LETTERS BY JEAN DENIS PUBLISHED IN THE *JOURNAL DES SÇAVANS* IN 1667 AND 1668

TRANSLATED BY PHIL LEAROYD

INTRODUCTORY NOTE

Some of the words in the reproductions of these articles are difficult to read due to the clarity of some of the letters. In addition, there are variations in the script with regard to the different spelling of printed French words used in the 17th century, i.e. related to substituting the letter ſ which was used to represent the letter s (i.e. the medial or long s), as well as the variable use of the letter u instead of v, i for j, etc., as well as the inclusion of different types of words that were in use at that time. I have however attempted to produce translations that are hopefully 'un-interpreted' in that I wanted to maintain the author's original meaning / wording as much as possible. In the few occasions when I have been unable to translate a word, I have included it within the translation in square brackets, spelt as in the original text.

FIRST LETTER

The first letter on blood transfusion to be published in the *Journal des sçavans* by Jean-Baptiste Denis in 1667 is in the 14th March edition (pages 69-72), which is actually an extract of a letter written on the 9th March to an unnamed recipient (who is Monsieur de Montmor), titled 'Extrait d'une lettre de M. Denis, Professeur de Philosophie & de Mathematique, à M*** touchant la transfusion du sang. De Paris ce 9 Mars 1667.'

I.e. Extract from a letter of Mr Denis, Professor of Philosophy & Mathematics, to Mr *** concerning the transfusion of blood. From Paris this 9th March 1667.

See: *Journal des Sçavans*, 14th March 1667, 6, 69-72.

https://gallica.bnf.fr/ark:/12148/bpt6k58122h/f70.image

Comments

This 'extract of a letter' describes what appears to be the first two animal (dog) transfusion experiments performed by Denis and Emmerez. It identifies that Denis has read about the transfusion technique in 'the extract from the Journal of England', which presumably refers to Richard Lower's paper: 'The method observed in transfusing the bloud out of one animal into another: and how this experiment is like to be improved. Some considerations concerning the same', that was published in the December 1666 issue of the *Philosophical Transactions of the Royal Society* (Vol. 1, Issue 20, p. 353-358). [https://royalsocietypublishing.org/toc/rstl/1666/1/20]

Denis describes how they modified Lower's method, firstly by using the crural artery of the donor dog rather than the carotid artery, due to its distance from the brain (thereby possibly reducing the chances of convulsions) and to the fact that it is easier to dissect out, and secondly that they wanted to keep the donor dog alive rather than let it die during the operation. They describe how, by correctly positioning the dogs they were able to use two very short interconnecting tubes, being obviously aware of the increased possibility of the blood clotting in a longer tube, which they state is reduced further by keeping the room and therefore the tube warm. They also describe how they checked that the blood was actually flowing into the recipient dog not only by feeling its pulse but also by disconnecting the tubes to show the blood flow. As with Lower's method, they also allowed blood from the recipient to flow into

a dish during the experiment, the volume of which they presumed to be equivalent to the amount transfused. Interestingly the account concludes by identifying that their next public experiment is to transfuse blood from 'a healthy and young dog through the veins of another who is old and mangy', which is equivalent to the experiment described by Thomas Cox, i.e. 'An account of another experiment of transfusion, viz. of bleeding a mangy dog into a sound dog', in the 6th May 1667 edition of the *Philosophical Transactions of the Royal Society* (Vol. 2, Issue 25, p. 451-452). [https://royalsocietypublishing.org/toc/rstl/1667/2/25]

Translation

You know that having advanced in one of my lectures that the transfusion, by which the blood of one or more animals was passed into the veins of another, is a new and quite convincing proof to confirm the feeling of those who support circulation; several people laughed, and called this transfusion chimerical and ridiculous. And since you were one of those who spoke more seriously about it, and you tell me that it was perhaps only a supposition made at pleasure in order to give the exercise to a few; I have since wanted to make sure of it, and I am now willing to inform you of the circumstances with which the thing has succeeded us by means of Mr. Emmerez our surgeon, whose patience and skill to dissect you have often admired, when he was doing this yesterday with so much accuracy the demonstrations of the particularities that I explained on a human cadaver.

On Thursday, 3 March, two small dogs were brought to us which had never been fed together, and which in their faces seemed as different as certain animals of different species, one being a spaniel bitch, and the other a short-haired dog resembling a fox. The bitch was full and a little bigger and higher than the dog; for it was twelve inches high, and the dog was only ten.

We proposed to do not only what was stated in the extract from the Journal of England, which is to pass the blood of one animal into another, by killing the one who communicates it to conserve the other who receives it; but we wanted to preserve them both, and for that we resolved to open the crural artery of the bitch to pass its blood into the jugular vein of the dog, persuading us that by drawing the blood by the artery which carries it from the thigh to the extremities, the convulsions would not be so much to be feared for the bitch as by pulling it by the carotid which carries it by the neck to the brain; apart from the fact that the crural artery is not so unbound or so deep as the carotid artery, we would not be obliged to use such loose tubes, which are liable to become engorged when the blood passes, and the dog does not suffer so much, it would be easier to have it reshaped.

In fact the thing happened in the presence of worthy people, as we had foreseen, in a very simple and easy way. Because having prepared our two animals, that is to say having uncovered the artery at the thigh of the bitch, and the vein at the throat of the dog, we made two ligatures on the artery at an inch apart followed by the vein of the other, of which the lower was a firm knot, and the upper one closest to the heart a noose, and between these two ligatures we introduce a very small thin [laton] pipe, an inch and a half long and curved at one end, in such a way that the curvature faces the heart to better receive the blood when the noose was loosened.

We also made two ligatures at the same distance on the vein of the other dog, but which were both a noose, and between these ligatures we introduced two pipes similar to the first, so that the curvature of one faced the heart to carry the blood there when the slip knot above is loosened: and the curvature of the other faced the head of the animal, to better receive the blood which comes from above and guide it into dishes, when the slip knot above, would also be loosened.

Then we strongly lay the bitch's artery on the end of her pipe, and the dog's vein on the two ends of the two pipes that we had introduced there, and after having put the dogs down next to each other, so that the thigh of the bitch responds to the throat

of the dog, we made the first pipe to enter the second, that is to say that of the artery of the bitch in that of the vein of the dog which faced the heart, and having loosened all three nooses, we watched the blood flow from the crural artery of the bitch into the jugular vein of the dog, while the third pipe poured into a dish about as much of this dog's blood as it did receive.

And to make sure that the blood was really flowing from the bitch's artery into the dog's vein without curdling in this small interval, which was only 3 inches long, we withdrew the first pipe from inside the second, and we did not find the blood willing to stop on the way, because there was too much movement and heat; besides that, it was very easy to feel it flowing by putting your finger on the dog's vein below the ligature; because there was quite a considerable heat and swelling there, which is not noticeable when someone presses with the finger on the artery on the bitch's side and thereby prevents the blood from entering the communication pipe.

Moreover, we observed during this operation that the third pipe was discharging through the dog's jugular a much larger quantity of blood than usual; which came to my mind the fact that this dog received arterial blood by the second tube, which entering in abundance must by the means of circulation, cause another to exit in the same quantity.

When we had drawn by this third pipe nine ounces of blood from the dog into a dish (which is a lot for an animal of this size) the bitch who had given it back as much, and who therefore had nothing left to do with the rest, began to weaken. This is why we immediately arrested her artery by tightening the slip knot; and after also making two strong ligatures in the dog's jugular vein instead of the two nooses we had made there, we untied the dogs; and here is what we noticed in particular.

The bitch who had shed her blood was weak enough and only had the strength to go and throw herself in a corner of the room on the side that had not been opened. But for the dog which had received new blood, he appeared vigorous enough, in that he having untied the [pates], he made several efforts to tear off a muzzle which had been put on him to prevent him from crying out; and after shaking himself a little, he immediately fled from those who wanted to approach him, because of his naturalness which is quite fierce.

We must not believe that this dog was as lively and as gay as before, for he was in fact a little more downcast; and this change was undoubtedly not due to the new blood he had received, but to the pain which he would have felt when cutting the skin and discovering the jugular vein to make this transfusion: which can be confirmed because we had prepared a third dog of the same size to substitute in place of the one that we would miss; but having had nothing to do with it, because we had succeeded according to our designs, we sewed up its skin, and although we had not opened any vessel in him, he was nevertheless more dejected than the one who received new blood, for the two dogs which had given the transfusion ate very well two hours later, and not the third.

Since then, I have had these three dogs together and their vigour has increased from day to day in proportion to their appetite, we have not noticed that there is reason to fear any harm from this blood transfusion.

The bitch eats extraordinarily, and she has now given birth to a little dog, which came into the world dead and in which only three or four drops of blood were found.

The Tuesday following 8 March having found our dog who received blood, very vigorous and with a very good appetite, we allowed ourselves to use it for a second experiment, not in truth to receive more new blood as he had done six days before; but to recover it and pass it through the veins of someone other than we intended to receive it, in order to experience what the transfusion of blood which had changed vessels a few days before could do. And for this escape we chose the third dog that we did not use in the previous experiment, and having adjusted its jugular vein to the crural artery of the other with a little more diligence and warmth than the first time, we made the blood of the first pass through the veins of the last, and after having

reduced the first to the [abbois] and having it so distressed that it appeared to us as dead, and that his artery no longer supplied any blood, we found that the last one who had received it had nevertheless seen in a dish his own eleven and a half ounces; which made us believe that what was communicated so much to him could not escape. However, this is what we noticed in particular in this new experiment.
1. We confirmed to ourselves in our first thought, that by opening the crural artery instead of the carotid artery, we eliminated the convulsions of the animal which communicated its blood, and that we did not put it so much in danger of losing its life. Because what if we had left our [nostre] in a corner as apparently dead; nevertheless, someone from the company, having poured wine in his mouth, gave him back some movement, and after that he rested on his feet, only by tottering extremely. We kept giving him good food and we still have him alive.
2. We have clearly seen that if the one who prepares the animals has a great deal of skill and diligence not to let them languish for a long time, the transfusion is much better and more successful.
3. That the fire is used a lot in the room where the transfusion is done.
4. That the communication pipes, which are too long and too thick, are not so clean for this operation, because of the difficulty in warming them up.

Finally, if the transfusion were well practiced, it would not be as dangerous as many imagine it for the one who receives new blood. For we noticed in this experiment that the blood which was found in three different bodies in less than six days, did not in any way inconvenience the one who had received it last; but on the contrary, as soon as this animal was released, he jumped down, shook his ears several times, and came to pet those who called him as usual. He even ate with a very great appetite half an hour later, and made appear as many marks of vigour as he had shown weakness at the first experiment, that we had not opened his vein at that time, and that we are happy to discover it and to get away from it if we need it, as I have remarked above.

All this happened to the great astonishment of those who honoured us with their presence, and mainly a very skilled Doctor in Medicine, who ingenuously admitted that he would never have believed the thing if he hadn't been able to examine all the circumstances himself.

We intend to give public proofs as soon as possible. And for this topic we will choose the first ordinary day of my conferences, which will be Saturday next 19 March at two o'clock in the afternoon on the Quai des Augustins. And to see what change this transfusion will produce, we will pass the blood of a healthy and young dog through the veins of another who is old and mangy.

SECOND LETTER

The second letter by Jean-Baptiste Denis on blood transfusion to be published in the *Journal des sçavans* in 1667 is in the 25th April edition (page 96), which is another extract of a letter written on the 2nd April to a M. *** (who is Monsieur de Montmor) titled: Extrait d'une lettre de M. Denis, Professeur de Philosophie & de Mathematique, à M. *** touchant la transfusion du sang. Du 2 Avril 1667.
I.e. Extract from a letter of Mr Denis, Professor of Philosophy & Mathematics, to Mr *** concerning the transfusion of blood. Of 2nd April 1667.
See: *Journal des Sçavans*, 25th April 1667, 8, 96.
https://gallica.bnf.fr/ark:/12148/bpt6k58122h/f97.image

Comments

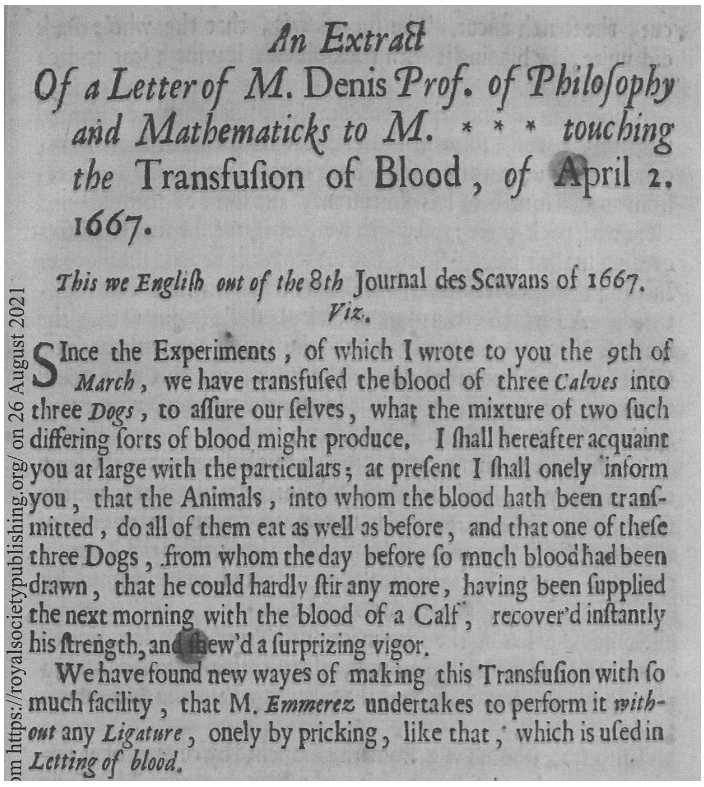
This extract is actually a short communication to identify that Denis and Emmerez have performed three additional transfusion experiments using calves as donors and

dogs as recipients, to examine the effects for mixing bloods of different species. It identifies that one of the dogs was bled, until it could 'hardly move anymore', and then transfused the following day. All three transfusions were deemed successful, by the criteria that the three dogs ate well, though no survival times are given. The report also identifies that they have made changes to the technique used, by using only a single (venal) puncture (as for a phlebotomy) and without a ligature, though the actual practical details are not provided. Note: These three experiments must therefore have been performed between the 9th March and the 2nd April 1667.

Translation

Since the experiments which I wrote to you on the 9th of the previous month, we have passed the blood of three calves into three dogs, in order to assure ourselves of the effects which the mixture of two bloods so different could produce. I will tell you more about them in a little while, now I will just tell you that the animals in which the blood has been transfused, all eat as well as before, and that one of these three dogs from whom so much blood had been drawn the previous day, that he could hardly move any more, having received the blood of a calf the next day, instantly regained his strength, and showed a surprising vigour. We have found new ways to give the transfusion so easily, that Mr. Emmerez makes a point of doing it without any ligature with a single puncture similar to the one done in the bleeding.

This 'extract of a letter by M. Denis' was also published in the 6th May 1667 edition of the *Philosophical Transactions of the Royal Society* (Vol. 2, Issue 25, p. 453), titled: An extract of a letter of M. Denis, Prof. of Philosophy and Mathematics to M. * * * touching the Transfusion of Blood, of April 2. 1667.
https://royalsocietypublishing.org/toc/rstl/1667/2/25



An Extract
Of a Letter of M. Denis Prof. of Philoſophy and Mathematicks to M. * * * touching the Transfuſion of Blood, of April 2. 1667.

This we Engliſh out of the 8th Journal des Scavans of 1667. Viz.

SInce the Experiments, of which I wrote to you the 9th of March, we have transfuſed the blood of three Calves into three Dogs, to aſſure our ſelves, what the mixture of two ſuch differing ſorts of blood might produce. I ſhall hereafter acquaint you at large with the particulars; at preſent I ſhall onely inform you, that the Animals, into whom the blood hath been tranſmitted, do all of them eat as well as before, and that one of theſe three Dogs, from whom the day before ſo much blood had been drawn, that he could hardly ſtir any more, having been ſupplied the next morning with the blood of a Calf, recover'd inſtantly his ſtrength, and ſhew'd a ſurprizing vigor.

We have found new wayes of making this Transfuſion with ſo much facility, that M. Emmerez undertakes to perform it without any Ligature, onely by pricking, like that, which is uſed in Letting of blood.

Philosophical Transactions of the Royal Society, 6th May 1667 (Vol. 2, Issue 25, p. 453)
(Image credit: royalsocietypublishing.org)

THIRD LETTER

The third letter on blood transfusion by Jean-Baptiste Denis is published in the 28th June 1667 edition of the *Journal des sçavans* (pages 134-136), titled: Lettre de M. Denis, Professeur de Philosophie et de Mathematique, à M. de Montmor premier Maistre des Requestes touchant deux Experiences de la Transfusion faites sur des hommes. In 4 A. Paris, chez J. Cusson.

I.e. Letter from M. Denis, Professor of Philosophy and Mathematics, to M. de Montmor first Master of Requestes concerning two experiences of transfusion made on men. In 4 A. Paris, at J. Cusson.

See: *Journal des Sçavans*, 28th June 1667, 11, 134-136.
https://gallica.bnf.fr/ark:/12148/bpt6k58122h/f136.image

Notes: This is the first time that Monsieur de Montmor is actually identified by name - the previous letter extracts refer to him only as 'M. ***.' J. Cusson is the printer / publisher of the *Journal des sçavans*.

Comments

Although stated to be a letter by Jean Denis, parts of it translate in a way that makes it appear to have been written by another person, i.e. as an interpretation of what Denis has said and done.

This letter starts by defending the use of transfusion, commenting that it is a 'natural event' equivalent to nourishing the foetus in the mother's womb, thereby arguing that it 'feeds the body by a different mechanism'. Given that the transfusion process involves bleeding as well as transfusing the patient, it is claimed to satisfy both the doctors who perform phlebotomy and the doctors who claim that this process weakens the patient. In this first section of the letter, various terms such as 'corrupted', 'impure', 'clean', etc., are used when referring to blood, relating some of the beliefs of that time.

The report then describes the transfusion of two people. The first is a 15 to 16 year old boy who has suffered from a fever for more than two months and who is described as being 'heavy and drowsy' due to his blood being 'thickened by the heat of the fever'. He is stated to have been bled three ounces of blood and given eight ounces of arterial lamb's blood in return, which resulted in a 'great heat' along the course of the vein. It is claimed that the transfusion cured his drowsiness. The second is a healthy man, about 45 years old, who is working as a [sedan] chair porter. He is stated to have been bled ten ounces of blood and was given twenty ounces of arterial lamb's blood in return, which again resulted in 'a great heat from the opening of the vein to the armpit'. Although it is claimed that both of these transfusion experiments were successful, it is also identified that further experiments are required to properly assess the 'usefulness that can be derived from transfusion'.

It concludes by stating that Robert des Gabets presented the idea of transfusion at a meeting 'more than ten years before' (i.e. about 1657) and it was this that gave the English the idea of performing transfusion on animals.

Translation

Finally, the transfusion of blood, which some people believed to be impossible, which many considered dangerous, and which most considered at least unnecessary, was fortunately carried out on men; and the first experience we have with it, it cured a person of a fairly annoying illness. We will see in this letter the account of these two experiences, with several arguments for and against this operation.

I will not go into the details of the objections that have been made against transfusion, nor of the answers that Mr. Denis gives; because they would take too long to relate. I would say that the main reasons that this author uses to demonstrate

the usefulness of this operation are, that by practicing it we only imitate the example of nature, which in order to nourish the foetus in the mother's womb, make a continual transfusion of the mother's blood through the umbilical vein. To have the transfusion done is nothing other than to feed oneself, by a more than usual way, that is to say to put ready-made blood in one's veins, instead of taking food which only turns into blood after several changes. That this abbreviated way of feeding is preferable to the other, in that the food taken by mouth having to pass through several parts which are often badly disposed, can contract several bad qualities before it arrives in the veins, and is subject to several alterations which are avoided by immediately putting ready-made blood in the veins. That this operation brings together the doctors who approve of the bleeding and those who do not approve of it, those because it removes the corrupted blood and those because by putting new blood in the place of that which one draws, the patient's strength is not diminished. Finally, reason seems to teach that diseases caused by the bad weather and the corruption of the blood must be cured by the transfusion of pure and well-tempered blood.

After replying to those who reject the transfusion as useless, he replies to those who condemn it as barbaric. What gives them this bad opinion is that they imagine that in order to do well, the animal which provides the blood must be of the same kind as the one which receives it; and thus we can only prolong the life of one by shortening that of the other. But Mr. Denis shows that this is not necessary, and that on the contrary the blood of animals is better for men; than that of the same men. The reason he gives it is that men, being agitated by various passions, and little regulated in their manner of life, must have more impure blood than beasts, which are less subject to such disturbances; and that in fact we do not find any corrupted blood in the veins of the beasts, instead of always notice some corruption in the blood of men, however healthy they may be, and even in that of little children, because having been fed on the blood and milk of their mothers, they sucked corruption with food. Moreover, why shouldn't the blood of animals be suitable for men, then that it is the same kind as the milk and the flesh on which they usually eat? We could add that if what some authors have noticed is true, that these barbarians who eat human flesh are subject to several unfortunate diseases, from which those who eat the flesh of the beasts are exempt, it must be concluded that like the human flesh is more unhealthy than that of beasts, their blood is also less suitable for transfusion. Besides that for the cure of diseases one needs blood sometimes warmer, sometimes colder, sometimes thick and sometimes subtle, and therefore as these qualities dominate more in various animals, their blood is cleaner for transfusion, than that of humans where the difference is not so great. Mr. Denis says that we still have this advantage in doing away with the beasts, that we do the operation more boldly, and that we can better prepare them by feeding them in addition to suitable food.

All these reasons that we read with pleasure, because they are written in a pleasant manner, serve as a preamble to the two transfusion tests which are the main subject of this letter. The first test was carried out on a young boy of 15 to 16 years who had suffered from a disease which was believed the transfusion would be good for. This boy, who by nature was quite ready and quite alert, since a obstinate fever with which he had been tormented for more than two months, and for whom the medicines had made him go to bed twenty times, was often so heavy and so drowsy, that he was quite stupid. He almost lost his memory; his mind was dull, and though he slept ten and twelve hours every night, he dozed off during the day, sitting down to table, eating, and doing all the things which usually dispel sleep. It was judged that this drowsiness was due to the fact that the little blood that remained in him was too thickened by the heat of the fever which he had had, and thus it was believed that he could be cured by giving him new blood. This remedy having been approved, Mr. Emmerez, who had a special skill for this operation, opened a vein at the folds of the

elbow at five o'clock in the morning, and after he had drawn from it about three ounces of blood, which was extremely black and thick, he also gave, by the same opening, arterial blood of a lamb whose carotid artery he had opened. During the operation, this patient, who was often questioned about his condition, complained of nothing, except that from the opening of the vein to under the armpit, he felt a great heat (that came from the course of the arterial blood) and nevertheless allowed the operation to be completed, without testifying to being much inconvenienced. After giving him about eight ounces of blood, the opening of the vein was closed, in the same way as is done with ordinary bloodletting, and carefully observed what would happen to him. The first advantage he received from the transfusion was that he felt relieved from the pain he had in his side, for having fallen the day before, from the top of a ten-foot ladder. He was also in a short time perfectly recovered from his drowsiness, and on the same day, having risen at ten o'clock in the morning, he appeared much more gay than usual, and said very well without falling asleep. At four o'clock in the evening he seized through his nose three or four drops of blood; and having a good supper afterwards, he slept only from ten o'clock at night until two o'clock after midnight when he woke up, and could not sleep any more. But the next day he slept a little longer, and even more the following days, until he gradually regained perfect health, without having been inconvenienced since then with his drowsiness.

This first experiment having fortunately succeeded, a second was made, but more out of curiosity than out of necessity; for the one on whom it was made, had no considerable indisposition. It was a strong and sturdy Chair Bearer, about 45 years old, who offered to endure this operation for a relatively small fee. As he was well and had a lot of blood, he was given a much larger transfusion than the first. For about ten ounces of blood was taken out of him, and was given back about once as much blood of a lamb, whose crural artery had been opened to diversify the experiment. This man, who by his nature was quite gay, was in a very good humour during the whole operation, made several reflections on his bearing on this new way of bleeding, whose invention he could not admire enough, and complained of nothing except that he felt, like the first, a great heat from the opening of the vein to the armpit. As soon as the operation was done, he could not be prevented from dressing the lamb himself, from whom he had received blood, after which he went to find his comrades, with whom he drank a part of the money given to him. And notwithstanding that he had been ordered to rest for the remainder of the day, and that he had promised to do so, on the midday finding an opportunity to earn money, he carried his chair as usual throughout the rest of the day, he assured that he had never been so well, and the next day he begged that no one other than him be taken, when we would want to repeat the same operation.

This is the success of these first two transfusion trials, which must nevertheless be confirmed by other experiments, so that we are able to judge with certainty the usefulness that can be derived.

Thus the French have the honour of being the first to perform transfusion on men, as they had the glory of having been the first to invent it. Because, what the English before all the others, having put it into practice on the beasts; it is certain that it was the French who gave them the first thought. It is known, and there are several persons of honour who can testify to him, that it has been more than ten years since Dom Robert des Gabets, Religious Benedictine, made a discourse on transfusion in the assembly which was held with Mr. de Montmor, and there are still several copies. It is true that most of them scoffed at this proposal, and that it was believed to be impossible. The English seeing that no report was made in France of this invention, wanted to seize it as an abandoned thing, and have practiced it on beasts; but we have finally reclaimed it, and we have found a means of regaining possession of what belonged to us, by practicing it first on men.

FOURTH LETTER

The fourth letter on blood transfusion by Jean-Baptiste Denis is published in the 6th February 1668 edition of the *Journal des sçavans* (pages 23-24), titled: Lettre de J. Denis, Docteur en Medecine & Professeur de Philosophie & de Mathematique touchant une folie inveterée qui a été guerie par la transfusion du sang. In 4 A. Paris, chez Jean Cusson.

I.e. Letter from J. Denis, Doctor of Medicine & Professor of Philosophy and Mathematics concerning an inveterate madness which was cured by the transfusion of blood. In 4 A. Paris, at the house of Jean Cusson.

See: *Journal des Sçavans*, 6th February 1668, 2, 23-24.
https://gallica.bnf.fr/ark:/12148/bpt6k58123v/f24.image

Note: The recipient of the letter is not identified. J. Cusson is the printer / publisher of the *Journal des sçavans*.

Comments

This letter describes the background to the madness of Antoine Mauroy (who is not named in this letter) and the first two transfusions of calf arterial blood given to him, which involved the transfusion of six ounces on Monday 19th December 1667 followed by the transfusion of 'more than a pound' on 'the following Wednesday'. During both transfusions the patient complained of 'a lot of heat along the arm and under the armpit in the places where the blood passed', whilst after the second transfusion the patient experienced 'sweat all over the face', 'a violent back pain' and 'a great evacuation from above and below'. During each of the following two days he passed a 'large glass of urine that was all black' and 'bled a lot from his nose', what are now known to be classic symptoms of a haemolytic transfusion reaction due to an inter-species immune reaction.

Translation

It is from experience rather than reasoning that we must expect the decision of most questions of Physics. This is why as Diogenes believed that the best solution that one can give to the arguments of Zeno who maintained that everything is still in the world, was to walk around. Likewise, the author of this letter says that without stopping to refute all the reasons of those who have written against transfusion, he only wants to fight them by experience; and for any answer to their conjectures, he gives in this letter the account of what happened to the cure of a madman who was put in his good sense by means of this operation.

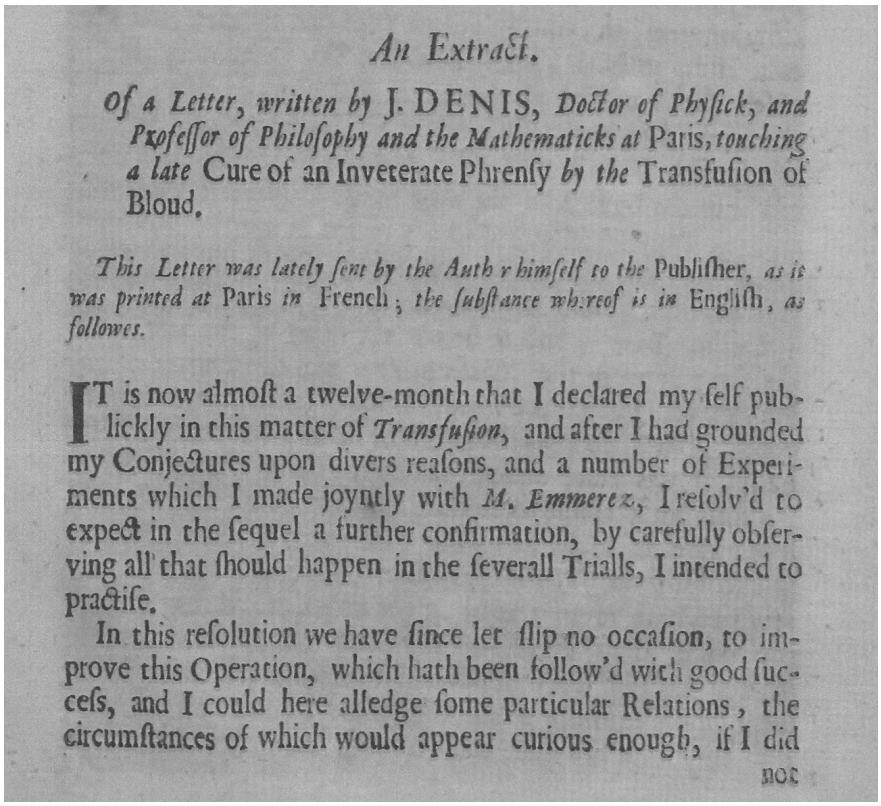
I notice that it is eight years ago that this poor man, who previously had several good qualities, lost his mind. It is true that his madness was only periodic, and that not a year has passed since he has not had a few good intervals. But his fits were always very long, and lasted no less than eight or ten months without giving him a break. His last attack had resumed about 4 months ago, with so much violence that since that time he had been running the streets without sleeping, night or day. And we despaired of being able cure him, all the remedies that we had done for him until then having only irritated his illness. Nonetheless on the proposition that was made that the transfusion might bring him some relief, or that at least it would cause him no harm, M. de Montmor, first Maistre des Requestes, touched with compassion, had him arrested, and put him in the hands of Messrs Denys and Emmerez to do this operation.

All things being prepared, on Monday, the 19th day of December in the year 1667, ten ounces of blood was drawn from a vein in the right arm, and so soon he was transfused in the presence of several doctors about six ounces of blood from the crural artery of a calf. This first transfusion moderated his outbursts a little. This is

why the doctors, having decided to reiterate it, the following Wednesday he was transfused with more than a pound of calf's blood.

During both operations the patient testified that he felt a lot of heat along the arm and under the armpit in the places where the blood passed. But the second operation was further followed by sweat all over the face, a violent back pain, a great evacuation from above and below, and finally a deep sleep which lasted ten hours without interruption. The sick man on his waking seemed much quieter than before, and little by little his mind recovered so that there is now no remnant of madness. What is remarkable is that the day after the second transfusion he saw a large glass of urine that was all black, and the next day he gave it back again, and bleed a lot from his nose; which obliged him to draw two or three [palettes] of blood. We will see in this letter all these circumstances more fully explained, with many other remarkable particularities.

NOTES:
This fourth letter is not the same as the letter sent by Jean Denis to the *Philosophical Transactions of the Royal Society* that was published in the 10th February 1668 edition (Vol. 2, Issue 32, p. 617-624), titled: 'An extract of a letter, written by J. Denis, Doctor of Physick, and Professor of Philosophy and the Mathematicks at Paris, touching a late cure of an inveterate phrensy by the transfusion of bloud', which gives a more detailed account of the transfusion of Antoine Mauroy.
https://royalsocietypublishing.org/toc/rstl/1668/2/32
This letter was not published in the *Journal des sçavans* in 1668.



An Extract,

Of a Letter, written by J. DENIS, Doctor of Phyſick, and Profeſſor of Philoſophy and the Mathematicks at Paris, touching a late Cure of an Inveterate Phrenſy by the Transfuſion of Bloud.

This Letter was lately ſent by the Auth r himſelf to the Publiſher, as it was printed at Paris in French; the ſubſtance whereof is in Engliſh, as followes.

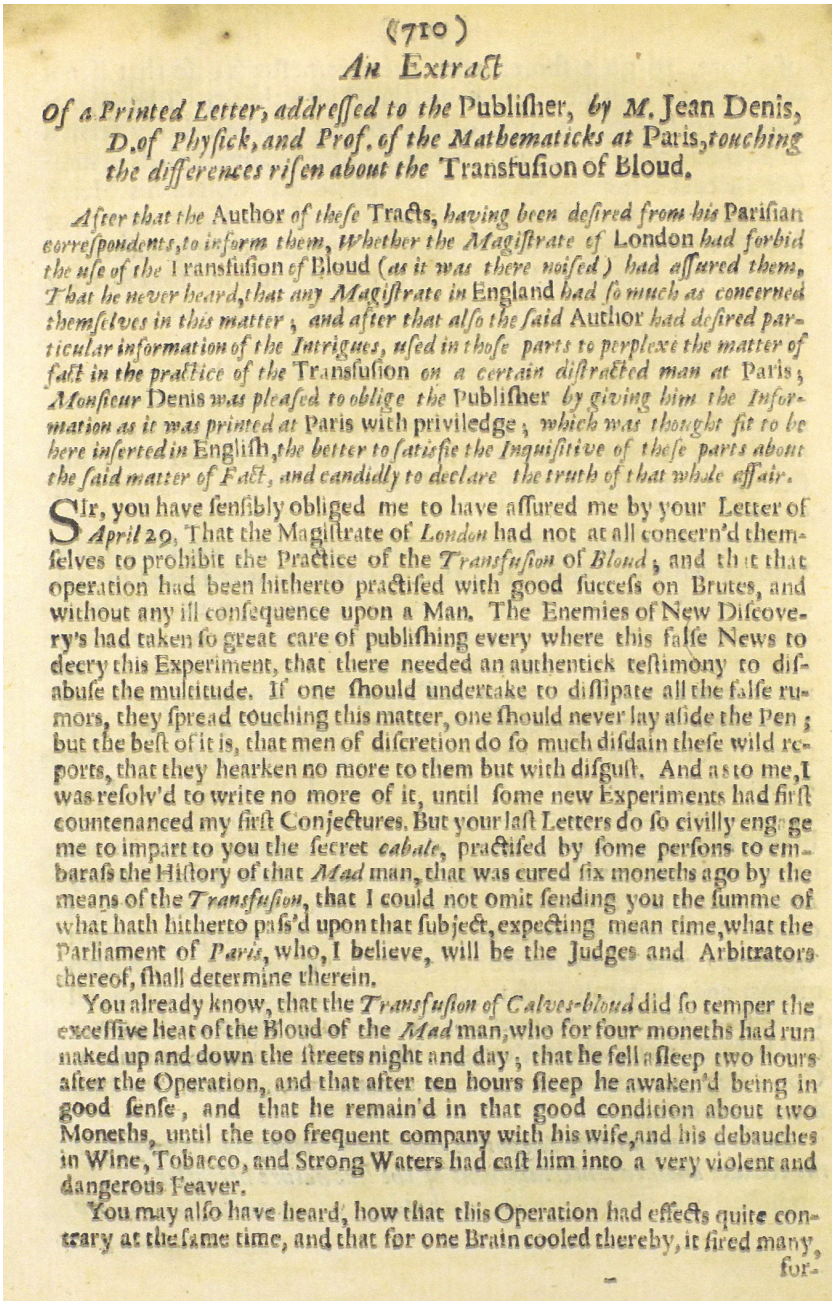
IT is now almoſt a twelve-month that I declared my ſelf publickly in this matter of *Tranſfuſion*, and after I had grounded my Conjectures upon divers reaſons, and a number of Experiments which I made joyntly with *M. Emmerez*, I reſolv'd to expect in the ſequel a further confirmation, by carefully obſerving all that ſhould happen in the ſeverall Trialls, I intended to practiſe.

In this reſolution we have ſince let ſlip no occaſion, to improve this Operation, which hath been follow'd with good ſucceſs, and I could here alledge ſome particular Relations, the circumſtances of which would appear curious enough, if I did not

Philosophical Transactions of the Royal Society, 10th February 1668 (Vol. 2, Issue 32, p. 617)
(Image credit: royalsocietypublishing.org)

Jean Denis sent an additional letter to the editor of the *Philosophical Transactions of the Royal Society*, an extract of which was published in the 15th June 1668 edition (Vol. 3, Issue 36, p. 710-715) titled: '…touching the differences risen about the

transfusion of bloud', that provides additional information relating to the transfusion and subsequent death of Antoine Mauroy, together with an extract of the sentence given at the Chastelet in Paris by the Lieutenant in Criminal Causes on the 17th April 1668.
https://royalsocietypublishing.org/toc/rstl/1668/3/36
This letter was not published in the *Journal des sçavans* in 1668.



(710)

An Extract

Of a Printed Letter, addreſſed to the Publiſher, *by M.* Jean Denis, *D. of Phyſick, and Prof. of the Mathematicks at* Paris, *touching the differences riſen about the* Transfuſion of Bloud.

After that the Author *of theſe* Tracts, *having been deſired from his* Pariſian *correſpondents, to inform them, Whether the Magiſtrate of* London *had forbid the uſe of the* Tranſfuſion *of* Bloud (*as it was there noiſed*) *had aſſured them, That he never heard, that any Magiſtrate in* England *had ſo much as concerned themſelves in this matter; and after that alſo the ſaid* Author *had deſired particular information of the Intrigues, uſed in thoſe parts to perplex the matter of fact in the practice of the* Transfuſion *on a certain diſtracted man at* Paris; *Monſieur* Denis *was pleaſed to oblige the* Publiſher *by giving him the Information as it was printed at* Paris with priviledge; *which was thought fit to be here inſerted in* Engliſh, *the better to ſatisfie the Inquiſitive of theſe parts about the ſaid matter of Fact, and candidly to declare the truth of that whole affair.*

Sir, you have ſenſibly obliged me to have aſſured me by your Letter of *April* 29. That the Magiſtrate of *London* had not at all concern'd themſelves to prohibit the Practice of the *Tranſfuſion* of *Bloud*; and that that operation had been hitherto practiſed with good ſucceſs on Brutes, and without any ill conſequence upon a Man. The Enemies of New Diſcovery's had taken ſo great care of publiſhing every where this falſe News to decry this Experiment, that there needed an authentick teſtimony to diſabuſe the multitude. If one ſhould undertake to diſſipate all the falſe rumors, they ſpread touching this matter, one ſhould never lay aſide the Pen; but the beſt of it is, that men of diſcretion do ſo much diſdain theſe wild reports, that they hearken no more to them but with diſguſt. And as to me, I was reſolv'd to write no more of it, until ſome new Experiments had firſt countenanced my firſt Conjectures. But your laſt Letters do ſo civilly engage me to impart to you the ſecret *cabale*, practiſed by ſome perſons to embaraſs the Hiſtory of that *Mad* man, that was cured ſix moneths ago by the means of the *Tranſfuſion*, that I could not omit ſending you the ſumme of what hath hitherto paſs'd upon that ſubject, expecting mean time, what the Parliament of *Paris*, who, I believe, will be the Judges and Arbitrators thereof, ſhall determine therein.

You already know, that the *Tranſfuſion of Calves-bloud* did ſo temper the exceſſive heat of the Bloud of the *Mad* man, who for four moneths had run naked up and down the ſtreets night and day; that he fell aſleep two hours after the Operation, and that after ten hours ſleep he awaken'd being in good ſenſe, and that he remain'd in that good condition about two Moneths, until the too frequent company with his wife, and his debauches in Wine, Tobacco, and Strong Waters had caſt him into a very violent and dangerous Feaver.

You may alſo have heard, how that this Operation had effects quite contrary at the ſame time, and that for one Brain cooled thereby, it fired many, for-

Philosophical Transactions of the Royal Society, 15th June 1668 (Vol. 3, Issue 36, p. 710)
(Image credit: royalsocietypublishing.org)