

# ESPERIENZE SULLA TRASFUSIONE DEL SANGUE IN ROMA, PRECEDUTE DA CENNI CRITICI SULLA STORIA DI DETTA OPERATIONE.

By: F. SCALZI

## A TRANSLATION BY PHIL LEAROYD

A copy of the paper 'Experiments on blood transfusion in Rome, preceded by critical notes on the history of this operation' by Prof. Francesco Scalzi, published in 1866 in the journal *Giornale medico di Roma* [Vol. 2, pages 224-236] can be read or downloaded from the following site:

[https://books.google.co.uk/books?id=53URAAAAYAAJ&dq=Scalzi+%2B+Esperienze+sulla+trasfusione+del+sangue,+precedute+da+cenni+critici+sulla+storia+di+detta+operazione&source=gbs\\_navlinks\\_s](https://books.google.co.uk/books?id=53URAAAAYAAJ&dq=Scalzi+%2B+Esperienze+sulla+trasfusione+del+sangue,+precedute+da+cenni+critici+sulla+storia+di+detta+operazione&source=gbs_navlinks_s)

As the title identifies, the author initially looks at the various, sometimes obscure, historical claims by different people who have been quoted as being the first to suggest blood transfusion as an operation, starting with the story of Medea by Ovid, but then discussing the claims of Pegelius Magnus in 1604, Andreas Libavius in 1615 and Giovanni Colli. He then relates the story of Francesco Folli, who in 1652 claimed he had the idea of transfusion much earlier, which he had told to the Court of Florence, but which he believed was relayed by Englishmen, who were in the Court at the time, to others in England, who then used the idea to develop their own experiments. Folli's precedence claim was not however actually documented at the time.

Scalzi then describes Riva's experiments in 1667 having apparently read about the experiments that had been performed in France and the author then notes that the experiments in Rome 'aroused the applause of many' unlike in France. Though he then identifies Santanelli's confused but adverse comments regarding blood transfusion and notes the banning of transfusion by the Court of Rome and the reasons for this decision are examined and the basis for it questioned. He then identifies the resurrection of transfusion in other countries in its ability to combat anaemia resulting from haemorrhage as well as a case of carbon monoxide poisoning in Germany and ends by lamenting the fact that Italy has not done the same.

Scalzi's writing is occasionally selectively biased and the style is somewhat 'flowery' and as a consequence difficult to accurately translate its meaning in places. Most of this paper is reproduced in his later monograph published in 1871 in Rome\*.

\* See: 'La Scoperta della Trasfusione del Sangue rivendicata all'Italia' [The Discovery of Blood Transfusion claimed by Italy], which can be viewed or downloaded from the following site:

[https://books.google.co.uk/books?id=4WCYM5rM6rsC&pg=PA1&source=gbs\\_selected\\_pages&cad=1#v=onepage&q&f=false](https://books.google.co.uk/books?id=4WCYM5rM6rsC&pg=PA1&source=gbs_selected_pages&cad=1#v=onepage&q&f=false)

I have produced a translation of this paper from the original Italian into English to hopefully enable its content to be appreciated by a wider audience. Whilst I am obviously aware that instantaneous computer generated translation is available, this process however struggles with accurately reading the original text and interpreting specialist terminology, as well as producing a 'colloquial style' not always representative of the original text. In

addition, an 'automatic translation' may either purposely or inadvertently alter the wording to 'make it read better' but in doing so there has to be an element of interpretation involving something on the lines of 'I believe that this is what the author is actually trying to say'. I want to avoid that as much as possible and try to present what the author actually wrote and as a result the reader may find that the English text does not 'flow' as well as it could. Although I have taken great care in accurately identifying the original text and producing a true representative translation of the author's original wording I cannot guarantee that this work does not contain 'translational errors' and the reader is recommended to check specific details against the original text.

I have reproduced the original paragraph settings and general layout as accurately as possible and maintained within the translation the words that are originally printed in italics.

I have reproduced the spelling of the names of people and places as they appear in the original text but where appropriate have added alternatives to these, within square brackets, directly after. The original references to the text are included at the bottom of each separate page; I have sequentially renumbered these and reproduced them as written at the end of the translated text, together with English translations to some of the titles or where additional information is presented. These reference translations are included in italics within square brackets.

The text includes a number of Latin quotations. Given the relevance of some of these to the author's narrative I have also included English 'alternatives' to them, which are included directly after the Latin text, reproduced in italics and placed within square brackets.

## **PROFESSOR FRANCESCO SCALZI**

Francesco Scalzi was born in Rome in 1821, graduating as a Doctor of Medicine at the University of Rome in 1848 and where he was appointed Assistant Professor of *Materia Medica* in 1856. He was fluent in Latin – all lectures at that time in the University of Rome being delivered in Latin. In 1865 he founded the *Giornale di Medico Roma* and took an active part in the Roman Academy of Medicine. He was also Director of the San Spirito Hospital from 1877 to 1888, a member of the Supreme Sanitary Council for nine years and a Communal Councilor. For his services to science and to the community he was named a Knight of the Order of St. Gregory the Great (Cavaliere or Cav.). He is credited with having introduced the experimental method of studying the action of drugs into Italy, establishing the Institute of Experimental Pharmacology and Toxicology in 1876. He also founded a Pharmaceutical Museum, assembling and organizing an extensive collection of Roman antiquity medical instruments.

He was a prodigious author of published works on a great variety of subjects. In 1860 he published the *Synopsis Pharmacologiae Generalis* written in Latin and in 1870-71 his great work *Trattato di Materia Medica* that contains a history of pharmacology and is identified as being practically a history of medical treatment.

An obituary in 1890 (1) states that 'Scalzi was an ardent patriot and he carried this feeling into the realm of science, claiming for Italy a number of discoveries which the world persists in attributing to workers of other nations, for example identifying that Andreas Cesalpinus discovered the circulation of blood.' The same could be said for his assertion that Francesco Folli discovered blood transfusion and that the work by others, especially Wren in England, resulted from comments 'probably overheard by some Englishmen' in the court of Grand Duke Ferdinand II that were then passed onto others.

1. BMJ Obituary: <https://www.bmj.com/content/1/1535/1282.1>

## Experiences on blood transfusion in Rome, preceded by critical notes on the history of this operation; by Prof. Francesco Scalzi.

Although the transfusion of blood has not brought many great advantages to the art of medicine, nor has it been able to arouse enthusiasm in us, even today, as on other occasions, it has engaged eminent authorities to take it into account. Let us also be permitted to speak briefly about its history, which has not seemed to us to be in agreement with various authors, and about the experiments carried out by our fellow citizens, which in the many writings published so far have been omitted or not sufficiently appreciated.

Turning our attention to this subject, we thought it possible to divide the history of transfusion into three distinct epochs, which we would like to call mythological, rational and experimental, and in each of them we found some trace of our work.

In the Latin myths the concept of reviving the waning age by instilling new life with more fervent blood was foreshadowed, and Ovid marks the image with expressive colours, when Medea suggests to the daughters of Pelias to empty their father's veins of the old blood, promising them that it would infuse him with new and youthful blood.

Quid nunc dubitatis inertes?  
Stringite, ait, gladios, veteremque haurite cruorem,  
Ut repleam vacuas iuvenili sanguine venas:  
In manibus vestris vita est aetasque parentis (1).

*[Why are you now idle in doubt?  
Clasp your swords, says he, and draw the old blood  
To fill the empty veins with youthful blood:  
In your hands is the life and age of the parent.]*

Here is the first and remotest clue of the transfusion, which, like a fleeting flash, flashed in the mind of our poet. Nor could we join those who reproach Ovid for having thereby delayed the discovery by putting the project in the mouth of an evil woman, as if it had been mad and lying advice; indeed, since Medea was very learned in the art of medicine, we believe that he made her speak wisely, but with the intention of not keeping her promise, as in fact she did by letting old Pelias perish.

While, however, the attached passage is a sure criterion that Sulmonese followed the discovery of the transfusion, we could not similarly recognize a proof of it in the other text of the same poet reported by Esler (2).

... Stricto Medea recludit.  
Ense senis iugulum, veteremque exire cruorem  
Passa, replet succis: quos postquam combibit Aeson.  
Aut ore exceptos aut vulnere, barba comaeque,  
Canitie posita, nigrum rapuere colorem.  
Pulsa fugit macies: abeunt pallorque situsque,  
Adiectoque cavae supplentur corpore rugae,  
Membraque luxuriant (3).

*[... Medea closes it tightly.  
The sword of the old man's throat, and the old blood to come out  
Raisins filled with juices; whom Aeson afterwards devoured.  
Either be spared, or with a wound, beard and hair,  
When the gray hair is placed, the color is black.  
The pulse runs away thinly; they go pale and pale,  
And by addition the hollows are supplied by the body of the wrinkles,  
And the members are luxuriant.]*

On the contrary, it appears that what is proposed here is the infusion or introduction of medicinal substances into the blood, a practice which has since passed into the rational methods of therapy, without realizing that it was taken away from the ancients.

And returning to the true concept of transfusion, we can conclude that it has already been clearly pointed out in the fabulous era by a poet who belonged to us. Nor do we know by what documents it is claimed that the idea was drawn from Homer or another Greek singer.

However, we have represented little or no part in the era that we liked to call rational, which moreover was almost entirely Italian. With the turn of the sixteenth century, the idea, still covered by the veil of fables, entered the domain of philosophy, and passed from verisimilitude to the regions of solid reasoning. Whoever was the first to take up the discussion and put it in a position to carry out the experiment, is variously asserted by the various historians of medicine, which indeed is sometimes referred to those who deservedly do not deserve it. The illustrious author, on the other hand, of the Pragmatic History (4) attributes it to the famous Marsilio Ficino; in which he was imitated by Salvatore DeRenzi (5) and Giovanni Pozzi (6) naively imitating each other. But the Tuscan philosopher and physician studied nothing but the sucking of blood, considering it suitable for prolonging life. "Cur (here are his words) non et nostri senes omni videlicet auxilio destituti, sanguinem adolescentis sugant? volentis inquam adolescentis, sani, laeti, temperati, cui sanguis quidem sit optimus sed forte nimius. Sugant igitur more hirudinum ex brachii sinistri vena vix aperta unciam unam aut duas." (7) [*Why do not our old men, destitute of all support, suck the blood of the young, willingly, I say of the young, healthy, happy, and temperate, whose blood is indeed the best, but perhaps too much? They therefore suck, after the manner of a leech, from the vein of the left arm, barely open, an inch or two.*]

For these concepts, all referable to the introduction of blood by the digestive route, Ficino not only cannot be considered the discoverer of transfusion, but cannot even enter the list of promulgators of the same; as such we cannot consider Pliny when he speaks of epileptics who drank the blood of gladiators dying on the arena (8); not Celsus, who remembers the same custom (9), not Aretaeus, who rebukes those who collected the blood of the beheaded to guzzle it (10), not Bartolinus (11), not Zacuto Lusitano (12), to show that they too were aware of it.

An idea of this operation is seen foreshadowed by the contemporaries of Girolamo Cardano (13), accompanied by so little credibility that he, although a lover and propagator of amazing novelties, places so little confidence in it that he barely remembers it in his lip-smacking works. "Sunt qui cum alio iuvene bonorum morum duplici fistula, alii unica, commutare sanguinem posse sperent; quod si fiat commutabuntur etiam mores." [*There are those who hope to be able to exchange blood with another young man of good character with a double pipe, others with a single one; and if this is done, their manners will also be changed.*] The simple or double fistula mentioned here shows the artifice to be used in practicing it, but leaves us unclear how and where to apply it.

It was also a serious mistake to have asserted that Pegelius Magnus of Rostok proposed transfusion in his *thesaurus rerum selectarum* published in 1604, as Pozzi thinks, restricting his reasoning to obscure expressions that can be interpreted in several ways. Here are the words of Pegelius: "Ratio chirurgica insignis et rara homini communicans externa quae ipsi bona et interna multa quae noxia avertens." [*A remarkable and rare surgical system, imparting to man external things which are good to him, and turning away many internal things which are harmful.*] Nothing else can be deduced from this except that he recommended remedies for the surgical hand introduced and capable of amending various and serious morbidities. In the whole context of the work, then, he does not add any other motto that alludes to the passage of blood from individual to individual.

Until 1615 there was no work that showed signs of the art of transfusion. In that year, then, Andreas Libavius of Halle (14) reports that an empiricist contemporary of his had the idea in good credit, without clearly showing by what operation he considered it to be executable. So that not even to Libavius, as others think, we owe the discovery and introduction, even showing himself to be its adversary to the point of judging worthy of hellebore those who had attempted its practice. "Sed quomodo ille robustus qui sanguinem

suum transfundendum exhibuerit non languescat? Danda sunt ei bona confortantia et cibi, medico vero helleborus." [*But how can that strong man who has offered his blood to be shed not faint? He should be given good comfort and food, but the physician should be given hellebore.*] The name of the empiricist is unknown; nor can it be believed that Pegelius was the one, who, as has been said, only mentioned the infusion of medicines. It is evident that it would be wrong to judge this man as the inventor, since he left no argument that he had a distinct idea of it, and means to carry it out. So that, as far as we gather from the Libavius, his contemporaries and those who followed him shortly afterwards remained in the same obscurity.

History is similarly offended by those who on the authority of Sprengel (15) want to attribute the merit of this invention to Giovanni Colle of Padua, finding in his work on the method of preparing medicines (16) the injection of remedies into the veins rather than the actual transfusion.

Here ends the series of theories, which remained obscure, little appreciated or derided, and in such a state would have lain if, in the third or experimental epoch, meditated again and put to the test, they had no hope of possible success.

Therefore we see it resurrected by the industry of an eminent Tuscan genius, Francesco Folli of Poppi, who ran in 1652 in the court of Florence before the Grand Duke Ferdinand II made solemn proof of this. We forgive Sprengel and Rochoz (17) who were not aware of these facts, but we cannot forgive some Italians who, drawing their information not from their homeland archives, but from outsiders, have ignored them. It is slight to show that the first experiments are not due to the Englishman Wren, as the German historian has written, and many of us have repeated, suffice for us the ineluctable arguments that Folli adduces on the subject in his *Stadera Medica*. (18) He recalls having suggested transfusion in some of his works dated before 1657 when he instituted his experiments in English. "In the year 1652," he says, "I read the little English book by William Arveus [Harvey], which deals with the motion of the heart and the blood, which reading, with some information he had of grafting plants, produced in my imagination this third problem, namely, that given the circulation of the blood, transfusion was possible, with which it was possible not only to cure some ailments, but to rejuvenate and magnify further, as I mentioned in my booklet on the culture of the vine." (19) He adds that he had secretly communicated it to his excellent Lord, so that, if it was proved true, the prince might have the glory to proclaim it to the world. Here are his words: "The transfusion of blood had been invented by me and since the year 1652 manifested to the most serene Ferdinand II Grand Duke of Tuscany, of eternal memory, nor did I ever communicate this thought of mine to others, giving myself to believe that if such an invention were to have a good end it would only be worthy of monarchs." (20) That if he was prejudiced in the publication of Wren's experiments in England, it was through the work of certain Englishmen who, present at the court of Tuscany at his attempts, communicated them to their countryman, who did not hesitate to proclaim them as his own, without even mentioning the industrious Italian. Who, understanding the ungenerous work, handed down the memory with these words: "For having been here at the court of Florence some virtuous Englishmen and still present at many experiences, as attested by Mr. Redi, among whom was Mr. Finchio, who is at present ambassador to the Porte, could have understood it in that court and then transported to their homeland." (21) Nor do we know that a voice was raised throughout England to deny it. For all the proofs, add having called Ferdinand himself, who still reigned in Tuscany, as a factual witness of his many experiences. "I discovered myself the inventor of it by calling as a witness the most serene preface Ferdinand II, who was living at that time." (22) Who will it be who will now be able to oppose him the honour of the first and true experimenter? He could therefore well say of this practice: "with reason, therefore, I can call it mine." (23) It was not enough to assert this culminating feature of the history of transfusion, as the distinguished Copello does (24) it was necessary to ascertain it by force of good documents.

But first Folli and then Wren, and several of his fellow Englishmen, confined themselves to experiments on brutes, not daring to try them on man. This last step gave the transfusion first between brutes and man, finally between man and man. The Roman Medici took all the

advantage at this time; for their trials were contemporaneous with those of Denys [Denis] and Emmerez in France, were celebrated with solemnity, were conducted with better sense, and had a happier outcome.

In the Journal of Scientists of Paris it is reported that Denys [Denis] experimented on man in the year 1667 (25); and from the Miscellanies of the curious of Germany (26) we learn that Guglielmo Riva in December of the same year also made his tests (27). This did not escape Sprengel, who asserts: "At the same time similar experiments were also instituted in Italy. Guglielmo Riva Piemontese, who practiced surgery in Rome, performed a blood transfusion in a consumptive patient, and Paolo Manfredi, professor in the said city, performed the operation with happy success." (28) Manfredi also confirms this in one of his works, leaving us with the words: "As soon as I read some letters from France to the court of Rome, I immediately started to experiment." (29) And it should be noted that in this he had been preceded by Riva, who therefore had to act before news of it reached Rome.

It is admirable then how much solemnity Riva gave to his experiments by instituting them publicly and in the presence of the most conspicuous luminaries of medicine in our country, including Gio. Maria Costanti, Antonio Egidio Petraglia, Giovanni Trulli and Giacomo Sinibaldi, not excluding the foreign scientists who rushed to the novelty of the fact, and in the presence of the main authorities who authenticated the results with a notarial deed (30). Esler, who was in Rome and present, did not hesitate to deliver the story in the above-mentioned miscellanies (31) with the following title: "Trium sanguinis transfusionum ex animalium trium viventium arteriis in trium laborantium morbis diversis venas celebratarum anno 1667 mense decembri Romae, non bestiali more sed feliciori et humana methodo prosperoque eventu a Ioanne Guillelmo Riva ac principalioribus comprofessoribus qui praesentes operationibus interfuere subscriptae ac testificatae." [*The three transfusions of blood from the arteries of three living animals into the veins of three patients suffering from different diseases, celebrated in December 1667 in Rome, not in a bestial fashion but in a more successful and humane method, with a successful outcome, signed and witnessed by John Guillermo Riva and the principle co-professors who participated in the operations.*] Among the three individuals subjected to the new method was Francesco Sinibaldi, Professor of Medicine at the Roman Archiatheneum, suffering from very serious phthisis, son of Giacomo, another highly reputable doctor present at the operation (32). While Denys [Denis] was content to operate in private with Emmerez as the sole witness, without bothering to give greater publicity and a sure guarantee.

It is also comforting to assert that our experimenters put every effort into finding the most suitable ways to ensure the life of the patients with regard to the instruments and the ways of using them, which were judged more perfect than any other that had been proposed by the French. Esler testifies to this when he called Riva's method not crude but easy and humane. And Manfredi wanted to deal with it so much that he found it the subject for two treatises, one Italian (33), the other Latin (34), filling them with a complete doctrinal on this subject.

It was thanks to these studies and to the most accurate and prudent work that our transfusers reaped the best fruit from these operations. So that if in France under the hands of Denys [Denis] and others who imitated him they had bad effects, they generated common distrust and attracted the decree of prohibition issued on 17 April 1668 by the Castelletto [Châtelet] court, in Rome they aroused the applause of many, the praiseworthy memory of foreigners, and the hope that if perfected they might be of some use.

Only one Roman doctor, Bartolommeo [Bartolomeo] Santinelli, rose up against it with a violent diatribe (35) condemning the transfusion in man. He judges it barbaric "quaedam veluti barbaries" [*like some barbarism*] as if the work, although great and bloody, were not lawful to convert it into a means of salvation. The rest of the writing is full of futile and pedantic sophisms, useless for the solution of such a topic, indeed page 16 contains the contradiction of praising the best experiments and conceptions on the way of carrying them out by Ippolito Magni, his respected friend.

The goodness of the new method and the fortunate successes achieved by Manfredi and sincerely recorded by the impartial foreigner will always be remembered, understood by the power of the facts seen and solemnly proved. The artifice that Manfredi operated on was

joyfully reviewed by Elsler, after some time, alive and flourishing. "Feliciter autem isthanc operationem cessasse ipsemet ego fideliter contestari possum, qui hominem sanum et valentem post aliquot menses eiusdem anni Patavii offendi exercentem in publico operas suas scriniarias cumque aliis pluribus ostendi." (36) [*But I myself can faithfully testify that this operation was fortunately discontinued, who, after several months of the same year, found a healthy and strong man in Patavium practicing his cabinet work in public, and showed him to several others.*] [And when the physician himself (Sinibaldi) was despondent and dying of despair] Yet the famous operator was forced to exclaim: "They were not ashamed to say that he who had the public experiment in my house after two days had already died; yet, by the grace of God, today, 20 or more days after the experiment, he is well and healthy, although when it was performed on him he was unhealthy as can be faithfully seen from the authentic faith attached to this sheet." (37).

For this reason, if Riva's first trials performed on subjects for uncontrollable diseases almost lost "Et cum physicus ipse (Sinibaldi) derelictae spei et destitutus et moriturius esset" yet maintained beyond that end that was already believed to be near, "Et Sinibaldum post menses non ratione doloris vulneris inflictis sive sanguinis infusi vel diffusi in transfusione sed illius anno XIV interpolate per tracheam reiecti, catharro, febre, et ulcere pulmonum glaciali tempore consumptum obiisse" (38) [*and that Sinibaldi died months later, not because of the pain of the wound inflicted, or of the blood infused or diffused in the transfusion, but in the 14th year of that interlude, rejected through the trachea, consumed by catarrh, fever, and ulceration of the lungs in the icy season*], did not have a good result, the other tests that Manfredi made on more suitable individuals gave reason to hope. It is therefore without foundation that the Court of Rome issued the decree of prohibition as asserted by Merklin (39) and repeated in good faith by Sprengel (40) and Machanzie (41). Whereas the misfortune seized by Riva's patient, and given as the cause of this determination, having been nothing but the effect already foreseen of indomitable and advanced illness, could not have elicited such a rigorous resolution. It was also false that Manfredi's craftsman from Udine was missing, who, on the contrary, returning to flourishing health, had to avert any ill-conceived prevention. Nor could Santinelli's fanatical declamations have any power on the authorities, having as their basis only failed operations or at least solid reasons. It is also a historical fact that Riva's operations were followed by others by Manfredi, Ippolito Magni, G. B. Pieri (42) and several others. Finally, in none of the surviving works of illustrious contemporary doctors of our city do we read words of distrust or opposition. So that neither Paolini, nor Coluzzi, nor Piacenti, nor Guidarelli, nor Gagliardi, nor Lancisi, who frequented the medical circles in Riva's house, have handed down to us a motto that hints at the alleged condemnation.

The zeal which we have hitherto explained as a mere elucidation of Roman history on transfusion must now be protected from the reproach of fanaticism or excessive love of advocating a subject of almost universal consensus that has been forgotten. Even if we were to leave the office of simple historians for a short time, we were permitted to interpret the reasons for which transfusion was abandoned in Rome from Riva and Manfredi onwards, we would find them outside of it and placed rather in the accumulation of objections that every great novelty, either evil or good, is wont to encounter.

And however foolish this therapeutic practice may have been judged to be by eminent men, yet there has never been lacking among the most cultured nations those who have not placed some hope in its wisdom; including Rosa in Italy (43), Blonndell [Blundell] (44) in England, Prevost and Dumas in France, Diefemback [Dieffenbach] (45) in Germany. It has been considered, it has been tried for a long time, tirelessly in order to surround the fact, by wise advice and practical deductions, with all the certainty of which human prudence is capable. In our century clear authors have devoted all their speculations to it, and can count examples of good success. In 1818, Bloundell [Blundell] (46) revived it, and Waller and Doubladay [Doubleday] praised it in 1825. It was successfully performed in 1826 by Brigman and in 1833 by Banner. Nelaton in 1850 gave splendid proof of this; in 1851 Marmonier and Seristan used it advantageously. And, to mention the nearest, I will recall the experiments of Polli (47) and the pamphlet "Transfusion of human blood as a heroic

remedy in idiopathic anaemia" (48) by the most meritorious Dr. Giovanni Copello, a writer already known for his new zoology.

The last word of science on this subject would be that the transfusion performed by infusing healthy, defibrinated and oxygen-rich blood, although not without difficulties and dangers, can in cases of exception and of great danger arrest the irreparable and speedy end that usually follows anaemia by copious and repeated haemorrhage. And if facts win all reasoning, there is no shortage of facts. Impressive is that of Banner of Liverpool who on 26 April 1833 (49) arrested the death of a woman taken by long and repeated metrorrhagia refractory to any more effective means of art. No less memorable was another from Berg of Ingelfingen, employed to help another unfortunate woman who, due to overflowing menorrhagia, was assailed by syncope, hiccups, icy cold, orthopnea, barely sensitive pulses. A few minutes after the transfusion of two and a half ounces of blood taken from a healthy man, the sick woman regained her knowledge, her strength, her freedom of circulation and breathing, and after a month she reached perfect health. Two other similar cases were also published by the illustrious Klet, for which the efficacy of the method and the small quantity of transfused blood sufficient to obtain such reported effects would be demonstrated.

Today there would also be another hope that it could be useful in asphyxiation by carbonic oxide and acid, and an example that has just occurred would make the probability less remote. On the morning of 12<sup>th</sup> March, an unconscious young man was found lying on the floor of his room in Neulle-Frederic Street in Berlin. Dr. Badt, was summoned immediately, and ascertained poisoning by carbonic acid gas, and made every possible attempt to bring him back from asphyxiation to life; but his efforts and those of Prof. Sachs who had arrived later had no other result than to make the patient breathe slightly and to make his pulses barely sensitive; but he was unable to regain consciousness and the doctors two hours after noon found him *with symptoms of paralysis of the brain and heart*. Dr. Badt then proposed blood transfusion as a last attempt, and Dr. Martin, consulted on this subject, offered himself for the operation with the assistance of Drs. Sachs, Badt, and his son. A bloodletting was done to the brother of the sick man and another to a clerk and blood was infused into the dying man. The operation was very successful. Shortly afterwards the sick man opened his eyes, his face blushed, and was able to swallow a little water. In the meantime he remained in a soporific state until 12 o'clock in the evening, but then he recovered the use of his senses, and at present he is in a perfect state of health (50).

It would therefore be a laudable work to institute new investigations, and to find the facts agreed and authoritative, to initiate and educate the young surgeons who practice in our hospitals to keep them prepared to help those unfortunates who, in the gravest danger of life, having previously fruitlessly exhausted all other attempts, claim this daring operation as their last.

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2. Miscell. Acad. Natur. Cur. Paris, 1772 p. 293.
3. Metamor. L. VII ver. 285-388.
4. Curzio Sprengel; Storia prammatica della Medicina, Venezia 1814. Tom. VII pag. 78 § 31. [*Curzio Sprengel; Pragmatic History of Medicine, Venice 1814. Vol. VII page 78 § 31*]
5. Storia della Medicina Italiana. [*History of Italian Medicine*]
6. Dizionario Classico di Medicina Tom. XLV pag. 436. [*Classic Dictionary of Medicine Vol. XLV page 436*]
7. Marsilio Ficino de vita producenda. Basil. 1549 Cap. XI pag. 85. Il Ficino morì in Firenze nel 1499 in età di 66 anni in altissima fama di filosofo, teologo, letterato e medico. [*Marsilio Ficini of productive life. Basil. 1549 Chapter XI, page 85. Ficini died in Florence in 1499 at the age of 66 with a very high reputation as a philosopher, theologian, man of letters and doctor*]
8. Plin. L. 28 cap. 1.

9. De re medica L. 3, cap. 23.
10. Lib I. De Curat. Diut.
11. Disquisitio medica de sanguine vetito.
12. Pract. Med. Admir. L. 3 obs. 79.
13. Nacque in Milano nel 1501 e morì in Roma nel 1576. [*He was born in Milan in 1501 and died in Rome in 1576*]
14. Andreas Libavius. Appendix syntagmatis arcanorum chirurgicorum. Francof. 1615.
15. Op. cit. pag. 79.
16. Iohannes Colle. Methodus facile parandi iucunda tuta ac nova medicamenta, cap. 7. Ven. 1628. [*Johannes Colle. An easy method of preparing pleasant, safe and novel medicines. cap. 7. Ven 1628*]
17. Diz. Class. Med. T. 45 pag. 434.
18. Ha equivocato Giovanni Pozzi e dietro lui l'egregio Dott. Giovanni Copelli nel suo opuscolo sulla trasfusione del sangue umano, riferito negli Annali Universali e nell'Osservatore Siciliano fasc. genn. e febr. 1865, pagina 404, asserendo che la citata opera "Stadera Medica" appartenga a frate Paolo Sarpi. È men vero poi che il detto Sarpi potesse conoscere e parlare delle esperienze del Folli praticate nel 1652 e pubblicate nel 1660, mentre egli cessò di vivere nel 1623.  
[*Giovanni Pozzi and behind him the esteemed Dr. Giovanni Copelli misunderstood in his pamphlet on the transfusion of human blood, reported in the Annali Universali and in the Osservatore Siciliano fasc. Jan. and Feb. 1865, page 404, asserting that the aforementioned work "Stadera Medica" belongs to Brother Paolo Sarpi. It is less true that the said Sarpi could have known and spoken about Folli's experiences practiced in 1652 and published in 1660, since he died in 1623*]
19. Stadera Medica nella quale si bilanciano le ragioni favorevoli o contrarie alla trasfusione del sangue, già inventata da Francesco Folli ed ora dal medesimo descritta. Fir. 1680. [*Medical steelyard in which the reasons for or against blood transfusion are balanced, already invented by Francesco Folli and now described by the same. Fir. 1680*]
20. Op. cit.
21. Op. cit.
22. Op. cit.
23. Op. cit. Tale lo acclamò Pietro Francesco Tocci, suo contemporaneo, nell' epigramma laudatorio intitolandolo "ad Franciscum Follium transfusionis sanguinis inventorem". [*Op. cit. This is what Pietro Francesco Tocci, his contemporary, praised in his laudatory epigram entitled "to Franciscus Folli, the inventor of blood transfusion"*]
24. Osser. Sicil. Fasc. Genn. e Feb. 1865 pag. 404.
25. Journal des Savants 1667 pag. 87-94.
26. Op. cit. pag. 290.
27. Guglielmo Riva nacque in Piemonte nel 1627 e morì in Roma a dì 17 ottobre nell'anno 1677 in età circa di 50 anni. Il suo cadavere fu tumulato con solenne pompa nella chiesa di s. Marco presso la casa da lui abitata, che fu in via della Pedacchia n. 10, secondo che attesta il Dott. Cav. Andrea Belli nella sua operetta "delle case abitate in Roma da parecchi uomini illustri". Raccogliamo dal Fantoni che fu nell'intimità del famoso Stenone; ed il Bartolino gli dedicò la sua epistola. "De ovarii mulierum epistola anatomica ad D. Guillelmum Rivam anatomicum Romae celebrem: Romae scripta die XII Ianuarii 1667". Marcello Malpighi lasciò scritto nelle sue opere postume: Romae mihi datum est cum famigeratissimo Nicolao Stenone colloqui, cum quo et Domino Guglielmo Riva in Lodovisiana Villa coenavi. Uno degli scolari del Riva fu il Lancisi, il quale col nome di suo maestro lo chiamò nell'opera "De noxiis paludum effluviis." [*Guglielmo Riva was born in Piedmont in 1627 and died in Rome on 17 October 1677 at the age of approximately 50 years. His body was buried with solemn pomp in the church of St. Marco at the house he lived in, which was in No. 10 della Pedacchia Way, according to what Dr. Cav attests. Andrea Belli in his operetta "of the houses inhabited in Rome by several illustrious men." We gather from Fantoni that he was in the intimacy of the famous Steno; and Bartholinus dedicated his epistle to him. "De ovarii mulierum epistola*

*anatomica ad D. Guillelmum Riva anatomicum Romae celebrem: Romae scripta die XII Ianuarii 1667.*” Marcello Malpighi wrote in his posthumous works: *Romae mihi datum est cum famigeratissimo Nicolao Stenone colloqui, cum quo et Domino Guillelmo Riva in Lodovisiana Villa coenavi. One of Riva's pupils was Lancisi, who called him by the name of his teacher in the work “De noxiis paludum effluviis.”*]

28. Op. cit.
29. Raguaglio sugli esperimenti fatti sotto la direzione di Paolo Manfredi Medico Professore nello studio di Roma ecc. Roma 1668. [*Information on the experiments carried out under the direction of Paolo Manfredi, Doctor and Professor in the Rome office etc. Rome 1668*]
30. Ego Ioannes Baptista Rondinus Romanus civis et Cur-Causarum Cap. Not. praesens instrumentum subscripsi et publicavi. [*I, John the Baptist Rondinus, a Roman citizen, and of the causes of Cap. Not. I have signed and published the present instrument*]
31. Oper. cit. p. 289.
32. E il Manfredi dice delle sue operazioni “esperimenti praticati più volte in mia casa e nei bruti e negli uomini dal sig. Bartolomeo Simoncelli, chirurgo ed anatomico eccellente, regolato da miei ordini. Il 5 gen naio si fecero in presenza di molti principi e titolati col concorso de'virtuosi e con non poco applause.” [*And Manfredi says of his operations “experiments practiced several times in my house and on brutes and men by Mr. Bartolomeo Simoncelli, excellent surgeon and anatomist, governed by my orders. On January 5<sup>th</sup> they took place in the presence of many princes and titled people with the help of the virtuous and with no small amount of applause.”*]
33. Raguaglio degli esperimenti fatti sotto la direzione di Paolo Manfredi ecc. Roma 1668. [*Summary of the experiments carried out under the direction of Paolo Manfredi etc. Rome 1668*]
34. De nova et inaudita medico-chirurgica operatione sanguinem transfundente de individuo ad individuum. Romae 1668. [*On the new and unprecedented medical-surgical operation of transfusing blood from individual to individual. Rome 1668*]
35. Confusio transfusionis sanguinis. Romae 1668. - Opuscolo dedicato al card. Giovanni Rospigliosi. [*Confusion of blood transfusion. Rome 1668. Brochure dedicated to Card. Giovanni Rospigliosi*]
36. Op. cit. p. 295. - Questi fu tal'Angiolo da Udine. [*Op. cit. p.295 – This was Angiolo da Udine*]
37. Fu giudicato in istato di buona salute 20 giorni dopo l'operazione dai Dottori Baldassarre Coluzzi ed Ottaviano Paolini, Medici Romani. [*He was judged to be in good health 20 days after the operation by Doctors Baldassarre Coluzzi and Ottaviano Paolini, Roman doctors*]
38. Op. cit. p. 290.
39. De ortu et occasu transfusionis sang. Norimb. 1679 pag. 25 e 85. [*On the rising and setting of blood transfusion. Norimb. 1679 pag. 25 e 85*]
40. Op. cit. pag. 88.
41. Histoire de la santé Loin 1761 pag. 469.
42. Niuno scritto si trova di questi due sperimentatori nella Biblioteca Lancisiana. [*No writings by these two experimenters can be found in the Lancisiana Library*]
43. Michele Rosa tornò a sperimentarla sugli animali in presenza dello Scarpa (Ved. Lettere fisiologiche T. 1 p: 288). [*Michele Rosa returned to experiment on animals in the presence of Scarpa (See Physiological Letters T. 1 p: 288)*]
44. Annali Univ. di Medic. Omodei Vol. 12 - 26.
45. Idem. Volume 53 p. 572.
46. Annali Universali di Medicina. Omodei. Vol. XII-XXVI.
47. Annali di Chimica 1852.
48. Anuali Univ. - Osserv. Sicil.
49. Diz. Class. di Med. Vol. 45 p. 453.
50. La France. 27 Marzo 1866.