

**ON THE  
EMPLOYMENT OF  
WATER IN SURGERY**

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On the employment of water in surgery by Alphonse-Auguste Amussat & Frank H. Hamilton

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**ALPHONSE-AUGUSTE AMUSSAT & FRANK H. HAMILTON**

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WATER IN SURGERY  
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THE  
PROPERTY  
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NEW YORK HOSPITAL  
ALPHONSE-AUGUSTE AMUSSAT,  
OF PARIS.

TRANSLATED FROM THE FRENCH  
BY FRANK H. HAMILTON,  
PROF. OF SURGERY IN THE UNIVERSITY OF BUFFALO, AND ONE OF THE SURGEONS OF  
THE BUFFALO HOSPITAL.



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#### TRANSLATOR'S PREFACE.

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In offering to the public a translation of the *Thesis* of M. Arnusat, who was at the time of its composition a candidate for the Doctorate in Medicine, we believe we are performing an acceptable service. That the work contains interesting historical information, and valuable practical suggestions upon a subject of great importance, are circumstances in themselves, independent of the position of its author, which establish its claim to attention. But it is affirmed to have been written under the instruction, and to embody the experience, as far as relates to the use of Water in Surgery, of his illustrious father, and in so much it may be regarded as an original record of the views of a master.

We find also an additional reason for its publication in the exigency of the times, when empirics are every where assuming to themselves the honor of having first introduced water as a hygienic, and therapeutic agent, and are claiming the right to its exclusive use. We do not expect to arrest the streams which are daily pouring their golden tides into the pockets of these men, but simply to establish to whom the right of discovery actually belongs, and thereby, perhaps, induce some practitioners to divert and appropriate to their own use as much of this element as may subserve a useful purpose.

For the manner in which the work has been accomplished, an apology is undoubtedly due both to the public, and to the author, to whose politeness we are directly indebted for the original copy, and who, perhaps, would have hesitated to permit himself to be thus uncerimoniously introduced to his cisatlantic neighbors.

It was undertaken as a contribution to the "Buffalo Medical Journal," and has been written *currente calamo*, at intervals of leisure, and page by page as called for by the compositor, and often therefore without time for correction. We hope, however, whatever may be its faults of style, it will be found that the matter and spirit of the original has been faithfully conveyed in the translation.

FRANK H. HAMILTON.

BUFFALO, April 8, 1851.

## INTRODUCTION.

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In choosing as the subject of my inaugural dissertation the "use of water in Surgery," I have intended, after having made historical researches to compile most of the observations which have been published, as well as those unpublished, which pertain to the practice of my father, with the view of demonstrating the incontestible success which has attended the use of water in the treatment of surgical affections.

Next I have endeavored to determine in what surgical diseases we may, and ought to, have recourse to it.

was also my original purpose to divide my work into four distinct parts.

1. History of the employment of water in surgery.
2. General considerations and various modes of application.
3. Classes of maladies in which it ought to be applied.
4. Special observations and modes, with reference to regions.

But the multitude of facts which I found in my possession, and the space occupied in the consideration of the diseases which demanded its use, compelled me, reluctantly, to limit the plan I had laid out for myself, by considering at present but the two first, viz: the "History," with "General considerations and various modes of application."

One point of paramount importance to which myself and my father have directed especial attention, is the proper *temperature* of water. After a careful analysis of the inconveniences which have been attributed to this agent, we have ascertained that they were due mainly to the cold. We are convinced that water at 18° to 25° centigrade (64° to 77° F.) possesses in general nearly all the advantages of cold water without any of its inconveniences. It appears to me, therefore, that the use of water at this temperature, ought to be the rule and the use of cold water the exception.

I regret that I cannot give to my subject at this moment, all the latitude which its importance demands; yet I hope to be able to demonstrate that water, skillfully applied, is a most potent topical application — that it is preferable to all others, and that we may make it the basis of a rational therapy in a majority of surgical affections.

However, I propose at some future time to resume this work, and to render it as complete as possible, especially in its practical portions. I will then publish the numerous cases which I cannot now make known, and I will examine with care what classes of surgical maladies can be advantageously treated by water.



HISTORY OF THE EMPLOYMENT

OF

WATER IN SURGERY.

CHAP. I.

I was curious to know how an agent so simple, and at the same time so powerful, as water, has been appreciated by the surgeons of antiquity, of the middle ages and of modern times. It is this, therefore, which I have undertaken to ascertain in the present historical review, and with a full understanding that I am yet far from having exhausted a subject so extensive. I think, nevertheless, that I have been able to prove that this therapeutic agent, whose value has not always been appreciated, has been gradually occupying a place of more and more importance in surgery.

Hippocrates, whose writings furnish an excellent summary of practice up to his time, has left us some precious documents upon the subject before us. In cases of ecchymosis, contusions, stretching and rupture of muscular fibres, in luxations, sprains, diastasis, fractures extending into articulations, etc., etc., he prescribes, after the application of suitable bandages, copious affusions of water.

In luxations of the astragalus, calcaneum, and in all articular lesions he recommends warm affusions.

In comminuted fractures with protruding splinters, and laceration of the integuments by the bone, he gives the following advice: "If in the summer, the compresses should be frequently moistened with wine; if in the winter, undressed sheep's wool, saturated with wine and oil, should be applied. Under the whole there should be placed a sheep's skin, to enable the liquids to drain off, and to keep the parts open to view, remembering that parts which remain a long time in the same position, become touched with excoriations difficult to cure."

We see, then, that physicians of antiquity employed, in the treatment of wounds, not only water, but also wine, oil, and decoctions of aromatic plants.

In the book of Aphorisms, we find rules on the temperature of therapeutic agents, the judiciousness of which every day's experience sanctions, and which, perhaps, have been too much neglected.

Celsus, who extolls more than any one else the use of water in internal, as well as external, affections, expresses himself thus upon the subject of the dressing of wounds: "a sponge immersed in cold water, alone answers in slight cases; but whatever may be the liquid with which it is charged, it allays pain so long as it is moist; therefore we must not permit it to become dry. In this way we may heal wounds without having recourse to foreign, scarce and compound medicaments."

Farther on we find the following passage: "if adhesion has commenced, and if there is but slight tumefaction, we must adhere to the first kind of dressing; but if inflammation is active, and there is no hope of agglutination, we ought to employ suppuratives. The use of warm water is equally necessary to resolve engorgements, to diminish hardness, and to render suppuration more active. *The warmth of the water must be such, that the hand, when plunged into the liquid, shall experience an agreeable sensation; and it is well to continue this application until the wound appears less swollen, and has a more natural temperature.*"

Celsus further recommends the use of water in hemorrhages, fractures, diseases of the eye, &c.

Galen, whose writings had so much influence upon physicians and surgeons, in all the middle ages, employed water in a great number of affections. In his "Treatise on the nature and properties of simple remedies" he investigates the action of snow and of cold water upon our tissues.

In wounds he employed successively warm water, wine, vinegar, and he recommended especially affusions of warm oils for those cases in which nerves and tendons were implicated. He cites many cases of cure by this last method; and having had his own clavicle luxated upon the scapula, he treated himself in this way.

In Aetius we find for the first time the word *irrigatio*; but at paragraph 172, we read the following passage: *Irrigationibus utitur nisi ob obliquam circumstantiam adhibere prohibemus*, which proves that he made little use of irrigations, and that he especially confined them to medical diseases.

Rhazes advises warm water in fractures, and cold water, or rose water cooled by ice in burns.

Avicenna reproduces in his works the great principles laid down by Hippocrates and Galen, upon the use of water and oil in the treatment of certain surgical affections.

According to M. Malgaigne, Marianus Sanctus had projected a commentary upon the entire surgical works of Avicenna. He intended to teach a new mode of curing wounds, even those of the gravest character, by means of pure water alone, only adding thereto certain words; for all the art of medicine consists in words, herbs and stones! "This work," continues M. Malgaigne, "has not been published; there remains nothing of it but the preceding quotation, which I have recalled for a double purpose. It enables us to see how Italian surgery had declined after Jean de Vigo, since his best pupil had come to have faith in such superstitions; and it discloses to us the true origin, in modern times, of a mode of treatment generally ascribed to Michel-Ange Blondus."

In 1542, Biondo or Blondus published a work entitled *de Partibus ictu sectis citissime sanandis et medicamento aquae myres invento*; in which he recommends water as a new and efficacious remedy in the treatment of most wounds. But we have just seen that Marianus Sanctus had preceded him in this discovery.

Ambrose Pare is the first French surgeon who uses the word *irrigation* which he defines as follows: *embrocation, according to the Greeks, or irrigation, according to the Latins, is a sprinkling, similar to rain, when from a height, we allow a decoction to fall, drop by drop, upon some part.*

Water at this epoch was especially employed by empirics, who, after the example of Marianus, Sanctus, and Blondus, only used it with the aid of sorcery and conjuring words. This induces our own great surgeon to write: "I will not omit to say that some cure wounds with pure water, after having pronounced over them certain words, and having applied linen cloths cut in the form of crosses and saturated with water, often renewed. I affirm that it is neither the words nor the crosses, but it is the water which

cleanses the wound, and by its coldness repels the inflammation and the fluxion which might attack the injured part, in consequence of the pain. This healing can be accomplished when the wound is in a fleshy part, and in a body young and of good habits, and where the wound is simple."

This passage shows that A. Pare appreciated water at its just value, and sought to disembarass its use from the superstitious practices of charlatanism.

1560. Gabriel Fallopius, imbued with the doctrines of the early physi-