

CONFUSIO TRANSFUSIONIS

By: BARTOLOMEO SANTINELLI (1668)

AN INTERPRETIVE TRANSLATION* OF THIS BOOK BY PHIL LEAROYD

The book 'Confusio Transfusionis' [Transfusion Confusion] written by Bartolomeo Santinelli (born 1644) was published in Rome by Mascardi in 1668. This book is written in Latin and has the sub-title 'Refutation of the operation of transfusing blood from individual to individual'. A copy of this 139 page book can be viewed or downloaded from the following websites:

https://books.google.co.uk/books?id=t8VjAAAacAAJ&printsec=frontcover&source=gs_vpt_read&redir_esc=y#v=onepage&q&f=false

<https://www.woodlibrarymuseum.org/rare-book/santinelli-b-confusio-transfusionis-sive-confutatio-operationis-transfundentis-sanguinem-de-individuo-ad-individuum-1668/>

* Given the difficulties of accurately translating 17th century Latin into 21st century English, I have not called this a 'translation of the original' as there has to be an element of interpretation in the production of such a document. I have therefore called this an 'interpretive translation' to explain this difficulty. Having said this, I have tried wherever possible to maintain what I believe to be Santinelli's original meaning, intent and detail.

Although I have taken great care not to misrepresent the author's original wording I cannot guarantee that this work does not contain translational errors. The reader is therefore recommended to check specific details against the original Latin text and as such, I have included the original page numbers within the document to help locate specific areas of text that the reader may wish to consult. I have maintained the author's use of italics. There are a small number of words that I have been unable to translate – these are presented in square brackets in the document as the original Latin word. I have not translated the two sections at the beginning of the book, i.e. 'Bartholomaeus Santinellus Foelicitatem' and 'Lectori'.

This book is frequently quoted as being one of the foremost contemporary texts presenting arguments and reasons for opposing the introduction and use of blood transfusion, written two years after the first blood transfusion performed on dogs by Richard Lower in England and the year after the first blood transfusion performed on a human by Jean-Baptiste Denis in France. Blood transfusion experiments had also been performed in Italy during the period 1667-1668 by Cassini, Magnani and Manfredi. While these experiments were being performed in Italy, transfusion found an eager opponent there in Bartolomeo Santinelli, Doctor of Philosophy and Medicine. The arguments and objections that he made were obviously thought to be of great importance at the time and Santinelli can be identified as being someone who was pivotal in affecting both physician as well as public opinion.

Although the outcomes of the transfusions performed in Paris probably influenced opinion in Rome as well, it is highly likely that Santinelli's work also influenced governmental attitudes as well, which together resulted in the banning of the transfer of animal blood into humans by government authorities in Rome in 1670, a ban which

appears to have affected the rest of Italy in a similar way as the legal edict given in Paris on 17th April 1668 appears to have affected the rest of France. As such Santinelli's work is recognised as being of interest to the historical development of blood transfusion in Italy and potentially the rest of Europe in the 17th century.

Francesco Folli certainly appears to believe that Santinelli affected the acceptance of blood transfusion because he discusses Santinelli's arguments in detail in his book 'Stadera Medica', published in Florence in 1680. Folli discusses Santinelli's writings as a series of 14 selected extracted comments, each of which he responds to, which include those topics that were believed to be of serious importance given the knowledge available at that time, such as the potential detrimental effects of mixing blood of the same as well as different animals; the volume of blood transfused and how such a relatively small volume can be effective in producing a change in the patient's condition, the concerns regarding the belief that a transfusion can change the temperament, morals, etc., of the recipient, and that transfused blood loses its 'spirit' by moving out of the circulation, etc. The different points identified by Santinelli as well as the responses made by Folli provide an interesting insight into the opinions of people living in the 17th century regarding not only blood transfusion but the functions / roles of blood in the body.

Santinelli includes an index, but this lists only the section and chapter headings together with the page numbers. This index is presented at the end of the book (after the last numbered page). I have included a translated version of this index below, (together with the original page numbers and the pages numbers where the chapters can be found in this translation). As can be seen from the titles of these different chapters, he not only includes medical arguments but also what he considers to be religious, moral and legal ones as well.

SUMMARY INFORMATION – GENERAL

As would be expected of a text written in 1668, although Santinelli is aware of the circulation of blood, he demonstrates that very little is known or understood about the roles and functions of blood or of the major organs of the body. The information written by Hippocrates (especially), Galen and others is unquestionably presented as irrefutable fact and interestingly much of the text presents the overall view that existing treatments are not to be medically questioned and that potential new treatments are not even believed worth examining from a trial / experimental / scientific basis. Although Santinelli initially discusses the 'medical arguments' against the use and value of transfusion, this information is consistently clouded with vague terminology as to the role of blood as one of feeding, nourishing, providing 'heat' and 'spirit', being corrupt, as well as a number of other rather vague terms, the majority of which are based on unsubstantiated ancient beliefs and not necessarily clinical practice. He for example frequently quotes the roles of 'the humors and references vague 'fluids' and 'spirits' active within the body. At no time does he quote any personal observations, case studies or treatments to support his assertions. In addition, he is very prone to using somewhat emotive and extravagant language during the arguments he presents. Santinelli also then includes what he describes as religious, moral and legal arguments that are used to sway the reader with specially selected points that do not necessarily relate to the actual infusion / transfusion of blood.

SPECIFIC SUMMARY INFORMATION RELATED TO INDIVIDUAL CHAPTERS

SECTION 1: UNCERTAIN TRANSFUSION

Chapter I: The invention of transfusion is related, and the method by which it is celebrated is explained.

Santinelli starts by denouncing infusion ‘that had a cradle in England and crept into France and afterwards transferred itself into Italy’. He describes transfusion as ‘savage, brutal, horrible and cruel’ before briefly describing a basic carotid artery to jugular vein transfusion process. Note: The ‘antiquity’ or discovery of transfusion is briefly noted in Section 2, Chapter V.

Chapter II: Transfusion in men is condemned, and the method by which it is performed is considered.

Santinelli elaborates on the belief that transfusion produces ‘wounds’ in the patient, describing it as ‘barbaric’ and states that it ‘inflicts great damage’ whilst elaborating on the pain that the transfusion tubes and ligature are responsible for, because the skin is lifted and parted to allow access and provides, according to him, the possibility of tearing and splitting of the patient’s veins. He does however stress that he is criticising the operation and not the workers who perform it. He describes the method used by a colleague Hippopitus Magnanus when performing transfusion experiments on animals; finally summarising that the transfusion method is uncertain, awkward and painful.

Chapter III: The place into which the blood is transfused is questioned.

Santinelli examines what he believes to be the apparent distribution of blood in the recipient’s body, suggesting that the force with which arterial blood is infused into the patient’s veins results in an increased possibility of it leaving the circulation and moving into other areas of the body. He is aware of the valves (‘little doors’) present in the veins and, not knowing their actual role, suggests that these obstruct the transfusion process. He does admit however that this effect is not universal and will vary dependant on the amount (and rate) of the transfusion.

Chapter IV: The amount of blood transfused cannot be determined.

Santinelli discusses the disadvantages and problems, as he sees them, associated with single large and multiple small transfusions of blood. This discussion includes such things as the ability of the blood in these situations to ‘reach all parts’ of the patient’s body and the ability of small volumes of blood to be able to effect a cure of the patient’s condition. He concentrates however on the ‘detrimental effects’ resulting from the sudden changes that a large volume blood transfusion has on the body, presenting as evidence information published by Hippocrates, Galen, Christophorus and Vallesius., especially when the bloods differ, i.e. human c.f. animal. The amount of blood transfused is challenged from the viewpoint of ‘good blood’ vs. ‘bad blood’, excessive transfused amounts producing ‘excess heat’ – as a result of which he argues that repeated transfusions do not ‘remove distortions of metabolism’ but actually increase the possibilities of it occurring, whilst then questioning whether repeated transfusions (of smaller amounts of blood) over a number of days is actually practically possible. He likens the transfusion of different amounts of blood (‘good’ and ‘bad’) to the mixing of different types and quantities of other fluids, using the mixing of good and poor wines, red and white wines as comparators. He also argues that because the amount of blood transfused cannot be accurately measured it is easily possible to exceed the amount required and likens this to the detrimental effects produced by exceeding the doses of some medicines.

Chapter V: There is a dispute about the quality of the blood that is transfused.

In this chapter Santinelli examines the use of animal blood, starting with the question 'who can believe that blood, fit for nourishing a shabby, dirty, foul and vile creature, is fit for a man'. The perceived differences resulting from the beneficial effects of nourishment given to the body by animal food through digestion compared with the detrimental effects of infusing animal blood directly into the body as a source of 'food' are highlighted. He also then introduces the idea of the possible transfer of the animal's nature and qualities via the transfusion, using as an example the grafting of a tree onto another. Although he disowns the suggestion that the ability to grow horns, wool and hooves is transferred by transfusion he does argue that the 'qualities of the blood itself' are transferred, resulting in changes to temperature and temperament of the recipient. He examines the argument put forward by some transfusers that animal blood is actually better than human blood for transfusion as animal blood does not transfer 'passions of the mind', by arguing that man has the ability to control such urges whereas animals do not, thee being an assumption that such things are determined by and reside within blood.

SECTION 2: UNSUCCESSFUL TRANSFUSION

Chapter I: It is argued that transfusion is useless on the part of the blood transfused.

In this chapter Santinelli looks at the ability of transfused blood to affect a cure and restore lost health. His arguments are based on the belief that 'the principle functions of our bodies are performed by means of 'spirits' and therefore transfused blood must 'not only be pure in quality, proportionate in quantity but also loaded with natural and hot spirits'. He argues that these are only present in arterial blood but that the spirits are lost during the transfer process within the transfusion pipes and tubes. He rather somewhat strangely compares this loss of 'spirit' in transfused blood to the transfer of sperm during mating.

Chapter II: The same disadvantage is confirmed by the ratio of the recipient parts.

The author discusses the difficulties of 'uniting' different bloods (i.e. the patient's own and the transfused blood) and its need to 'spread through the whole compass of the body', which he believes is actively 'sucked' into the body, operating through a medium of 'heat and spirits'. He argues that arterial blood rushing into the body cannot affect the necessary changes required by the patient as this needs to be done slowly over a period of time. Also, he states that the heat of the transfused blood reduces the heat in the bowels leading to their stagnation that has the potential to cause inflammation and abscesses.

Chapter III: This shows that every benefit that transfusion could offer is unproductive and not very durable.

Santinelli states that transfusion has no benefit and if it did it is of such short duration as to make it useless when applied to the types of conditions that it has already been used for, as it 'nourishes quickly and is therefore excreted quickly' (i.e. a quote by Hippocrates). As an explanation of this he uses the analogy of a vinegar vessel into which wine is placed, which alters the wine due to the vessel being infected, comparing this to the effect that the veins of a patient has on transfused blood.

Chapter IV: Transfusion is not particularly useful for any diseases.

In this lengthy chapter, Santinelli examines the potential effects of blood transfusion on specific diseases. Starting with 'diseases of the head' he initially states that transfusion may be of benefit by replacing the 'boiling blood in the head' with a new

and more temperate one, but this statement is of course compounded by the fact that the transfused arterial blood is 'hot'. The author thinks that transfusion may be of use in treating melancholia and mania, but since Hippocrates states that such conditions are best treated gently over time, he changes his mind and then states that transfusion could be harmful. He does mention that he has heard that a 'certain maniac has been cured in France', though he suggests that the effect could be due to the calf's blood that was used for the transfusion being 'thicker', or that the patient's care had coincidentally changed for the better, as well as the fact that because the patient's condition was transient his 'cure' could therefore have coincided with one of these periods and that his condition will reappear in the future. [This patient is presumably Antoine Mauroy who was initially transfused by Jean-Baptiste Denis with calf's blood on the 19th December 1667.] He attributes any beneficial effects due to the transfusion causing a temporary 'agitation of the body', as shown by the great sweating the patient experienced and the subsequent evacuation of black urine, which he equates to 'sinful material' leaving the body and therefore providing temporary relief. He then also comments on another transfusion performed in France on a young man who had suffered from malignant fever, which he states is due to 'hot and cold' blood' and that this patient was already recovering, as exemplified by the fact that he bled thick and black blood prior to the transfusion, which Santinelli attributes to 'a mixture of melancholic humor'. He argues that a blood transfusion 'will not take away the morbid cause' of the fever and attributes the patient's recovery to the fact that his long standing fever was actually already being cured by the body naturally and the patient's described drowsiness, etc., was the natural reaction of someone recovering from a long illness. [This patient is presumably the 15-year-old boy transfused by Jean-Baptiste Denis with lamb's blood on the 15th June 1667]. Santinelli then states that transfusion is much less successful in curing apoplexy or paralysis due to the fact that the blood has no access to the nerves that cause such conditions. Nor will it cure epilepsy, which he believes to be caused by a 'malignant air' generated at the base of the brain, whilst also denouncing Pliny's cure of an epileptic, by drinking the blood from the throat of a newly slain man. He states that diseases of the chest, e.g. pleurisy, pneumonia, asthma, phthisis, etc, and diseases of other organs, e.g. stomach, intestines, liver and spleen, cannot similarly be helped by transfusion due to the heat of the transfused blood, which he believes 'excites the inflammation more' and cannot cure the patient's underlying condition. He then finally and probably most interestingly, argues that blood transfusion cannot help haemoptysis and other haemorrhages since the transfused blood is lost by existing mechanisms – he does not consider 'blood replacement' at all as a reason for giving a transfusion.

Chapter V: There follows an enumeration of other diseases for which transfusion is not suitable.

Santinelli questions the effectiveness of transfusion in treating fevers as he initially says that it depends on the type of fever, of which he says the different types are ephemeræ, putrid and hectic – though he later considers that none of them can be helped by transfusion, but for different reasons. He states that phlebotomy is better used to help fevers as it removes the 'corrupt blood', which the body then replaces by a natural process, stating that transfused blood inhibits this natural process (as well as adding heat, which is obviously detrimental). Similarly transfusion is of no use in curing malignant fevers as the transfused blood cannot repair the destruction of the 'substance' (a malignant humor) that cause the condition. The problem of transfusing hot blood is also given as the reason why transfusion is not effective in curing hectic fevers. He also dismisses the idea of old people drinking the blood of youths as a means of restoring youth, and finally somewhat out of context for the title of this chapter, he briefly discusses the antiquity/origins of transfusion, stating that it goes back to Ovid's description of Medea using transfusion in Greek mythology, as

well as noting the contribution of Andreas Libavius and his quotation of the physician needing hellebore – which are both presumably included since they underline not only the uselessness of transfusion but its danger.

SECTION THREE: INCOMPATIBLE TRANSFUSION

Chapter I: Transfusion is demonstrated to be incompatible with the tenets of medicine.

In this chapter Santinelli's stated aim is to prove that transfusion is apposed to the 'laws of medicine', identifying that the common precept of physicians is that they 'cure quickly, safely and pleasantly', but a person who uses transfusion is stated to not fulfil any of these criteria. He argues that the patient frequently requires more than one transfusion given 'well apart from one another', and that the transfusion itself is a lengthy process, e.g. preparation of the patient's arms, tubes, etc, and is therefore not quick. Neither does a transfusion affect the pathogenic cause (as identified above). He then states that medicines taken by mouth become more effective as they pass through the body – somewhat contrary to what some contemporary physicians believe, which is why they developed infusion methods for some drugs. He also states that transfusion does not safely cure, again for the reasons given above, but then also interestingly states that this has not been 'confirmed by many experiments to be sufficiently efficacious'! He then compares the effects of phlebotomy, which he says is very successful, with transfusion – repeating the belief that replacing the lost blood by giving a transfusion robs the body of 'immediately doing this naturally', and in doing so is also stated to be able to 'get rid of stronger pathogenic causes'. He quotes Hippocrates in stating that it is not appropriate for physicians to produce two adverse reactions in a patient's body at the same time, which 'excite contrary movements' and states that for example this is why enema and phlebotomy are not used on the same day. He compares this with infusing blood whilst at the same time bleeding the patient.

Chapter II: The texts of Hippocrates are explained, in which he neither affected nor followed transfusion, but rather rejected it.

Santinelli starts this chapter by stating that Hippocrates and medicine 'are mutually inclusive' and transfusion he believes is not in agreement with Hippocrates teaching, as identified in various places above; ergo transfusion is not good medicine. For example he repeats the fact that Hippocrates condemns sudden and great changes and that to affect a cure there is a need for 'stable food', and transfusion does neither of these things. Though he concedes that it is 'difficult to attain the true meaning' of Hippocrates writings, he manages to selectively interpret some of these statement to suit his purpose!

Chapter III: Transfusion is rejected because it is contrary to philosophy.

In attempting to prove that transfusion is 'contrary to philosophy, Santinelli states that it is based only on experience and not on reason and therefore 'it does not respond well to the laws of philosophy'. He uses two (selected) philosophical axioms to support his argument. The first is: *That which proves too much proves nothing*, and he argues that transfusion does this because it is stated to provide cures for varying diseases, curing the sick and rejuvenating the old. The second axiom is: *Whatever is received is received in the manner of the recipient*, against which he gives the arguments presented above, stating that this is not the case for transfusion. He also briefly discusses the argument used by supporters of transfusion that it is no different to the fetus being fed by the mother whilst in the uterus, denying any similarity stating that the umbilical cord provides a continuous and natural link between mother and

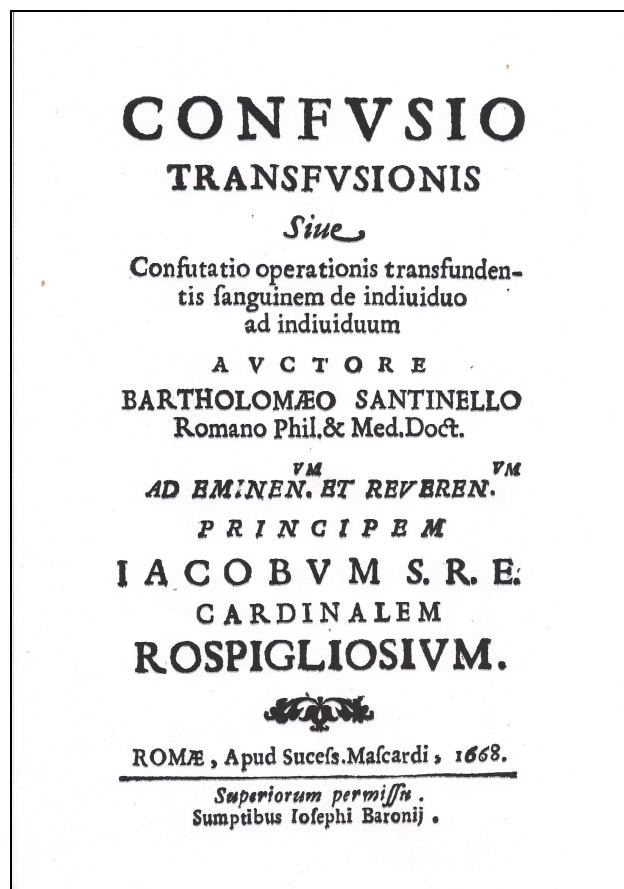
baby (who are also linked by nature) whereas a transfusion tube does not achieve this and it is between a person and an animal.

Chapter IV: The incongruity of transfusion is gathered from the Holy Scriptures.

In this chapter Santinelli uses quotations from the Bible that relate to the prohibition of the ingesting of blood, i.e. from Genesis, Deuteronomy and Leviticus. Although he readily admits that these quotations relate to eating / ingestion of blood he rather vaguely argues that transfusion can be included within this because 'although blood is not drunk during a transfusion, it carried with it the same inappropriateness as a drink' – he supports this statement based on the fact that transfusion is a cruel act!

Chapter V: Transfusion is examined by legal arguments, and demonstrated to be prohibited by them.

Santinelli examines if transfusion 'breaks the law', stating that although it is permissible for physicians to use medicines it is less reliable legally for them not to use established and generally reliable treatments in place of one that is 'probably less effective'. He provides the names of a number of people who have written in the past supporting this concept and quotes Fagnanus who states that physicians are 'bound by their duty and obligation to justice'. He also adds that it is unlawful for physicians to experiment with new medicines/procedures on patients and that he believes that transfusion falls into this category. He does not explain however how this marries with the development of medicine.



Title page: Confusio Transfusionis by Bartolomeo Santinelli (1668)
(Image credit: woodlibrarymuseum.org)

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* The first column lists the page numbers in the original book whilst the second column lists the location of the equivalent section in the translation below.

CONFUSION TRANSFUSION

Or

Refutation of the operation of transfusing blood from individual to individual

BARTHOLOMAEO SANTINELLO

Roman Phil. & Med. Doct.

TO THE EMINENT AND THE REVERENT PRINCE JAMES S. R. E;
CARDINAL ROSPIGLIOSIUM

Rome; In Success. Mascardi, 1668

Superior by Permission

Govt Josephi Baronij

CONFUSION TRANSFUSION

DIALOG

The race of mortals truly mourns the careless and helpless constancy of one's own life;

The best day for wretched mortals

The first flees, diseases undergo, and sad old age

And work, and roughly snatches the cruelty of death.

[Page 2] But the unfortunate man rightly weeps, for he himself is the chief cause of his own misfortunes, and he at length receives the enemy lying in wait for his own safety. I pass over strife, hatred, and a thousand other savage machinations of a barbaric mind, by which man, more stubborn than the beasts themselves, plots against man and murders. I pass over an inordinate amount of food into the gluttony, and desecrate the multitude of dishes by which the bodies are fed; and no other powers are supplied by the innate heat than to kindle the flames of great diseases perniciously, as even the oracles of Seneca himself testify: *Many courses have caused many diseases: you wonder that there are innumerable diseases, count the cooks.* Restart the unbridled dancing of Venus, in which the boys were indecently enslaved, prepare themselves for an overly hasty destruction among the enticements. These [Page 3] are the base crimes of abandoned men; it pleases me rather to consider it, into which men of a better note do not at once rush, when, of course, the health measures approved by the event were nauseated, and those who deny assent to pure dogmas, they most easily embrace the vain, nay, and pernicious medicines, and they cling tenaciously to the new opinions which you have already lived, and thus hasten the loss of salvation to themselves, receiving only the new kinds of diseases in the reward of the beloved of a new one, so that he might as well exclaim by right.

We as men live an unworthy life

We serve discoveries by laws and beliefs.

But perhaps the error of these men might merit an excuse, for it is violent; faith, by which they aim at lost health; and they can do so without any knowledge of medicine, or only superficial ones, so that whatever is announced on those days [Page 4] do not hesitate to immediately experience it, and always expect the miracle of novelty to come together. The major reason for this abuse is that it should be rejected among physicians, some of whom, perhaps, prefer to bring new opinions to themselves, rather than to those who consult with the sick, which view is a useful and glorious genius, but to turn them into use is difficult and dangerous to the sick, and yes, to the physicians themselves. For what faith will be added to the practice of

medicine while we try to overturn the fundamental foundations of it?; while we strive to promulgate the first leaders of our profession (and even the common people themselves) as blind, maimed, and erroneous, and do we avoid safe and upright paths, and condemn?; who will please physicians, and will use the faith of Hippocrates himself, who, wandering aimlessly through so many centuries could not discern the very fabric of the blood, as physicians of the liver for correcting the infections of the blood, [Page 5] while the innovators did not celebrate the liver but celebrate the heart with haematosiis? Who will laugh at the reviews that were made here until he finds out that they were made in a completely inverted way, supposing a newly-invented circulation? These opinions (like many others) seem to be less daring; endeavour in vain to reduce themselves under the banner of Hippocrates, as though they had set out by showing him; for they are so directly opposed to his doctrine, so that he may be truly bleary-eyed who does not know them; nor do they agree with him on account of any other insignia of antiquity, than that they may be more easily able to hawk more at his charms.

Nor has it been given enough curiosity: new discoveries spring up daily, which add new troubles to the sick, and remove the great value of medicine; among the most recent issues is blood transfusion from individual to individual, whose novelty was undeserved, so that even among the learned men of the city it was immediately [Page 6] acquired by themselves as supporters, who disdained not only to profess, but also to experience ... *sometimes good Homer sleeps*, the eager fervour of his talent pushed them too quickly to believe. Therefore, lest the damages listed above will grow more on the occasion of this novelty, it will endeavour to infringe the strength of this work supported by the patronage of famous men, by demonstrating, that notwithstanding the experiences of blood transfusion, it is still uncertain, useless, and inconsistent. If only the applause of that springing up is strangled in the cradle, and its deceit was discovered, let the new ones not dare to sprout in the future, so much so that this transfusion of novelties is truly the last.

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SECTION ONE: UNCERTAIN TRANSFUSION

CHAPTER I

The invention of the transfusion is related, and the method by which it is celebrated is explained.

Orta to testify to his principles, you are a common dogma among the philosophers, therefore it will not be very difficult to trace the origin of the transfusion, since it utterly voids opinion, since no one will doubt that it is only the offspring of another rather foreign one. That birthday derives from an operation devised a few years ago, namely, to infuse food and medicines into the veins through a [syringam], this operation which is a healthy activity while imagining the three instruments of medicine, of a journey, of surgery, and of pharmacies in a single action, confounds them all, completes none, and makes an overly violent mix [Page 8] of perfect and imperfect, nourishing and excrementitious, and while it endeavours to avoid several agreements, and to remove the nausea of taking medication from the sick, it increases indigestions, and brings about greater torments.

This transfusion therefore, boasts of its relation to it, and indeed boasts that it has surpassed it, when it does not mix unripe foods, it does not mix other drugs to the blood, but infuses purer blood into the veins. It testifies that it had a cradle in England, and thence immediately crept into France, afterwards, being still tender, transferred himself into Italy, impatiently, and at length arrived at Rome, where, demanding protection from an infantile age, it immediately had nurses and flattery; but I am afraid, lest, being wearied by such great marches, many certainly will quickly turn away the violent infant.

But some one will inquire further as to what the transfusion is, not looking at it, what its appearance is, what kind of gait, what manners, or what is being done, and how is it celebrated?, it knows that its appearance is savage, its manners brutal, and its gait horrible; for the transfusion itself is nothing else than the admission of blood flowing out of a healthy body into the veins of another ill-treated body, from which the first to be voided at the same time by the entry of new blood, as by the shedding of corrupted blood, and by the new admission of the best, the cause of all diseases, [Page 9] though obstinate, will be eradicated, and the body itself will return to its former health. Let him see how great the outpouring of blood he carries with him, how great the loss of his strength, what great breaches in the limbs, how great is the weariness, the pains, and the dangers; but, if he can, let him hear his distinct operation, so that he may know better the imagined cruelty.

An incision is made in the skin where the carotid artery is detected, or (as the French have experienced) the leg of that animal which is going to transmit the blood on a more distant part from the heart, bound by a strong connection, lest the blood coming from the heart may proceed further; on the other hand it is fastened to the nearest part of the heart by a ligature, but easily loosened, so as to prevent the descent of blood from the heart, but it may be optional; the artery itself is split between two ligatures, and a tube of brass, or any other material, is inserted into it, which has a bend located in the direction in which it enters the artery.

The jugular vein of the receptive animal is stripped in the same manner; it is surrounded by two ligatures; but both have a knot that is easy to loosen, and the vein itself is opened by two holes, [Page 10] and in these, two tubes, like those described, are introduced, the upper part of which has the bend facing the head, and is inserted to bring out the old blood, and the lower tube has a bend located toward the lower parts, for it should be inserted to introduce blood of another individual into the whole body; they are also added; then the veins and arteries are made more reliable with stronger fastenings, which confine the tubes well in each hole, so that they do not move or slip away.

When this has been done, the tube of the emitting artery is joined with the tube of the receiving vein; the lower ligature of the artery is loosened, that is, closer to the heart, and both sides are loosened in the vein, the blood begins to pass through, and in the meantime hot sponging of the tubes is encouraged, lest the blood clot in them, and thus the whole work of transfusion is carried out. You know reader, the bindings, the breaches, and the martyrdoms; if you love it, try it, if you dislike them, do not hesitate to attack them with further examination.

[Page 11]

CHAPTER II

Transfusion in men is condemned, and the method by which it is performed is considered.

The bodies of brutes can be freely used for the work of the transfusion, as they may be torn apart (although not by the end of a total repugnance to a free-born mind), but a man's most perfect body, admirable structure, cannot be tortured so cruelly without a great cruelty known to his soul.

If the transfusion operation only rages against brutes, everyone would be satisfied: *But a man, a sacred thing, a man already slain by pastimes and joke (according to the words of Seneca), and whom it was a crime to be instructed in inflicting and receiving wounds, he is now brought forth naked and unarmed; death is a spectacle in man; and if not death, yet danger akin to death.* He saw the encounters of many men, the transmission of a theatrical procession celebrated in man, and the more accurate design of the operation had been mitigated by the brutal activity.

For what is the split of his throat, what is the swelling of his veins, who could bear so many ligatures [Page 12] and two more wounds, and therefore they endeavoured to execute it in a mild manner. They changed the vein of the throat into the vein of the forearm, which is large and wider, so as to make the skin more lenient, he took hold with his fingers on each side and lifted it up transversely, and, having previously noted the effect of running down the veins, they cut it; they opened the vein itself with only a single hole, introduced the tube, and added a single ligature to more firmly position the tube, in the mean time allowing human blood to come out of the same hole, so that, running over the tube itself, he would favour it, so that the blood passing through the inside could grow grumbling.

But, nevertheless, some barbarism has not been entirely destroyed, nor has the operation acquired an exquisite perfection, for although the vein of the forearm was correctly cut, (when no one would have dared to open the throat of a man) the elevation of the skin however, contributes little to soothing the sense of pain, because by such an elevation the senses are not taken away from the skin itself, nay perhaps it is increased, for the skin is drawn into a violent situation, its adjacent parts are stretched out, and it is compressed in some way by the fingers, whence it is not possible, that some heat and spirits [Page 13] should be summoned into it again, who can not dull the senses, but rather sharpen it; besides the fact that the skin is thus raised, it does not lie down well on the muscles, it has an adipose membrane underneath, on which, as it were, leaning on a soft pillow, it felt very blunt and sharp wound, because the parts thus loosened and soft could less resist a blow, and would render the continuous solution easier, and consequently less pain.

But let the pain be lessened, yet the split of the skin is not diminished, since it becomes large enough that, when a vein is detected, it may be bound conveniently: this, although it does not seem to inflict any great damage on the spot, however well-confident, will be very suspicious; skin splits in flexion of the forearm, where we see that they themselves are everywhere defamed for the slightest cause of phlebotomy, and it may be suppurated, therefore it will be much more possible for this to occur in such a fissure, where a greater pain arises from a larger wound, sutures which are sometimes used increase the disadvantage of a larger section of the vein itself, the ligature, and the insertion of the tube, and by the concussion of the hands, they weaken the part and call in the heat with the spirits, and at length the tumult of blood coming out and entering, which is supposed to [Page 14] occur in the body. It supplies the material there easily: it supplies to bring forth suppuration, especially if the transfusion is repeated several times, as it pleases some. If one considers, moreover, that the body has already been enlarged by an ancient illness (for transfusion is considered to be one of those advantages), if it was hoped that a disturbance of the fluids would necessarily follow from such agitation, it ought to be considered serious even if only a slight pain was added to it.

The vein is indeed opened by a single hole, in which, if loss is weighed with profit, I do not know which of these may outweigh; for utility is limited only to the fact that one punctuation of the vein is avoided; but if there be only one, it must necessarily be sufficiently large so that the tube can enter, and there is room left for the blood going out through the same hole; so that the size of this one is nothing less than two openings made by others much smaller. A loss will emerge from there; for one larger incision would maintain more pain than two narrower punctures, (the sensation of the large vein of the elbow is not denied when it is dressed in a common tunic, as Laurentius says) for they rub very lightly against each other, since they make a small continuous solution, and the interval of time in which one [Page 15] is distant from the other (for the second is not effective for the eduction of blood unless it has been previously joined and tied into the first tube and the introduction of new blood is already in progress) such, I say, will nature rest in such a space of time so that she may forget the former and promptly issue a new one; but the larger one, the whole of it, at the same time rushes in, it tears the vein more sensibly; therefore even more

painfully; add that even small splits coalesce more easily than larger ones, and as described above, the inconveniences of skin splits in the vein are likewise avoided; indeed, the outflow of blood is also hindered, which could then very easily happen, both on account of the wider orifice and of the arterial blood, abundant and warmer, by which the swollen veins are supposed to transmit.

Nor does it prevent what is added, namely, that the blood, which proceeds from such a large split of the vein, can be washed out by the tube, and that blood flowing inwardly should be carefully cherished, because when the blood is exiting, it indeed strikes into the tube, but does not progress through the whole course of it on all sides, rather, it runs through the arm itself, especially when it is unable to pass by force, on account of a more extensive opening of the vein, we see with water itself, in that the more it passes through the narrower channels, [Page 16] the more violent it goes out, and the more distant it goes. Moreover, although it always runs out through the tube, it is not able to communicate much of the internal heat to the blood, when it is altered from the hot air, and the spirits which it possesses fly very quickly into the air at the departure from the vein, as will be explained below: a lot of heat is also required to fuel the tube, and especially silver, (whom I hear has been employed) that they can perform fully with a sponge and hot water, and often repeated, with only little blood gently licking the surface of the channel.

Having said these things, I wish to criticize the operation alone, not to accuse the workers, whom, both foreigners and our countrymen, to praise, never amaze me, who, so as to offer the example of their skill, were unwilling to abandon nothing intended, in which the dexterity of one's hands did not shine forth, but it is impossible and it is useless to wash Aethiopes, namely, to celebrate transfusion without pain and inconvenience.

Hippolitus Magnanus, the most accurate professor of anatomy and my unique friend, mediates (who, scarcely heard in the city, exercised a transfusion on several occasions among brutes, so as to satisfy the prudent curiosity [Page 17] of some) to make the transfusion in a more attractive way, and generally with phlebotomy, not so much as to declare himself as his assistant, but only so as to show his own diligence in the work of the anatomy. He, with the naked arm, plans to make in it two bindings, one below the bending of the elbow, and the other above, and to make the lower part stronger, by adding a lead plate to intercept the bleeding, hence, to open the vein by the same aperture, which is effected in phlebotomy, and immediately loosen the upper ligament by inserting the tube, and the blood enters very well, without any laceration of the skin, and inappropriate handling of the veins and ligaments; but at the exit of the former haemorrhage, he cut a vein in the foot, where the blood was emptied without any loss to the patient. I was well pleased with the invention, which, although contrary to my argument, I could not keep silent, not to be confused with the basic principle of transfusion: the praise of the friend prevailed. But only one could doubt about such an operation concerning the lower band of the forearm, which, unless it is very close it will not be able to properly prevent the ascent of the blood, especially when it is supported [Page 18] by the entry of new blood within the veins, and the motion of the same may be made more rapid; but if it becomes very strong, a great pain will be stirred up, along with other disadvantages, on account of the rigid compression of so many muscles. Moreover, the lips of the section fall off very easily, especially if the man is of fattening habit; and this often happens, although the vein is filled with blood, from which the obstruction of the wound may be more easily prevented, therefore in this case the orifice of the vein will be more hindered, since blood does not run through the section of the vein on account of the lower band of the forearm; but from the obstruction of such a wound, the insertion of the tube becomes more difficult, and not without danger of laceration, and not a slight sense of pain.

I am pleased here to also include a difference between the French and the Italians in regard to the selection of cut arteries: for the former wishing to avoid the

death of the transfusing animal, leaving the carotid arteries, cut through the leg arteries, and, on account of their exuberance, experienced an impossible operation in them; which disparity, indeed, contains nothing solid in itself when it becomes not a man but an animal, that the blood will be poured out, neither does it matter whether the artery [Page 19] is cut into, or whether it will die from that section; but if a man had to share blood with another man, then the lower section of the artery would certainly be important, doubtless great dangers threaten the carotid incision (whatever the contrary, some may think), also because of the proximity of the brain and heart, and also because of the oesophagus and a rough artery standing there nearby, which parts from such a split will easily succumb to any lesion. But no one doubts that it is better for blood to come out of the carotid artery than out of the crural, because it is newer, and being more satisfied with spirits, it rises from the heart, and is therefore more apt for transfusion. But I am not surprised that cutting the legs in all brutes has not occurred so happily, for the carotid arteries are far easier than the incision of the legs, on account of the greater swelling and length of the legs; cutting of the legs, however, is not impossible, according to the testimonies of the Parisians; most learned men would certainly have been unwilling to lie in such a trivial matter; even if they themselves had attained this, I would doubtless believe that they had cut the larger dogs, and, moreover, that they were either more careful, or more happy.

[Page 20]

CHAPTER III

The question is about the place into which the blood is transfused.

You have already seen, Reader, how uncertain the method by which transfusion is performed, and how awkward and painful the procedure that is used. It is my pleasure now to examine for a short time the place into which the blood is shed. But as soon as the transfusers rise up with a stiff neck, he rebukes and condemns an examination of this kind, since the blood entering the veins is open to an irrefutable experience; for the animal, which shares blood, is left bloodless from the operation; but he who receives it, has more severe pulsations in the heart and a swelling in the receiving vein. But let him rest a little, I beseech you, and let him know that I am in no doubt about the entrance of the blood into the body, but about its right distribution through the veins, and please reason with me in such a way.

But first let us suppose that arterial blood does not enter by the same measure, and goes corrupt, since the latter, owing to its thickness, proceeds more slowly, and the arterial impulses [Page 21] is intruded into the veins more rapidly by the impelling force, and consequently in a greater quantity. But on this supposition, there can be no doubt of the perfect distribution of the new blood; indeed one dram of blood is emitted during the period of one pulsation, and for example in the same space two drams of arterial blood are introduced: moreover, at the same time fresh blood should be generated within the body from foods taken, for the baker and the bloodsucker are never smitten; therefore, when more is put in than comes out, it will certainly regurgitate, especially when it has come to the more remote, and the ramifications of the thinner veins, where, on account of the narrowness of the road, and the oncoming blood supply, the same regression rate will take place internally.

And although this swelling of blood was not present in those veins, and the blood, by the same measure by which it entered, went out; there would still be some doubt as to the direct diffusion of blood to those veins; for since as soon as so much blood is distributed within the body, and it is in agreement with a much greater speed than that of its natural motion, and, besides, they obstruct the chaotic veins, that have very thin ramifications, it is probable that this could not be done perfectly, but it must either be asserted [Page 22] that such blood passes into other parts than into the veins, or is to be admitted in those veins with great attractive capacity, which blood,

notwithstanding any impediment, entices violently to them; this truly attractive violent operation cannot be admitted so freely, since it is done by means of heat and spirits; there, however, no amount of them can be found which would be required for the performance of such a work; since the chance of heat is not so close to those parts; nor can the body, already afflicted by the rebellious illness of the gods, be able to possess such an abundance of spirits, being able to afford the effect of a violent attraction; by what means then, will the blood go thither so quickly, not being able to enter freely, nor be attracted by the veins?

Nor should anyone put aside the fear of the void, on account of which such an attraction may be made, although it could not be done by reason of the spirits. For I replied, that it is probable that there can be another way to guard against the void of nature itself, by breaking down, namely, that you come within them, and these, being put together with a simple and subtle coat, they easily collapse, and are straitened if they are emptied of the blood, and thus the vacuum is very well avoided, nor does the nature of the spirit need to pass from the noblest parts to the farthest [Page 23] veins, so that intense blood intake may occur through the medium.

Nor again can the better condition of the incoming blood be raised, the nature of which is wanting, so as to repair the loss of the disease, it eagerly exacts it, and the greater the speed with which it can distribute through the innermost parts of the whole body; for it is falsely supposed that this condition of incoming blood is better, as with the blood of another species, however best, it cannot be congenial to the human nature (as will be proven diffusely below) and, consequently, that it is not sought after by that great eagerness. And although you may ask, it could not dilate those veins so much that they might release the suction of the blood in such a short time span; unless it be said that it is yet to discover unknown ways by which it may direct the humors of the whole body; only to discover unknown ways which fluids lead to the whole body, but nature strives for this where there are no proper paths, and the greatest necessity of a meal demands; but in this case the veins are very well diffused on every side for this purpose. But what are these ways, which nature prepares for bringing down the infused blood, we will further reveal a little below.

The incoming blood is so rapid that it does not obstruct the spouting valves, or the openings of the veins discovered [Page 24] by Aquapendente [believed to be Girolamo Fabrici d'Acquapendente, also known as Girolamo Fabrizio or Hieronymus Fabricius – PL] that are no small obstacle; for whatever may be their use, it is certain that it can in some measure retard the movement of the blood through the ascending veins; (I speak according to the doctrines of circulation, or else I would debate with the transfusers in vain) for either they have an orifice in the direction of the liver, or, on the contrary, the blood will always stumble in it, and from the intercepted course it will regurgitate to the arteries. These little doors, however, are found not so much in the upright and open ducts of the veins as *where the smaller branches are scattered and propagated obliquely*; therefore when the blood wants to be spread out from the oblique branches into the larger trunk; as soon as it finds an obstacle, will undoubtedly come back far greater; nor is it to be thought that these valves, that are very small, can be easily broken off by the entering blood; for Aquapendente himself testifies, *the highest slenderness is also linked to the highest density, which is made for the security of the doors, and the difficulty of suffering, not even in the course of strong and precipitous blood, when he stumbled on these valves, they were disintegrated*; to prove this density, he adds an example of varicose veins, since for a long time these valves retain the melancholic blood, [Page 25] which is certainly not only a sign of strength.

Therefore, the direct diffusion of the transfused blood within the body suffers many difficulties, although repeated experiences have demonstrated that the whole blood is received within the body; nor do my eyes take the credit, nor do I absolutely deny here that blood is transfused into another body, but only with good reason, I

doubt not, by a straight path through the veins of the gods; I do not only resolve the reasons, but I add to the experience.

While he was celebrating the transfusion of brutes at Rome, the most careful Professor of Anatomy, D. Hippolitus Magnanus, opened the jugular vein of a large dog, and he gave it the abundance of blood which he had first drawn out of that same dog; the blood went in very well, and after the operation had been completed and the restraints were loosened, the dog began to advance, but had suffered only a few paces when he was taken with great dizziness and began to turn round, until he almost fell lifeless; and the following morning he was found possessed with a similar affection; the spectators were astonished, and the cause of such dizziness was commonly reported to have been due to an excessive supply of blood, that when the veins of the brain were filled, they had produced such an effect; and so the dog was cut, so as [Page 26] to satisfy the prudent curiosity of some, he had no blood in his brain, and was present entirely in the cavity of the abdomen, and within the bladder and kidneys.

Let the transfusers see whether the blood is distributed perfectly within the veins, or rather that it is transmitted into the open cavities of the body. Certainly this dog was not so small that I could not withstand that amount of blood, and more, which in the days preceding that almost all his own blood had been removed. Moreover, if, on account of the withdrawal of food, the attractor capacity is increased in the veins, as it was argued above, why did it not prevail in such a case, since this dog had been deprived of his own blood many times before, and on its arrival there the blood was necessary for life, not for safety? As if it had been able to travel in some places, it would certainly have come to the brain: there are no valves in the jugular which can retard its motion; nay, the superiority of the brain requires the shedding of blood as quickly as possible from the other parts; therefore, when it has not been found there, it is a sign that either it cannot pass through it, or that foreign blood is not controlled by nature. But I believed that the vertigo had arisen from the flow of boiling blood within the abdomen, and that [Page 27] it had arisen in the head.

But you will say, that it is not to be argued at all from a single case; indeed, if it has been treated only once by a worker, but it has been successfully accomplished on several occasions, as a result of experiences of craftsmen, especially those made by the French, testify, who not only transfused the blood of one dog into another, but the blood was transfused into another dog, and again they communicated happily with each other.

And, indeed, I do not assert that it turns out exactly the same from the history as has been brought in so far, I confirm this issue only by reasons of doubt. Besides, the dogs from the Parisian transfusions behaved very well, nor cannot it be argued this as a universal statement for the contrary; perhaps on account of the association of canine haemorrhage, and of the milder onset of infusion, on account of the smaller amount of blood being admitted, no lesion appeared so sensitive; although the distribution was not pursued, which could be improved with the passage of time. Nor are we stating that the exact diffusion of ingested blood infallibly proves that the same blood is repeated in another dog needing a transfusion; since it is conceivable that the dog, best fed for five days, could have produced a suitable amount of blood, which could be inserted into the new transfusion, together [Page 28] with that portion which had previously remained in its body before the first transfusion, so that the blood which was transfused into the third dog was not the same as the blood that had previously been transferred from the first dog to the second, since it could not have been perfectly distributed, it had been expelled from the body as if useless, along with other excrement.

But that the dogs who have received the blood, as soon as they are released from their bonds, rise and run with enthusiasm, and it seems no wonder, since this is especially the case with dogs of a fiery nature, and especially if they have been detained for a long time and tortured. Moreover, the blood being ingested, although

it is not well distributed, immediately communicates to them some spirits, on account of the heat which it has with it, as is the case with those who feel that spirits are exhilarated and strength increased by a drink of pure wine, and yet that wine scarcely reaches the stomach, nor yet begins to be assimilated to the body, likened to being cooked.

I can add to the strength of our doubt the unfortunate fate of another dog, lest the chance of ulceration be brought in, it may seem of little moment. He had good blood on his recovery, but shortly after suffered a very large amount of urine and an effluence of sweat, which if of the blood [Page 29] could either be regarded as profuse eruptions from nature by these paths, or the melting of the body made by the blood itself, on account of an impeded natural flow, and consequently the agitation and excessive heat produced within the body. The worthy Professor further reported that the two other dogs urinated blood for the same reason.

But someone answers that all of these disadvantages can be easily identified and avoided if blood is injected in a small quantity. This is now to be examined.

CHAPTER IV

The amount of blood transfused cannot be determined.

To suggest that the whole blood should be transfused in a single moment, seems at first, to be a great avoidance of discomfort, which accompanies repeated transfusions; for it cannot be done without, as has been proved above, during the surgery itself the patient does not suffer pain and discomfort, and does not experience any agitation from the blood entering the body, and the alteration, all of which, if transfusion is done several times, [Page 30] is multiplied to the detriment of the patient, but if it is to be celebrated only once, the sick person is also treated once; and the help which is hoped for is more easily acquired, since the whole quantity of blood, when entering at the same time, by its own strength can more easily and more quickly drive out the morbid disposition.

Moreover, it is recommended to do so, because unless new blood reaches all parts of the body, it can offer no advantage, because it cannot communicate heat everywhere, nor can the spirit be more vivid, that food and convenience should be distributed to each and every one, and health in equal proportion to the balance of the whole body, and it consists in vigour; if, therefore, the whole quantity of it is not together, but is infused gradually over several times, this undoubtedly happens, for a small quantity of good blood, however well it may circulate, is scarcely sufficient for the repair of one part, nor is new heat (which it contains a little in a small quantity, and perhaps partly loses it) can print firmly on the parts for their restorative stability.

But they are especially mistaken who think that only one transfusion is useful and convenient; it is true that the repetition of pain and discomfort arising from repeated operation is [Page 31] unavoidable, but it is not avoided; nay, the internal agitation is increased, and from the supply of blood being let in, more easily and sooner the disease is removed, but it becomes more stubborn, and new diseases are heaped up in the former. For how can the blood be fully infused into the parts?, has it not been abundantly proven that blood is not so easily distributed through the ramifications of the vein, but the more strongly the cavities within the body grow back, the more plentiful it is; dogs suffering from a bloody micturition after transfusion, and a mass of blood found within their abdomen, clearly testify to this; and this agitation will seem less than if the blood be admitted gradually over and over again? In addition, the attack of abundant blood entering, although strong, will always find some resistance to the pathogenic cause, will be opposed to it more powerfully, so that the violence of it will be much stronger in expelling the corrupted blood, brought about in both fresh and temperate parts; and from these the motions of the agent and the patient, the

body will indeed be shaken very sensibly, and much more, than if the gentleness of the agent was fighting with the lesser of the patient who was resisting.

And leaving these, there was a great loss to the body from a sudden and total change of it [Page 32] from a diseased state to complete health, which immediately emerged from such an infusion of good blood. Both Hippocrates and Galen, in hundreds of places, noted the dangers of such sudden changes; and especially he spoke of this kind of change which takes place in transfusion more properly when he said: *It is very dangerous to evacuate, or fill up, or heat, or cool the body, or otherwise move the body, for everything is too much of an enemy of nature; but that which is done by degrees is safe, both at another time, and then when there is a passage from one to another.* For in a single time after the transfusion has been completed, the body is very much emptied out, and indeed suddenly and very much; and then suddenly the body is filled with new blood, and from the blood of many having entered into with spirits; it gets hot and much altered, therefore there is danger from such a transfusion, and so much the more, which at the same time voids much, fills up much, heats much, moves much, when Vallesius thought that only one of these would be dangerous. Nor does it matter that such a change, if it happens for the good of the body cannot be dangerous; for the agitation which takes place within the body completely destroys all the goodness of the change, [Page 33] as the most learned Christophorus asserts that such a change is the opinion of the rest. *It does not so much harm where it is changed from a natural disposition to that which is contrary to nature, but also if it is brought back from a non-natural disposition into a natural and proper disposition.* Nor again does it matter, that Hippocrates said that passing from one to another is dangerous, so that it can be done between contrary things, but the blood which is emptied and which is infused, may be the same both by reason of blood, and by reason of quantity. Since the answer is that these bloods differ, because they belong to different individuals, among whom there is generally a great difference, and there are also different species, when a brute animal transfers blood into a man; and if there were any other disparity, there is the greatest, that one is diseased with blood, and the other is drunken, pure, subtle, and excellent, and so they comment. Galen, this change is dangerous, *when we go over to the other, to whom we have been accustomed,* and as Vallesius adds, *when we return to the customary,* in transfusion the patient returns from the unused morbid blood and [congeneum], or if you prefer to say, from the diseased blood with which he had been accustomed to be nourished, he receives again the good blood, by which he had been destitute for a long time, [Page 34] therefore undergoes a great and dangerous change, although it is the blood which is brought out and which is received.

Finally, neither can other texts be opposed to the aforementioned text of Hippocrates, in which he proves violent changes, and especially discharges of blood until the mind is unconscious; for he wished that such evacuations and movements should not be taken over in regular care, but in such a manner the Foroliuius feels compelled to do so; but in the case of transfusion, which is especially appropriate for chronic diseases, it does not seem that care should be used so precipitately, since such diseases give sufficient respite for the repetition of the operation.

I pass over the extinguishing of the heat of the natural birth, which there is in the body a single and plentiful transfusion, for this is one of the experiments, which are contained in sudden changes, as we reported above, nor would this be contrary to reason, since it was found among all that the synthesized heat was extinguished, not only on account of the lack of forage, but also on account of its excessive abundance, which when overwhelmed is dissolved; but there was no doubt that there was too much heat in the body of the sick man with too much blood rushing in at the same time.

Now I see exulting [Page 35] transfusers congratulating me, because, in condemning only one transfusion, I assent to their own dogmas, while most of them assert with good reason that it is to be carried out over and over again by days, but

let them rest for a moment, and therefore think not that I am their friend, ... *let them fear the Greeks bearing the gifts*, the arguments cited above do not tend to support the transfusion, but to the downfall: for it was therefore proved that it was not to be effected on one occasion, it may be proved that it is not even possible for them to be accomplished over and over again, and as a result, as to the amount of blood infused, that it is altogether uncertain and doubtful; let them then hear the proofs of the second proposition.

It is most certainly established by experience, that when two things combine together, those which, either in quantity or in quality, surpass the other and assimilate it to itself, so that it retains almost nothing of its own qualities and virtue; this is seen everywhere in the mixture of many waters with a small quantity of wine, from which, although wine surpasses water in quality, it is nevertheless surpassed by water by reason of its quantity, and its nature is changed; and, on the contrary, the same thing is done in the mixture of a little red liquor with much [Page 36] white, which remains red in colour, on account of the more intense quality of colour, and does not resemble white in any way, although it is in greater quantity.

It is well known, moreover, that if the transfusion is repeated on several occasions, much greater will be the quantity of blood remaining in the body, of which the quantity of depraved blood remaining will be much greater than that of the good, which is newly transfused from another individual; it must necessarily be asserted that the good introduced far exceeds the quantity of corrupt blood to correct corruptions; but rather that it could be infected by its conditions and degenerate entirely into its nature, whereupon it will be inferred that transfusions were of no other purpose than to increase discrasia and to establish the extent of the pathogenic cause.

But if the blood sent by transfusion does not exceed the quantity already existing in the body, yet it surpasses it in quality, and thus renders the rest to itself similar and purer even in very small quantity. However, if the excess of the qualities of one blood is to be measured above the other, certainly corrupted blood will not prevail, for besides the fact that it had already established its discrasia in the principal parts of his body, and had confidence in the proper place of [Page 37] its generation, the more severely it exercises its tyranny there; certainly in many mixtures, the worse part prevails over the better. Mix a little muddy or bitter water with a greater amount of pure and sweeter water; and you will certainly see very sensible water communicated to sweet water, clearing of the bitterness and confusion: it will not happen if a large quantity of the same bitter water is overflowed with a little sweet, for you will have a taste of almost no sweetness shared with it, and this will certainly be done on account of the excess of the evil quality above the better. It happens in exactly the same way in a mixture of blood, since a depraved man will have an excess over the good, than on the other hand, notwithstanding the greater degree of this.

Don't tell me that new heat is introduced with fresh blood, which, being able to separate the etherogeneous from the human race, will also be able to separate the bad qualities of blood, lest they infect a new one. For I reply, that just as the quantity of mixed blood is very small in comparison to that of another, so too will the heat be small, inadequate and insufficient for such a work, especially since it cannot be cut off from the obstinacy of the contrary qualities.

It confirms our assertion of Hippocrates' precept, [Page 38] when he says: *The more you feed impure bodies, the more you will injure them*; for that reason, which Galen adds in his commentary: *spoiled for arriving food, along with those vicious fluids that already exist in the body, so that the quantity of them is increased, and the quality is maintained*. Although he is speaking there with Hippocrates of nutrition, which is done by means of cooking in the stomach, and of the indigestions arising in the primary ways, the assertion is also valid in our case, when we speak of the more

immediate nourishment of the body, and of the impurities which, since they are within the veins, are also more stable and stubborn.

I don't know who is sharp enough to rely on the above-mentioned intelligent transfusers' objectification; if repeated blood transfusions are not able to remove the distortion of the metabolism but rather increase it, then it will also provide repetitive alterations, and the medicines which cleanse by epicrasis, which they drink in a few quantity; but experience asserts the contrary. I assign the disparity, nevertheless, very easily, since they are not both altering and purging, as the blood which is infused into the body agrees with the former, and it only differs with respect to [Page 39] the greater perfection, and consequently can easily pass into its nature; they differ greatly from the other bodily fluids, both in substance and in fundamental qualities, and therefore they cannot be turned into their nature, nor overcome by the same, since they act chiefly as excuses for the whole substance, and do not construct anything else than the production of the offender's material.

It is, therefore, not uncommon for blood to be injected over and over again. But although at some time it could thus be admitted, yet there remained another difficulty in sifting it out, namely, the quantity, that it should be transmitted both in individual injections and in the total subversion of the disease, since the convenience of the remedy consists chiefly in this, but this cannot be so easily established, since exceeding the dosage of other medicines inflicts serious risks, and therefore so much more, when the nature of the sick of the old was exhausted (in these as transfusion is celebrated very much), the more feel the excess of the remedy, nor is it known exactly the temperature of the blood of the brute being let in, and the correlation with the blood of the patient, nor can the quantity of the [Page 40] same blood coming in, be weighed in such a way that it corresponds to the proportion of that going out, lest the patient be filled beyond reason, or may be wanting a necessary meal.

I have heard that a certain instrument has been devised for weighing the blood that is introduced into the structure. In those extremities of the tubes, in which they meet one another, a vesicle is attached to each side, which contains e.g. one inch of blood into which the blood of the transfusers is collected, nor is it permitted to pass over into another receiving tube, until a gallbladder becomes full, for it is then well known that one inch of blood was transfused. But such an instrument leads to another danger, if indeed it renders blood altogether useless and impoverished of spirits, while it causes it to dwell as it were in a hole before it enters the body. There are others who by the benefit of a clock or a pendulum, are believed to be able to determine the amount of blood transfused in the space of so many minutes, or so, but as contractions and diastoles can occur in transfusing bodies, by which the force of the cause is now faster, sometimes more slow, and by them blood is introduced into the body of the other; thus it cannot be established [Page 41] how many beats take place within a quarter of an hour, and how much blood is shed by them. But he has grown up too much in quantity, and hastening to and fro among other things.

CHAPTER V

There is a dispute about the quality of the blood that is transfused.

The transfusers themselves were horrified at the injection of human blood into another man, when reading and refusing to carry out the work of the enemy of piety, which on account of the common assent, they used the blood of brutes, whom they consider fit for this purpose, and even better than the human; but whether this usage corresponds to reason seems to be denied rather than asserted.

There stands also the other sensible ones, a common disparity between brute and man, by which even uneducated housewives declare that it is impossible to share perfect communication with one another. For who can be induced to believe that the blood suitable for nourishing a shabby, dirty, foul, and vile creature is fit for

man, not only for nutrition, [Page 42] but excellent restoration?, will it not inflict the same imperfection and excrement which it shares with his own body when intruded into another by force? We eat, indeed, and we are nourished by the flesh of the sage, and the flesh of other living things; but we do not bring them directly into our own bodies, but both outside and within our body, we render them pure in various assemblies, and something which we impart to them in a certain way to human beings before we are nourished by them; but in a transfusion from a brute we receive blood immediately within the innermost parts of the body, which, as far as most of the qualities are concerned, differs from us, nor can it be properly received and perfectly assimilated.

He assures us that this incompatible discord of different species is daily presented to us in a very common way. There is inserted into one tree a small branch of another tree of a different species, here it is linked to a larger trunk, and each of them lives by the common nourishment which is supplied from the earth; but even if it becomes one tree already, although they enjoy the common nourishment, they do not change their own nature, but are altered by each other, and eat the fruits of both natures. A small branch, therefore, could produce such a change in the tree, in which the [Page 43] ruder condition renders the impression of the other's qualities less easily, nor is the nature of the fluids so exact and manifold, nor are the functions of the internal organs so arranged that they may cause alteration and harm to be readily received, and shared by the advent of the other.

It can, therefore, reasonably be inferred from this, that blood from brutes injected in a man should indeed be united, but it makes such a mixture that the body must be altered so that it must receive the necessary qualities of such blood, and in any way may degenerate into its nature, namely, the recipient of its filth, and the beast's own temperament.

And indeed, the morals and manners which follow the temperament of the body, as Galen diffusely proved, and in particular, Rodrigo de Castro asserted, that the temperature and manners of ingested foods can be changed from time to time; in transfusion a man is nourished immediately by the brute's blood, imbued with all those spirits who were able to accomplish those operations within the animal itself, this is an arterial blood, which is considered by Senerto to be more efficacious for doing this; among whom are read several examples of these changes arising from the assumed brute's blood in a man; the organs are nearly the same, [Page 44] in brutes, and therefore men will very easily perform brute operations.

I think that the shape of a man can be changed from the infused blood of a beast, in such a way that a man is imbued with split-blood, grows horns, fleece, and nails, I totally deny it and think it is utterly ridiculous, but although ridiculous, it will still be disliked by the transfusers. Certainly there are in the split-blood, parts of excretive things which degenerate into the hair of the horns and the nature of the nails, whilst the other parts of the blood resemble the purer parts of the body; but these parts of the blood, whether they come of themselves to nourish the parts of the body or are attracted by them, is of little importance, namely, that such excremental parts of the blood are introduced into the human body, or they will be commanded concerning those parts, as it was done in brutes, and thus the fleece shall beget horns, etc, or they will not be commanded concerning it, because none of these things are found in man, they will remain with the rest of the blood, and will pass through to the more noble organs, where they will cause no slight damage by destroying the rest of the upright portion of the blood.

We have seen how great an imbalance of quality there is between the human body and the blood of the beast that is transfused, from which we have rightly gathered [Page 45] that a convenient restoration can by no means be offered by it, but that the inconveniences are considered to be despised. I think that the clever transfusers will nevertheless continue, and will add, 'brutal blood', although it differs in respect to other qualities from the human, to come together, however, with the

notion of heat, which is the main thing that is taken into consideration for the physical repair of the body, for, even as Plato himself asserts, of all living beings, though in the form of just one of several, and it is the same heat, and it is evident from the common experience, that the heat lost in man is restored; attached above the cooled part of an animal still alive with warm guts, from which only the symbolic heat of each individual is inferred.

Let him know, however, that the proposition which he himself makes concerning the heat of different species of all living things is not so undoubted, if indeed the native heat produces much in one animal, which cannot operate in another species, although it is generally the same or even to a lesser degree. I pass by the fact that the camel-wort is said to be carried by the carrion itself, detailed by the force of its heat, which it is not permitted even to a lion, the hottest of all living things; this is without doubt evident in the hay and straw on which the torpid and sluggish ass is chiefly [Page 46] nourished, and, therefore, supported by a little warm heat, it cannot pass into man's natural food, although the heat of man is the same as the heat of a ass, or at least a more lively one: the raw flesh with which the other animals innocently eat, man can by no means digest perfectly, although he is more perfect in heat; therefore it is evident that the temperatures of animals of different species is not the same, since they may produce so many different effects, not to a greater or lesser degree, but from different specific format. Plato asserted very well that *every animal in the blood and in the veins has heat, as it were, a fountain of fire*, because in every animal there is heat, like a boiling fire, but it does not proceed in the same way in each one, since, according to their different species, it operates differently in the cooking. No comparison of temperatures among all living things is proved by the experiment presented on living and cut animals to restore the heat to the cooled parts of man; because combinations of other heaters and the features of hot medicines often perform it equally well, of which the heat of the same species ought not to be reckoned as the innate heat of man, for that addition [Page 47] of warm animals excels nothing else than the elementary qualities of the maker, by which the pores of the cooled part are opened, and the spirits are enticed, so that they may flow together, the thick and slow fluids are dispersed, if perchance they are there, and they are called the native heat, so that it leaks from the other parts of the body even for a while, and indeed not violently; so that it leaves the heart and the other more important organs, but with a sufficient irradiation, that even that part of the body that has been lost gradually, without any danger to the rest of the body, enjoys the common influx of such heat; but it is not credible that its own force is transmitted there by that distraught animal, and that the spirit by which that part is immediately nourished, as it were, embraced them as if it were the animal itself.

The transfusers will insist: did you not say above that brutish blood can be transferred into the human body to produce brutish morals and qualities?, therefore you make him of the same species, and you admit altogether that which you have lately denied, namely, that the heat of these subjects is different, because what works in one cannot operate in the other.

I reply that I have not so universally asserted that all things pass from brute to man by means of the shedding of blood, but have spoken [Page 48] only of the qualities of the blood itself, both first and second, to communicate with man, and consequently to be able to alter his temperature, and by changing his temperament, to wit, those manners which may arise from the intemperance itself, for instance, from the wet and the cold torpor, sloth, stupidity, hot and dry rage, madness, etc., but not those manners which belong to their own brute nature, and specify them by man, for example, the voice, the reason of food, etc., for these are those operations which constitute the species of living things, and as heat, which they operate in one species, do not produce in another. But, and not supposing this, let the adversary take as much as you like from the above assertions, and it will be enough for me, for if the first be true, namely, that beastly nature can be communicated to man by blood

and heat, therefore, on account of such danger, this transfusion must not be performed, therefore it is concluded that the transmigration of one to another is useless; therefore, these two assertions, despite no contradiction of them, will each fight against transfusion.

But no matter how much brutish heat can operate in man, [Page 49] and if it is exactly the same species as he is, will this transfusion be free of danger?, not at all, when transfusing the animal's warmth from the wound, the amulet, and the violent situation in which it is being held, it is exceedingly agitated and becomes hot, from which it cannot approach a very friendly individual who receives it and perfectly restore his topmost strength; nay, from the force and agitation mentioned above, he can easily conceive of a phlogois, which may inflame the fever in a recipient subject, especially since such a body, loosened by a rebellious sickness and cold by the shedding of its own blood, may very easily feel the violence of such an impulse, and receive it more firmly; nor can he resist the intruding heat in such a way that it tempers its heat with contrary qualities, for his own weakness does not permit him to stand in the way of this approaching opposition, but rather to succumb to it.

You have already heard how much inconvenience this cruel infusion of blood into a man brings with it; you have once again seen that the lost arts of the fabulous circus have emerged into light, by which men were converted into brutes; even more savage than they are by this name, because they used the sweet harmony of these harmonies; but these are accomplished by stiff shedding of blood. But [Page 50] in order that their abuses may be more fully eradicated, it will also help here to refute some arguments by which some transfusers, not only consider brutish blood suitable for this work, but thought it far better than human blood. The first argument is as follows: Brutes are not subject to the passions of the mind as a man, nor do they serve scraps of food as he does; they are able therefore to produce better blood than man, and pure blood is not even found in infants. The second is: we enjoy daily the flesh of animals, and by their milk many diseases are cured, therefore we will be restored perfectly even with their blood. The third is that the operation is performed more easily in brutes, since they can be adapted in any way; the artery may be cut innocuously, and may be prepared for work, and by nourishing them before the operation with those foods that may resist those diseases which we intend to cure.

To the first, therefore, the answer is that it is false that brutes are more subject to the passive spirits than men, and are unscathed; for man differs from brutes in this way, that he can control his passions by the command of reason; for it is accidental that man perseveres obstinately from them in certain things; [Page 51] but what kind of brutes do they not attack so that they may obey their passions?, at what time of intercourse are they insane with fury?, so much so that almost many of them pine away; with what fury are they caught by the impetuosity?, which appetites do they serve incessantly, when they are found to be constantly ready and eager to eat?, but a man, however much more gluttonous, prepares for his food at the appointed times, at a convenient distance for digestion, which one may change, as long, however, as he does not stray from the statutes of law, or against his will, according to the just norm of his nature. But if the blood of men almost always appears impure, nothing prevents such a thing from being seen even in brutes: if any humor flows from it, their blood will be infected as well as in a infected person: but, compared to the brute, human blood has a better substance and a more vivid spirit, which no one will dare to deny.

To the second reply elsewhere in this chapter, that while we are nourished by the flesh and milk of brutes, we return them first to us, congenital to us by several cookings, before we compare them to ourselves; not so in the present case, in which the blood of the brute being in no way cleansed, we immediately attach to our innards, [Page 52] and liken it to the body.

To the third, it is conceded that an artery can be cut in brutes, because we care nothing about their life, that they could also be tied up, and in any way adapted to

their work, and that they could also be best nourished; yet the perfection of this bloody campaign is not known; for if man is nourished by the same foods, he will no doubt produce better blood than brutes, therefore let the insult inflicted on human blood be abolished, by which he was declared to be more imperfect than that of a brute, and firmly embarrassed, that the quality of the blood was still undecided as to be fit for transfusion, since, like the human, it is dangerous, and in a manner execrable, but to a brute it is useless and dangerous.

[Page 53]

SECTION TWO: UNSUCCESSFUL TRANSFUSION

CHAPTER I

It is argued that transfusion is useless on the part of the blood transfused.

We have pointed out to many in the above section the uselessness of the transfusion, although we have not talked properly about of the amount provided, and by which we have noted by a certain rule the stability of transfused blood, we have reviewed at the same time its harm and danger, and have recognized it not only as un-injurious, but as dangerous: it now remains for us to speak of such an unprovoked uselessness, as transfusers boast, will remove the aforesaid by continual uncertainty, and repeated observations, nay, they avow that a successful transfusion had been managed several times since the event had cured some diseases with precision.

It will therefore be noted [Page 54] that the help which is supposed to be received by transfusion is entirely in vain; and first this will be proved from the transfused blood itself, which, however much it may be of the same condition as the man, and let it have heat in keeping with that species; yet while it is still admitted into the body, it is no longer able to produce a stable utility, and to restore the lost health perfectly by nourishing it constantly.

It is certain that the principal functions of our body are to be performed by means of spirits, and that the undermined nutritional economy will not be suitably restored by the application of the optimal materials, unless such matter is also coupled to the living spirits, who are assisting in its distribution, addition, and cooking; therefore, if we wish to relieve the body from the insolent affection which has been relieved, by transfusion, it is necessary that we may transfuse such blood, which is not only pure in quality, proportionate in quantity, but is very much loaded with natural and hot spirits, so that it may be able to operate and be distributed within the patient's body, and to combine the functions corrupted by the innate force of the viscera, and to change the whole body sensibly; and hence arterial blood is best taken, which is best filled with spirits [Page 55] when it leaps immediately from the source of heat.

Assuming such a truth, it seems useless to say that the transfusion is celebrated, with arterial blood, which goes out from an animal and through a shooting tube enters a sick man, by such an exodus of spirits it loses the greatest amount, and from the purer and better of them, so that whatever was needed can by no means be effected within the body of the patient through those mediations: nor does it matter that by many aids the outflow of these spirits is hindered by heating not only the surrounding air, by warming the tube itself, or by warming it with a hot sponge, or by washing it with the blood coming out of the man, or by anointing it with human fat as a super-transfuser proposes; for the most easy escape of these spirits, and the almost impossible resistance of their departure, nature teaches us, and it is well known by experience, to which it is immediately necessary to acquiesce.

By general consensus the work of reproduction is especially hindered if the penis of a mating male is a little longer, thus Aristotle, and Avicenna, who speaks principally in this way, and adds an account of such an event: *And when [Page 56] the rod is greatly prolonged, the movement of the sperm is prolonged, and therefore it comes to the uterus when its heat is already broken, and therefore does not*

generate according to the greatest degree; but if in such a case heat is lost, and the spirits evaporate, why will it not be done in transfusion?, the penis, which represents the tube, is not only protected by the heat of external air, it is heated mainly by contact with the body, it is only composed of cold and inanimate matter; but it lives, and is nourished by the veins and arteries, but even within the woman's vase almost entirely closed, it is encouraged more precisely there than the blood in the transfusion tube is encouraged with fats and sponges. Moreover, the seminal matter, by which the spirits are wrapped, is of a far greater thickness than the arterial blood itself, whose spirits can certainly not be lightly held back, lest they should flee; the operation is performed very quickly, and at length by the motion of the body most of the heat is summoned there, adding no slight benefit to the whole work; nevertheless such a loss follows, so that the generation becomes null and void. Will not, then, the nourishment and restoration of the body be rendered useless by transfusion, in which the blood suffers a greater defect of spirits, since it has no stronger remedies by which it may be fortified? Moreover, in the above-mentioned [Page 57] case, the semen, although destitute of vigour, may enter into, and is immediately received by the womb; there the whole is collected, and best nourished, it is strengthened by the mixing of the menstrual blood, and is assisted by the access of the female egg to the work; and yet the unprofitable still persists in procreating; so great was its vigour which it lost on such a journey, though best fortified. But the transfused blood is dispersed throughout the whole body and the viscera, not only deprived of heat, but when afflicted with stubborn obstructions, and afflicted with a very bad diathesis; henceforth it is mingled with blood, which cannot be imparted to the spirit, but causes a contagion, whence comes strength, which it has lost in the sending, it can by no means be taken up again, and thus it will be transferred to no avail.

For other reasons, an ingredient in blood can be declared unprofitable, as discussed below. It remains to be said of the human fat, which is proposed to smear the tubes, lest the passing blood suffer loss, which I declare does not belong to a double name, first of all because I do not suppose that the blood will be grumbling on its journey, the penetrating material may need to self-disintegrate. In the second place, because even if he had need, it could not take advantage [Page 58] of a smeared tube like this; for it is necessary that the applied medication either touch the affected part immediately or at least be inserted close to the skin, by which means the general heat is received and transmitted to the affected part, but it is not applied to an inanimate object, which can either resist admission or infringe the powers of the medicine, being unable to cure any swelling or ulcer existing in the patient's arm, it is not congenial to his condition, as if he would put plasters on his clothes thinking that it could penetrate the pores of the garments, & hence bring relief to the working member of the body; so that human fat is smeared outwardly as a cure for blood inside the tube of gum. But the debate on these matters is quite useless; it helps to convert the pen to better things.

CHAPTER II

The same disadvantage is confirmed by the ratio of the recipient parts.

We have already begun to prove in the first section that the blood was admitted [Page 59] into parts of the recipient body not correctly adapted, whilst we have said that they were not rightly united either on account of their quantity, or on account of their diverse qualities; but now the same thing needs to be proved more specially, whence, by abandoning the other reasons, only one thing will now be repeated, as in Section 1, Chapter 3, namely, we have intimated that in order that the blood that enters immediately spreads through the whole compass of the body, and passes through the various diversities of the veins, and overcomes the difficulties of the same, inasmuch as it seems to some to be, de facto, distributed in such a way, since

it seems that a great amount of blood is transfused from one animal to another, a strong attraction facility is necessary in all parts of the body into which it is violently sucked; whatsoever notwithstanding, it shall carry the blood to them; but we have denied that this powerful attraction that operates through the medium of heat and spirits can be given in a sick body, and in such a body nearly all of which have been exhausted from the obstinacy of an ancient sickness. But now also this violent attraction is to be freely given to them, so that by such a concession new proofs are provided for transfusion, it can [Page 60] indeed be admitted that nature, so as to restore the loss of blood to a void, is wholly bound to the attraction of new blood. Shall the parts of the body so eagerly cut off from them be refreshed with such blood?, indeed they will experience very harmful consequences, and are only suitable for strengthening the former diseases, for if we are speaking of nourishment, and it is intended to bring about the repair of external fleshy parts, such as in cachectic, and it is intended to be tampered with by means of transfusion, I assert that it could not be attained by means of this blood, to them in such abundance and in so much inhaled, since before it is added to our flesh, it ought to undergo several changes, by which, as it were, it is gradually changed into a man's substance; but the blood rushing in this way cannot receive the aforesaid changes perfectly, indeed the temperate dew [rore] cannot be filtered out; because the violence, which has taken its course from its attraction, is unable to restrain it, nor does the concept of heat generated by motion permit it to dwell so much. With the dew [rore] kindly and peacefully not oozing out, the glue [gluten] consequently becomes unfinished and a little sticky, to wit, diluted by the abundance of the overcoming liquid. Glue [Gluten] is unfinished; cambium [Page 61] is turned into evil, then on the self side with little able to stick due to the imperfection of the glue [glutinis], and because the exact degree of cooking [coctionis] was not acquired, as well as on the part of meat recipients, those who suffer from persistent dyscrasia, whatever is applied to them, they turn into their own nature, and especially if the nutrients which arrive are not exactly the most perfect, so that they may be able to resist their depraved disposition.

But if we are speaking of the attraction of the same blood, it will be immediately affirmed that it has been done from the bowels, that it can extinguish the heat in them, to strengthen blockages, abscesses, and perhaps fits, and thereby increase the loss of health to the rest of the body when it rushes violently into it; whether it be drawn most eagerly from the very bowels, as we have supposed it to be done from the other parts, or from itself to the former, from the fact that it is never distributed according to the same good measure, and proper blood is distributed (for the slenderness of their own substance, and the agitation of the brute emitting it, they themselves reconcile the violent motion, at least through the first and more open ways) it can be easily disposed of in abundance and the heat will soon overwhelm them, whereupon the rebels made more blockages, and were not collected there, and either [Page 62] stagnant in their cavities, or diffused through their substance (when the whole body enters in this manner and enters into the substance of the bowels, it cannot be easily changed so soon) it can easily cause inflammations and abscesses, with a severe risk of health and life. But we will describe individual damage, inflicted on individual diseases in which blood is transfused, in more detail below; it may suffice for now to have manifestly shown that the transmission is not only guilty of novelty, but is also insolent of other crimes.

CHAPTER III

This shows that every benefit that transfusion could offer is unproductive and not very durable.

With respect to the blood transfused and the parts receiving it, a transfusion can offer no benefit; and if perhaps it could someday be of some help, it would have such a

short duration, that it could scarcely obtain the name of a shadowy commodity. The diseases with which transfusion is used, [Page 63] since they are, as it were, for the most part, very much antiquated and rebellious, and are stable and relieved only by great valour of assistance, and with respect to the operation itself, which is laborious and difficult, no profit is considered unless it is noticeable and firm. But that it (if they were sometimes allowed to enjoy it) would escape very quickly, and he says it is most assuredly proven by the oracle of Hippocrates: *The excretions of those things which in close and fast nourish* but when the blood is transfused it feeds quickly, therefore it will have quick excretion from the body; the minor premise of the argument is proven, since Valesius asserts that those things which at the same time excel at once and quickly produce, feed on every food which they can afford, in close and fast nourishment, but here the blood, if it gives any nourishment to the body; there he pours out the whole, because it is immediately added to the parts, not like the other foods, which, when passing through the various organs, they do not immediately pour forth their strength, but in due time, and they are distributed in a just portion, according as the necessity that the parts demand, that they may better adhere to them. Moreover, because, as was proved above, this blood is sucked from the parts of the body by a powerful attraction; and thus it transmits whatever good it has by violence with speed, bringing not only a faulty display, but [Page 64] also a smooth and inconstant refreshment. Finally, because it is unable to provide stable nourishment due to its own nature, since it is in an artery and consequently very thin in substance, and the fluid and the amount of heat it loses during the journey, receives so much of the external heat from the internal commotion of the transfusing body; therefore, if it feeds quickly and is applied, it is also quickly excreted, that is, *the substance which it affords to the body will soon be emptied, not lasting for a long time* as Valesius explains.

The shortest duration of this benefit can also be confirmed, from the fact that when one pound of blood is transfused within the body every turn, or a little more than that quantity of blood, the whole amount is absorbed in a few circulations into the nutritious body; but after it has been completely consumed, the body begins to be nourished again by its own blood, constantly begotten by the ill-affected viscera (for if a better condition is present in the transfused blood than it is in the proper condition, certainly they first allure it to its side, spitting out the worse) who will destroy the aid brought by the former blood, hence the transfusion will be repeated almost every day, so that there may always be a very good supply of blood in the body, by which the parts [Page 65] may be unfailingly restored, or at the very least it will be performed until the principal organs can resume their natural state, so that they may be even able of themselves to draw up good blood for the nourishment of the body, but we will show below how it can achieve this only with difficulty. It is certain, however, that when they repeat the transfusions so many times, that they frequently agitate and afflict the sick, that it could not be celebrated without great danger, that it can not be celebrated without great danger, so that the aid may be increased together with danger, and thus it may have the appearance of loss rather than of profit.

But a stronger argument makes us withdraw from what has been said above. We conceded above that the blood was immediately transfused and received, to share some portions of the meal, and that it was quickly attracted by them, as if it were better, but now it seems that it should be restricted, since there is no trivial reason for it, proving that as soon as the blood enters the body it loses its purity, and consequently no matter how quickly, that nothing is useful for the repair of the body. Since when it ought to penetrate the affections of the liver and other viscera, and run out through those vessels, which were wont to contain bad blood, it will be defiled by the same vices by which that blood had first been defiled, [Page 66] and thence arriving in the nourishing portions, it will supply them with exactly the same nourishment which they had been accustomed to receive from their own blood: this is

proven as to the chief organs, for if they have force, such as the blood which they produce, or they receive it from another source, they therefore make it to be evil, because they share in the intemperate offenses of their own; why do they not inflict the same corruptions on this blood on its arrival in the same way? The liver, in the opinion of the innovators, does not produce blood, but only separates it from the bile when it is taken there, and the diseases arising from the liver occur only for this reason; and if the blood is transmitted in the same way, it is undoubtedly committed to it, therefore if the liver becomes impaired, nor will it truly separate it, and will vitiate it by his own intemperance, as it has utterly defiled the blood of its own body.

The proof is then given by the comparison of the vessels containing vinegar, or another stinking liquid has been stored (which warfare is commonly cited), for if wine is poured into such a vessel, it will receive the qualities of the former fluid, vinegar, because the vessel has been infected whatever it receives, affects it with a similar defilement; thus, if good blood is infused into the veins, which were wont to contain constantly corrupted and excrementitious blood, [Page 67] it will accept the stubbornness and vices of the former by reason that the veins already infected. The transfusers deny that the veins can impress the quality of the blood that runs within them; but it can be easily proved, because if hot the blood glows, it will certainly communicate with the veins themselves by constant contact, if it has an excess of humor, thinkable or melancholic, it will also share in the intemperateness of the veins; if the blood is contaminated by indigestion and other heterogeneous substances, a portion of this will coat the veins; if at length the blood has been imbued with a deleterious quality, the veins themselves will not escape this infection; certainly if wood or other inanimate objects are in contact with something for a period of time it easily and firmly accepts its qualities, I don't see why wood that engages in this activity, is able to perform this any more than veins; they do not retain in themselves any of the qualities of that blood, which, although in some way bad, is familiar to them, and is constantly concerned with them.

Nor does it prove this, that neither is there any danger to the prevention of diseases by the very medicines or of the foods themselves; lest their juices be immediately mixed together with the contaminated fluids of the body, or they penetrate [Page 68] into the ways infected by them, and may also be infected with bad conditions. For just as the wine, which is poured into a vessel in which vinegar or bad-scented wine had remained, immediately receives such qualities; but it does not receive them, if any cooking has been done in these cases, usually by experts, in order to eliminate these depraved qualities, it must first be applied to that vessel, because this cooking has contrary qualities, and that they are greatly superior to them, whence it can suffer nothing, but only overcome the contrary: not so much wine, which is allowed to privately be vinegar, and spoiled wine is better, that is it does not actually have those vices which it possesses; it is not positively better, because it does not have anything to be able to withstand the aforementioned infections and overcome them, but rather it has an aptitude for deteriorating in it, and can easily be infected by the present infection. The same thing is done within the body during the delivery: foods and medicines have the opposite influence on the morbid qualities, the things that take place in the body, from which they are not only touched by the infection of them, but repair them, and overpower them; but the blood, although it is not diseased and rotten, yet is still fit to receive such vices, and so much more, if it has a mix of rotten blood, or it always runs out within the bounds of the infected [Page 69] vessels.

Nor, by persisting in the likeness of wine, can the transfusers say, which can be corrected, like a dry or weak wine of a sweeter and stronger mix, so likewise, either too hot or corrupted blood can be changed by the infusion of more temperate blood, and equally well of purer blood. For the answer is that it is either supposed that such a flow is confined to the veins and ill-affected viscera, and so no matter how much you want pure blood to flow, it will never be changed for the better, unless it is before

the bowels for example, and let the badness of the vessel be removed, as it is from wine, which, unless it is extracted from an unfinished vessel, can receive no good condition. Or it is supposed that such blood would pass through the well-organized organs and vessels; since the corrupted blood, existing in greater quantity and strength, can infect the good, which to be exchanged for good, as we proved in Section 1, Chapter 4. But now I am tired of living more among wines, let us now resume the more noble arguments, and the more congenial to the physician.

[Page 70]

CHAPTER IV Transfusion is not particularly useful for any diseases.

Transfusion is indeed not suitable for healthy bodies, but for those who are sick, and especially in those in who, on account of the obstinacy of the disease, in which supplied medicines are wholly ineffectively experienced, to which it can certainly afford no benefit, but since it is sometimes used not only for ancient ailments, but also for newer and more acute diseases, it will not be necessary to review the paramount diseases in detail, and to refute the reasons by which the transfusion might seem appropriate to them; so that it was wounded more closely, and consequently more strongly.

And first, we ought to treat individual temperaments generally, with matter or without matter, which transfused blood [Page 71] might be able to correct; but just as hot blood is allowed for example to correct the hot or cold, by the nature of its intemperance, or to warm the cold liquids, it is denied that it can be achieved by transfusion, for several reasons, and diffusely adduced above, namely, because it loses the more vivid spirits by which it may be rightly united to the parts, and to remove all contracted from intemperance, because it reaches them by a more violent and excited motion, from which it is not possible to make a perfect mixing with the correcting fluids; and since at length it is rather defiled by vicious humors, how can it correct them, and why repeat the same things here; it would be altogether unnecessary; except that when any intemperance manifests itself by some symptoms or illness, it seemed rather fitting that I should mention here one of their chief things, since thus a discussion of the very temperaments must necessarily be made.

And as it progresses in the usual order in this enumeration of diseases, the beginning of the chapter will outline the diseases of the head, in which the principal ones are chosen, by which it will be possible to pass through them briefly. He first encounters phrenetics, to whom perhaps transfusion [Page 72] would seem to help, by detracting from the boiling blood which flows into the head and replacing it with a new and more temperate one. But if blood is transfused into the artery, since it necessarily retains the bilious parts along with its heat and subtlety, it cannot afford relief to an inflamed brain; a greater coldness is required to lessen such a heat, not only potential, but sometimes actual (albeit more moderate), therefore unless they infuse the blood of fish, I do not know who can be useful for this. Moreover, since a great deal of fresh blood may be drawn from the heated head, and may be communicated even from the lower parts when filled, it seems doubtless to be contrary to this admission, since phrenetics not only require the evacuation of the blood from the head, but demands every precaution lest it should come thither from any quarter; but since it is almost impossible for phrenetics to adapt to the work of the transfusion, it is unnecessary to dwell on it further.

The same is to be said of dizziness, which arises in the brain from the agitation of animal spirits; but the agitation of these things depends in particular *from the irregular motion of the breath through the veins, and [Page 73] the most portent burst through the arteries into the head*, as Sennertus says; such agitation will certainly increase, and the motion of the breathless spirit with the blood coming out of it, and the blood

coming in, and this will occur especially if there is supposed to be a circulation; for in such a movement of blood the circulations will become faster, so that the agitation of spirits will become even greater.

It will seem more likely that transfusion could contribute to both melancholia and mania, especially from the vicious blood existing in the body, and it hangs at the head of the confluent, and it is emptied in the transfusion, and another is put in its place, which is less fat, and less furious, so that it produces spirits, or less hot ones, or less dark ones, from which these affections cannot be aroused. But as to mania, exactly the same arguments which were made about phrenesis are valid, and are not to be repeated here. As regards melancholia, it must be said; that although it might be conceded that more pure blood would be introduced, which pure spirits might in the future raise the shadows of the brain and remove all darkness (which, however, is difficult, since such spirits may soon be obscured by a melancholic and faulty constitution of the brain) but then however [Page 74] a great harm was inflicted in the act of the transfusion itself, and after that no considerable profit would follow; the first part is proven, since melancholia should be treated gently, as Hippocrates says; but most of all the body is shaken and agitated when the blood enters and exits, and there can be many confusions of spirits within the brain, which are able to confound the imagination, and increase the ravings by its presence; nor can any vapour in the blood itself be carried to the vital parts by the blood of a melancholiac, and produce a syncope, by which the melancholic are usually tempted, not by a slight risk. This operation can be much more harmful to the melancholiac, with their delirious delusions such as the greatest dangers of death, and the terrors are engaged in following them, or to be condemned by punishment, or by a violent accident, or wound due to an ambush, and they imagine that their hatred will perish; therefore they will be subject to the transfusion with great difficulty, or at least not without a very alarming attack, while they will look upon themselves as bound and wounded, and the brutes also will have a butchery before their eyes; whence they will judge only a new kind of death prepared for them; but not only the appearance of sad things, but even the brief talk about the unfortunate thing did not apply to melancholia.

[Page 75] But no profit could follow the transmission, since in the melancholic blood is not present either; or intemperateness and opacity of spirits, but a kind of malignant quality, as Platerus likes, or as Sennertus explains, *secret disposition; which is evident from this, that if it is satisfied by their imagination; health is returned* as has happened to many who have not been healed for any other reason than when they saw that their own imagination had been fulfilled; there are many examples of this among the authors; thus Alexander Trallianus relates that the melancholic girl had no other way of thinking about the serpent enclosed within her body; that it might have been taken away, which he had secretly placed in the serpent's vessel, in which he gave vomiting medications; believing that he had ejected from one of the other humors by the force of that medication. It is therefore evident that the transfused blood cannot remove melancholia by its roots; although from another source he could control the humors and the spirits; nay, they may be better able to perform other things by medicine, in vainly a transfusion is employed in trivial melancholia, and when in the stubborn, as stated above, such an adjustment is not sufficient, and it is likewise redundant to apply the same.

[Page 76] After these things had already been written down for a long time, a certain epistle from the French arrived at Rome, by which it is said that a certain maniac had been cured by the benefit of the transfusion: this epistle deserves undoubted credit, both on account of the authority of the French author, partly because of the ingenuity of the most learned men who had committed it to the government; I am unable, however, to say what I think of such a treatment, and at first it seems to me very difficult to say that the calf's blood was transfused into him, as it is asserted that because of its thickness, the patient was able to control and

thicken the blood, because there was such an arterial blood flow, and consequently it could not have so much thickness of the parts, nor could there be much temperature, for it immediately stirred up great fervour and heat in the body when it entered. In the second place, it can probably be thought that this maniac was not perfectly cared for; for he was so accustomed to revert to this affection only during periods, why, therefore, can it not be so that he was therefore made whole because the time of such an attack has been completed, with the danger, however, that it may not return again. In the third place, it may be reasonably said that even if it had been cured entirely and perfectly, it was not done properly and directly by transfusion, [Page 77] but only indirectly and accidentally, insofar as the transfused blood agitated the whole body; and from such agitation there was followed up by great sweating, chiefly of the head, a great abundance of fluids was brought forth both from below, and from above; there was at last a considered evacuation of the black urine; of which all the sinful material either came out of the body, or at least was very much distracted from the affected part, and the patient was relieved from it; however, the transfusion deserves no praise if it has been performed in such a way, since it is rather to be ascribed to an accident or to the disposition of those fluids, than to that unfortunate event of its own virtue.

At least it will be helpful to those who are slumbering in affections, since it is able to warm the cold fluids existing in the head with fresh blood, and hence easily expel sleep, as it is related similarly to have happened in France, where a young man of prolonged fever, and excessive emission of blood into the comatose feeling, and the lapsed detention of the internal senses, by the transfusion of lamb's blood, his former activity was restored, and his sleep was utterly driven from him. But in the same way, it does not occur to hot diseases, nor does transfusion even benefit cold, since coldness [Page 78] of the humors alone is not able to induce preternatural sleep, sometimes filling the head with cold fluids intrigues, without any motion of sleep; nor do many hot things and hot fluids usually produce a sickly sleep by their evaporation, but a certain quality of narcotics is required in the humors, by which natural spirits are subdued; but this quality is elevated to the head, either from malignant fevers, or from drunkenness and intoxication, or from deleterious things; which can directly resist these causes, will offer no effect, since it is not sufficient that it should be cleaner and hotter, but required, so that either it has alexipharmic efficacy beyond these qualities, or such cases are removed from other sources by the use of other drugs. In fact, there is rather a danger lest this blood fill the head more by its hot eating, and render it more prepared by sleep. It does not contribute specially to lethargy, in which phlegm is stuffed into the brain, but it is also associated with fever, on account of the putrefaction of such phlegm, and, as some feel, on account of the same abscess collected there, therefore, if blood was transfused to cure this disease, while it reaches the brain, [Page 79] it may be of cold temperament, it will not certainly dissolve the accumulation of phlegm; if it is hot, it will help the same putrefaction, and to an abscess it disposes more with an increase of fever; therefore no matter what kind of approach, it will not take away the morbid cause.

As to the experience brought about by a stupid and sleepy young man, cured by such an infusion of blood, it must be observed that, as we are told, his blood, before he was given the transfusion, was thick and very black, but such a blackness of blood did not arise from its coldness (since it could not be supposed that there was such a dissipation of heat in the blood inside the body, which produces a blackness, as is the case with the other members of the sphacelate), but rather from a mixture of melancholic humor, either from the burning of that blood, or from an abundance of soot; therefore, not because of the lack of heat in the blood, the generation of animal spirits and activity was hindered in such a case, and if the transfused blood had been rightly mingled with such blood, and it would have strengthened him (as the Transfusers say) would rather have strengthened his comatose affections, or bears other disadvantages; for either such blood was overflowing with bile, and thus foul

vapours had ascended to the brain, or it was excessively scorched, and thus by the entry and commotion of the other blood, [Page 80] the hot evaporations had attacked the head. It must therefore be said that those affections were made by nature rather for the good of the individual itself than for the detriment, namely, when the body had been impoverished by a more severe and long illness, and by an excessive discharge of blood to the spirits, and the body very much impoverished by heat, by nature's foreseeing, so that the individual should undertake reparation; he wished that not only to be restored with the best of food, but also to be kept for the most part by all internal operations, in which there is a very great dissipation of better spirits, whence it also induces sleep, by reviving the heat inside, that there would not be wastage of it, but reparation of what was lost. Thus everywhere we see the rest of the sick, after a severe illness, remain foolish, forgetful, and sleepy for a long time. The spirits, therefore, were restored in such a sick person, and the vigour of the inward powers gradually revived, although outwardly it did not appear; but the transfused blood, if it had done anything in such a case, certainly did nothing else than by its own heat, and by the force by which it came into close contact with the spirit, which were distributed by degrees to propel the organs of the powers, and there excite the operations by force, in the same manner, [Page 81] in which they operate the other medicines, which are employed for that purpose, which do nothing other than to collect the scattered spirits into one place, and thus shake them together and thrust them all into a slumbering part. Hence it may be supposed that on account of such violence of the nature working gradually, although the present utility has been subsequently inflicted on them, it will either not last long, or has added some other disadvantage to the body.

Much less successful will this remedy be for apoplexy or paralysis, since it has no power to open up the blockages of the nerves, so that it may be open to animal spirits and gain access to them; nor can he open the ventricles that are closed in apoplexy of the brain, and immediately shed or dissipate the phlegm that is clinging to them, especially since the disease is so precipitous that it cannot bring such relief, in which the oppressed forces collapse the more, and the vital capacity of the blood within the heart may be endangered by the agitation of the heart, and the respiration, but this will be discussed again below.

It is either from the convulsion, or from the filling, or from the inanition: to that which proceeds from the filling; a transfusion is certainly not required; but to it which, following the boundless emptying of the body, it might seem to have been conveniently relieved [Page 82] by the transfusion of blood. But it must be noticed, with the most learned Sennertus, that a collision is not effected by inanition alone, but also by an intervening irritation of some parts of the nervous system which is caused from a drying cause of the progeny; nor can any kind of drying cause a convulsion, as Riverius notes, it is only the drying, which occurs in thick and unevenly, therefore, when a blood transfusion is crowded into the torn body and injects with a certain impulse, it cannot influence the correct moisture in it, for in order that humidity may penetrate into the substance of the torn parts, it ought to be applied to them by degrees, not violently, when, moreover, in such a manner the whole blood rushing in, since it is hot and very subtle, may induce irritation with the moisture; which is the main fuel for moving together.

Epilepsy likewise occurs when it is caused by a certain malignant air, either generated in the brain itself, or raised in some part to it, and does not consist in blood, but is generated in such parts in a special way; (as we are told about epilepsy, in which a malignant vapour was brought from the foot to the brain) certainly not by a fresh injection of blood, but rather by a drug, that it has power, [Page 83] in particular, to destroy the malignancy of that vapour, and of the matter by which it is raised, what alexipharmic power does so much blood have, whence the drink of human blood extracted from the throat of a newly slain man, was thought to be profitable for the epileptic, as reported by Pliny and Cornelius Celsus, it was also considered

superstitious and execrable by the same authors, but it was declared by Sennertus to be wholly unprofitable and destructive in like manner, therefore, transfused blood will be considered incapable of removing epilepsy.

Headaches are not cured by transfusion, as can be inferred from what has already been said, and especially when entering the blood is endowed with its vapours and subtleties, if it is drawn to the head, it stirs up a commotion, and of necessity a continuous solution, from which the head becomes weaker, and becomes more liable to pain.

After listing the affections of the head, a discussion will be made about diseases of the chest, and first, as it pertains to angina, pleurisy, and pneumonia, all these are inflammations of these parts, with severe symptoms, as they are very numerous and advance at a rapid pace, [Page 84] in which transfusion can only be of help by bringing more temperate blood to these parts, but, as has been said of phrenitis, this cannot be done since a far greater coldness is required to allay the heat of inflammation, which can be found in the arterial blood of any living thing; and besides acute diseases, and the sickness of this commotion cannot be borne by the sick with impunity. There could only be doubts about the lungs, when they are damaged by cold and are nourished by arterial blood, and therefore they would feel no injury by the hot blood injected into the arteries. But, although this may be admitted, however, because the transfused blood immediately enters the heart, and is immediately shed into the lungs, it can get overly inflamed, and by the impetuosity and commotion with which it is borne, it excites and can also carry fluids from the other parts to the lung itself, and increase the cause of inflammation; since we see that the colder air only stirs up the lungs several times during the retraction of heat; therefore how much more will a violent movement of blood within the lungs itself, and the parts nearest to it be roused?

Transfusion of haemoptysis [Page 85] and all other haemorrhages is of no avail, except to supply the materials of the disease abundantly, for the veins have been opened, blood is introduced into them in a subtle and hot act, and is carried on every side by them, and as it were, is hastily received by them; what else will then be expected, except that it can very easily prepare itself for departure by means of the already wide paths? But if a transfusion is to be used to repair the body deprived of blood from some violent haemorrhages, this will not result successfully, since this new blood, because it is thin and violent, can easily break open, or penetrate the rarefied coating of the veins, and to tend to the going out rather than to the repair of the body, which additionally it can afford to restore the weakened body and the exhausted spirits, non required fuel that will collide violently in the parts and easily flows past, but something which is gradually and firmly attached, since the restraint capacity of the body from the release of spirits is greatly diminished: for this reason emplastic medicines and foods are commonly offered in these cases, and blood is not transfused for this condition, nor does it come gradually to repair the parts; therefore it is uselessly applied to no avail, [Page 86] both for the repair of the body, and for the consolidation of the veins and the correction of the blood.

Transfusion will not contribute to phthisis unless it heals the wound that exists in the lungs, on which all the inconvenience may depend, but since it is very difficult to cure it, especially if it is to some extent confirmed and degrading, therefore it is clear to anyone that transfusion is inappropriately associated with this disease.

Asthma is considered either in paroxysm itself or outside of paroxysm; it certainly does not require transfusing; it might provide extra accessory to preservation, especially if the opinion of Sennerti is admitted, who established that asthma may arise from serous fluids collected within the veins, and through the arterial vein into the lungs, but such serous fluids, when they are corrected by the liver when not properly sanctioned, and the transfusion cannot correct the haematoses lesions, as will undoubtedly be proved below, it will be invalid for such maintenance.

Syncope comes from a lack of vital spirits, but these spirits either fail because they are destroyed, overloaded or scattered by some unbridled evacuation, they are overwhelmed by violent blood, and by the flow of the spirits to the heart, however, in the transfusion of arterial blood, [Page 87] the blood strongly bursts into the heart, therefore the spirit will overwhelm it, and will produce syncope, but will not remove it.

There remain briefly to be enumerated the diseases which infest the lower part of the stomach, among which the affections of the stomach first occur, in which it either does not digest foods, does not retain them when ingested, or suffers great pains when taken; but in order to cure all these, something is required which either removes blockages, or directly increases the heat to the stomach, whence hot medicaments taken by mouth, or externally attached to it, contribute more than blood infused into the veins, which cannot so much as present an immediate remedy.

In this way it will cure essential diseases of the intestines, since when it occurs from diarrhoea or indigestion, or from an excess of fluid, a transfusion of the stomach cannot correct the damage, on which the generation of these things depends, nor can it evade those already begotten; it is fruitlessly administered. Dysentery of the wound is required for a cure, but the transfusion does not wash the intestines as close as would be required, nor does the wound soften with arterial blood, but rather by refrigerant medicaments, and repress the acridity of the humor. [Page 88] In like manner the pains of colic, and of the ileum actually applied to the intestines, require special remedies, they do not expect blood coming through the veins for a very long time, for their relief, and since inflammation is often joined to them by the approaching blood, they hope not for help, but for loss.

But it must now be examined whether a transfusion is beneficial to the liver, whether obstructed, or inflamed, or not bleeding, since on this account the treatments of many and almost all diseases depend; and as to inflammation, when a discussion was already being made about phrenitis and pleurisy, it was said that the entering arterial blood could not soothe the inflammation but increase it impetuously, as is possible for purer spirits; and it loses adequate nutrition in the transfusion from one individual to another; yet it retains the heat, by which it is undoubtedly very satisfied, but it is not added for allaying the inflammation, but the humor is detracted from the affected part, and if any is added, it ought not only to be potentially cold, but actually as practice teaches us daily.

As to the obstructions, and the faults that arise from the haematoses themselves, and the bitterness of the whole parenchyma, it must be said that if they [Page 89] grew up, so that they could change the tone of the bowels, and the resultant elaboration of the blood may not be discernible, however much hot, subtle and pure blood may be put in, it will never be able to be brought back to its original state, nor can it perform its operations properly unless perhaps another liver is placed freshly in the body, which certainly cannot be achieved by transfusion.

For an haemorrhage which will be sufficient to restore the bleeding of a scrofulous bed, or to restore it when it is mainly cold, and has now been wont to bring forth serous taints, and excite hydrops?, or when it ceases to supply the excrementitious juices for the nourishment of the body, whence the bodies become cachectic, and represent the condition of the nourishing juices in the colour itself? Transfusion also does not occur for these diseases, namely, that it cannot remove the enduring generation of pathogenic causes, but also because, as we have said, either during blood transfusion it loses those spirits which are subservient to nutrition, or if it does not lose them, they are carried to the parts by an exceedingly violent attraction, and they cannot be properly applied to them, and restore their substance. The things that have been said about the liver may be said proportionately to the affections of the spleen, and to the hypochondriac disease, [Page 90] to which another transfusion might also be incompatible with the cause, namely, that by reason of the agitation with which it was said not to belong to the melancholic, which

it does within the body, and on account of the commotion of the heat, which, while agitated in hypochondria, produces a very noxious effect.

There still remain several other diseases to be enumerated, but either transfusion can in no way be used for them, or each one of the reasons mentioned above it can argued that it is not beneficial to them; some will only be examined in the next chapter who deserve particular attention.

CHAPTER V

There follows an enumeration of other diseases for which transfusion is not suitable.

Transfusion could quench fevers and unreasonable heats; it was deemed convenient and useful, that in order that it may be accurately diagnosed, a division of fever is to be performed, and it must be seen in each of these species whether a transfusion can be used for them. The fevers, therefore, are commonly divided into ephemeræ, putrid, [Page 91] and hectic. No mention should be made of the ephemeræ here, since they require no infusion of blood, but only the emission of the overheated body, by which these fevers by their nature are brief, and quickly killed.

Transfusion might be appropriate for putrid fevers, by expelling the putrid fluids from the veins and setting aside the good blood in their place, and thus taking away every cause of the fever, for if phlebotomy is beneficial in such fevers, because it empties the blood when it is putrid and when heated, the transfusion itself will benefit much more, through which not only is the sinful blood emptied, but moreover the same amount of good is stored up in his place.

However, it can increase the feverish flames, and favour the transfusion of putrefying fluids. Galen considered five causes of fever, motion, putrefaction, contact with something hot, and an admixture of the same, and the obstruction by soot of evaporation through the blocked pores of the skin, each of these causes is able to excite fevers, especially the putrid, in detail; if, therefore, it will be accepted that by blood transfusion, one of these causes is being enlarged in the body already in a severe way, it will also be obvious, [Page 92] transfusion does not cure rotten fevers, but only soothes them. And first, as regards motion, he is certainly excited by transmission within the body, since, as we have said several times, the whole mass of the blood is stirred, and all the spirits are shaken, but with the motions, and in the parts stirred up in greater numbers, and the spirits within the collected blood, more intense heat is communicated to the body by their concurrence; and from such heat the fever may be inflamed; if it is not done, yet it has already been increased or to be preserved, when the blood of another individual is mingled with the already putrescent fluids; when it is infused in less quantity than there is blood, which has already rotted in the body, it is easily contaminated by the rot, and especially when it brings with it a new heat, which is able to elevate the putrid evaporation, and inflame them with fever. Thirdly, the contact of something hot, and the mixing of it within the body, is exactly the same as that experienced by transfusion: if the outpouring of hot baths, if after a long stay under the sun, if hot objects applied to the body externally communicate heat to the heart through the veins and arteries, and they inflame the fever, which happens much more in transfusion, in which the temperature of the body does not [Page 93] come from without, but hot blood is poured into the veins, which is strongly impelled within the heart itself, where it is able to excite a much greater heat and a more severe fever: and for the same reason, if hot things are mixed with blood, like warmer foods, hot medicines, hot air, are the causes of fever, and yet the blood is not immediately mixed together, but are first prepared in various places, in which they lose nothing of their own fermentation, doubtless this will result in much more from the mixing of the arterial blood, which is immediately mingled with the rest of the blood, and is not associated with it peacefully, but attacks it with a spurious

motion. Finally, it remains to be examined whether transfusion can prevent soot evaporation and cause fever, which seems very doubtful, since, by reason of heat and movement, it may be able to cause the contrary. It must, therefore, be repeated that in this section Chapter 2, we have said clearly that if the transfused blood reaches the farthest parts of the body, it must necessarily be drawn thither by force, and viscid juices, which restrain the exhalation of the soot through the internal pores [Page 94] of the skin, from which a fever may arise; therefore it is clear how a transfusion can promote heat even in this case of fever.

Some try to prove the consistency of the transfusion in fevers, because it is better than phlebotomy, which is commonly considered to be the most excellent remedy for fevers; for in phlebotomy, together with corrupted blood, good blood is also brought forth, and the finer goes out while the thicker remains inside; but in transfusion not only does good blood not go forth, but another is added, more perfect and purer. But these, a little anxious about the safety of the individual, declare that nature, as long as it has not been prostrated, strives to draw out the worse parts of the blood as far as it can, while retaining the better, which appears from the blood being sent, which is almost always perceived to be corrupted. And although it may be argued, it would be true, let them say, I beg you, while they are celebrating transfusion, do they not even send blood?, therefore, if the purer goes through the opening of the vein, it will remain in the body, which will resist the advent of more blood, and it will defile by its own depravity; similarly, if it becomes more subtle, it will remain thicker inside; which, when injected with fresh blood, being attracted to the surroundings of the body, [Page 95] it will more easily stuff the pores because of its thickness, and inhibit sooty transpiration, from which the fever arises, as we have already said.

Among the putrid fevers to be considered are malignant fevers, in which, as to refresh the heart afflicted by a hot-blooded quality, alexipharmic medicines are beneficial, much more will pure blood be able to help penetrating into the heart, and refreshing it with natural warmth. It does not therefore appear that a transfusion should be applied to them, both on account of the pathogenic cause and on the basis of the symptoms; not even by reason of the cause, because *a malignant fever does not consist in a simple change of temperament, or a common rottenness, such as is found in other putrid fevers, but in the whole of nature, by destroying the natural substances, just as wine, when it is converted into vinegar, will suffer complete corruption;* (so Riverius) but the transfused blood cannot repair the destruction of this substance, nor can it resist this deleterious quality, since it has no alexipharmic power, with which this quality is to be assailed, but only the heat and the better substance, by which it is not sufficiently resisted by such malignancy; indeed, as has been said elsewhere that it will also be depraved when it [Page 96] is mingled with poisonous humors; for just as vinegar, which is wine in every way corrupted, infects its moisture with its qualities, so are malignant humors, those who have been born from the total corruption of good infused blood, although the best, they will draw their way into nature, since if the bodies were absorbed in these diseases, not only by breath, but as such infections infect others through contact with clothing, I do not see why the blood which is mixed with the malignant causes should not be infected within the innermost parts of the infected body. On account of the symptoms which accompany malignant fevers, a transfusion is not appropriate, since it is very severe, and the powers are mainly prostituted, and the body is very much agitated, and, within the heart itself, there may be a very severe commotion of blood. What has been said of these fevers may be said in proportion to the number of any poisons taken within the body, or those inflicted by any animal, as are the bites of snakes, and a rabid dog, which poisons with its worst qualities can destroy a whole mass of fluids, and cannot receive treatment by transfusion, since their depravity cannot be taken away from blood alone, but rather they may be able to share their miasma on the arrival of blood; and this also ought [Page 97] to be brought concerning venereal crime, which, not only unhealthy, but also in a depraved quality, annoys the sick.

We shall now talk about hectic fevers, the treatment of which consists in fixed fever, allaying the insolent heat, and restoring the consumed parts; neither can a transfusion be effective; it cannot reduce heat, since, as we said when speaking of other hot diseases, no relief from the overheated body can be produced by arterial blood coming violently to it, and as if some fluid is injected into the overheated vessel, it also gets hot at once, so long as it is not so cold that it can completely extinguish the heat in the vessel; if we pour blood into the body imbued with fixed heat, which is not cold but actually very hot, the heat will not be quenched in the body; but it will be associated with the blood, from which the temperature itself will be increased. Nor can the transfused blood restore the parts that have been destroyed, since, as we have said before, spirits have lost their primary service to nutrition during the journey; when in an undue manner, and excessively violently, it is drained out of the parts, hence it cannot be firmly assimilated to them; and finally when it becomes hot and subtle, [Page 98] but for such a restoration a firm, thick, and temperate food is required.

It agrees with the hectic age, in which, on account of the dissolution of the heat, and the consumption of substantial moisture, decreases and evaporates the body; but although the infusion of fresh blood may seem to be beneficial, since it carries with it the gifts of fresh heat and better humidity, it does not however provide any assistance, since it is able to extinguish the heat of the aged altogether, not to increase it; for, as Galerius says *just as it desires to be stirred up by a kind of wind, and kindled by the warmth but with a more violent motion*; but during transfusion the blood strongly insinuates itself into their bodies, and goes violently to the bowels, whence the aging heat can undergo no restoration, but a greater dissipation. Moreover their faculties are very weak therefore it is not possible for them to receive new blood without loss of their own heat, nor would their parts be able to draw it, nor to digest the bowels, nor retain it for a long time; or assimilate it perfectly to themselves.

The remedy for the restoration of the old condition, which Marsilius Ficini has spoken of, for he recommends, when worn out with age, as in the manner [Page 99] of leeches, let them suck the blood of well-tempered young men from the scarcely open vein of the left forearm, as the frosts do, by sucking the blood of infants, so that they may grow youthful according to their strength. But a tie is not valid, since in that case the blood is gradually sucked out by the lips of the reckless old men, nor is it immediately effected by transfusion through the innermost parts of the body, the whole body runs faster, and thus the heat, when it fades away, is not so strong as to stir up, nor dissipate; and since it is the blood of a healthy young man, on account of the nature of his nature he can infuse more vigour than that of the brute, which is sent by transfusion: nor do the elders suffer any further harm in that operation, as they do in the case of transfusion, when neither are they wounded, they shall not be tied up, nor detained in any inappropriate manner; therefore the remedy of Ficini might be more easily conferred on the old, than on the transfusion of the modern.

But neither should that be considered a fitting burden for old age (spare a highly educated man of venerable reputation), since the stomach of the elderly is weak, who can scarcely digest the foods most easily digested, much less digest raw blood, which, when it is shed outside the veins, might also be coagulated within the stomach, to which, [Page 100] Ficinus himself adds, the difficulty of cooking, of smelling: *if crude is still hard to digest, it should be cooked first along with sugar or with sugarcane, drip into moderately hot sugar, and then drink*, but since the blood, destitute of its own spirits, may be worth nothing, and all these should escape in the cooking, it will certainly not be able to share with the sick, the aged, much immediate aid. There is also sucked corrupt blood, which according to the doctrines of the circulation is that blood which abounded over the nutrition of the parts, and thus having consumed the better parts, it again returns to the heart, so that it may resume again; therefore, he will not bring to the old a considerable refreshment of heat, when

it has already lost it, and since he is fat and feculent. At length the example of the Sage, which Ficinus cites, is not valid, for it may be said that they do not so much strip off the blood of infants for the refreshment of oneself, which in order to satisfy the fury and the urge to do harm, which are borne to the human race, while, so as to root it out, they attack and destroy the tender buds that are scarcely born. But if those lost women were planning to preserve their own vigour, and could obtain the desired strength, it might be reasonably [Page 101] believed that it is fictitious and not true, since the worst demon deludes them, and apparently satisfies them in all respects, so as to subdue them to him with greater bondage; and if sometimes the true strength is augmented by them, it would not have been so naturally implanted in that blood, but inflicted by other means by the demon himself. Therefore it is not permissible to argue at all from these cases, nor the barbaric drafts of human blood, and to turn the familiars of the devils into common use.

Transfusion, however, does not take pride in it, nor does it declare itself useful, to avoid all the inconsistencies of the above section; when, if this does not bring forth inconveniences, but let it bring with it other things, which we have enumerated above, from which it feels no less usefulness and inconvenience. But it freely boasts of its antiquity, which flows from the aforesaid suction of blood, for I further concede, but cannot congratulate it, since it imitates the example of the Sage, and acknowledges the barbarian drink of human blood as its origin. Indeed, I give it an even greater antiquity, since it was even disclosed by Ovid himself (as a most learned man pointed out to me), and described in any way, while, after he had related that the daughters of Pelias had fled to Medea, so that by his valour [Page 102] he might bring back an aging father to a youthful age, and introduces her to the arranged work, addressing them thus:

He says, draw the iron, and draw your old blood

To fill empty veins with youthful blood

in which words the work of transfusion is explained in the manner in which it is now effected; but at the same time he obtains no fame from it, since even in this case it is declared a very cruel operation which ought to be ascribed to the cruel woman Medea, which, however, brought about a more cruel end, so that he caused the old king to be slain by his own daughters; not so that he might restore to him his youthful vigour, so that he might sufficiently fulfil this treasonous deed of old hatred.

Nor does the transfusion improve the lot in the most thorough description of itself, which is discovered by Andreas Libavius, a very learned man, where it is shown that it was not so much thought out in our days but was known even during the beginnings of this century; he does not, I say, obtain a better lot, since it is considered a work of [Chimericum], and whoever uses it; a man of sound mind is judged to be of little consequence, and therefore it is asserted that he needs hellebore; please refer to his words here: *But my friend, [Page 103] I ask, by what remedy could he obtain those unexpected things? There may be a young man strong, healthy, full of spirited blood; geared to being exhausted by strength, thin, emaciated, barely breathing. The master of the art has silver tubes corresponding to each other. Let him open the artery of the robust, and insert the little tube, and fortify it; soon he will also split the artery of the patient, and implant the female tube. Now attach two tubes to one another, and from healthy and warm arterial blood, and a spirit will leap into the sick, and will bring along a fountain of life, and will rid him of all sickness. But as the strong man will not languish, comfort and food must be given him; the doctor bled.*

It remains to be seen whether transfusion may aid in joint diseases and cutaneous diseases, of which it must be briefly said, that joint diseases occur not so much from sourness, and to fresh fluids at the joints of those lying down, which mixed with the blood from a kind of tartar, and particularly to the descending joints, but this tartar humor is produced by the liver, not so much surpassing the lack of primary qualities, as it possesses a special power to generate such humor, just as

the kidneys have a particular power to generate [Page104] sand grains; from which it is evident that the blood that is infused, although it may be able to relax the excessive heat of the liver and blunt the disbelief of the humors, is nevertheless unable to take away the tartar from the blood; nor does the liver have an aptitude for hurriedly producing tartarish blood, when infused blood does not have the qualities, nor does it have a particular energy, to dissolve such tartar which lays in the joints, indeed, if it had, it might be able to increase its affection by another name, to the dissolution of tartar and earthiness; great subtlety, sharpness, and heat are required, which if it had blood infused, it might increase the hot temper of the bowels, and thus concur in any way to increase the pathogenic cause: moreover, when the flow of the fluids to the joints is stirred up either by internal or external agitation of the body; however, in the case of transfusion there is no slight agitation of the fluids within the body, rather that it can alert arthritic pains, but not guard against them.

Cutaneous affections are not only caused by a proper lesion of the humors, but also by their impetuous flow to the skin, thus when the blood is carried out untimely to the circumference [Page 105] of the body, there are many things that are injurious to the skin, and when raw liquids are drawn to it too quickly, or when it does not receive perfectly cooked food, scabies, and a thousand foul defilements are collected, whence Riverius condemns violent body motion after food, not only because it prevents food being cooked in the stomach, but also because the raw juices are attracted too quickly to the surroundings of the body, and there they produce scabies, for which reason he asserts that students often suffer from scabies, because immediately after food they stir up the body excessively, either by playing or by running. Therefore, as it has been proven in transfusion, the blood is drawn too quickly to the periphery of the body, so that there is no time to complete the cooking of such blood, so that it is assimilated to the parts, it follows that the fuel is supplied through the pathogenic cause already existing in the skin, which can be removed.

These are the reasons which have been adapted to each of the diseases reviewed, in addition to those previously quoted, so that it was demonstrated that the transfusion is not specifically suited for any particular disease, to which others could be added, but its usefulness seems to have been sufficiently proven by these quotations.

[Page 106]

SECTION THREE: INCOMPATIBLE TRANSFUSION

CHAPTER I

Transfusion is demonstrated to be incompatible with the tenets of medicine.

Having now set forth the principal arguments in transfusion, it pleases me to include some reasons by which it may be proved that the former is not only useless and uncertain, but inconsistent, that it may satisfy the Readers fully in all things, nor should they define those motives by which they may reject it and disapprove of it; and especially the inconsistency with which it is opposed to the laws of medicine, for which cause merits the assent of any prudent physician, who truly desires to observe the exact norm of treatment (pardon those who up to this point have assented).

The most common precept of physicians is that they may cure quickly, safely, and pleasantly, [Page107] but he fills none of those who can cure by transfusion, therefore he does not fulfil the role of a good physician. It does not cure very quickly, for it requires repeat transfusions several times, according to the common method of transfusing, and indeed, at different intervals, well apart from each other, lest excessive loss of energy should follow, since no less time is spent in recovering transfusion than in drinking other drugs. But if we speak of the act of transfusing itself, it is not accomplished quickly; when the patient is kept for a long time while the vein of the forearm is prepared, while tubes are being fitted, while the blood is let into

the body, which is not violently inserted at once, so that the operation may be better. Nor does such a remedy quickly overcome the pathogenic cause, for it resists the advent of blood just as much as other medicines, nay resists even more, since the rest of the medicines fight against it not only with the most important qualities, but also with a special force, so that they may attack it for the most part. It seems only that the transfused blood arrives quickly to the affected part, since it ought not to pass through so many organs, as other medicines, in which they lose a great deal of their vitality. But it [Page 108] is not always necessary that remedies reach the place of affection so soon, for it is generally agreed upon, that its force may be broken down before it arrives there, so that the opposite temperature may be gradually induced into that part, since it would not be less harmed by the sudden approach of remedies, of restoring it to its former safety, which had already been injured by a pathogenic cause, likewise rushing into it, and causing a sudden change; wherefore the other medications taken by mouth, from the fact that they pass through several organs, do not loose their force, but rather they increase, since they do not rush forthwith to the hardworking part, but operate their force more effectively, by relaxing their effect on the way, it is sweeter, and even when they acquire foods cooked in the bowels, they are acquired as it were, as if filtered by dripping through vessels, and they are dropped, so that, having laid aside all their impurity, they may be able to better attack the sinner's material. Nor is there any danger that, by passing through the infected bowels many times, they are similarly defiled, since they have in themselves powerful qualities to resist those infections, and that they are so eagerly attracted by nature itself to the part where there is need for them, existing in this way, they may not be able to stay long [Page 109] reducing the risk of pollution.

Nor does he who employs transfusion safely cure, since the dangers listed above are abundantly clear, which may be stimulated by the greatest agitation which it produces within the body because of the intermingling of different bloods with one another: which agitation is indeed not very safe in sick bodies, and especially in those which have been for a long time detained from a persistent disease. Moreover, the transfusion is not safe, because, as has been proven, it still remains uncertain, and has not been confirmed by many experiments to be sufficiently efficacious. Nor does it at length cure pleasantly, as it wounds the sick man, and most incongruously restrains him in the operation itself, and especially upsets and agitates.

The indications are to be considered exactly by the doctor, if he truly wants to use the standard of medicine, and to report a happy victory over diseases; it will then be considered whether one who is using transfusion in the treatment of diseases will best satisfy the indications. And first it must be supposed that transfusion is a great remedy, as is phlebotomy, and that it is greater, since whatever is done in the discharge of the blood is not only done in transfusion, but something further [Page 110] is also done. Blood discharge is mainly determined by strength: for if the disease becomes however great, if age does not alter; if, however, strength is lacking, this remedy is carried out altogether in a senseless manner, and Celsus himself gives so much to this indication of strength that he has preferred it before all others; therefore much more should be considered true in the celebration of transfusion. But these reasons are certainly not considered by the transfusers, as long as they administer it for the most part in weakening bodies, and loosening their treachery on sickness. Nor should they say that there is no need of so much strength in transfusion, and in phlebotomy, because in the latter blood is lost and the spirit is exhausted with it, but in that, if blood is shed, yet it is immediately replaced by the same amount of new and improved, whence there follows no loss of strength, and consequently there is no reason to have them. For the contrary might be said, since while blood is being poured in a simple phlebotomy, nature itself is brought out by the impulse of the blood, more of the sinner than of the good, or at least it is removed from the principal parts, and therefore it is possible for some spirits to flow out at the same time, from which the forces may be more prostrated, a serious loss,

however, does not follow, because being driven off by the [Page 111] noxious nature of the blood, gathers itself together and gradually resumes new powers, it returns to its original vigour and gets rid of the stronger remaining pathogenic causes. But in transfusion, although all the above ought to follow on account of the discharge of the sinner's blood, which takes place while a new one is admitted, yet it has not been correctly reported, since nature cannot collect the forces that have remained, when they would further destroy them from the advent of the blood; nor is it able to control the amount of blood which is admitted, and distribute it perfectly throughout the body, and consequently it will rather succumb to the debris, than come to life when removed. There is therefore a need for more strength for transfusion than for simple phlebotomy, and therefore to apply it in desperate diseases, as is commonly done, it is incompatible with the satisfaction of the indications, which ought to be considered most by the physician, if he desires to find a cure according to the true method.

It is also not appropriate for the physician to produce two adverse reactions in the patient's body at the same time, since great harm is thus inflicted on him. Thus prudent physicians often refrain from enema on the very day on which they wish to discharge blood, lest they excite contrary movements in the body by a double evacuation, and, consequently, [Page 112] by magic of commotion they agitate it. Therefore they will adopt a transfusion much less, by which two totally contrary motions occur simultaneously in the body at the same time, namely, motions from outside to the inside by the injection of another blood, and from the inside to the outside by the evacuation of blood, from which indeed follows great movements in the body, as has been said often, for which reason these two contrary movements are wont to be avoided by prudent physicians.

The transfusers do not acquiesce to these arguments; in fact they try to prove that some similar transfusion operations are performed by physicians, and therefore transfusion is not incompatible with the precepts of medicine, but is most suitable for them. He uses the medicine syringe for babies when swallowing is impaired; he attaches plasters to the navel to strengthen the fetus, he restores the worn out milk from prepared baths, and so does something similar to the transfusion operator.

There is, however, an imbalance at first with respect to clyster (of which many do not hesitate beyond reason), because through them there follows nothing inappropriate in the body, when food juices are infused into the intestines, and in some way they are digested in them, and thence by mesentery [Page 113] or milky veins, and conveyed to the blood-factory in the same manner, as if it had been ingested by the mouth; and thus the economy of the body is not entirely renewed; but in transfusion the blood which is let into it, runs through the usual paths, and receives no cooking in the bowels, by which it is rendered congenial to man by nourishing it, but because it is blood, it does not need to be cooked further, since it is immediately mingled with the rest of the blood; if it is not able to nourish medially, then it should be first cooked in the other organs before it is exposed to the parts requiring nourishment; but if it is apt to nourish them immediately, from the fact that while in another body it underwent the first cooking, it follows that if it is taken through the mouth, and passes through the liver and the stomach, it will receive no cooking, but in the same way as it is sucked, the completely changed blood will be mixed with the rest, since it has no need of receiving repeated cooking, as it has already recovered them within another body; but this is false, when inhaled it is either converted into chyle and then again grows into blood, or is cooked in the stomach. And do not say that the extravasated [Page 114] blood would then change its own nature, and therefore would have the need for repeated cooking, for it passes through animated paths, supported by heat, and likewise filled with blood and blood vessels; if, therefore, it does not change its nature until it passes through the glassy and inanimate tube, it will not change even when it passes through the oesophagus, stomach, and liver, which are fortified by all its spirits. Certainly that is, that if nursing physicians employ enema, or nourish the body in a regular and customary order, or if

the nourishment does not succeed, no principal part is injured, when immediately the intestines may be ejected from the syringe; but if they use transfusion, they agitate the whole body, and place the noblest viscera into great danger, if the operation does not succeed perfectly; and therefore it is lawful for them according to the medical laws to use enema but not transfusion, because in the former they experience no danger with probable utility, but in the latter they expose themselves to certain danger with doubtful utility.

There is, moreover, an imbalance between baths and plasters and transfusion, because these produce nothing but breaths and certain qualities through the pores of the skin, nor do they in any way stir up the humors, but kindly and gently assist in nutrition, and let their [Page 115] feeding strength fail; but transfusion however, aims not only to correct the faults of the fluids, and to assist in the functions of the faculty but wishes to renew everything entirely, and it is therefore not so common, whereas baths are used by physicians who wish to safely treat the sick.

CHAPTER II

The texts of Hippocrates are explained, in which he neither affected nor followed transfusion, but rather rejected it.

It is the same thing that Hippocrates and medicine are mutually inclusive, and to be incompatible with medical laws is the same as to not obey a legislator; the most important argument, therefore, to prove that transfusion is incompatible with medicine is that it is not in agreement with Hippocrates' teaching. This has been already shown in many places, namely, that Hippocrates condemns sudden and great changes, and that in transfusion there may be a very great, violent, and sudden change in the body, by reducing it from a completely diseased state to safety, with the end of any previous dispositions, and accelerated cooking, so that nutrients can be added to the body before [Page 116] it is kept within the body at the required time, and has been cooked through the appropriate steps. It has also been shown by Hippocrates that such a method of repairing bodies is rejected, since stable food is not provided to them, from the fact that those things which are quickly applied and nourished are also quickly excreted, and therefore such a meal should be used to no avail, as he himself also repeats in his book on the food, saying, *that food, which is scarcely altered, is easily absorbed but in addition is easily consumed*. And it might be inferred that in many other places transfusion was not rightly adapted to Hippocratic doctrine, and condemned by it, not explicitly, indeed, because neither did he dream it, but implicitly, by comparison of that dogma with the nature and effects of this operation.

But some try to make Hippocrates, if not the attendant of transfusion, at least the aspirant of the same, and argue this desire from what he said in his book *De Alimento*: *For those who need a quick application, this liquid is the best medication for repairing strength; but those who need still the faster, by means of the sense of smell; for they say that he, proving that liquid is a preservative for hasty nutrition, [Page 117] and that the smell of the food itself is required, in any way insinuates itself into transfusion, as if he had said that if we want to feed someone very quickly, we infuse the blood into their veins, which is moist, and better than the smell itself, and it refreshes very quickly, since, when the smell of a spicy substance is effected, it will avoid the lasting boils of the bowels.*

But it is permissible for everyone to meditate on the words of Hippocrates, yet all do not reasonably attain to his true meaning. There Hippocrates speaks of those who need a quick meal, and orders them to be given moist foods, according to that: *easier to be filled with drink than with food*, when moist foods are more easily digested: he does not, however, intend that these moist foods should not be cooked in the bowels, for this would be entirely contrary to his own doctrine; wherefore

among these moist foods it does not include blood transfused within the veins, since the latter avoids all the former cooking, and this is entirely different from the mind of Hippocrates, who a thousand times emphasized the necessity of three cooked meals, which food must undergo in order to become properly assimilated to the body.

But when he speaks of the meal through the sense of smell, he wants it to be used only in those cases containing or due to psychological failure, [Page 118] or, on account of the immense disintegration of the forces, the patient has need of something else to restore some spirits at once, so that the body can then gradually undergo a more solid refreshment, since the smell of some refreshment may not be able to refresh firmly, just as he himself said: *those which nourish them quickly, are quickly excreted*; it is not, therefore, credible, that the transmission itself would ever have been used in such violent cases, for though he had supposed that it could very quickly repair the body, however, considering the quality of its operation, it would not have been used, since even in these cases the transfusers themselves would refrain from it, because in order to endure the inconvenience of such an action, work is done to many spirits, and danger comes, lest they should be dissolved rather than reimbursed by the sheer entry of blood, as we have already stated above while we were speaking of syncope, it is clear therefore that Hippocrates in this place in no way reasonably desired a blood transfusion.

Rather he seems to have condemned transfusion in the same book, or at least clarified as very dangerous, while saying: *Proper blood is useful for bleeding; foreign blood is particularly noxious blood*; he did not speak [Page 119] these words of the milk by which infants are nourished (as the most learned Vallesius explains), that is proper maternal and foreign, namely nurses, sometimes useful, sometimes useless, because he spoke below expressly of this by saying: *foreign milk proper refined foreign milk noxious milk, proper milk useful*, but it is incompatible with the excessive brevity, and, as it were, the enigmatic repetition with which he enjoys in this whole book, nor is there so much doubt that the generation of milk is from blood, so that, while Hippocrates speaks of blood, it ought to be understood of milk, since it can be inferred from him that milk is not generated from blood. Therefore it is credible that in the above-mentioned words he himself spoke of the blood itself, and perhaps wished to say nothing else than that proper blood was useful and harmful, useful if it is good, noxious, if it is depraved, and ill-nourished: that the blood was sometimes inappropriate, sometimes useful, and sometimes harmful, that is, that it could sometimes be well adapted to our bodies, but sometimes it could not, hence it can be concluded that it is very dangerous to transfuse another's blood, since it can sometimes be harmful, and he had placed the reason of this immediately above, namely, [Page 120] from the fact that *nature of all things without a teacher* they are taught, that is, that they operate on the nature of their bodies, so that the nature of a body becomes such that it is refreshed by something, which we think is contrary to it, from the fact that it is learned without a teacher, let him know well that such a thing then must come together with him: thus, when speaking of another's blood, it may sometimes be useful, because it is sometimes injurious to the nature of the recipient body, because although it may seem to be fitting for it, it nevertheless rejects it better than we have learned. Whence it is concluded that it is very dangerous, and doubtful, to give blood to another, from the fact that not so much of the body as of the one receiving it, then the nature of the giver can be known exactly, both from the fact that the agreement between them is not generally available to us, but only to nature itself, from which the blood which is infused can often be harmful, and inflict serious dangers.

From these transfusers are able to collect two things against us: first, what a transfusion can sometimes confer; second, that if the statements are true, the same doubt may also be predicated of any drug, [Page 121] and consequently the whole of medicine will be destroyed. But replying to the first, that although it can be inferred from the above mentioned place of Hippocrates that transfusion can sometimes be

beneficial, however, from the fact that it becomes very doubtful what utility can be expected from it, since it is equally dangerous, it follows that it must be rejected in the same manner as if it is always dangerous. As to the second however, there is no valid tie of blood infused with other drugs, since the possibilities of other drugs may be well known, from the fact that they are always the same, but cannot be so well known as of the nature of living things, since not only does each individual differs from another, but also that one individual may be made different from himself several times on account of changes in the qualities and alterations of the humors: fig e.g. any Rhabarbari root cleanses, because each has the same temperament, and therefore each can be taken indiscriminately to take away the bile (provided that it does not have any fault accidentally coming to it, namely, it has been eaten, rotted, or something similar has befallen it). But not every animal is hot and moist for example, nor is it known to us exactly [Page 122] whether it has in the blood such qualities as it can cure such an affection; and therefore not every animal can be used so indifferently for transfusion, and so there remains a firm doubt, which, according to Hippocrates, can be had in transfusion, from the fact that it is difficult to find strange blood which may be useful to the individual recipient, since the nature of living things cannot be fully traced; and at the same time adapted to each other.

Other passages of Hippocrates are noted, in which it can be seen that transfusion was indicated by him, namely, in the Book of Reason, he was overcome by acute things, where he was speaking of aphonia, he said that it could be done on account of the closing of the veins and the interception of spirits in them; but since these interruptions could be opened by transfusion of blood, it would seem that Hippocrates was indicating transfusion. But there he speaks of the sudden aphonia, occurring from the veins being filled with excessive blood, from which the passage of spirits is hindered; but these fillings of the veins of Galen are either made from an excessive supply of blood, or from the same lesion, namely, by mixing with the acrid fluids themselves, that attract a lot of material into the veins of the affected party, when these are filled, they refuse the passage to the spirits, but to this [Page 123] filling of the veins Galen proves that the discharge of blood alone is sufficient for this, sufficiently evacuated both in quantity and in quality, and no further action is required by another injection of blood, when the spirits who are in the body are present and the routes are opened, they are sufficient to remove the former affection, and no new blood is required in any way, lest the veins be again filled up and the former evils again return.

In like manner in the second Book of Diseases, Hippocrates appeared to have established the infusion of new blood into the veins, when he spoke of apoplexy, and said that a man fell into an inability of the whole body, to chill the blood inside his veins, and there is much phlegm mixed with it, and that it can escape if the blood is heated either by itself or by medicines, therefore, in this case transfusion seems most appropriate, since it can be done immediately and heat the blood very quickly through a mixing of hot blood.

Hippocrates speaks there of apoplexy, and the idea of impotence for the body: he understands the privation of the senses, and movement, which is caused by obstruction of the brain or ventricles, for which reason spirits cannot be generated in them and diffused into the body; or it comes from the fact that [Page 124] spirits are not supplied to them in order that they may be able to work, and this results, either because they are not produced, or because they are not committed to them on account of the obstruction made in the surrounding veins, and for this reason it is said by Hippocrates that the veins are blocked up, and that the blood being cooled can induce the inability of the full body. It is necessary, however, that this congestion is not slight, that it may hinder the spirits from every passage; but if there is a severe obstruction, no matter how hot blood is infused, it will not be able to remove it as soon as an acute illness requires; and the danger, neither can hot blood go thither so easily, for those veins which are close to the brain are very much diffused from the

heart and the liver, and are very slender and confused by many convulsions, thus, the hotter blood will not be able to be returned by transfusion, as soon as it is necessary. This may indeed be done better with anointing, urinary processes, and other hot things, which are immediately applied to the head, and more powerfully and quickly reach the parts of the labouring quarters: and these are the things which seemed to me to be said about the exposition of these passages by Hippocrates, in order to demonstrate that blood transfusion [Page 125] was in no way admitted or worked out by him. Better expositions could without doubt be brought from those to whom the secrets of Hippocrates may be better known; it is enough for me to have brought something for the defence of my opinion.

CHAPTER III

Transfusion is rejected because it is contrary to philosophy.

It is unbecoming for a physician to prescribe remedies which are based more on experience than on reason, therefore the use of transfusion will not be praiseworthy in medicine, which asserts no other better proof of its own than experience, and ignores whatever else; the reasons that they use to fight against it, celebrated innocently by come, citing only experience as self-defence, and since the permeation of the blood has not been well received, it declares that it is entirely safe, not caring to fall into the disgraceful sobriquet of the empirical.

Therefore it will be no surprise if it does not respond well to the rules of philosophy. And, indeed, [Page 126] it seemed to differ greatly from them, when it wished to confuse the species of individuals, and that it would be useful to mix together distinctly different bloods; but we dealt fully with these above, and the time is now come to study in brevity, we will look at all the things which may be collected in part from what has already been said, or may be noticed by each, we will only be content to explain one or two philosophical axioms that are directly opposed to transfusion. The first is the most common text: *That which proves too much, proves nothing*, but that the transfusion proves too much will be easy to show: it infuses the blood of the elderly and the seriously ill, and the blood of a young living creature, and therefore infuses it, because it supposes that the parts of the senile body weakened by such blood can be nourished, the strength can be increased, and that when cooked, it should be restored; and finally, imbued with all those qualities, the body which was endowed with youthful blood, was shed; therefore the old body will grow young and for some time it will enjoy this good food, if there is none, it is also better, and such a body will be established more firmly, since it has not only been nourished with the best blood, but has also been shared with its force, and a certain [Page 127] energy for resisting any contrary, and for exercising all the necessary functions, which force and energy will be more confirmed by the blood transfused the second time; better also the limbs will be refreshed with this repeated diet, and thus if the transfusion is repeated several times, the senile body will become stable, strong, and just as youthful, and if at some time for any reason he will be in danger from this transfusion, he will be able to be immediately brought back to his former state, and thus will in any way be able, so to speak, become immortal. Transcendental philosophy rejects these arguments, and when it examines the causes of natural things, while it strikes at absurdities of this kind, it does not at all assent to them; therefore the philosophy of transfusion will not assent to it, and will declare it altogether contrary to it.

The other axiom is that: *Whatever is received is received in the manner of the recipient* the transfusion must either be assented to, or it must be declared useless. Whatever blood the veins and viscera receive, they receive it in the same way, and they are related in the same way as the liver receives the chyle, and it turns into blood, just as the liver itself is in proportion to its temperament and ability to give

blood; if, therefore, the veins and viscera have been infected with a diseased diathesis, and convulsed by persistent obstructions, [Page 128] nor can they be defiled by deleterious humors, nor will they be able to receive the blood coming in according to their own measure; and will infect and defile it; therefore, transfusion is performed to no avail, since it may serve to accumulate the pathogenic material rather than to remove it: or at least it will not be a true philosophical axiom that whatever is received is received in the manner of the recipient. Transfusion certainly does not want to declare itself useless, therefore it will not care to be incompatible with this philosophical dogma, and therefore it will be firmly incompatible with it.

But what shall we say to the argument brought by the transfusers, by which they demonstrate that the transfusion is celebrated by nature itself, and consequently that it is in agreement with the natural science itself. They bring the nutrition that the fetus receives within the mother's womb, the maternal blood being taken through the umbilical vein, and in this manner of nursing they acknowledge true transfusion, when maternal blood is absorbed into the veins of the fetus, in the same manner as spitting blood is fed into the veins of man by the transfusers themselves. I find, however, that there is a great difference between the two works, namely the shedding of blood, [Page 129] which the mother produces into the umbilical vein of the fetus is not truly a transfusion, but a continuous passage through the vessels common to both; for although the fetus may in some way be different from the mother by its different temperament and separate souls, yet while it is still residing within the womb, it depends mainly on the mother, and according to her different alterations, the former behaves well or poorly: and even with respect to the soul itself, it has a great deal of dependence on its mother, as the theologians commonly assert, that the angel is not assigned the guardian of the fetus before it comes out of the womb, but is guarded by the mother's angel, because it has a very strong connection with her, and almost the same thing happens with her. Certainly at least, that is, that there is less disparity between mother and child than between men, and truthfully, from which the more tolerable and far better communication of blood is obtained in them by nature, than that which is performed by transfusers.

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CHAPTER IV

The incongruity of transfusion is gathered from the Holy Scriptures.

It may be permitted for a short time to pass beyond the bounds of medicine, and to abundantly satisfy the curious reader, the already approved medical reasons for the inconsistency of transfusion, it may be possible to confirm it further in the records of the sacred pages, for whatever opposition there is to it will be made known not only to physicians, but also to the learned.

This inconsistency is inferred from the ancient precepts of God, by which he prohibited the people of the Jews from using blood; for we read in Genesis that it was commanded by Noah and the others going out of the ark: *You shall not eat flesh with blood; for I will require the blood of your souls at the hand of every beast, &c.* and also in Deuteronomy, that it was commanded by Moses to the people, that they should also abstain from the blood of a dead animal; likewise, in Leviticus, mention of this prohibition was made in several places, and especially in these words: [Page 131] *You shall not eat the blood of all flesh, because the soul of the flesh is in the blood and whoever eats it will be cut off.* And the apostles seemed to confirm such a precept, while they determined to preserve abstinence from blood and to preserve the strangled new church (though the decree would not last for ever).

The end of these commandments was that men should not become accustomed to treating of blood; where they could escape with their faces to murder, which almost all the interpreters have judged, and above the rest the divine Augustine, speaking in like manner, *And he does this so that in those early times he compresses his lewd*

assault and propensity to murder. And also, as Pererius explains; That is, you shall not eat living flesh, like wild animals of all living things, of animals or of men, they eat the flesh, or you shall not eat blood which live animals mainly contained.

But although the use of blood was forbidden, it tended only to that extent, lest men should eat it, on which account it seems to belong less to our cause; nevertheless, the end of that precept is so incompatible with modern transfusion, that he who employs it may seem to oppose the gentleness of God who intends it. For what [Page 132] could be more cruel than not to draw blood from the veins, but to draw it out by force, and not to dread so great a pain, which the eyes scarcely bear? For not only are brutes bound and wounded but the more precious blood is gradually drawn out of their arteries (not to mention in jest) entirely; is it not, then, that among these cruelty is nourished, and, in such a shedding of blood, to dwell over a long time, does it not take more pleasure, and gets accustomed to it more firmly? Therefore, although blood is not drunk in a transfusion, it carries with it however the same inappropriateness as a drink, it may well be included, not even under this precept, which the new law abolished, but in the end, which God intended by his commandments.

Although, doubtless, to carry out similar things for the safety of man, and to remove his disadvantages, it does not matter whether the life of the brutes is endangered; yet is it wise to kill that particular rigid body in such a way, and it seems less fitting to omit innumerable milder remedies, that it may be used more severely, not only with the greater torture of the sufferers, but also not without the greatest danger to the power of the agents.

Let the doctors, therefore, shun this brand of stiffness, and if, even while they acted gently in other remedies, [Page 133] they cannot generally avoid this name, they define to embrace this new form of remedy which relates to wider savagery, and the more reasonable can impress upon them such a character.

CHAPTER V

Transfusion is examined by legal arguments, and demonstrated to be prohibited by them.

Now we have thrown our scythe into another harvest, while, having left the path of the physician's arguments, we diverted our greenery into the sacred scriptures; it pleases, therefore, to proceed further and to enter into the broad grounds of the laws, and to collect among them companies, that is, certain authorities, by which they may pursue and beat transfusion.

But the foundation of the present discourse will be novelty, and not an exact certainty of this remedy, on which account it is forbidden to physicians to apply similar medicines, and much more to transfusion, against which not only novelty and uncertainty fights, but powerful and effective reasons, and also natural light, which at first sight [Page 134] demonstrates the vain utility of it to many.

It is not, therefore, permissible for physicians to use medicines, and the less probable and reliable method of curing, leaving behind more information, and more general ones, as transfusers do; those who abandon the most common rule of medicine employ this less probable and certain remedy, thus Portell, Sotus, Suarez, Villalob, Vasquez, Sanchez, those who are cited by Diana, to whom Castropal may be added; and Fagnanus, who not only condemns the testimonies of other doctors who work in this manner, but also disapproves and convicts by natural reason, *because no one would have such a physician, who, using less probable and safe medicines, would slay a more probable one; how he would cure, and who would choose such a physician, he thinks that the latter is more sick in mind than in body:* in fact he quotes Innocent among others; he who does not take the probability of the medication widely, but also restricts it to trivial doubts which can be obtained by

employing the drug, determines that, *The doctor is not only flawed when he uses medicine doubting whether it is going to do harm or be beneficial, but even when he strongly believes that it will benefit, if he has any doubt, or ought to have, don't harm them, the safest part is for ever to be* [Page 135] *understood.*

There are, however, exceptions some cases, in which the doctor may lawfully use less probable medicines, namely, where no more reliable drug could be found by which such a disease could be cured, thus Diana, Castropal, and many others; but this cannot be applied to transfusion, since innumerable other safer medicines are present to cure those diseases by which it is used, and innumerable diseases have been cured hither and thither exactly without it.

Fagnanus also goes on to prove the same, that third party physicians should follow the most probable and more common method concerning the choice of medicines, and the method of healing, not only from the debt of charity, which demands, that we may help the patient in a more certain manner by which we can; but also that they are bound by their duty and the obligation of justice; but in this way he proves it; first *because it is the physician's duty to apply medicines which he deems to be more beneficial rather than harmful, but he cannot conjecture that it would be beneficial to some physician, which is more likely to injure him; it is necessary to consider that art which has a stronger motive; therefore the doctor, who follows the less probable part,* [Page 136] *he does not satisfy his duty, and thus sins even against justice.* Secondly, he proves, *because if we are bound out of charity towards the sick, that we may help him with greater certainty; certainly no less ought we to do from the love of the truth and right, which is loved by us and all, it ought to be inquired into with earnestness, and if not so let us inquire, and we love, we sin formally, not so much materially; for just as he who does not use a more certain means to aid the sick, is convinced not to love the sick, and he sins, so whoever does not use the means to obtain the truth with greater certainty, is convinced by this very fact that he does not love God, who is the truth itself.*

But someone will say that transfusion is not considered a non-acceptable drug by transfusers, but is in harmony with reason and experience; therefore if they follow it, they do not err. I reply that, although it may be considered by them to be an acceptable medicine, they also cannot deny that it is far less acceptable to all the other medicines, which are commonly used by other physicians, and have been found to have been profitable for so many centuries. Nor can they deny that there is still some doubt even now concerning the utility of it, since they [Page 137] themselves also know that three or four cases in which it benefited were not sufficient for the establishment of its complete security; moreover, since there is still some doubt among them concerning this, they ought not to use them, whilst abandoning the other remedies which are altogether beneficial to diseases in a more certain manner, according to the opinion of Innocent, whom we reported above.

The transfusers will come again by saying: we use them so that we can get more certainty about it for the probability itself is determined by multiplying the experiments. But Castropalao answers them, asserting that, *it is unlawful for physicians to make experiments of drugs, whether they were beneficial or harmful, even in desperate fields, because no one is permitted to obtain knowledge by the death of his neighbour, and because the operator in this way is doubtful that the drug will accelerate death, therefore, as far as he is concerned, he intends the acceleration himself, and he sins.*

These are doctors' opinions on the use of dubious drugs, among which, as has been proven, should be included, especially on transfusion. But if someone has questions pertaining to the doctor, discussed by the physicians themselves, he will also be satisfied, since Zacchias, [Page 138] the most learned physician of our time, the most renowned physician in his legal investigations, has dealt with this matter abundantly on several occasions, as it is here subjoined.

And indeed he spoke thus in Book VI. *But it must be decreed before other things, that the physician who is in the cure of uncertain, new, doubtful, and he pursues existing beliefs outside of daily practice, he commits a serious error, since he is obliged to follow from his conscience certain safe and common opinions: and below thus: To be condemned and punished, there are those physicians who reject the art of canonized medicine among all the most famous remedies in the world; and on account of their own heresy, they omit them with the greatest prejudice to the sick, inherent in certain absurd and insipid reasons, which are not worthy even to be put forth in the middle: and, moreover, he adds below: in this error also the physician is involved, who will develop new medicines that he has no experience of, when he has experience and knowledge received from the common use. Thus the Canonist wished, that he had experienced such medicines, so that if the doctor doubts whether any medicine would be beneficial or not, if they wished to release the patient into the hands of God rather than expose the patient to such an [Page 139] experience, thus he quotes Nauarr, Carrar, Actium &c. He also pursues the same status as Book 10, cons. 40, n. 3. & 4. & cons. 71. num. 14. lib. 8. tit. 2. questions. 3. num. 1. and 2, where he asserts that not only the physician who prescribes dubious medicines sins, but also the patient who takes them.*

These, therefore, are the chief arguments, by which the transfusion is rejected by the decrees of the laws, which were therefore attached here, in order that it might more fully satisfy the minds of the eager readers, and that no kind of arms would be left in which no transfusion would follow; which arms indeed, if in some places, either a little sharp, or not exactly wiped, and they will be found bright by the readers, please forgive them, and by perfecting the projects of their own minds, they will add to their sharpness and brilliance, and so while they will mix their own doctrines with this little work, so that by their approach it may be rendered more visible, more accurate, and utilitarian transfusion.