1st edition
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5 heller 1916 die catalogue

23-8-2011

DOA 1916 T

German East Africa 5 heller 1916 T struck at Tabora

a die catalogue

part A - introduction



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In this catalogue 5-heller coins struck by 48 dies, used in 27 (+1?) die combinations, are depicted, plus some coins of uncertain lineage. Some of these combinations could in future be shown to be one and the same, and new ones might still arrive on the scene.

Writing this introduction to 5-hellers I assume that you have read the other introductions, so I do not have to repeat all things said there.

Known types

Some catalogues list two types: one with an oval base of the crown and one with a flat base. Schön's *Kleiner Deutscher Münzkatalog* (2003) and Michel's *Münzen Katalog Deutschland* (2002) both list only one type.

KM 14.1 = Jaeger 723a = oval base. Krause puts extra note: 1.5-2 mm thick.
In Germany this type is named Modifiziertes Stempel = modified die.
KM 14.2 = Jaeger 723 = flat base. Krause puts extra note: 1 mm thick or less.

From eBay it is clear collectors and dealers use a further subdivision, distinguishing thick and thin coins. This could result in four different types, but I doubt strongly that any thin oval base coins exist.

Base of crown



Oval base D1 Type 1 flat base (D11A) Type 2 flat base (D15)

Coins with oval base crown, Jaeger 723a, KM 14.1 were produced by just one pair of dies, which combination I have named H1-D1.



D2 D4 D8 D10 D11

Type 1 flat base, which I will hereafter refer to as straight base, is found, besides D11A in the upper row, on the five D-dies shown in the second row. Only on D4 the cross is clearly visible. Besides two H8-D8 that might be thin no other thin straight base coins are not known to me. You might notice the differences in the way the ribbons are attached to the crown.

The five dies in the second row were used simultaneously in the 5-heller machine, as will be explained below. D11A = D11, but possibly used in another machine, as the direction of the die axes of H11-D11 differs from that of H11A-D11A.



D3 D5 D6 D7 D6

Type 2 flat base, which I will hereafter refer to as wobbly base, is found on all other D-dies.
In the row above are shown D-dies with wobbly base for which I have found no thin coins yet.
All thin coins found until now have wobbly base crowns, with the possible exception of the 2 H8-D8 mentioned before.

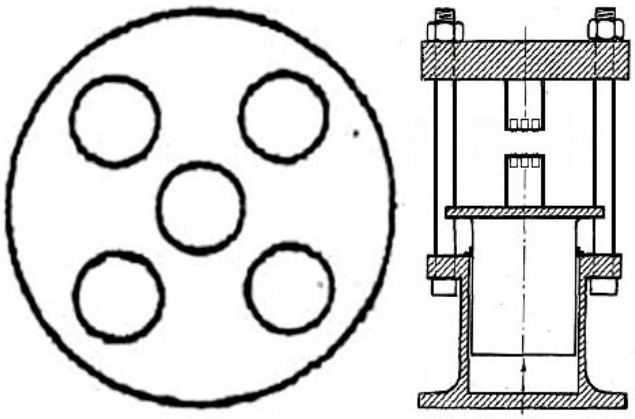
These 2 H8-D8, of which 1 is multi-struck, figure in a picture of 15 5-heller coins on which also figures a note stating: thin 3.0 > 3.7 gram. As this lot was dispersed I have no opportunity to check correctness of the indicated weights for the H8-D8. In the following I will treat these 2 coins as exceptions to the rule that straight base coins are thick coins.

Thick and thin coins # 73725

The known weight range of 5-heller is 2.6 < 6.7 grams, the heaviest being less than 1 gram lighter than the lightest 20-heller.

Numismaticely interesting is that Schumacher's mention of it being decided to change the weight standard can be pinpointed in the coinage. No coins with a weight less than 3.9 grams are known to me from 9 die combinations, none with weight over 3.7 for 15 and only 3 die combinations as far as I know of have produced both. So if a division has to be made between thick and thin coins, **thick would be 3.9 grams and over and thin 3.7 grams or less.**

5-heller machine – multiple struck coins



Part of the 5-hellers where struck in a hand-driven press. If this press was not the same as the one used to strike the 15-rupien coins, then it will have been a very similar one.

To counter slowness of the operation five dies where assembled in big blocks of steel as in the drawing left. Thus five coins could be struck at the same time.
As the 15-rupien needed to be pressed three times to get a reasonable result, it would be surprising if five 5-heller coins could be struck in one go, even though the material was considerably softer.

Whereas in striking the 15-rupien coins the upper block was standing free on the lower parts, I think the upper block was attached to the upper part while striking the 5-hellers. Thus the play between the different parts of the machine would easily result in visibly multi-struck coins. This theory would explain why just five out of 29 die combinations produced at least 52 and probably 58 multiple struck coins, out of the 63 seen from all combinations.

These five dies have all straight bottomed crowns, which are shown in the second row of crowns supra. I nickname these die combinations used in the 5-heller machine for short “5ers.” In the catalogue part they are indicated by (5) top right of the page. In Zeno you may find them combined in one picture # 89408

As they, as far as I know, produced (with the possible exception of the two H8-D8) only thick coins, production by the 5-heller machine must have stopped before that of thin coins started.

As yet I found 21 H2-D2, 12 H4-D4, 22 H8-D8, 9 H10-D10, 13 H11-D11 and six multiple struck coins with straight base that I cannot identify. It is so long ago that I had anything to do with statistics that I have forgotten nearly all about it. Using http://www.surveysystem.com/sscalc.htm to calculate 95% confidence intervals it appears the amounts of coins found do not correspond with an equal amount of coins struck. Thus I cannot say more than that I think there is a chance that, striking five coins at a time proving to problematic, after a while less coins at a time were made in one go. Candidates would be H2-D2 and H8-D8.

Is there any chance 5-heller machine could be the same as the first 15-rupien machine? One clue could be that the 5-heller have about the same diameter as the 15-rupien coins, +/- 22.5 mm. This would mean 15-rupien dies might fit in the same blocks of steel as the 5-heller dies did. Besides the same punch could be transferred to the gold mint (the average 5-heller might be 0.1 or 0.2 mm bigger though. Possibly because it was not struck in a ring like the gold coins

By the end of April 1916 some 27,800 5-hellers had been produced. As the gold mint started production 15th of April, no more than these could have been produced before that moment if both machines are one and the same.

In my own lot 11 out of 97 coins are 5ers. If representative this would give +/- 34,250 coins. Likewise 46 out of 345 would give 40,000 coins.

As several reasons could be thought of, why multiple struck coins might be over-represented in both selections, the best I can say is that above numbers do not confirm that both machines are the same, nor that they would not be.



H4-D4

The ring drawn by Schumacher between the upper and lower block is indispensable if the upper block has to rest on the lower block and if you want to strike the coins three times with a steady die position. It is a cumbersome device though, that will have hindered production, especially if the ring was so tight that the coins might get stuck.
From 5ers that look like single struck, it seems that the starting position was rather steady. This means that the flans were not put in randomly by hand only. There must have been something to help placing them.

As multiple striking is most seen and most pronounced on the D-side, a shift of up to 1.5 mm being quite normal and taking gravity into account, it may be assumed that that die was the one on top. As displacement of the upper die was big enough to strike sometimes partly outside the flan, a ring higher than the flan might, if it would be hit, hurt the die in the same way as self-strike in the 20-heller machines. No signs of this have been found yet.
As the H-side of the coins also got regularly multiple struck, the flan must have had enough place in the ring to move around quite a bit. One other possibility is that there was no ring at all but that the lower dies were put somewhat lower than the surface of the block.



Some multiple struck coins did not only slide, but did also rotate in the process. One explanation might be upstanding pieces on the rim of the flans, which were formed as they were punched from the rods.

Multiple struck dies # 89314



Not to be confused with multiple struck coins are coins struck by multiple struck dies, where all coins struck by these dies show the same elements twice. To make things easy H2 and H10 are 5ers who themselves were apt to produce multiple struck coins.

Oval base crown flans # 73817



One other particularity of oval base coins is that part of them is struck on flans that have a bulb on the rim. As these bulbs are found in different positions and on both sides of the coins, they must the result of a flaw of the punch. On some flans a second smaller bulb appears next to the first. These bulbs are not found on any coins struck by other dies. It may therefore be assumed that the bulby punch was replaced by a new one while the flans for the oval base coins were made.

Modified die – modifiziertes Stempel # 73799



Top left, middle and bottom right straight base, top right wobbly, bottom left oval base.

If a piece gets broken off the positive die, used to strike the production dies, it cannot return unless it gets engraved directly onto the production die. In 20-heller this was a great aid in sequencing the dies.

In sequencing 5-hellers we have the problem that there are two crown types that cannot be explained as the result of pieces broken of the other as original positive die, nor as re-engravings of that die.

There are three possibilities:

a. Straight base is the original, five production dies are made before the bottom of the crown breaks away, the oval bottom is engraved directly on 1 production die.
b. Oval base is the original, one production die before bottom breaks away, straight bottom is engraved directly on five production dies.
c. Wobbly base is the original, both oval and straight bottom are engraved directly on 1+ 5 production dies.

For all three options long and short stories can be made up.

The fact that I find it hardest to explain why there would be just one oval base crown die, if it is not the original, makes me present the following story as the most plausible.

Oval base production die is made, positive die gets hurt. For 5-heller machine five dies are needed, which of course should be as much as possible the same. As the cross is not seen on four out of five straight base dies, striking is done carefully. Five dies are produced. They do not try to imitate the oval base, but engrave a straight one, because that is easier (that direct engraving on these dies has been done can be seen when you look at the way the ribbons touch the base, but that may also have been prompted by the weakness of the striking of the production dies).

The 5er dies were the first to produce 5-heller coins. When it was decided also to produce 5-hellers on 20-heller machines, the oval base will have been used first, as it was still laying around.

After all the multiple struck 5-hellers nobody will have bothered any more about the base of the crown being there or not, let alone engraving it on the dies. Some engraving on the positive die must have been done though to fill gaps between crown and ribbons.

H11A-D11A

Not being able to explain the rotation of a die in the 5-heller machine, I have named the combination of H11-D11 in a position with 3 degrees rotated die axis H11A-D11A. Thus leaving open the possibility that this die combination was afterwards reused in a 20-heller machine. I have found nothing convincing that would indicate later use of other 5er dies on 20-heller machines. In the calculation below I didn't take H11A-D11A into account.

Total production

Monat	Zwanzigheller		Fünfheller		Gesamt-summe
	Stück	Rupien	Stück	Rupien	Rupien
Febr. 1916	74 800	14 960	8 800	440	15 400
März „	148 700	29 740	6 200	310	30 050
April „	214 500	42 900	12 800	640	43 540
Mai „	302 000	60 400	34 200	1 710	62 110
Juni „	362 500	72 500	16 000	800	73 300
Juli „	448 000	89 600	8 000	400	90 000
August „	72 500	14 500	191 000	9 550	24 050
Sept. „	11 700	2 340	25 000	1 250	3 590
bis 5. IX. zusammen	1 634 700	326 940	302 000	15 100	342 040

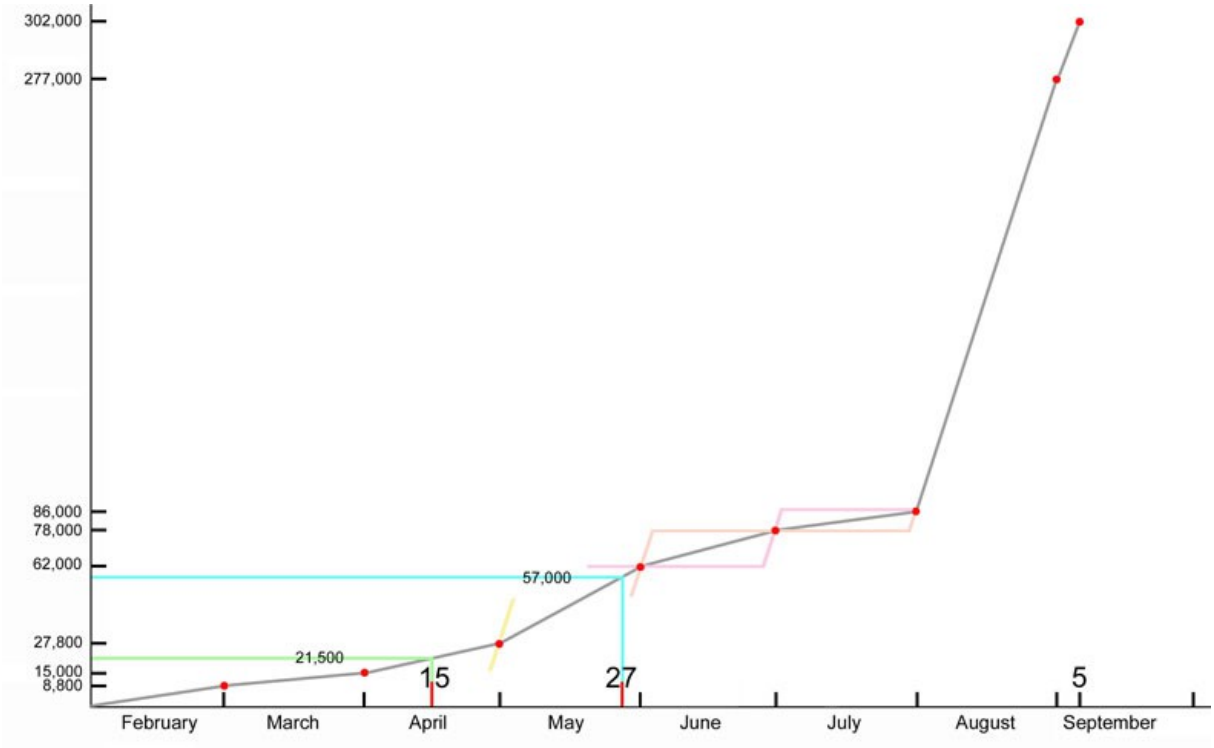
Schumacher's production details show, after a slow start in February, a small peak in May and then a soaring mountain in August, as production of 20-hellers collapses. As Tabora fell a total of 302,000 5-heller coins had been struck

Schumacher explains the collapse in production of 20-hellers in August by a lack of possibilities to provide the army in the east with coins, because the railway connection had been cut. But that would not explain why so many 5-hellers were produced. I presume lack of material for 20-hellers may have

played a role as well, allowing the 5-hellers more machine-time. Lower overall production might indicate that by half of August one of the machines had broken down.

From the overall production of July it can be deducted that maximum daily production of a machine was more than 7500 coins.

Die production #112889



The decree # 112825 of 27 May, published 2 June, did change the weight standard for 5-heller coins, that before had been about 5 grams, to about 3 to 5 grams.

One reason for this decree could be to legalize already struck low weight coins, another to anticipate at a looming shortage of proper material for the 5-heller coins.
Whatever the reason the decree gives a point in time around which the change from thick to thin flans took place.

As production of June might have taken only 2 days and the date of production would not be necessarily the date of counting and registration of the coins, it may be suggested that total of thick coins produced would be between 62,000 and 78,000 coins.
Deducted from 302,000 this would leave between 240,000 and 224,000 thin flan coins.
Parted by 17 coin combinations this would give an average thin-flan die-combination production of 14,118 to 13,176 coins.

In my original lot 28 out 97 coins were over 3.9 grams, which would give about 87,000 thick coins. From a total, seen by September 2010, of 345, 130 might be thick coins, giving a total of about 114,000 thick coins.
Both these selections will be less representative then one would like, if only for the fact that circulation area for the coins struck in August did not include the coastal regions. Also the thin coins by their appearance would not be first choice for a collector to bring home, thus influencing what we get to see here now.

The second 20-heller machine arrived in the mint beginning of March. As 20-heller production would have had absolute priority over 5-hellers, all 5-hellers struck in February will have been struck by the 5-heller machine. Output of 5-hellers in March was lower than in February and also in April we do not really need 20-heller machines to explain production figures.
If the 5-heller machine = 15 rupien machine, half of April's production would have been little more than a days work for a 20-heller machine.

Presuming the 5-heller machine being the same as the 15-rupien one, it may be suggested 5er dies produced 21,500 coins, being an average of 4,300 per die combination. Larger amounts as suggested at page 4 seem less plausible considering the daily production in February and March. The 5-heller machine must have been very slow indeed.

If so there would be left 78,000 to 62,000 minus 21,500 = 56,500 to 40,500 thick coins for 5 die-combinations used in a 20-heller machine.
Parted by 5 this gives 11,300 to 8,100 coins per die-combination.

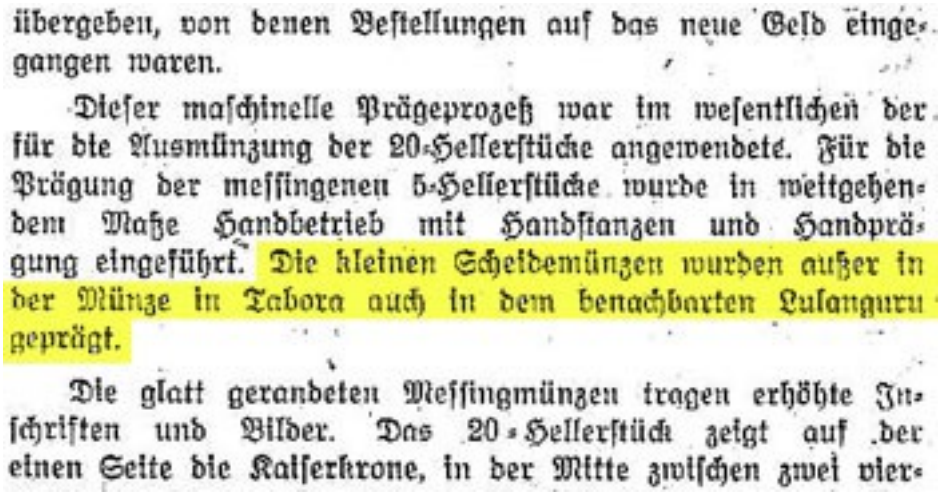
Calculations based on 84 coins, seen by September 2010 from these combinations, against 46 5ers would give 39.250 coins

Pulling the Lulanguru card for H1-D1, parting 56,500 to 40,500 by 4 would give 14,125 to 10,125 coins.

Calculations for the amount of J 723a H1-D1 give results between 12,500 and 25,000.

5 heller struck in Lulanguru ?

Krenkel states in *Wirtschaftsdienst* that the “kleinen Scheidemünzen” were struck not only in Tabora but also nearby in Lulanguru. I would interpret these to be 5-heller coins.



übergeben, von denen Bestellungen auf das neue Geld eingegangen waren.

Dieser maschinelle Prägeprozeß war im wesentlichen der für die Ausmünzung der 20-Hellerstücke angewendete. Für die Prägung der messingenen 5-Hellerstücke wurde in weitgehendem Maße Handbetrieb mit Handstanzen und Handprägung eingeführt. Die kleinen Scheidemünzen wurden außer in der Münze in Tabora auch in dem benachbarten Lulanguru geprägt.

Die glatt gerandeten Messingmünzen tragen erhöhte Inschriften und Bilder. Das 20-Hellerstück zeigt auf der einen Seite die Kaiserkrone, in der Mitte zwischen zwei vier-

Could Krenkel’s statement be correct, or did he make a mistake and did he mean the 15 rupien gold coins? Or did he (as he had left Tabora already in March) misinterpret stories he heard later about minting in Lulanguru, guessing it would be the small denominations that would have been struck there?

If Krenkel is correct he must have been talking from his own experience and production in Lulanguru must have started before he left Tabora in March.

From a logistic and management point of view it seems not logical to mint in two locations, but if you have to produce as much coins as possible and you have a location nearby where there is equipment to do so, why not? There was a press in Lulanguru and this press could also be used to punch the flans out.

Production of 5-heller coins in Lulanguru would explain why the bulb seen on oval-base-coin- flans is not found on other types, as this punch was only used there. Here also oval-base fits in, as in my opinion they were the earliest dies.
If coins produced in Lulanguru were delivered directly to government, they would not figure in production reports of Tabora mint and may thus have escaped Schumacher’s attention. If so they don’t figure in his production data.

As the gold-mint was Schumacher’s direct responsibility he would have noticed if there had been any other minting activity in Lulanguru at the moment his striking was replaced there. So minting of 5-heller coins there must have stopped before that time.
This could be explained by the fact that the press in Lulanguru was normally used for pressing oil out of peanuts. Peanut harvest season would start in May. If the rate at which 5-heller coins were struck

was about the same as that of 15 rupien, it would not have made sense to let peanuts rot because the machine was used to strike coins.
Thus there would have been a considerable interval between first and second minting.

So Krenkel might be correct and some 5-hellers could have been struck in Lulanguru.

In contraindication to this is the fact that, if the amount of H1-D1 seen is subtracted from the amount of coins seen from non-5er thick coins producing die combinations, the resulting difference with the amount of 5ers seen (56 against 46) gets so small, that it becomes very hard to explain.

Die production details # 98701

An indication of the coin production per die may be obtained from *DOA 1916 T, 5 heller part E, weight distribution* or by using the link above.

These lists may not be as representative as one would like, as what people show on internet is influenced by their personal interests and their perception of what will bring good money on the market. I think for these reasons H1-D1 and multiple struck coins may be over-represented.

Below are given the number of coins per die in the lot I once bought. Perhaps here also multiple struck coins are overrepresented, as the dealer who owned the lot before me may have regarded them as unsalable. If two numbers are given, the first is for coins that look singly struck, second for clear multiple struck ones. The coins in the list below are also included in the lists above. To get the ones from internet only, you would have to subtract the ones below.

H1-D1 5	***H2-D2*** 1-5	**H3-D3** 1	***H4-D4*** 0	**H5-D5** 2	**H6-D6** 0
H7-D7 8	***H8-D8*** 0	***H10-D10*** 0	***H11-D11*** 0-4	**H11A-D11A** 1	H13-D12 0
H13-D13 5	H14-D15 1	H15-D15 2	H15-D16 6	H17-D17 6	H18-D18 4
H19-D19 3	H20-D20 8	H21-D21 0	H22-D22 0	H22-H23 0	H23-D23 9
H24-D24 5	H25-D25 2	H25-D26 5	H28-D28 8	***980*** 0-1	990 5
Total 97					

… … … … die linkage;
bold type no thin coins observed; ***italic type*** idem, 5ers; underlined straight base crown; regular type, no thick coins observed; red type a minority of thick coins known
bold italic red type a minority of (possibly) thin coins known

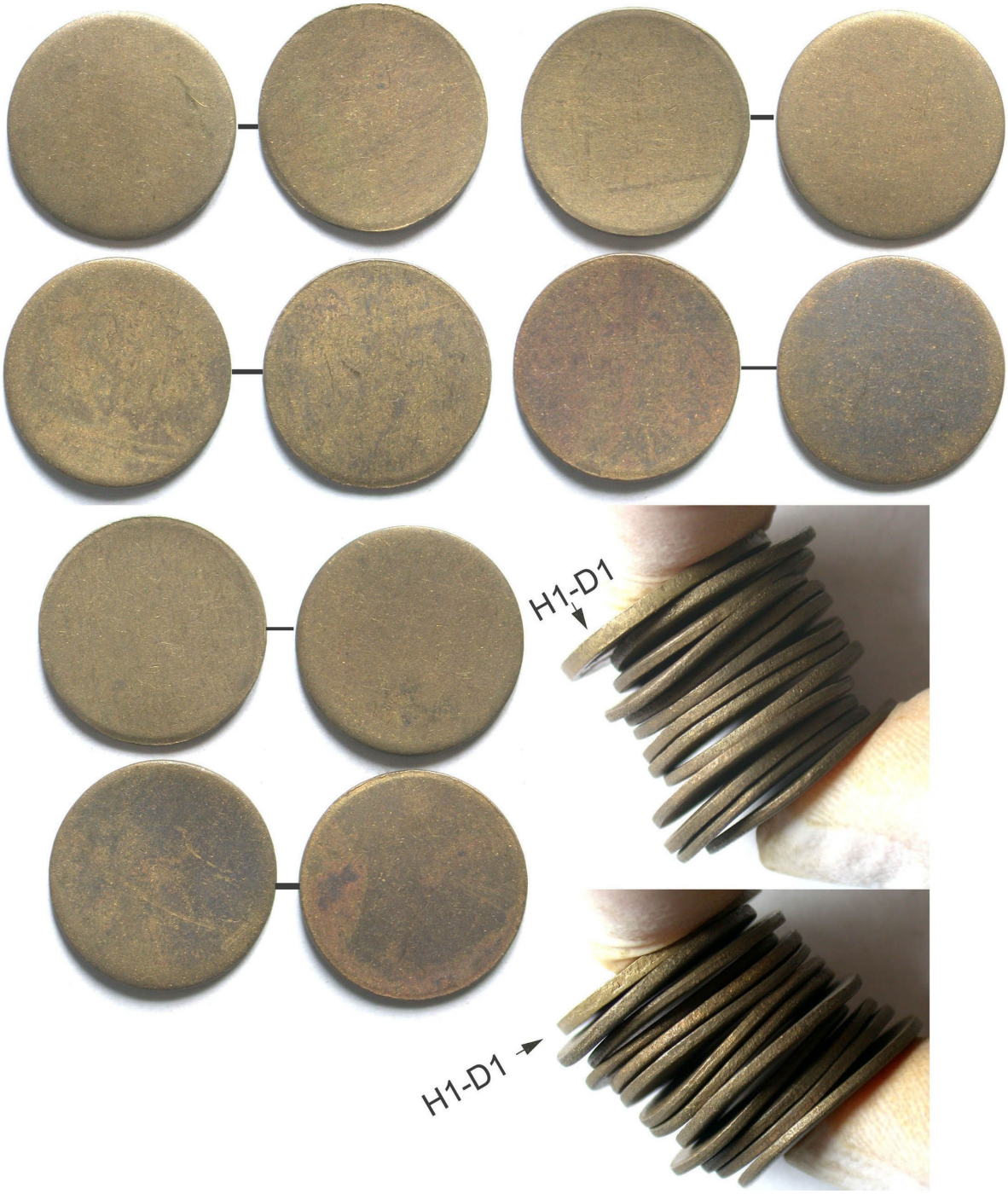
Help in identification

Some coins may safeguard their privacy to an extent you might start to despair about ever identifying them. The 5-hellers, being smaller, are even worse than 20-heller. If getting depressed you better send pictures of the coins to 5heller@ptbvhrokerspartij.nl so we can look at them together. If possible send also pictures with die positions (see # 73596 and # 91588, line is along the bottom of heller). Small pictures are of little avail, so let them be big. If I am not on holiday I will do my best to answer quickly.

Of course, I would also like to get pictures of all coins that would ad to the series shown in Zeno, especially for the first and last stages of dies. If I am lucky you find me new dies. If you send me pictures I suppose you will have no objections to them being used in Zeno or this catalogue.

Flans # 112039 & 112561

The Belgian Royal Museum for Central Africa's collection HO.1927.511 of DOA coins contains 19 thin 5-heller flans. (see *DOA 1916 T, extra A, The Royal Museum for Central Africa's collection of 20- & 5-heller coins*.)



For comparison a thick flan H1-D1 is shown.
The rims show the same punch patterns as the 20-heller. Also the black spots are similar to those on 20-heller flans.

“Mules”

Mules are coins struck by die combinations that were not intended to be in that combination. As the 5er dies were intended to strike coins in medal alignment, coins struck by them in an other alignment may be regarded as mules. March 2017 the existence of only one such coin could be attested, a combination of H8 and D11 with die axis crossing at 90 degrees # 167370
As five coins were struck at the same time, mules of three other combinations and a coin of the cental dies with turned axis must also have been struck. Please inform me if you ever find such a coin.

Easyfinders

Easyfinders are intended to make identification easier if a coin shows certain characteristics.

easyfinder circle & filing lines # 73852
easyfinder die position # 77446
easyfinder double struck dies # 89314
easyfinder haircracks & pieces broken off # 77278
easyfinder self-strike # 73578
easyfinder straight bottom crown # 102849
easyfinder strike-out # 73853
overview, H2-D2 – H15-D15 # 89270
overview. H15-D16 – H28-D28 # 89271

5 heller part B, D & E

5 heller Part B, die catalogue, shows the die combinations in alphabetical order of the H-side.
Pictures are better if you magnify Adobe Reader to 125% (or more)

5 Heller part C has been omitted from the 3rd edition of this catalogue. It consisted of a map with seperate pages for each die combinations.

5 heller part D, Thick and thin 5 heller DOA 1916 concentrates on the implications of weight distribution.

5 heller part E, weight distribution shows the amount of coins of each die combination seen before end of September 2010 and weights noticed through March 2013.