it will not be without interest to consider somewhat at length the rules he has laid down for the treatment of the latter process, which was called in those days an apostasis and simply means an accumulation of pus. The physicians of antiquity and the middles ages did not include in this conception an accumulation of pus as such, but, as is evident from the etymology, it means in a wider sense the conception of extension, an increase in height, that is, rising above the level from the surface of the body. A swelling, which under certain conditions, especially resulting from an external or internal inflammatory process, they called apostema.

The ancient writers assumed that the "*vix medicatrix naturæ*" endeavors to provide an outlet for the so-called "*materia peccans*" contained within the body and by this means endeavored to eliminate it. The formation of pus was in their way of thinking a matter of secondary consideration only, while, on the other hand, the therapeutical measures employed

by them show that they were not convinced of the absolute necessity of the formation of pus.

Various repelling remedies, the so-called repercussiva, to which I have already alluded in the translation above given, were employed by the older surgeons for the purpose of preventing the formation of pus.

The works of Hippocrates refer in innumerable places to the words apostasis and apostema, usually in the sense in which at the present time the word apostate is used in its primary sense, that is, as a transition or a termination of one disease into another. "*Οἱ δὲ διαφεύγοντες φθάνουσι μετ' ἀποστήματος*" qui vero effugiunt aut cum abscessu aut . . . effugiunt. (Those who recover in certain severe epidemic diseases, or from severe fevers, are cured by the formation of an apostema.) Thus, for example, it is stated in the twelfth chapter of the well known treatise on the manner of living in acute diseases, by the immortal father of medicine.

In the expression *εἰς ἄρθρα ἀφίστασθαι*, which literally means "to throw itself on the articulations," is to be found in the works of Hippocrates, the original meaning I take it is as a critical phenomenon in general, and this meaning was attributed to the word as is most plainly shown if the text is carefully read. Each termination of a disease, no matter whether *δι' ἐκκρισιν* (by elimination), or *κατ' ἀπόθεσιν* (by deposit of sediment), is called apostasis, as has been pointed out by Galen in his well known commentary to the sixth book on epidemics by Hippocrates. In another part of his commentaries on the epidemics of Hippocrates, Galen confirms that the physician of Cos designated the transitions, the so-called metastases, as "*ἀποστάσεις*". According to him they could arise either by the veins, arteries, the abdomen, in the skin, bones, the medulla, or to other "*ἐκρυάς*", that is to say, outlets, to the mouth, ears, nose and genital organs including the uterus.

Galen derives the word apostema directly from "*ἀφίστημι*" in his two books on Therapeutics which were dedicated to Glaukon, and explains the designation particularly: "*ὅτι ἀλλήλων ἀφίστανται τὰ πρότερον ἀλλήλων ψαύοντα*," because by the formation of the apostema that which formerly touched had now become separated.

In the works of Paulus, of Aegina, the renowned physician of the Byzantinian period, whose principal work attained such

a large reputation, especially for surgery, the word apostasis is strictly confined to the process of suppuration. At the commencement of the 65th chapter of the 3rd book at which abscess of the vulva is discussed, the following passage occurs: "*τῆς φλεγμονῆς εἰς ἀπόστασιν μεταβαλλομένης*, etc., that is to say, when inflammation transforms into suppuration, the symptoms described increase in intensity while irregular elevations of the temperature accompanied with chills, set in.[1]

It is not to be a matter of surprise that in the later authors of the middle ages the expressions apostema and abscessus are used merely in the wider meaning of "exitura," meaning simply the termination of an affection with a tumor-like formation on the surface of the body. This is especially evident in the writings of Avicenna, who as is well known has supplied us with a clue for the understanding of the medieval medical literature. One of the passages in the famous Canon is as follows: "Eminentiæ enim sunt apostemata parua, sicut apostemata sunt eminentiæ magnæ. Et in apostemate enim omnia ægritudinum genera reperiuntur. In eo namque reperitur ægritudo malitiæ complexionis . . . . Et invenitur in ipso ægritudo communis, quæ est continuitatis solutio. Nullum enim accidit apostema nisi procul dubiò continuitas soluatur; propterea, quod effunduntur materiae superfluæ ad membrum aposteatum et inter partes penetrant ipsius, et separationem inter unas faciunt et alias, etc." So speaks Avicenna, and how important the doctrine of abscess formation and the treatment of abscess in general was to the medieval surgeon, is most plainly evident from the fact that Guy de Chauliac in his Chiururgia magna places his chapter on abscess immediately after his treatise of anatomy. The following is a free translation into English of what de Mondeville has written on abscess, and in what I have here given the reader will be able to glean an insight into the conception that the medieval physicians had formed of abscess formation, and especially on the general principles for their treatment. Taking it all together, de Mondeville has given us a résumé of the teachings of his predecessors commencing with Avicenna and the representatives of School of Salerno, and this section of de Mondeville's treatise is an excellent basis for the formation of a historical appreciation of the work, because later surgeons as, for example, de Chauliac, make no additions

1. For these explanations I am indebted to the monograph of Dr. Max Neuhaus, Berlin, 1897.

or innovations on this subject, and we here insert the English version of his teachings.

Chapter II. Doctrine II. Treatise III.

On the ordinary treatment of abscess, in which will not be discussed the special forms of abscess, or the materia from which they originate, excepting when quoting examples.

We have three general points to be considered: (1) the recognition, (2) the treatment, (3) the explanation.

1. *Definition.*—An abscess is a swelling or thickening in a member when this increases its natural size, although barber surgeons and laymen, who are all ignorant, do not believe that this is an abscess when there is no suppuration, or where no suppuration appears to come of necessity, and when the swelling is not great. This, however, is in contradiction to Avicenna (Chapter II., on Complicated Diseases), who says that small protrusions are small abscesses, while large ones are large abscesses.

Division—Abscesses originate from the humors of the body, from the water and from the gas. Abscesses arising from the fluids of the body originate in the blood or bile, in the mucus, or the atribile. These humoral abscesses may also originate from an over abundance of bad qualities of the natural humors. Consequently, abscesses originating from natural or unnatural humors may be composed of a single humor without the admixture of another, as, for example, pure blood. Or, they may be composed of several humors mixed together, as, for example, blood with bile or mucus. They may also be produced by certain internal causes, such as an abundance or bad condition of the humors, or by some external cause, such as a fall or a blow, or by both causes combined. In other cases the abscess is due to an occlusion, others by derivation, while still others arise from a combination of both these causes. Some project considerably, others not at all. Some protrude in part, while the remainder does not. They may originate in very important organs, in their neighborhood or at some distance from them. Then again, in the fleshy parts, in a body in the best of health or in one in bad condition, in strong bodies as well as in delicate ones.

Causes.—In order not to lose one's self in the intricacies of the unknown it is necessary to learn how each abscess has originated, whether by obstruction, derivation or in any other man-

ner. Thus it may be said that an abscess originating at any part of the body on account of an excessive alimentation of that part, inasmuch as for some reason the nutritive substances cannot be transformed into the tissues of that part, has originated from an obstruction, that is to say, an accumulation, and in no other manner. The causes of obstruction are an excess or bad condition of the nourishment flowing to the part, and a weakness of the digestive or expelling power of the member itself. An abscess in any part of the body which does not thus originate in this fashion, but arises from substances which have been transferred to it from some other member of the body, and to which said member cannot resist for one or several reasons, is said to have originated by derivation, that is to say, by deposit.

Adjuvant causes are weakness in the receiving member, strength of the repelling member, deeper location of one or the other, the quantity or bad condition of the transmitted substances, the caliber of the veins leading to the receiving part, or small caliber of the veins leading from it, patentcy of the receiving parts and of the glands.

There are still other causes, all of which coöperate in the formation of abscesses, but which are not necessary to enumerate here, as they have already been considered when speaking of the cause of ulcers, in Chapter I., Doctrine II., Treatise II. The recognition of abscess is greatly helped by the knowledge of their manner of originating, as will be shown in the Explanations.

Symptoms.—Regarding the symptoms of abscess in general, Avicenna says that the senses, that is to say, both sight and touch, demonstrate those abscesses that are visible, and he immediately adds that it is very difficult to enumerate all the signs of abscesses, and even were it as easy it would require lengthy explanations; therefore, it is better that the discussion of these symptoms should be deferred until the question of special abscesses is taken up. As an additional reason for this we may say that since abscesses in general do not offer any symptoms but those found in individual cases, as in phlegmon, erysipelas, and the like, the symptoms of abscesses in general in no way differ from what will be shown in the specific cases which are to follow. From what has been said certain positive symptoms may be gleaned by means of which, when we meet with an abscess, it can be diagnosticated by the experienced eye and touch.

The above mentioned definition in its single parts, the divi-

sion with its variations, the causes enumerated, as well as innumerable others, along with the symptoms referred to to which others should be added, must be observed by the physician if he desires to successfully treat abscesses, because whether any specific condition, or two or more, are found present in a given case of abscess, or if they are wanting, it is necessary to proceed in some way or other, and this is characteristic for the entire general doctrine of abscesses and similar affections.

There are three kinds of general treatment—namely: (1) the preventive, (2) the curative, (3) the paliative. The preventive treatment, both in its application and indications has already been alluded to in the preface to Doctrine II., Treatise II. Prophylaxis is a triple one according to the various periods of the disease to which it is applied: (1) the treatment of an abscess that is not yet formed, but which will be if not prevented from so doing; (2) the prevention where an abscess already exists, and will become larger if not prevented, and (3) the prevention in case a large abscess should suppurate.

The first of these is effected by four factors—namely, by the necessary control of the six unnatural things (aer, esca, quies, repletio, gaudia, somnus), by abstinence, such as the experienced physician knows how to prescribe against the cause of the disease, by medical and surgical evacuation carried out at the proper time and place.

The doctrine and prescribing of these evacuations are given in Doctrine I., Section 2, in the fifth part of the principal Chapter I., which deals with the manner of evacuating and the potions for the wounded, and also in the Explanations of the section referred to; and also by protection against contusions and similar external injuries. But this preventive treatment must not be obtained by evacuations brought about by derivation, because it is impossible to know from which spot they are to be diverted. For there is no doubt that if a body is kept in a proper condition of health no abscess will ever arise in it.

Prevention is obtained by means of three things, namely—a proper diet and evacuation, which is spoken of in Doctrine I., and if all is not said about it there, it remains for the physician to supplement it; and it may be that a local treatment will produce certain results aside from those obtained by the special ones.

Local treatments are of three different kinds: protective measures of the diseased spot, repercussion above the abscess

(only in places and cases where repercussion can be borne by the patient, such cases being described in the chapters treating this matter); the application to the abscess of dissolving remedies, which are sometimes applied alone and in others in conjunction with repercussiva.

Thirdly, preventive treatment is effected in the case of a large or fully developed abscess, in order that it may not suppurate by three things—namely, good living, evacuations as above indicated, local dissolvent, and other measures, as will be described later when considering special cases. The various local treatments will be discussed in the Doctrine devoted to antidotes.

Galen formulates rules regarding that prevention in the 10th Book of the Megategni Chapter, which begins "nunc auten conderdentum, etc.," as well as Hali in his commentaries on the Microtegni, where he calls the preventive cause the preventive treatment to which the surgeon may have recourse.

In regard to the curative treatment there are eighteen general rules:

1. Each abscess arising from an internal cause has its source in a superabundance of or a decomposition of humors, or in gas or water or in both, or in several other things mentioned. In abscess arising from an external cause they are sometimes occasioned by and sometimes without those causes.

2. Every abscess is either repelled, hardened, or suppurates, and then follows the termination of which Avicenna says in speaking of acute abscess, that no abscess may be considered as nearing its end so long as pus is formed in it.

3. If an abscess can be healed by an operation without causing suppuration, it should be done, because in all cases where pus forms in large quantities fever and other dangers naturally ensue.

4. The condition of the abscess should be carefully observed by the surgeon, for his aim should be to bring about a cure without suppuration, whether the abscess is derived from external or internal causes, so that if an internal cause be connected with an excessive amount of humor and great danger involved, the treatment should begin with an evacuation. If, on the other hand, decomposed humors are present, and if the abscess be small, a rectification is sufficient. Not every unfavorable condition of the entire economy can be cured by its contrary, that is, by evacuation, for occasionally a restrictive diet is suffi-

cient where there is plenitude, which means that the patient is fleshy and his organism in bad condition. Care must be taken not to apply local remedies in those cases where an evacuation is indicated before this can be done with propriety, because this repercussivum would not repel, and therefore would have no action on the matter. For this reason Galen says: "If we wish to collect that which is bubbling, it would not be absorbed by the full body; it happens on the contrary that if repercussiva are applied, even if for a time pain should be relieved, they nevertheless harden the abscess so that in the end the patient will be a greater sufferer." The same mistake is made in applying dissolvent remedies, because, according to Galen, with the exception of chamomile, every dissolvent attracts more than it dissolves. He also says in II. Metategni, Chapter III., "si auten e contrario, etc." Each dissolvent is warm, everything warm attracts except when moderate.

In a like manner if an irritative is applied it will at some time or other attract fine matter by means of its warmth, which is already on the point of liquidating, and will also increase the pain and produce an enormous abscess. With regard to purgatives, something has already been said in Chapter III., Doctrine I., Treatise II. The remainder, which is sufficient for the experienced surgeon, will be found in Doctrine III.

5. An abscess of large size occurring in a full habit is treated by the four following rules, namely: (1) general purging; (2) local purging; (3) local repercussion and local protection; (4) by solution when repelling is not sufficient. This Galen says, in the chapter above quoted, when he speaks both as physician and surgeon, adding: "If what we have mentioned is not sufficient, one must resort to ripening, but this holds good immediately after the first rules given, as is explained in the above mentioned second rule—namely, that the ripened abscess should be opened."

6. In the case of a plethoric patient no severe evacuation should be given, nor should any incision be made in the diseased part excepting to give exit to the pus, because one should not evacuate, since owing to the pain of evacuation more matter will be drawn to the spot (according to Galen); therefore it results that if an abscess forms in the anus no evacuation should be allowed by means of laxatives in a plethoric patient, but should be obtained by vomiting, and if an abscess occurs over the umbilicus, the evacuation should be produced by laxatives.

It thus results that under no circumstances should hot local remedies be applied, because they attract more matter from other parts. Averrhoes, however, corrects this rule in the 7th Book of his "Colliget" as follows: "When the principal bulk of an abscess has been compensated, evacuation may be made through the affected part.

7. When an abscess is commencing in a plethoric patient, the surgeon should generally begin treatment by means of a derivation, according to the rules of medicine, after purging has been produced, and in the commencement in a nonplethoric patient where no purgative has been used, by means of repercussiva, excepting in those cases where either before or after the purging, even in a nonplethoric patient, a repercussive remedy is not indicated: (*a*) where the matter is thick or solid, so that the surgeon cannot repel it even where he should and ought to do so, because the matter is not suitable for this and on the contrary becomes more solid when an attempt is made to repel it; (*b*) those cases where the matter is cold, because it would not obey; (*c*) if it can be done by blocking it off, because it is better that such matter should be discharged by the member in which it is collected than by another, which nature always ascertains; (*d*) where there is a superabundance of matter, because in this case it cannot be repelled; (*e*) in a pregnant woman, because it is to be feared that the repercussivum might injure the fetus; (*f*) when a vital part is affected, because it is better for the matter to be drawn out through a nonvital part; (*g*) if suppuration is deeply seated, as for example, in the hip; (*h*) if the patient has a critical abscess, because it might kill him; (*i*) when the patient is on the way to recovery, because the pus of such an abscess represents the remainder of the former disease, which the organism expels because it is strengthened and its functions are normally carried out; (*j*) if it is in an emunctorium, because, as has been shown by all writers, no repelling but an energetic expelling method is indicated, and if necessary by gas producing means, as will be shown later; (*k*) in a youthful individual, because owing to the weak condition no repulsion will take place; (*l*) in an aged person, for the same reason; (*m*) in the neighborhood of a vital part, because if it is repelled some danger might be created for the part involved; (*n*) if the matter be hard, because it cannot be repelled and would become still more dense; (*o*) if the matter be of a virulent kind, because there will then be danger that it would be carried

to the vital parts; (*p*) if the matter be poisonous, for the same reason; (*q*) if the pus is deposited in a joint, because in this case the repelled matter might enter the cavity of the joint, destroying the nerves and ligaments; (*r*) if the abscess is near the anus, because repelling causes it to be fistulous; (*s*) if it has been produced by some external cause, because it is better that the decomposed pus should be withdrawn through the skin of the injured part than that it should escape inwardly.

These nineteen rules are laid down in the well known Salernitanian rule: "Thickness, cold, obstruction, fulness, pregnancy, importance of the part of the body, subsequent crisis, convalescence, secretion, youth, age, neighborhood of a vital part, density, poison, seated in the joints and anus, external causes. In these cases thou shalt not repel neither prior to nor after purging, but in the other cases thou shalt repel after thou hast purged the full body, or not have purged the weakened body."

8. An abscess due to an external cause in a well preserved body does not require to be opened nor to have local protection; on the contrary it is sufficient to repel and strengthen the part by means of local remedies. Avicenna says, however, regarding the treatment of abscess, that dissolvent and softening remedies are to be applied in the beginning, but if the habit be plethoric an evacuation should precede and also other measures are to precede, which will be mentioned further on.

9. In cases of acute abscess cold applications should be made after purgation, because contrasts are cured by contrasts. Thus Galen says: "Therefore the repercussiva for acute abscess are pure styptica, dry and cold remedies, such as chimolea and similar ones, and the repercussiva for cold abscesses, if I may term them such, are to be composed of this and other warm subtle dissolving remedies, or simple remedies which are both styptic and dissolving in their quality, such as absinth and schoeanthus." Thus also does Avicenna speak on the treatment of abscesses.

10. A part of the seat of an abscess must not be moved violently nor should it be allowed to hang down. Thus if the foot be the seat of the trouble, the patient should neither walk nor stand. If the hand is involved, it should be suspended from the neck and not allowed to hang down. (Galen, de ingenio, V., Chap. IV.)

11. A member which has solid pus deeply seated, or which is covered by a thick skin, or both, requires stronger remedies

than where the opposite conditions prevail, as for instance, in the foot or nipple.

12. An evacuation should never be made below the abscess, that is, so that the abscess is situated between the chest and the part through which the exit is made. Thus, in the case of an abscess of the tibia, the evacuation must not be effected through the foot, no matter what may be the stage of the disease, be it that the humors of the abscess are really discharged by means of the said evacution; be it that such is not the case, from the entire body or from the member involved, or from both, several humors will be withdrawn which otherwise would follow the current of the evacuation towards the abscess, and these will remain in the abscess after evacuation has ceased, will enlarge it and will in the course of time become decomposed by remaining within it.

13. If an abscess is in its early stage or is growing, or if it is seated in a member very remote from the chest, such as the hand or foot, the opposite member must be violently used or it must be tied and balasted by a stone. Thus speaks Avicenna, Chap. XXV., on the treatment of abscess. For in this manner the abscess is compensated or destroyed, or at least reduced in size, because by means of such methods the flowing humor is withdrawn from a commencing abscess.

14. If an abscess commences in an emunctory, the matter should be drawn towards it thoroughly, by means of dry cupping if not possible with other means.

15. If an abscess whose complete maturity has been awaited becomes completely ripe, the symptoms of this being a decrease of the fever, redness, pulsation and pain, improvement in sleep, etc., then if it does not spontaneously open it should be incised with the knife, but observing the rules and cautions which have or are to be mentioned, and also taking into account the condition of the abscess, the quantity and nature of the matter, as well as the localisation of the abscess, for instance, near the anus or the head, etc., as well as observing the patient's condition, that is to say, whether he is a hardy peasant, or a weak inhabitant of a city, whether he is an old man or a boy, whether he is strong or weak; and also the influences of the heavens, for instance, whether the moon be free in the sky or covered, whether the moon is on the decline or has gone down, whether it is not at the end of the scales or in the beginning of the scorpion, or not in any sign, which designates the number

that is to be operated on. Such signs can be recognised by the astronomer and can also be found in the planet almanac, or in the small astronomical treatise entitled "Circa instans."

The incision must be made for two reasons: firstly, because pus burrows too much; and secondly, because if we await a spontaneous opening a circular ulcer results, which heals in some cases with difficulty, while when an incision is made a longitudinal ulcer is created.

16. In cases of abscesses which have already opened, no softening or moistening remedies are to be applied, but drying ones should be used which are appropriate for the ulcer, because we should now be more preoccupied for the cure of the ulcer than for the abscess, because the former has been added, and is more important than the latter lesion.

17. No abscess should be opened before it has sufficiently ripened excepting in six cases. The symptoms of ripening are various, according to the variety of the pus, as will be seen in the special cases. The reason for this rule is that a ripe part, which is extracted, helps another in maturation; another reason is that if an unripe abscess is opened the pain is more violent, and pain destroys the power of resistance and increases the supply of humors. The first of the six cases to be excepted is the following: if the pus is about to damage the member, or has undergone coction, because then it is better to open an unripe abscess than to lose the limb; secondly, if the abscess is situated near some vital part, in order that the matter which is retained too long in the abscess may not be drawn towards this vital part; thirdly, if it be situated in an emunctory, for the same reason; fourthly, if it be in the joints, because the pus might spread and destroy the ligaments; fifthly, at the anus, because the discharging fecal channels easily become fistulous; sixthly, if the abscess arises from a thick heavy mucus wherever it be, because occasionally such an abscess is filled with liquefied fleshy matter before it becomes ripe.

18. As soon as the abscess is ripe it should be immediately opened so that the pus may be evacuated, observing those rules and other indications which are to be observed, excepting in three cases. The reason for that rule is to be found in Galen; all things which are in the body contranaturam must be extracted, etc., and this is still more clearly demonstrated from the declarations which precede that part, and which are contained in Chapter I., Doctrine 1, Tractus 2, on the Treatment of

Wounds. The first exception is where an abscess is composed of humor having undergone coction, as anthrax, etc., because the pus is as thick and as tough as skin and sinews, and because the pus will not escape after an incision is made. In this case, too, the strength of the patient is quite exhausted, and if the operation be made and the patient should die, the surgeon is responsible for his death. The third instance is where the surgeon requires money, but has as yet not received it, according to the principle: take the money while the disease still hurts, that is, because if the abscess is opened and if the fever and pain subsides, the silly surgeon frequently has to go without his fee.

Aside from the rules just mentioned one must also have recourse to other rules, which have been treated above in the first chapter, Tractus 2, on the Treatment of Ulcers, and he must select those which he will there find that are necessary for the art he is practising. From the definition mentioned with its explanations, from the divisions given, from the causes and reasons, from the above-mentioned general rules, besides some other things which refer to the above-mentioned matter, the educated surgeon can be sure to see almost the entire modus of how one should operate in general and in accordance with the rules of the art. This modus consists of four parts—namely, (*a*) the general evacuations or purgations; (*b*) of the special and diverting; (*c*) of suitable diet and conduct; (*d*) of local remedies and manual operations, according to the rules of art.

In order to render the fourth point clear five conditions must be noted: (*a*) it is to be remembered that each abscess from which a patient is cured has four stages—namely, the commencement, the development, the height, and the decline. The commencement of an abscess is taking place when some matter begins to distend and thicken a limb, and when positive disturbances of the natural functions of the diseased limb are first noticed, and when nature up to that time has not taken the matter of the abscess under her care. Growth exists from the beginning until the abscess has developed and ceases to do so, and as long as the force is weakened, and while the matter increases; then nature occupies herself with the abscess, but as yet does not successfully combat it. The height of an abscess I call that condition when the lesion neither increases nor decreases in size and when the natural force controls the diseased matter in some way or other. The period of decline is when the abscess commences to decrease and when the accompanying

symptoms become milder until the lesion is healed or becomes transformed into some other affection, such as a fistula or an ulcer.

(*b*) It is to be remarked that any of these stages may remain latent for a certain lapse of time; thus the stage which we call the beginning of the abscess may represent the beginning, middle or end of the process, for which reason an abscess may appear to be small for a long time. A similar statement may be made regarding the stage of growth—namely, that occasionally mucous abscess, botia, and tubercular glands and so on, grow continuously for several years, occasionally during the entire life of a patient, and thus the stage of increase has several periods. The same holds good for the height and the decline. If, therefore, in the beginning of an acute abscess, according to writers, local measures, dry, cold and styptica, should be applied, and if these do not cause improvement, and if since they do not counteract, the abscess grows, it is necessary to employ some dissolving remedies in conjunction. From this it follows that the nearer the stage of commencement is to the period of growth the less local cold, dry and styptical remedies are to be applied; on the other hand, the more advanced stage of growth, and the nearer it is to the period of the commencement of the abscess, dissolvents should be added in smaller quantity than repercussiva, and the further away it is from the stage of commencement, stronger dissolvents must be added in preference to the repercussiva.

The same holds good for the nearness or the distance of the height of the lesion relative to the stage of growth, and of the period of decline as regards that of the period of height, and thus the respective remedies must be added and, as the case may require, be added or reduced in amount.

(*c*) It is to be noted that the distinction above mentioned of the stages of abscess and the latent condition of any one of these stages must be considered if the surgeon is to proceed according to the rules and in a minute way. But it will happen occasionally that the process heals although the surgeon is heedless of what we have said, in which case the healing is usually neither good nor prompt and the result thus obtained is more to be attributed as an accident than to the skill of the surgeon.

(*d*) It is to be noted that the modus referred to for the regular healing of an abscess only applies to those lesions which

do not suppurate, because suppuration does not belong to the four principal intentions of cure as will be seen from the above-mentioned rules. And supposing that the treatment just mentioned would not suffice to cure an abscess, and that for some reason or some error, suppuration should supervene, the abscess must be ripened as the case may require, and as will be shown later on when describing special kinds of treatment. A ripe abscess is to be opened, observing the rules and cautions enumerated in the chapter on the treatment of ulcers. When it is opened it should be cleansed, after which it must be dried out and the flesh to be renewed, and is to become firm after its removal, all of which is to be accomplished as laid down in Chapter I., on The General Treatment of Wounds, section 7, which discusses the treatment of acute abscess, and the bad condition of those suffering from wounds, as will be shown later when treating the special methods of the treatment of abscess. The local remedies have, nevertheless, been treated in the present chapter, and also what is going to be mentioned in a separate chapter of the special methods of treatment, and will be found in the Antidotarium, to which the reader is referred.

(*e*) It is to be remembered that beside the professional treatment described, there is still another which is partly based on logical consideration, partly on experience, and which method has a wonderful influence on all abscesses, admitting that they have not as yet arrived at the point of suppuration, and which perchance, the ancients did not know, or which they did not desire to write on, because of its usefulness and easy application. When we are in doubt as to whether an ulcer will or will not suppurate, we should apply the following prescription at once both day and night. It consists of a plaster of marshmallow leaves with their stalks but without the hard stems, and rolled in oakum, moistened with water, boiled under ashes, and then carefully ground. Then from three to fifteen leeches should be applied, their size being selected according to the size of the abscess, the age and the strength of the patient, at one point one after the other, where nature appears to collect the largest amount of pus, and then this point is poulticed by means of hot water and is carefully dried. Then leaves of the leek which have been pounded or ground in warm olive oil, are spread over the abscess and a large area of the surrounding parts, and then a goodly amount of hemp-oakum should be spread over this in order to retain the heat. This is continued

for three days with only one change; on the fourth day the plaster, as described above, is again applied and in the morning the leeches, and then the plaster of leek leaves is applied as before. Thus, the abscess with the treatment continuing alternately till the tenth day becomes ripened, is reduced considerably in size, and in most instances will give exit to the pus without resorting to the knife or medicine.

And if an abscess appears ripe and does not open by itself, it should then be incised, observing the necessary rules. When the opening has been made a strip of lard is inserted, because that prevents the opening from closing up, renders the borders of the wound pliable, and thins the pus; thereupon an infusion of wheat flour should be applied with which water and a little oil is boiled to produce the consistency of dough, whereupon the said infusion is daily renewed with the application of the lard on top until a cure is effected.

Palliative Treatment.—As to its manner, usefulness and the question as to how many physicians quote it in their works, it may be said that it is similar to what is described in the preface to Oct. II., Tract II. Palliative treatment is to be recommended in three cases: (*a*) when the abscess is simply incurable, such as hidden cancer, or an abscess forms a tumor which arises in the nipple or the eye; (*b*) if the patient is desirous of being freed from the suffering of an abscess; (*c*) if the treatment of an abscess, for example old hemorrhoids, would necessarily be followed by a disease or some worse conditions, such as lepra, hydrops, or mania. The last rules regarding this manner of treatment will be described in a separate chapter.

Regarding the explanation of what has been said, and the subjects relative to them, eleven items are to be observed: (*a*) that abscess, tumor, protrusion or elevation, a thickening, or an unnatural swelling are one and the same thing, in other words, they are synonymical expressions. All that belongs to the species abscess, has many variations, such as exitura, pustula, and the like; (*b*) exitura is different from abscess and the rest, of which each can be applied to any unnatural tumor, whether it produces or must produce suppuration, or be it that such is not the case. But of exitura one only uses it with respect to acute abscess, or one that has accidentally become acute, after suppuration has arisen in it and not before, as will be afterwards mentioned in the chapter referred to. If

you observe very marked pulsation or a lasting hardness or warmth, the abscess is then on the point of becoming an exitura. Until this it was nothing of this kind before the mentioned symptoms appear, and this is no abscess; (*c*) it is to be noted that bother and pustula are two different things, because according to Avicenna, bother is a small protrusion or abscess, the entire collection of pus of which is situated outside the flesh, that is to say between the flesh and the skin, and is non-poisonous, while a pustula consists of poisonous matter which eats itself up; (*d*) what Avicenna says in Chapter V. on Complicated Diseases, should be noted: One must not assume that a walled abscess arises from the blood and bile, but is rather one which originates from some matter or other, whether this be warm by its own nature, or be it that warmth has been added to it because of an intervening decomposition, and it is quite permissible to divide these symptoms according to the division of the kind of every matter—namely, phlegmatic, melancholic, and the like; (*e*) it is to be noted that the expressions causa primitiva extrinseca and exterior antecedens, also intrinseca and interior, congestio and congregatio, derivatio and deligatio are identical; (*f*) this definition of the conceptions and terms is most important. Thus, Galen in the Fifth Book on Simple Remedies says: "An error in the things designated by name injures the patient very much . . . ," and he adds "physicians confound and spoil names, and not only the names themselves but also the knowledge of the names and things; (*g*) it should be noted, according to Avicenna in the chapter referred to that abscess is a composite disease, that is, in an abscess one has various kinds of diseases — namely, (1) an unfavorable diathesis, because there will be no abscess unless the humors are defective; (2) defective form, because no abscess will arise without an injury to the outer appearance or without a swelling, a lesion of continuity, since the pus of abscess is imbibed between the parts of the diseased limb and so severs the continuity of the parts; (*h*) it is to be remembered that an abscess is a disease which effects equal parts, equal functions or the entire body. It is a morbus consimilis, because it occurs in similar parts—namely, bones, nerves and muscles; officialis, because it effects limbs of equal functional importance, such as the hand and foot; communis, because it can occur in all members excepting the heart, which on acccount of its importance cannot undergo abscess formation; (*i*) according to Avicenna, in the

chapter referred to, the bones are affected by a disease which resembles abscess and the like, because all that takes nourishment will also take a superabundance of nutritive material, such are the bones; superabundance of nourishment, however, is not abscess, etc.; (*j*) Galen in his Tegni places the manner of origin of abscess as follows:

To any one part humors flow, or what comes to the same, they remain in it for its proper nutrition, the member becomes tense, its veins, even the very smallest, are gorged, so that matter which did not previously exist there is present, as may be seen in a tumor of the conjunctiva of the eye; afterwards they leave the veins and enter into the hollow spaces of the parts and are left there by nature, etc.

The manner of origin of pus is described by Galen in his fifth book on Internal Diseases, and in the commentary to the second part of the Aphorisms on the Origin of Pus:

That which is pus or poison, or putrid matter, dirt, scabs, crusts, and the relations of each other and from which matter, which is their effect and in the manner which each is created, all that has been said in the chapter on the Treatment of Ulcers and in the explanations, is to be noted that the disease can be called communis for three reasons: (1) because it attacks all members at the same time at once, as fever does, for instance; (2) because it comprises every kind of disease, inasmuch as it affects similar and general tissues of equal functional importance, and includes to the same extent abscess, scabies, pruritus, serpigo, and similar affections; (3) because it can originate in single organs, such as wounds and ulcers.

Such is the literal English version of the chapter on Abscess and its Treatment, although I must offer an apology for the very rough translation that has been given.

De Mondeville's remarks on the prognosis of wounds are most interesting in many respects, and show the progress made in surgery at the time of his writing. He says that according to the views of ancient writers, a wound whatever may be its character was considered as either absolutely fatal, usually fatal, or not fatal, and that according to Theodoric a wound is either absolutely fatal, not absolutely fatal, or not at all fatal. He then goes on to say that those wounds which the ancient physicians considered as usually fatal, and those considered not absolutely deadly, or not fatal by Theodoric, he considered as not fatal, or at least less dangerous than did his predecessors. He also says that he, and perhaps Theodoric also, considers no injury as

absolutely fatal, excepting one which kills the patient before he has been able to take any food, provided that no mistake in the treatment has been made, and he states that if the wounded patient has survived an hour and has partaken of some nourishment, his wound will not kill him unless some mistake in the care of the patient is made.

He points out that all wounds of considerable size, and wherever situated, are usually fatal if they are looked upon and treated according to the methods of the older surgeons, and that it is a peculiar fact that he learned by many years of experience in Paris that flesh wounds of the head, without injury to the bone, are usually fatal, perhaps more frequently than when fracture of the skull occurred at the same time. He explains this by the fact that when the skull is injured, a considerable amount of brain substance becomes evaporated, thus relieving the brain itself in many respects.

That de Mondeville was a sagacious clinician, is shown by his remarks on the general condition of patients, for he points out that some people have a great power of resistance and shows that some quite dangerous wounds will be recovered from in a robust habit, which otherwise would end fatally in a weakly constitution. Wounds of the heart, no matter what their size may be, are always fatal, because this is the most sensitive organ and its normal action is a fundamental condition for the existence of life; and whent his organ is wounded the spiritus and heat and the humors mingle together and produce an ulcer. An insignificant wound becomes most important when seated in a vital organ. If, therefore, a wound reaches the interior of the heart the patient will immediately die, while if the wound be only superficial the patient may live one day but will surely die in the end, because the accumulation of the humors will give rise to an inflammatory ulcer invariably resulting in death.

Injuries to the bloodvessels which extend as far as the digestive tract or the organs of respiration are also absolutely fatal because the blood will escape from the inside of the body through the mouth and the hemorrhage cannot be checked. This is likewise the case of wounds to the trachea which extend as far as the cartilaginous part of the organ, because this latter tissue is dry and on account of its great hardness and dryness union cannot take place. Wounds of the esophagus, pericardium, the stomach, gall bladder, the intestines, especially the jejunum, the uterus, the fundus of the bladder, are fatal if they

extend into the interior of these organs, for the reason that they are very rich in nerves and are dry, so that union cannot take place. He also points out that the pericardium and diaphragm are in constant motion, while the intestines and esophagus are subjected to a constant irritation, producing movement, thus preventing healing from taking place.

As absolutely fatal he also considered vast traumatisms, such as amputation of the leg, or crushing of a limb, especially the thigh, and he attributes the mortality in these cases to the vital strength not being sufficient to permit of the healing of such large wounds; but if the strength were sufficient the patient would recover, provided that no important organ were injured at the same time.

De Mondeville says that superficial injuries of vital organs, excepting the heart, no matter how large or severe they may be, are not necessarily fatal if they are treated according to the rules laid down by Theodoric, the reason being that the vital strength is preserved until healing has taken place.

Speaking of wounds of the brain, which appear to be particularly fatal, Theodoric says that he saw a man recover who had lost about a third of the posterior part of the brain, and the patient who was a wood carver lost none of his artistic qualities. De Mondeville says that he has many times removed shot from the brain, and that all the patients recovered. De Mondeville advocated dry dressings in most cases when the wound was fresh, but when he had to deal with one which was already suppurating he first purified it by means of certain remedies, and he points out that no healing can take place until the production of pus has ceased.

After the wound had been rendered clean he applied stimulating and healing remedies.

The first chapter of the third treatise, which treats of incisions, was written before 1314. The remainder of the third treatise was composed after 1316, which was the date of the death of Louis le Hutin, mentioned by De Mondeville. It took our author three years to compose this third treatise which has remained unfinished, and consequently would make the date from 1319 to 1320. Fearing that he would not be able to finish his work, de Mondeville did not complete the third treatise, but composed the fifth, the Antidotarium, because he considered the latter more important.

The complete or fragmentary manuscripts of de Mondeville's

surgery number in all eighteen, but to these manuscripts still one more must be added which today is found at the Laurentian Library, at Florence, and contains the provencal translation of de Mondeville's abridged anatomy, reproducing the course of lectures which he delivered first at Montpellier in 1304, and I here append the introduction of this provencal translation as given by Dr. Bos.

Comensa lo prologue de la notomia de la Surgia de Anric de Mondavilla.

Al comensamen d'aquesta obra, que es tracha de lati en romans dea la Surgia de Anric de Mondiviala, deves premieyramens saber que es subjet en tota surgia . . .

Lo premier es de la notomia coma defendemen de Surgia.

Lo segon es de la cura universal de plaguas et de concutios. Lo ters es de curas de totas malautias que non son pas plaguas ni ulceracios ni malautias de foras las quals venon comunamen a totz los membres del cap entro als pes.

Lo quart es de la cura de la strenquaduras et delogaduras et cossemens et plagamens.

Lo quint es l'antitotari.

Et a me sembla que Vicenna es pus savi en la notomia; et Tederic en la cura de las plaguas et Alofranc en la cura de las ulceracios et de las autras malautias procezen trop ben davant tot autres surgies.

Lo premier tractat d'aquest libre que tracta de la notomia est devisat en XII. capitols principalmen et per orde.

This small number of complete or fragmentary manuscripts, nineteen in all, of a manual composed for students and practitioners, appears to show that the work of de Mondeville did not have any great success. It was nevertheless a good manual, giving the status of the knowledge of his time, but it was incomplete and had as a competitor the almost contemporary work of Lanfranc, whose teachings had had perhaps a greater vogue and whose treatise on surgery had already been completed.

Like all works which are put aside as soon as science has made some little progress, the treatise on surgery by de Mondeville had only a short existence, and the work by Gui de Chauliac caused the name of de Mondeville to be completely forgotten, but to him will ever be attached the honor of having been the first French surgeon who wrote a book on surgery. But this was not his only merit, as I shall endeavor to point out in what is about to follow.

There is every reason to believe that de Mondeville was instrumental in founding the College of Surgeons, which truly

was the work of Pitard, and he was obliged to use his influence with the King of France, and with Prince Charles de Valois, in order to complete this useful work.

It was at about the time when he returned to Paris in 1306, that de Mondeville put into execution the project that he had conceived some time past, to write a complete treatise on surgery for his students. He was a persevering worker and most intelligent, and he had read and meditated on all the works of the most celebrated surgeons of his day, the names of whom I have already given. He had seen the practice of several of these noted men either at Montpellier or at Paris, and under the directions of his master, Pitard, he became familiar with all the operations.

De Mondeville had already taught with great success, and had a profound knowledge of the ancient sciences and the best Arabian writers, and while in Italy he had heard the lectures of the most renowned surgeons.

Nothing in his education was wanting, and besides talent he had an independent turn of mind, exempt from all cupidity and envy, contenting himself with simply the necessaries of life, and being a bachelor and consequently not obliged to look after the necessities of a family, he found that he was not even able to carry out the editing of his surgical treatise. He believed that his work would be all the more opportune because he found, as he says, that the surgeons of his day were disposed to serious study, and he was in hope that his treatise might be conducive to their desire for learning.

De Mondeville's life was well filled. He taught surgery and anatomy in Paris before a large assemblage of students and persons of distinction, and as I have already said he was the surgeon to the king and to the army. But the occupations and his deplorable condition of health prevented him from fulfilling the vast program that he had laid out for himself. In a few years he completed the first two treatises of his work which he read in 1312, "Publice, absque collecta, cum scholorium medicianae et aliorum aliquorum intelligentium maxima et nobilissima comitiva civium, curialium et pertranseuntium advenarum." But he soon received an order to follow the army commanded by the king's brother, Charles de Valois, which was to go to Arras and to England, and he was obliged to bid good-bye to his students and his much cherished studies. However, at his entreaty the king allowed him to return to

Paris before the end of the expedition, and he was thus enabled to again take up the work which was the principal charm of his life.

He commenced the third treatise of his work and finished the first two sections, when at this point he was again obliged to stop on account of his bad health. In a melancholy state of mind he wrote the following touching words regarding his condition:

Non cyrurgicus se exaltet, sed timens Deum qui amicus sapiens est, confidat de ipsius maxima largitate et suae plenituvine potestatis, sub quibus, quasi miraculose et de gratia speciali, eanguidus vivo et jam vixi continue per duos annos contra commune judicium medicorum. Rogans, insuper et supplicans Creatorem, ut sicut ipse Ezechiae regi vivendi spatium prolongavit, ita et vitam mihi prolunget, si placet, ad profectum commune, donec deintaxat, possim perficere opus peresens ut ad ejus complementeum concrescat ut pluvia, doctrina mea, et fluat ut ros, eloquium meum.

He hastened to trace in outline the titles of the chapters comprising the third part or doctrine of the third treatise that he intended to compose, and to outline the fourth which was given up to the study of fractures and dislocations. And, lastly, as I have already said he began to edit his Antidotarium. Although both phthisical and asthmatic he was able to finish this important therapeutical treatise. Such, in a few words, are the principal points in the life of this excellent man.

The first treatise, as I have already said, is given up to the study of anatomy, particularly that which applies to the practice of surgery and what would at the present day be termed regional anatomy. De Mondeville says that it is quite sufficient for him to treat briefly grosso modo the anatomy of the human body, nec intendendo ipsam radicitus nec ad unguem, but to consider it in its relation to surgery. It is very doubtful whether or not de Mondeville had dissected, because in his day this practise was extremely rare. But the illustrious surgeon of the King of France says that he first had had the idea of joining to his anatomical descriptions a certain number of drawings which would speak to the eyes, and thus impress more deeply in the memory the elements of a science which is so indispensable both to physicians and surgeons. It was, however, necessary to wait the advent of that great genius, Vesalius, aided by the artists of the Rennaissance, to see the great surgeon's

idea bear fruit. The drawings that de Mondeville has left us are extremely small and of only slight value, and it is probable that for the illustrations of his lectures he must certainly have had more correct and more expressive plates.

The second treatise of de Mondeville's works is consecrated to the study of wounds, contusions and ulcers, and was the object of his particular attention. It is preceded by a preface and long prolegomenon under the title of, Notabilia introductaria ad totam cyrurgiam.

The following lines regarding required qualities of a surgeon are in truth remarkable. He says:

The surgeon if he is desirous of operating well, should in the first place frequent those places where talented surgeons often operate; he should apply his entire attention to their manner of acting and fix it in his memory, then to exercise himself by operating under the guidance of his venerable masters. The surgeon must be endowed with a natural genius, because it is dangerous to operate when only guided by what is written in books, without consulting one's own proper inspiration and a sound judgment. Ingenium naturale adjuvat artem et naturam regentem. Necessarium est cyrurgicum fulgere ingenio naturali . . . He is not a good surgeon who does not know the art and science of medicine and especially anatomy . . . The surgeon should be fairly audacious; should not discuss questions before the laity; he should operate with prudence and sagacity; he should never commence perilous operations unless he has provided everything in order to avoid danger; he should have a well made hand, the fingers long and slender, supple and sure. He should promise health to all his patients; he should not conceal from the parents or the friends the dangers that may arise; he should avoid as much as possible difficult cures; he should never undertake hopeless cases; he should give the poor gratuitous care; if possible the rich should pay well; he should not sing his own praises; he should not cover his colleagues with blame; he should not cause envy among them; he should work always with the idea of acquiring a reputation of probity; he should be reassuring to his patients by kind words and acquiesce to their requests when nothing harmful will result from them as to their cure. . . . From all this it follows that the perfect surgeon is even more than the perfect physician, and that the former has need of a condition which the second may not possess—namely, manual dexterity.

His introduction to surgery is less a discourse than a series of twenty-six articles classed under the head of Notabilia. Under this heading our author considers a large number of points of great interest for the history of the art and practice

of surgery in the middle ages, such as the conditions necessary for becoming a good surgeon, remarks on quackery and empiricism; the relationship between physicians and surgeons and a large number of other questions relating to medical ethics.

It is well known what enmity there was between physicians and surgeons at a later period in the history of medicine, and dating from this time the fight was continued, and many were the debates which had for object to decide what diseases should be treated by the surgeon and what by the physician. It was finally decided that wounds, abscesses, ulcers, hemorrhoids, various skin diseases, all external affections of the head, arms and legs, the seat of which could be discovered, although external appearances were absent, such as pains of the joints and hands, deafness, decreased vision, etc., should belong to the domain of surgery and should only be treated by surgeons.

As to internal affections of the head and those arising in the thorax or abdomen, excepting perhaps dropsy and a few other similar affections, it was decided that they should be treated by physicians only.

Henri de Mondeville was opposed to the brutal separation of surgery from medicine, as well as against quackery and the pretensions of the clergy, and all abuses which at this epoch dishonored science.

His treatise on wounds is without doubt the most important and interesting part of his writings.

Immediate ligature, which was indefinitely indicated by Celsus and Galen, will be found perfectly described by de Mondeville, who in no way claims the idea as his own, but gives all the honor to Lanfranc. This method of ligating was usually employed when other means of hemostasis had failed. The skin was incised so as to expose the wounded artery, which was then drawn out with a hook or pincers, and then according to the text the vessel was twisted. It was then tied and the borders of the wound were brought together by sutures, allowing the ends of the ligature to be brought out. The ligature was removed as soon as granulation tissue had developed to an advanced degree. It was only reserved for Ambroise Paré to apply the ligature of arteries in amputations. De Mondeville expressed badly founded ideas of the success of this method, because he was unacquainted with the phenomena of the spontaneous dropping off of a ligature, and he says:

Either the ligature falls off before the wound is filled up by granulations or, on the other hand, it only comes away afterwards. In the first instance the blood continues to flow, while in the second the ligature can only be removed by an incision made in the regenerated tissues.

He describes fistula in ano with much care, and distinguishes two kinds, internal and external. The operation for fistula with an internal opening into the rectum, he describes as being accomplished by gradual constriction with a lead wire, or by section with the knife, guided by the finger in the rectum, or a canula of wood. This method has been little improved on since this time.

In his chapter on amputation of limbs, which in his day was avoided as much as possible on account of the fear of hemorrhage, he mentions the question of putting to sleep the unfortunate patient in order to avoid the pain of the incision, and I here give the exact Latin text of what he says regarding this:

Suntque (chirurgici) dant medicinas obdormitivas, ut patientes non sentiant incisionem, velut opium, succus morellae, hyosciami, mandragorae, cicutae, lactucae. Imbibunt in eis spongiam novam, et permittunt eam ad solam exsicarri; et quando erit necesse, mittunt illam spongiam in aqua calida, et dant eam ad odorandum tantum usquequo patientes capiant somnum. Et postea, cum alia spongia in aceto infusa, naribus apelicata expergefaciunt et evigilant eos.

This wonderful method of inhalation of anesthetics that the physicians of antiquity had already thought of, is consequently found distinctly expressed in the 13th century, but it took 600 years more for the realization of these dreams to be put into execution.

De Mondeville should surely occupy one of the highest places among the surgeons of the 13th Century, not only for the priority of many things, but from his talents and the high position that he occupied both socially and as a teacher. Educated in a healthy philosophical atmosphere, the mind enriched by the perusal of the best writers of antiquity, learned in medicine, familiar with both practical and theoretical surgery, surgeon to the Court of France, an enemy to quackery, a man of science, above all with an independent character, de Mondeville appears to us as one of the greatest glories of this epoch.

It is probable that de Mondeville was the first to demonstrate that the formation of pus was not necessary for the

cicatrisation of wounds, and he thus may be said to have a priority of 600 years over the practice of Lister. Although there is a great space of time separating de Mondeville's method and the modern practice of asepsis and antisepsis, there was also a long lapse of time between his practice and those of the ancient surgeons. He was a pioneer in this direction, but other more complete and scientific works were necessary in order to prove in the minds of men the truth of his teachings.

871 Beacon Street.