Annotation concerning the incuse-reverse mould casting of medals

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MA Conservation and Restoration of Cultural Heritage
Specialization: Metal
OGP II
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<title id="p092r_a2">Mouler cave d’un costé et de relief</title>

de l’aultre</title>

<ab id="p092r_b2a">Et pour cet effect on gecte une medaille d’estain fin, qui est plus dur à fondre. Et co(mm)e elle est nette, on moule avecq icelle. Et on la laisse en l’une moictie du chassis & on l’y presse un peu affin qu’elle y tienne mieulx. Et apres tu gecteras dans ton chassis de la souldure cy dessus descripte, ou aultre plus fondante que l’estain fin, et ainsy la seconde medaille se fondra & moulera sur la premiere sans la gaster. Mays pour faire plus seurement, destrempe du noir de lampe avecq de l’eau, & avecq un pinceau donnes en une couche legere sur la medaille qui demeure dans le chassis & laisse seicher. Ainsy elle ne fondra poinct.</ab>

<ab id="p092r_b2b">Mays si tu as une medaille de cuivre ou d’argent, tu la peulx bien laisser dans le gect si tu veulx gecter de plomb ou estaim. Mays il faut qu’elle soict un peu chaulde, car la froideur feroit retirer l’estain.</ab>

<ab id="p092r_b2c">L’estaim veult estre gecté bien chault pour venir net.</ab>

<ab id="p092r_b2d">L’estain doulx qui est le meilleur pour le gect est celuy qui, estant gecté en grille, est luisant & poly co(mm)e un mirouer, & qui semble avoyr esté bruny. Et n’ha poinct de trous co(mm)e celuy qui est aigre & qui n’est point luisant co(mm)e bruny.</ab>
Translation [from tl_p092r, 20 December 2014] and suggested changes:

<title id="p092r_a2">Molding a hollow on one side and a relief on the other</title>

<ab id="p092r_b2a">And for this effect, one casts a fine tin medal, which is harder to melt. And since it is pure, we mold with it. And one leaves it in one half of the box mold and press it inside so that it holds. Then, thrown in the box mold soldering, the one described above, or something else that melts better than pure tin. In this way, the second medal will melt and mold itself on the first one without damaging it. But to make this is a better way, soak noir de lampe in water, and with a brush, apply a thin coat on the medal which is in the box mold, and leave to dry. In this way the medal will not melt at all.</ab>

<ab id="p092r_b2b">But if you have a copper or silver medal, you can leave it in the casting, if you want to cast in lead or tin; but the medal must be a bit warm, because otherwise, the tin will shrink.</ab>

<ab id="p092r_b2c">Tin must be cast very hot, to come clean.</ab>

<ab id="p092r_b2d">Soft tin, which is the best one for casting, is the one that, when cast en grille is shiny and polished like a mirror and almost looks as if it has been burnished. This tin has no holes like the one that is brittle, and is not shiny as if burnished.</ab>
Concerning the experimentation on incuse-reverse mould casting of medals

When a casting mould is made in which the original design is left inside whilst casting to create a one-sided hollow cast medal, one speaks of incuse-reverse moulding. This is a technique that is described in the BnF Ms. Fr. 640 manuscript on folio 92r. The basic steps for preparing such a mould are filling up one half of a casting flask with sand, making an impression with an original medal, then filling up the other part of the flask with sand and pressing in the original design so that it holds. In this way while casting, the liquid metal will flow between the original and the made impression. One could say that by this method a medal is cast on top of another. The intended result is a medal that has a relief on the obverse and an exact negative of the design on the reverse. On folio 92r of the manuscript the anonymous author describes this method as being especially useful when a fine tin medal is used.¹ The advice he gives however is not very extensive and he leaves out some relevant information on how such a mould should actually be prepared.

Rozemarijn Landsman and Jonah Rowen of the Columbia University in New York, have before us tried to interpret the method described on folio 92r and searched the manuscript for comparable techniques as well as art historical references for corroborating information. They found that during the late fifteenth century a large number of these medals were produced throughout Europe, which indicates a well-established practice. However, they did not find a lot of information about the way in which these medals were used, designed, how the moulds for their production were made or how these medals were cast.² An article on Renaissance casting techniques of incuse-reverse and double-sided medals written by Patricia Tuttle in 1978 has been an important source of information for their interpretation of the descriptions on folio 92r.³ Therewithal related recipes from the manuscript were studied on their given descriptions as well as for the terminology used.

¹ “And for this effect, one casts a fine tin medal, which is harder to melt. And since it is pure, we mold with it. And one leaves it in one half of the box mold and press it inside so that it holds.” Citation from: Fol. 92r.
³ Landsmand and Rowen in their annotation refer multiple times to Tuttle’s method. Their interpretation of Tuttle’s method can be found here: Landsman & Rowen, 2014: 10-11.
Nevertheless, after performing several experiments based on all the found information, questions remained unanswered.4

Because of the facilities that are at hand at the studio building of the Rijksmuseum in Amsterdam another attempt was made for experimenting with the method described on folio 92r. The annotation written by Landsman and Rowen, as well as other manuscript pages concerning metal and metal-working was carefully read. The experimentation for making an incuse-reverse mould for casting a one-sided hollow relief medal was started by trying different ways of preparing the mould. Since there was no suitable medal at hand a small, fairly detailed brass lion’s head was used. Eventually two ways of making a mould were found relevant and clarified by writing a step-by-step procedure.5 The method that was found to be suitable for casting was used for the testing of casting a tin on brass medal. After which it was decided to create an actual medal out of the lion’s head so better conclusions could be drawn. A new ‘original’ medal was cast in tin and tried to be cast in brass. In this way the method by which the new tin medal would be left inside the mould and another tin medal would be cast on top could be tested. Through which the use of two metals with the same melting temperature was tested.6 This experiment was also meant to be carried out with a metal of a higher melting temperature, hence the attempts for casting a new brass medal. Unfortunately all the attempts for casting a new brass medal failed. Therefore this experiment remains relevant for follow-up research.

In this annotation all the carried out experiments are recorded. The operations performed are substantiated and all findings described. Ultimately, it was tried to draw a conclusion from all the information gained. To illustrate our findings pictures are included in the text, all made by the authors of this annotation unless otherwise stated.

**Searching for the right approach**

Before the method described on folio 92r concerning the production of one-sided hollow cast medals could be tested in a practical manner, the manuscript and annotation written by Rozemarijn Landsman and Jonah Rowen needed to be studied carefully. Folios from the

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4 During the experimentation of Landsman and Rowen multiple questions arose. For example in which half of the mould the original medal should be left, what type of sand should be used, how deeply the medal should be pressed into the sand etc. Landsman & Rowen, 2014: 7-13.

5 The step-by-step procedures can be found in the following chapter of the file.

6 An experiment that was also noted to be interesting for research by Landsman and Rowen. Landsman & Rowen, 2014: 13.
manuscript regarding the casting of metal, medals, hollow objects and the making of moulds as well as those concerning sand-casting were sorted. These were selected because they could contain relevant information that would be usable during our experiments and by this way they were at hand quickly in case we needed some extra information.

At first it came to mind to test several sorts of sand including a number of types mentioned throughout the manuscript for preparing a mould. However, after careful consideration with our lecturers Tamar Davidowitz and Ellen van Bork, it was decided to instead scrutinize the description mentioned on folio 92r, so that we would fully understand the actual process and get an idea of what other aspects remained unclear besides the type of sand to use. In addition to the experiments carried out by Landsmand and Rowen, the use of metals with a higher melting point could be tested, which was not possible for them to do. Also by only focussing on the technique and how it works, new information about the process could be obtained. The testing of different types of sand in this way proved to be better as a follow-up experiment.

**Making a mould**

The first step in testing the procedure as mentioned on folio 92r was to try and make a mould. The only sentence mentioned on folio 92r as regards to the making of the mould is: “And since it is pure, we mould with it. And one leaves it in one half of the box mould and presses it inside so that it holds.” Immediately a lot of questions emerged. The type of sand to use, what kind of flask should be used, the way in which the impression of the medal should be made, or how the casting flask should be prepared is all open for interpretation. Also no use of sprues or vent-holes is mentioned. So the best way to start was by reading the annotation of Landsman and Rowen about the method they used and see if there were things we could use, change or add, relying on our own experience.

The sand we used for the preparation of the mould was Delft clay, which is a reddish sabulous clay. We chose to use this, because we learned from experience that it is a type of sand that works well for making a sharp impression and since our first aim was to test the functionality of the technique it seemed suitable. Before we started filling up the flask with sand, we thought about on which half of the flask the medal should be left during the casting process. Other than Landsmand and Rowen we decided to try a method by which the medal
is left in the first half of the mould, after making a negative imprint in the second half.\textsuperscript{7} Also the way in which we came to make the imprint, differed from their approach. Landsmand and Rowen in their annotation describe pressing the medal into the sand-filled first half of the mould until the flat reverse was levelled with the sand, followed by first filling the second half with sand after which they put it on top of the first. We found this approach to be very interesting, since they next describe to turn the flask upside down, take the halves apart while tapping on the first half, which left the medal, now on the second half of the mould, perfectly aligned with its impression on the first half.\textsuperscript{8} This method seemed interesting to us, since we have learned to always put the second half of the flask on top of the first before you fill it up with sand. So we tried a different approach: first we filled the first half of the flask with sand. Next the lions head was put face up and slightly pressed into this half after which some talcum powder was applied as a separator. The second half of the flask was put on top and filled up with sand, during which we made sure that especially the first layer of sand applied was pressed in very tight, so that all detail of the lions head would be captured in the impression. When both halves would be taken apart we were certain the position of the medal in the first half and the impression on the second half would be aligned. The medal that is still in the first half of the flask could be pressed down a little, by which space for the molten metal to enter was created.\textsuperscript{9}

Nevertheless we had to try several times before we ended up with a mould that was suitable for casting. During the moulding preparation certain aspects came forth that needed some attention. A few times the impression in the mould seemed too crumbly to be prepared for casting. A problem also Landsmand and Rowen, even though they used a different type of sand, noticed during their casting process.\textsuperscript{10} Also the right firmness by which the sand needed to be pressed in to be ensured of a good imprint but by which it was also possible to press the medal down to create enough space for the molten metal to flow was not easy to determine. By the fourth trial we seemed to have reached the most suitable

\textsuperscript{7} They mention leaving the medal in the second half of the mould after making the impression in the first. “We hypothesized that it would only make sense to leave the medal in the upper, or male half of the flask, after making a negative imprint with it in the bottom, or female half.” Citation from: Landsman & Rowen, 2014: 7.

\textsuperscript{8} Landsman & Rowen, 2014: 12.

\textsuperscript{9} This method is elaborated in the first step-by-step procedure that can be found further on in the file.

\textsuperscript{10} “Before we poured the metal, we also noted that the sand had crumbled on the edges of the imprints in both halves of the flask. This most likely caused the molten pewter to extend beyond the edge of the original medal, enclosing it and making it a difficult task to separate one from the other.” Citation from: Landsman & Rowen, 2014: 12.
manner for this aim to be achieved. Nonetheless Tamar and Ellen had some advice on how a mould should be made. The difference between the two methods is that we placed the lion’s head face up into the first half of the mould and made the impression of the face in the second half, by filling it up with sand. However, they suggested a similar approach as the one used by Landsman and Rowen. To make the impression of the lions head in the first half of the mould they suggested pressing the lions head face down and deeply into the mould so that it holds. After the second half of the flask could be put on top and the flask could be filled up with sand.  
11 So we decided to give this method a try and see if this would lead to a better outcome.

The new proposed method resulted in a very sharp imprint. Nonetheless, after pressing the lion’s head in the second half of the mould there were still granular outer edges. But because of the very sharp imprint we got from pressing the lions head face down into the first half of the flask and because Tamar and Ellen recommended this method, we decided for the following experiments to remain with this approach. It was not until later during the experimentation, when the brass lions head was soldered on a small brass plate to create a medal in the original sense of the word, that our initial method for creating a mould seemed to be more useful.  
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We found that for the making of an incuse-reverse mould not a lot of instructions were given by the anonymous author on folio 92r. A lot was left open for interpretation and this therefore encouraged us to try different methods. During the experimentation a lot of moulds were made and sometimes steps needed to be changed to ensure a better result. All the single trials are elaborated in a report in which all the performed experiments are combined.

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11 This method is elaborated in the second step-by-step procedure that can be find in the complete project file.
12 The reason that this approach seemed more useful was because of the way in which the imprint was made. Around the lions head on the brass plate small letters and numbers were captured with the use of punches. To capture these details, one had to press the medal face down and very hard into the first half of the mould which seemed impossible to do. With the approach we initially thought of, the imprint was made by placing the medal face up in the first half of the mould, while later filling up the second half. In this way we had more control over the making of the imprint, because it was made by pressing the sand on the medal instead of the other way around.
Casting tin on brass

After the practice of making a good impression had been optimized, the moulds were prepared for casting by adding a sprue and vent-holes. Although the metal to be cast was of a considerably lower melting temperature than the brass original, lampblack was applied as mentioned in the manuscript, to prevent the two medals from melting together. Other ways of separating a cast from an original after pouring on top of it, although based on a similar principle, are mentioned in the manuscript. On folio 153r it is said: “You could also pour on the first cast of metal, lead or tin. This metal won’t melt if you cover it with a very thin coat of crushed chalk, or a coat of dry albumen, or if you smoke it with the smoke of a candle”. But because on folio 92r the author uses lampblack this is what has been used in the experiments as well. The tin was obtained by cutting up a small, old jug that stood in the workplace and that had been used as a practice object for soldering. All the solder was taken out and the rest was cut to pieces. The metal was presumably a lead-tin alloy. Therefore, precautions against poisonous fumes were taken during the melting process by placing it extra close to the fume extractor and keeping a distance. Several times in the manuscript the author mentions the good casting qualities of a lead-tin alloy as it comes to casting thin objects, so the alloy should not present any problems. As the tin melted a contaminated layer floated on top, so this was taken off before casting. To see if the tin was ready to be cast it was stirred; if all the metal had been molten and the substance had shifted from viscous to liquid, it was poured.

The first two castings were done almost directly after each other using the same alloy and in the same fashion. The second casting did not go as fluently as the first one; this might be the reason that the second medal was only cast halfway (fig. 1-4). The first casting on the other hand had been cast fully (fig. 1, 2). Both medals had remained their details on the obverse and reverse sides, as was also the outcome of the experiment in the annotation by Landsmand and Rowen. Another similarity is that with the second trial the metal had failed to flow into the entire cavity (fig. 3, 4). In the annotation is suggested that tilting the mould, heating the alloy to a higher temperature or widening the negative imprint might prevent this. Two of these ideas were already implemented in the second casting – the flask was tilted and the imprint was quite deep- and had not prevented this. The temperature or even

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13 Among others on fol. 48v & 49r.
the size of the sprue could still be the cause. Something else that was remarkable was the fact that the medals had come out thicker than expected. During the making of the mould a lot of effort was put in to pressing in the lion’s head deeply. Apparently this does not need to be done with this much pressure. This was taken in account by the making of the next mould, which resulted in a medal that was fully cast, thinner and still had the same amount of detailing (fig. 6, 7). It was thought that the medal could be thinner, which was the aim for the fifth casting. The medal that came out of this trial had the result that was hoped for; thin with as much details as the previous ones (fig. 8, 9). The biggest flaw of this one, was that it had two tiny holes under the cheeks of the lion’s head. With a bit more experience those could be avoided. To broaden the experiment it was decided that instead of just the lion’s head another design should be used for the casting; one that is slightly bigger and looks more like a medal. Since there were no medals to be used in the workplace the lion’s head was soldered on to a round piece of brass.
Fig. 5. Result of casting tin on brass, trial 3. Obverse.

Fig. 6. Result of casting tin on brass, trial 4. Obverse.

Fig. 7. Result of casting tin on brass, trial 4. Reverse.

Fig. 8. Result of casting tin on brass, trial 5. Obverse.

Fig. 9. Result of casting tin on brass, trial 5. Reverse.
Casting tin on tin

After having cast several tin lion’s heads on a brass example, according to our interpretation of the method, another experiment was undertaken where it was tested if casting a medal on top of another medal of the same metal would be possible. On folio 92r the writer mentions that the metal used for casting on a pure tin original should be “the one described above, or something else that melts better than pure tin”, where the one described above is a mixture of soft tin, pure lead, bismuth and quicksilver. But he also mentions that when applying “noir de lampe” on the medal “the medal will not melt at all”. After reading this passage it remains unclear if the writer means that a medal will not melt at all as long as a metal with a lower melting temperature is used, or that after applying lampblack even a metal with the same melting point can be poured on top of it. So it would be interesting to test if this is possible. In the annotation written by Landsman and Rowen this idea is also coined because it would be a good way to see if this method is also usable for casting in bronze, which due to its high melting point (between 800°C and 1000°C, depending on the specific alloy) would otherwise only be possible with a steel or iron original (melting points between 1390°C and 1538°C).

It was decided that at first it would be tried to cast tin on a tin medal, because of its lower melting point and higher chance at success. Firstly a new original in tin had to be cast. This was done in the same flask as used before but the method of making the mould was slightly changed; the addition of the letters and numbers made it almost impossible to make a clean impression with the method used at the end of the tin on brass experiment. That is why the method used in the beginning; putting the medal in the first half of the mould face up, filling up the second half from above with sand and after pressing the medal deeper into the first half to create space for the metal to flow. The metal used was pure tin.

During the first trial to cast a tin on tin medal the result at first seemed very satisfying; the tin had flown through the mould very well and had covered the entire original. But although lampblack had been applied as advised on folio 92r the two medals were not easily separable. From a visual and microscopical analysis it was concluded that the

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15 Fol. 92r.
17 For a more detailed information about the method a step-by-step procedure is added to the file.
18 The purity of the tin was not tested.
two medals were stuck but had not molten together, at least not on the visible sides. After tapping the medals on a hard surface and pulling on the flashes with pliers it was managed to loosen the upper side. But it turned out that the two medals had in fact molten together at the other side, where the sprue was attached to the medal. It was impossible to separate them without damaging the casting; therefore it was pulled off, leaving a part of the medal behind on the original (fig. 10, 11). Apart from the part that got stuck to the original the medal turned out very well. The detail, especially on the reverse side, was very sharp (fig. 11). The backside had a very smooth surface whereas the obverse surface was a bit rougher.

To try to succeed in casting a medal that would not get stuck, a new tin medal without a hollow reverse was cast; the first one had become unusable after melting together. This took several trials, probably due to the use of a different alloy for casting. The medal that succeeded was cast from a tin-silver alloy. The mould was altered so hopefully melting to the original could be avoided; the sprue was made smaller and did not proceed on top of the mould. To make separation even easier we pressed the original in until it was exactly levelled with the sand so the molten tin could not flow on the sides and a bigger amount of lampblack was applied. Unfortunately only a small part of the medal was cast. This is probably the result of the sprue being too small and also because it was tried to make the

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19 Pieces of a silver-tin alloy were mixed with pieces of pure tin.
medal really thin. Another attempt was made, which failed as well, probably due to the same reasons as before, albeit to a lesser extent. Since there was no more time left only one more casting could be done; a bigger sprue was made and the impression was made deeper so the tin could flow better, again a tin-silver alloy was used. But when the molten tin was poured into the flask it burst out accompanied by a sound that implicated a small blast inside the flask (fig. 12). This was probably caused by the lamp black still being wet. The moist had not yet been evaporated so the molten hot tin that was then poured into the flask turned it into steam that could not escape.20

A successful tin on tin casting has not been made although it is assumed that it should be possible. The first attempt was almost successful except for the casting head melting to the original. With more trials and experience it is thought that this can be avoided and it should be possible to cast a whole medal. More variations can be done on the mould by altering the sprue, like considering a forked sprue as is mentioned and illustrated on folio 091v and 086v off the manuscript. Therewithal make sure no moisture is trapped inside the mould before casting.

Fig. 12. Casting tin on tin, trial 5. Reverse.

20 As suggested by Tonny Beentjes.
Casting a new medal in brass

After the lion’s head was soldered on the sheet metal a provisional medal in brass was made. It had to be cast anew so there would be no undercuts, like in the soldered one, and so the molten metal would not interfere with the solder. This proved to be very difficult, over a course of time six attempts have been made to cast the medal and all of them failed (fig. 16-21). The first two attempts were made with a type of sprue that proved to be sufficient to cast the head, but not to cast the entire medal. Alterations were made in the mould by widening the sprue significantly and a third trial was done. This proved to be a big improvement, but there were still some vacancies on the sides (fig. 18).

To further improve the medal more research was done in the manuscript about making a mould. A drawing was found about how to make a mould on folio 086v where the author speaks of “Excellent sand for lead, tin and copper”. He writes: “When you mold make some grooves around your mold in the box frame, so that you draw in this manner the matter from all sides” and added the drawing (fig. 13). A similar drawing of a mould with spike-like forms at the bottom can be seen on folio 091v (fig. 14). Here he writes: “If the piece is difficult to cast, and composed of various pieces, cast it with a forked pattern, of three or four grooves, and make these grooves where the metal is the thickest. Also make these grooves around the medal and directly on the head because this attracts the metal and will fill the figure best”. On this folio the author writes about casting objects that are difficult to cast and composed of various pieces, but in the drawing the object in the mould had the same shape as the medal we like to cast (fig. 13-15). Right next to this drawing is another one, but this one is even harder to interpret (fig. 15).

The grooves suggested by the author were taken in account with the making of the fourth mould; three triangular shaped pockets were made on the bottom side of the mould, hoping that they would draw matter in from all sides like the writer mentions. Unfortunately in the small flask that was used, it was not possible to make more sprues like in the drawing. The result of the casting with this mould was not satisfying; the medal had been cast less well than in the trial before (fig. 19).
A decision was made to try this casting method with the use of a bigger flask. In this way there would be room for a forked sprue and the risk of the metal being cooled off by the iron flask would be reduced. Also the triangular pockets were added. This cast was better than the one before, but still not as complete as the third trial (fig. 20). One last attempt was made where the sprues on the sides were connected exactly to the point where the failures most often happen. Unfortunately it was not helpful; the metal that was going through the sprues on the sides had solidified before it reached the medal (fig. 21).

The author writes about casting with brass and that it is done “with difficulty”. He advises to add a small quantity of copper and a bit of tin to make it run better. Also he says that it is necessary to cast it very hot. The latter is also mentioned on folio 136v. Here the use of calamine (a mixture of zinc oxide with ferric oxide or a zinc carbonate) is also mentioned. These suggestions have not been taken account during the casting because it would demand an extensive research on the characteristics of calamine. The anonymous writer also mentions “latten”, by which he meant a copper alloy, but of which it is not certain with what it was alloyed. The way of what the author of the manuscript describes as to be the best way to cast brass, should be researched. Unfortunately the time was missing to conduct such a research or to make another attempt at casting a brass medal.

21 Fol. 154v.
22 Fol. 70r.
This has the additional drawback that an experiment with casting brass on brass cannot be conducted either.
Conclusion and further research

Many experiments have been conducted to test the method mentioned on folio 92r but still numerous questions remain unanswered. This is partially due to a lack of time to conduct more experiments, but also because essential knowledge and experience is missing. Although it has been established that the method as proposed by the anonymous author works, more experiments could be undertaken to refine it.

Firstly it is still not clear how thick the medals made by this method are supposed to be. This could be researched by further investigating the manuscript but also by looking at extant examples. Although this was planned at the beginning of the project, no actual incuse-reverse mould casted medals have been seen. Besides, this could have clarified the purpose of the method to cast with a hollow reverse because this is a fact that still remains unclear. In the manuscript is mentioned: “Tin recoils if thick, therefore it is better to cast it thin and from one piece, to make two and then solder them together, if necessary.”24 This could be a reason for making a hollow reverse; to avoid having to cast a piece that is too thick. It would be interesting to look deeper into the use and aim of this purpose because this would also explain the use of a paste for a hollow reverse, which would not ensure a detailed reverse.25

At the same time it was wondered how much the specific used alloys were influencing the outcome of the experiments. Much advice is given by the author about what metals to use for what intent. This has not been taken in account while performing the experiments because it would induce a time-consuming research that unfortunately was not an option for this moment. Especially in the casting of a new brass medal the benefits of this research could have been discernible, because no good result had been achieved, just as a further exploration of the making of a mould. With this not the making of the impression would profit but a better-argued way of making the sprues could be the outcome. Multiple times the author gives advice on how to make a mould, some of that knowledge has been used but some of it has not been implemented. For example the words that are giving on making a notch at the top of the mould; “Do not forget to notch the top of your mould, that

24 Fol. 103v.
25 Fol. 130v and 153v.
way metal won’t run too fast” and “Always notch the intake of the medal you will cast, it kills the violence of the metal”. 26

To fully conclude the experiment also the different types of sands should be tested, since this could be of influence for the results. It can be said that the experiments conducted regarding folio 92r, by Landsmand and Rowen and by us, have confirmed the workability of the method but therewith have cultivated a whole new range of questions.

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26 Fol. 122v and Fol. 129v.
References

BnF Ms. Fr. 640. And all the offered documents in the Google Drive.


The making and knowing project. 27-03-2015. <www.makingandknowing.org>