

The 1972 Västerås hoard and the monetary history of Sweden 1470–1520

1. Find

On 27 October 1972 one of the largest coin-finds in Sweden was discovered in the Johannes quarter in Västerås, between the River Svartån and Stora Torget (Fig. 1:1). The find weighed *c.* 18 kg and consisted of 16,231 coins, mainly Swedish örtugs and half-örtugs from the period 1470–1520, Tables A and B. The latest coins in the find are two Danish klippings, struck between 1518 and 1522 (Fig. 2).

Västerås is one of Sweden's oldest and most important towns. It is situated in a bay of Lake Mälaren, *c.* 100 km west-north-west of Stockholm (Fig. 3). The diocese of Västerås is mentioned in 1164, and the town probably had its own mint from the end of the 12th century. Västerås was a busy port where copper from Falun and silver from Sala were among the goods unloaded. During the late Middle Ages, Västerås developed into a powerful economic and political centre (Kumlien 1971).

The hoard in question was discovered in central Västerås barely 200 m south of the Cathedral (Fig 1:3). Formerly a monumental wooden building, the so-called Casino-house stood facing the square. In 1970 it was so badly damaged by fire that it became necessary to demolish the remains. During 1971 and 1972, before the construction of the present Casino-house, the County Museum of Västerås undertook archaeological investigations on the site under the direction of the present Museum Director Krister Ström. Under the central part of the building which had been burnt down a group of four cellars in grey stone with bricked, arched roofs was uncovered (Ström 1974). Due to lack of time a bulldozer had occasionally to be used during these excavations. While levelling out the surface near one of the cellars, the machine happened to break loose some of the bricks above the cellar entrance. Some patinated coins fell out. Ragnar Sjöman of the County Museum stopped all work and the hiding-place was uncovered and closely examined. We have a fairly clear picture of how this large sum of money was hidden some 460 years ago. After removing two floortiles located above the cellar and taking away the mixture of sand and shards, a small hollow, measuring approximately 30×20×10 cm was

formed into which over 16,000 coins were pressed. At the time of their discovery most of them were still arranged in stacks. Textile and leather remains indicate that the piles of coins were originally kept in receptacles, possibly small bags. When the coins were found most of the piles collapsed, but a few were partly preserved (Fig. 4). In addition to the coins, a round flat lump of silver and a rectangular unidentified iron object were found (Fig. 2, left part).

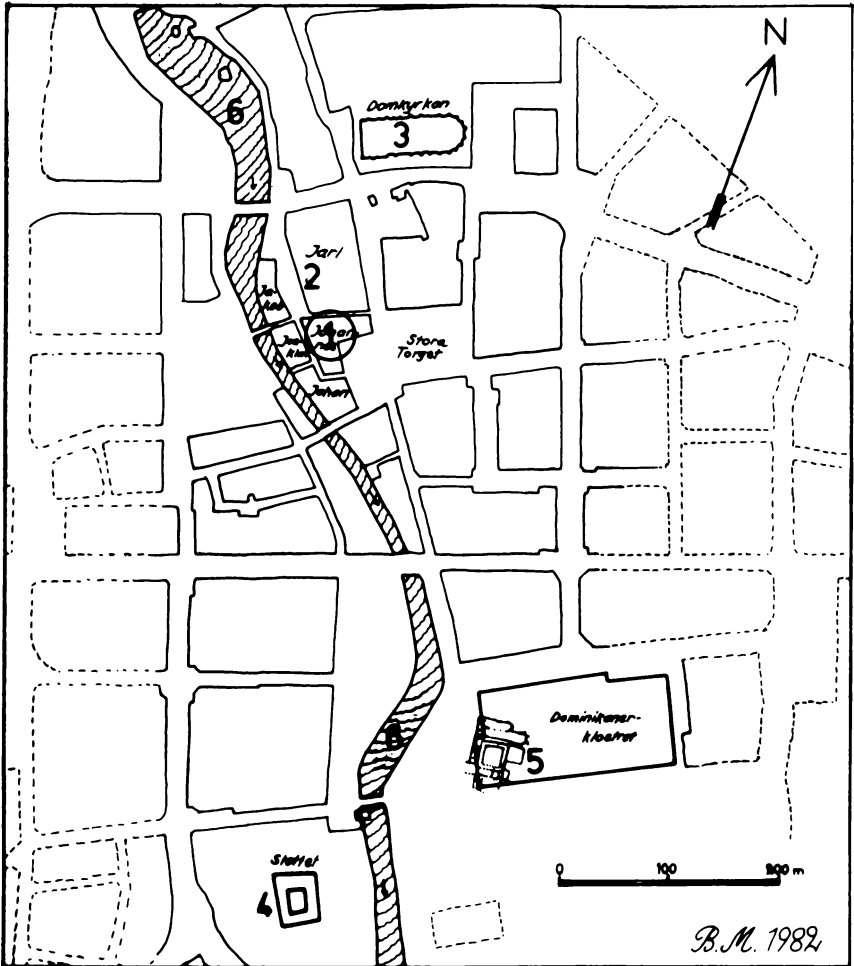


Fig. 1. The centre of the town of Västerås with its present street system 1. Find-spot in the Johannes quarter. 2. The probable location of the Mint. 3. Cathedral. 4. Castle (now museum). 5. Dominican convent. 6. The River Svartån. During the Middle Ages the Svartån branched off before reaching the Lake Mälaren so that the convent was situated on an island. According to Ström 1974 and *Västerås, Medeltidsstaden* 4, 1977, p. 20.



Fig. 2. The Västerås hoard. The round lump of silver in the bottom left corner has a silver-content of $\approx 99\%$. The angular, darker lump is an unidentified iron object found together with the silver. *Photo ATA.*

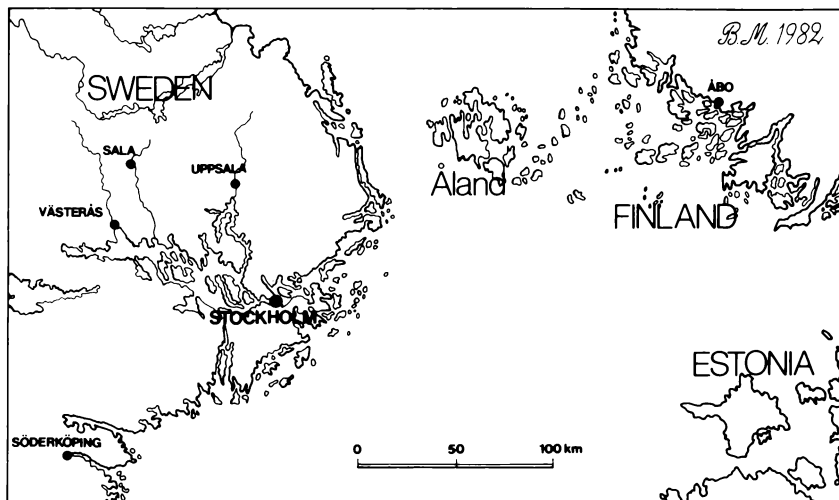


Fig. 3. Map showing the three towns where the coins were minted: Stockholm, Västerås and Åbo. The mines of Sala provided the silver for the Västerås mint.

The find has been retained by the Royal Coin Cabinet (abbr. KMK) and has the inventory no. 100354. Approximately 6,000 coins, mainly die-identical specimens which are unnecessary for the continuing study of the hoard, have been deposited at the County Museum of Västerås and form the nucleus of an exhibition on the find which was arranged by the KMK in 1978.

2. Political and monetary background. Contents of the find.

From 1397 to 1521 Sweden was part of a Union with Denmark and Norway with the Danish king as Regent of Sweden. However, for long intervals the Swedes broke loose from the Union and elected their own king or regent (*riksföreståndare*). The years that concern us here, 1470–1520, are called the *Sture period* and correspond to the end of the Middle Ages in Sweden. It begins with Sten Sture the Elder's victory over the Danes at the battle of Brunkeberg just outside Stockholm in 1470, and it ends in 1520 when Sten Sture the Younger died on his way to Stockholm after having sustained fatal injuries in a battle with the Danes. His wife Kristina Gylenstierna surrendered in Stockholm in the same year.

The new era starts with Gustav Vasa's rebellion against the Danish King Christian II and his subsequent election as Regent of Sweden in August 1521.

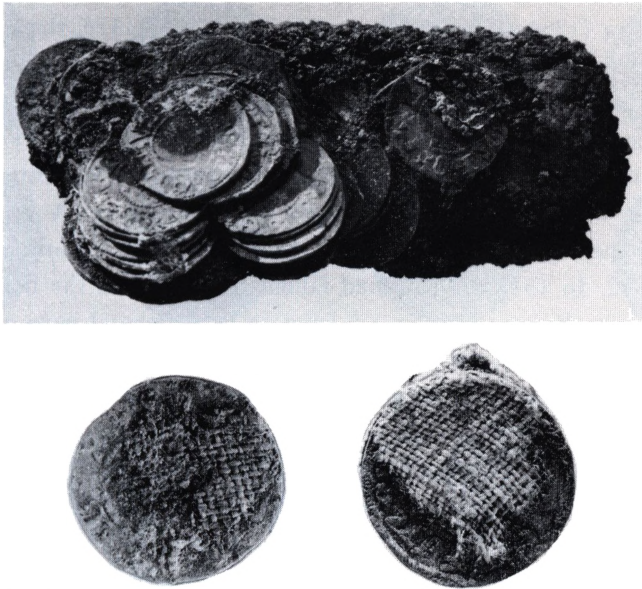


Fig. 4. Above: Coins, some of which are stacked, forming one solid block with a lump of iron. Below: Half-örtugs with textile remains. Scale *c.*2:1. *Photo* ATA.

1470–1497	<i>Sten Sture the Elder</i> (Sten Gustavsson Sture of the house of Sjöblad), regent
1497–1501	<i>Hans</i> (Johan II, Danish king of the house of Oldenburg), king of the Union
1501–Dec. 1503	<i>Sten Sture the Elder</i> , regent
Jan. 1504–1512	<i>Svante Nilsson Sture</i> (the house of Natt och Dag), regent
1512–1520	<i>Sten Sture the Younger</i> (Sten Svantesson Sture of the house of Natt och Dag), regent
1520–1521	<i>Christian II</i> (Danish king, son of Hans), king of the Union
1521–1523	<i>Gustav Eriksson Vasa</i> , regent, Swedish king (Gustav I)
	1523–1560

During the war of liberation against the Danes, Gustav Vasa occupied the town of Västerås on 29 April 1521. At the castle of Västerås just south of the town, near the outlet of the river Svartån into Lake Mälaren, the Danish army resisted until 30 January 1522, when the castle was finally captured (Fig. 1:4). We may fairly presume that these threatening events of 1521–22 had something to do with the concealment of 18 kg of coins in a house in the centre of the town.

The örtug (8 pennies) was introduced into Sweden by King Albrekt of Mecklenburg (1364–89). For about 100 years, until 1478, the penny and the örtug were the only denominations struck in the country. During Albrekt's time the rate of exchange between a mark of pure silver and a mark of pennies was 1:8 at the lowest and by the end of the 1470s it was 1:11. Another denomination, the half-örtug (4 pennies), was introduced in 1478, after which the penny gradually lost importance. A contributing factor was the high rate of inflation in the years *c.* 1504–12 and in particular 1510–12. In 1511 the rate had fallen to 1:16. From the beginning of Sten Sture the Younger's reign we have an experimental issue of a heavy silver coin (1512), but not until the 1530s were heavy coins struck on any larger scale. During the Sture period the örtug, half-örtug and penny were the only Swedish denominations of importance for coin circulation.

Surveys of the coinage of the Stures have been made by Hans Hildebrand 1887, Thordeman 1936 and Lagerqvist 1970, to mention the most important ones. Rasmusson 1970 gives a summary of the research on the subject. Among the more specialized studies may be mentioned Hildebrand 1888 and Appelgren 1923 (issues of large coins), together with Lagerqvist 1962 (Nils Sture). Ingrid Hammarström 1956 deals with the last part of the Sture period from an economic and historical point of view. As Rasmusson 1970 points out, we have a better and more varied collection of written sources for the monetary history of the Sture period than for any earlier period. There are the mint contracts for 1478, 1480 and 1497, and many documentary references to minting, coin circulation, mintmasters, availability of silver etc., especially in the correspondence of the regents during the Sture period (*Sturearkivet*), which is kept at the National Archives, Stockholm. In spite of these favourable conditions for research, the Sture period was a dark spot in Swedish monetary history when the Västerås hoard came to light. We are faced with two major questions. First, due to the political circumstances described above during the Scandinavian Union, many of the örtugs and half-örtugs from the Sture period are anonymous. They are struck in the name of Saint Erik, the Swedish patron saint, and Saint Henrik for the coinage of Åbo in Finland. Neither Sten Sture the Elder or Svante Nilsson struck coins in their own name. How should the anonymous coinage in the period 1470–1520 be dated? Secondly, before 1972, few coins had been analysed to help us understand inflation during the years *c.* 1504–12. Through the discovery of the Västerås find the available numismatic research material increased overnight from *c.* 2,000 coins to *c.* 18,000 coins. Fig. 5 gives a survey of örtugs and half-örtugs from the Sture period.



Fig. 5. Örtugs (1–4) and half-örtugs (5–14) from the Sture period. SCS, Stockholm (1), Hans, Stockholm (2), Ritter 1512, Stockholm (3), SCS, Åbo (4), SCS 1478, Stockholm (5), SCS, Stockholm (6), SCS, Västerås (7–8), Hans, Stockholm (9), Hans, Västerås (10), SCS 1504–12, Västerås (11), Ritter 1512–20, Stockholm (12), Ritter 1515, Stockholm (13), Ritter 1512–20, Västerås (14). Coins nos 1–4, 6, 9, 10 from KMK's systematic collection, coin nos 5, 7, 11–14 from the Västerås hoard. Photo Gunnel Jansson and Jüri Tamsalu.

The coins from the Västerås find are listed in Tables A and B below. All the Swedish specimens are struck either in Stockholm or Västerås. The anonymous coins all bear the inscription SCS (sanctus) ERICUS REX on the obverse, although there are a few minor variations. The obverses of King Hans' coins are inscribed with IOH D G REX SWE (Johannes, by the grace of God King of Sweden). Sten Sture the Younger's örtugs and half-örtugs read: STEEN STURE RITTER (Sten Sture, Knight). Only two dates appear on coins from the find: 1478 (anonymous half-örtugs struck in Stockholm) and 1515 (Sten Sture the Younger's half-örtugs also struck in Stockholm). In Table A below, SCS stands for the anonymous

	Stockholm		Västerås		Undeterminable	
	örtug	½ örtug	örtug	½ örtug	örtug	½ örtug
Erik of Pomerania 1396–1439	1					
Hans 1497–1501		51		43		5
SCS 1478		38				
SCS (1504–12)				99		
SCS –		294	5,601	7,745		
RITTER 1515		45				
RITTER (1512–20)		1,095		1,092		
Indeterminable (not cleaned or treated)					24	72
Total 16,205 coins	1	1,523	5,601	8,979	24	77

Table A.

Swedish coins in the Västerås find

	Malmö		Ålborg
	hvid	klipping	hvid
Riksrådet 1448	1		
Kristian I 1448–81	6		
Hans 1481–1513	16		1
Kristian II		2	
Total 26 coins	23	2	1

Table B.

Danish coins in the Västerås find

coins and RITTER for Sten Sture the Younger's coins. The SCS coins have been divided into three groups. First, coins with the date 1478 (Lagerqvist 1970, Sten Sture the Elder, nos 8, 9a, 9b, 9d); secondly, coins bearing the arms of the house of Natt och Dag (1504–12), (Lagerqvist 1970, Svante Nilsson nos 3a–d, 4a–c, 5, 7); and thirdly, the remaining SCS coins (SCS-). The RITTER coins form two groups: one with, and one without, the date 1515.

3. Research project: The monetary history of Sweden, the Sture period. 1973–82.

A glance at the Swedish coins in the Västerås find, as presented in Table A, shows the problem of dating the coinage of the Stures, with which we were faced in 1972. Of 16,205 coins only 2,565, or 16 %, could be dated more precisely. The remaining 84 % have a wide date-margin and could have been issued at any time between 1470 and 1520, except during the four years of the reign of Hans, king of the Scandinavian Union. The aim was now to determine the relative and absolute chronology of the anonymous coins of the Sture period. Hitherto, these had been assigned to the reign of Sten Sture the Elder, with the exception of a few small groups bearing the arms of Natt och Dag or a ring-cross (Lagerqvist 1970, Svante Nilsson nos 4, 6). A thorough study of the large material now available should solve not only this problem but also others. Such a study should concentrate primarily on:

- the dies
- the silver contents of the coins (including the penny)
- the written sources.

The Bank of Sweden Tercentenary Foundation (Riksbankens jubileumsfond) proved to be interested in a research project conducted along these lines. During 1974, 1975 and 1976, with the aid of generous grants, it was possible for a team of research students to proceed with the project. A study of the dies was started, extracts were made from the archive material, line-drawings were made of the coin inscriptions etc. Moreover, some 350 coins were selected for analysis.

The project had actually already been in progress since early 1973, led by the then Director of the Royal Coin Cabinet, Brita Malmer, and financed partly by Sven Svenssons Stiftelse för Numismatik. Between 1973 and 1977 Per Fröberg was deputy leader and was responsible for the practical side of the investigation. During the years 1973–77 the following persons were attached to the project for longer or shorter periods: Kåre

Fagerström, Inger Hammarberg, Kerstin Pettersson, Alf Rosenvik and Keith Wijkander (mainly studies of dies); Henrik Klackenbergh and Ingmar Munktel (extracts from the *Sturearkivet* and the *C-serie*, a series of medieval land-registers, also kept in the National Archives, Stockholm); Bo Zachrisson (drawings). The coin analyses were made by Lennart Carlsson at the National Testing Institute at Borås (scanning electron microscope) and by Eiliv Steinnes and Oddvar Johansen at the Institutt for atomenergi, Kjeller, Norway (neutron activation analysis). Ingrid Hammarström planned and led the work on the *Sturearkivet*.

In 1975, 8 stencilled booklets were published summing up the preliminary results: *The monetary history of Sweden, preliminary reports* (abbreviated *SMPM*).

1. Brita Malmer, The monetary history of Sweden, the Stureperiod; presentation of the project.
2. Per Fröberg, The connection between the half-örtugs from Sten Sture the Younger's reign and the anonymous half-örtugs from the Västerås hoard.
3. Keith Wijkander, Comparisons between half-örtugs from the Sture period in the Västerås find and those in the Royal Coin Cabinet's systematic collection.
4. Inger Hammarberg, Die-links between hybrids from Hans' and Sten Sture the Younger's reign.
5. Lennart Carlsson, Coin analyses.
6. Per Fröberg, Comments on the analyses performed on örtugs and half-örtugs from the Västerås find.
7. Keith Wijkander, The function of the punctuation-marks on the half-örtugs minted in Stockholm under Sten Sture the Elder's regency. An attempt at interpretation.
8. Inger Hammarberg, A letter style from the Sture period common to the coinage of Svante Nilsson Sture, Sten Sture the Younger and the anonymous Sanctus Ericus issues.

The main results of this investigation can already be found in these preliminary reports. A summary of the contents follows below.

At an early stage it was clear that the 5,601 identifiable one-örtug coins, all anonymous and from the Västerås mint, formed a very homogeneous group. They were shown to have been struck from only 3 obverse and 8 reverse dies. All dies are linked to each other, cf. die-chain I under section 5 below.

Two similar concentrations occur among the 8,979 half-örtugs from Västerås. Of these, no less than 5,693 are struck from a single anonymous obverse die (Table A, group SCS-), and a further 1,034 coins come from one obverse die of Sten Sture the Younger (Table A, group RITTER-). These two groups total is 6,727 half-örtugs. 3,761 of these – 3,743 coins of the SCS-group and 18 of the RITTER-group – share a common reverse die. The anonymous half-örtugs formerly attributed to Sten Sture the Elder must therefore actually have been issued very much later, presumably under Sten Sture the Younger, 1512–20 (Fröberg *SMPM* 2, and die-chain III in section 7 below).

All the örtugs and the two groups of die-linked half-örtugs, which together account for over 75 % of the Västerås find, are uncirculated. It is possible that the anonymous örtugs should also be dated to the first decades of the 16th century, cf. die-chain I below.

Studying the die-links of the uncirculated mass of over 12,000 coins was relatively quick and straightforward. Much more labour was involved in die-linking the remaining 4,000 coins, the majority of which had seen circulation. These coins, often badly struck, revealed a number of interesting die-links, e.g. about 100 mules, including one coin die-linking the mints of Stockholm and Västerås (Hammarberg *SMPM* 4 and die-chain II in section 6 below).

Already during the first years of the project as many as 100 or so coins were analysed by a scanning electron microscope. The silver contents agreed surprisingly well with that stipulated by the mint contracts of 1478 etc, i.e. 50 % silver for the örtugs (fineness 0,78 g) and 37,5 % silver for the half-örtugs (fineness 0,37 g). The inflation during the Sture period, especially in its later part that is recorded so clearly in the written sources, was not met by a debasement of the örtugs or half-örtugs (cf. Thordeman 1936, p. 46). A new discovery was the fact that the surface of the coins was covered by a thin layer of 90 % silver (Carlsson *SMPM* 5 and Fröberg *SMPM* 6).

Besides those in the Västerås find, only c.2,000 örtugs and half-örtugs from the Sture period were available for study, most of them from the Royal Coin Cabinet's systematic collection (which is made up of coins drawn from various finds). One of our first tasks was to find out whether the Västerås find was representative of the Stures' coinage. If those frequently recurring dies described above were disregarded, the Västerås find was actually found to be highly representative in relation to the half-örtugs in the systematic collection (Wijkander *SMPM* 3). A stylistic study of the letter-forms used in the coin legends and the differences between the va-

rious punctuation-marks were important complements to the die-chains (Wijkander *SMPM* 7 and Hammarberg *SMPM* 8).

After the publication in 1975 of the series of reports summarised above, we were left with the considerable task of carefully verifying these preliminary results and collecting comparative material from other finds and collections, as well as bringing together the relevant documentary evidence and preparing the manuscript for final publication. 1975–77 were productive years, and by 1977 a large body of written sources mainly from the National Archives (the *Sturearkiv* and the *C-serie* mentioned above) had been assembled. This material does not only contain information of interest to monetary history; particulars of prices and wages had also been collected and were to be added to the publication as a separate appendix. Neutron activation analyses were made as a follow-up to the analyses performed with a scanning electron microscope, cf. section 8 below. Line-drawings were prepared to a scale 2:1 of all varieties of inscriptions, all central motifs etc. The principles for a variety- and die-catalogue were established, cf. section 4 below. However, the most time-consuming task was the extended study of the dies, which meant checking and analysing the preliminary results.

Since 1978 only the authours of the present article have been working on the project. With the creation of a chair in numismatics and monetary history, the project itself was brought under the newly founded Numismatic Institute. Inger Hammarberg was responsible for the örtugs and half-örtugs and prepared the manuscript of the catalogue which is divided into three main sections: *catalogue of varieties*, *catalogue of dies* and *catalogue of all finds and collections containing coins from the Sture period*. Brita Malmer was responsible for the pennies from the Sture period, the lowest Swedish denomination which is not represented in the Västerås find. The results are included in the monograph *Late medieval pennies in Sweden*, published by Brita Malmer in 1980. In 1982 responsibility for the publication of the örtug denominations was transferred back to the Royal Coin Cabinet. In future the Numismatic Institute will concentrate on the publication of the coin finds from the Viking Age.

4. *The catalogues of the monetary history of the Sture period, the örtug denominations. Methodological principles.*

At a time of methodological confusion within the field of humanities it would seem desirable to touch upon the methodological point of view that

has determined the principles not only for the die-study, but also for the catalogues of varieties and dies.

The die-study. Studying the dies of, for example, certain Viking-Age coin groups usually presents no problems. On the one hand, English and Scandinavian Viking-Age coins are struck in comparatively high relief and on the other, their designs have such characteristic and varying details that a particular die can be identified relatively easily (cf. Blackburn 1981, p. 31). The örtug denominations are much more difficult to study, with their low relief, their extremely uniform designs and inscriptions and their flan which is often only partly struck or overstruck. To establish with certainty whether two dies are linked or not can be an impossible task. The abundance of the material leaves only two ways of dealing with the problem of the uncertain dies; either we refrain from trying to identify them, or we assume a certain die identity by guesswork and hope to see it confirmed with the help of other coins at a later stage in the project.

The basic concept of historical and archaeological research in Sweden during the 1950s and 60s was that all research should be objective and be led without preconceived ideas, and that one should start off with a fundamentally critical attitude (cf. Odén 1974, p. 12 f.). This approach to research slowly lost ground during the 1970s whilst simultaneously a new, intuitive approach was favoured by many, though without gaining general approval (cf. Fritz 1981, Lönnroth 1981, M.P. Malmer 1980). Now, in the early 1980s, the tide seems to have turned again. For our study of dies, we have naturally chosen to exclude the uncertain dies.

The exclusion of the uncertain dies demands the formulation of a definition. When can we speak of an identifiable die, and when is a die to be considered uncertain? The classification of more than 32,000 die-impressions has been accomplished according to the following definition:

For an identifiable die we have at least two coins struck from this die, furthermore, these coins have at least three common criteria. We have then numbered the die.

By criteria we mean peculiarities and errors in the inscription or design as well as damages to the die itself. Fig. 6, die no. 280 01, gives an example of die-criteria. The definition implies that dies that do not meet these requirements have been kept apart. They represent only a small group (less than 10 % of the entire material). The small group consists of unclear die-impressions having less than three common criteria with another die-impression, but also of clear die-impressions that are not die-identical to another coin in the material. Accordingly c.90 % of the material consists of identifiable dies occurring at least twice. The small group includes the

remaining dies. It would no doubt have seemed tempting for representatives of the more intuitive research method in vogue in the 70s to add the small 10 % group to the larger group, thus obtaining imprecise results.

Catalogue of varieties. The methodological principles discussed above are of relevance to both the catalogue of varieties and the catalogue of dies. The coin varieties are superior to the dies. In our Sture period material a variety can include up to 30 dies. The present catalogue comprises all varieties of the Sture örtugs and half-örtugs that have been available to us in major public collections (among others Stockholm, Uppsala, Gothenburg, Malmö, Lund, Helsinki, Åbo, Oslo, Copenhagen and Dresden). These amount to some 640 obverse and reverse varieties of which 131 are örtugs. The catalogue contains detailed line-drawings of designs and inscriptions, examples of which are given in Fig. 6. Had an intuitive approach been favoured for the anonymous örtug denominations, the catalogue would certainly have started with those coins bearing the date (14)78 followed by those specimens 'resembling' them most etc. We have applied a strict, logical principle. Those elements that determine the placing of a particular variety are: 1) the central motive (*centralmotivet*); 2) the initial mark (*initialtecknet*); 3) the punctuation marks (*ordskiljetecknen*, first, second etc.); 4) other varieties in the inscription such as spelling or the presence of a date and its form. We see that in the logical grouping the date is subordinate to both the initial marks and punctuation marks. This method is not only satisfying for those who aspire to a research free of assumptions. It has the advantage that one need not at this early stage commit oneself to a point of view regarding dating and questions of interpretation, e.g. the interpretation of incomplete dates (Lagerqvist 1970 p. 131, 9c). The present catalogue is also easier to use than one arranged according to an intuitive approach: the various central motives, initial marks etc. are always placed in the same internal order.

In the catalogue of varieties we find all obverses in the series 001- and all reverses in the series 501-. The örtug denominations are distributed as follows:

Obverses, örtugs	001–073
half-örtugs	074–283
Reverses, örtugs	501–557
half-örtugs	558–849

Die catalogue. As regards the die catalogue it proved impractical to examine all the coins included in the catalogue of varieties. For the coins in question a photograph was usually insufficient when establishing die-links.



+ SCS'·ABIQVSRK'

* IOBSðD'εðRAX·SW'

☐ SCS'·ABIQVSRK

STED·STVRK·RIT'

SCS·HEIRNICH·E·B·

+ MØDET·K·KROSI'

* MØDET·K·KROSIK

☐ MØDET·K·KROSI

☉ MØDET·K·STED·KØ'

* MØDET·K·KROSI

Fig. 6. Above: Die no. 280 01. The die-criteria are marked in black. These are found at the initial cross mark and at the letters S, T, N, R, E, R, I, T as well as at the central motive, the crown. Below: Examples of central motives and inscriptions. Drawings Kåre Fagerström and Bo Zachrisson.

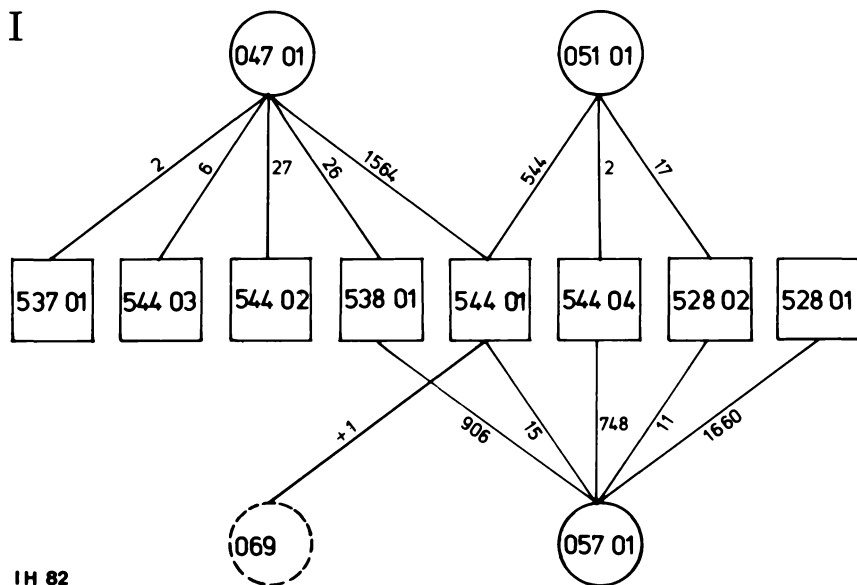
The actual specimens, as well as a large amount of comparative material was required. The study was, therefore, in the first place limited to the coins in the Royal Coin Cabinet's collection. For practical reasons the partly unconserved find-material had to be excluded. The die-study presented here comprises 16,108 identifiable örtugs and half-örtugs from the Västerås find, 558 half-örtugs from the KMK's exhibition and systematic collection, as well as a few isolated specimens. The identifiable dies are numbered within the respective varieties. The example already mentioned, Fig. 6, no. 280 01, is die no. 1 of obverse variety no. 280.

Die-chains. The die-links are represented graphically in the die-chain diagrams I–III. Circles represent obverses and squares reverses. The essential chronological results of the research project are incorporated in these diagrams. Due to limitations of space and in order to obtain a clear picture, only those coins with an 'identifiable' die (as defined above) on *both* faces have been included. Information about the number of specimens applies only to those coins included in the diagrams and must be regarded as figures on the lower limit. We may take, as an example, the obverse die 170 01 in die-chain III, the most frequent die in the Västerås find. In chain III, this die is represented by 5,614 specimens to which 79 coins can be added making up a total of 5,693 coins with die 170 01. The corresponding figures for the reverse die 617 01, also in chain III, are 3,761 and 3,767 respectively.

5. *Die-chain I. Anonymous örtugs/Hans.*

The 5,601 örtugs in the Västerås find are anonymous, uncirculated and struck in Västerås. They have been struck from 3 obverse dies belonging to 3 varieties, 047 01, 051 01 and 057 01. For the reverses, 8 dies have been used belonging to 4 varieties: 528 01, 528 02, 537 01, 538 01, 544 01, 544 02, 544 03 and 544 04. Die-chain I shows how they are linked. 73 örtugs are by definition uncertain and cannot be included in this diagram. There are 3,340 örtugs which have been struck from the obverse die 057 01, in combination with 5 reverse dies. Slightly smaller in number, 2,123 specimens were struck from reverse die 544 01, combined with three obverse dies. These figures are only for örtugs from the Västerås find. A certain similarity in design may be observed between some varieties. Variety 544 has a trefoil and three circles as accessory symbols near its central design. The trefoil reoccurs on the obverse die 057 01. Cf. Fig. 7.

One instance of die-linking and a case of similar varieties point to a connection between the anonymous örtugs and the period 1497–1512. In



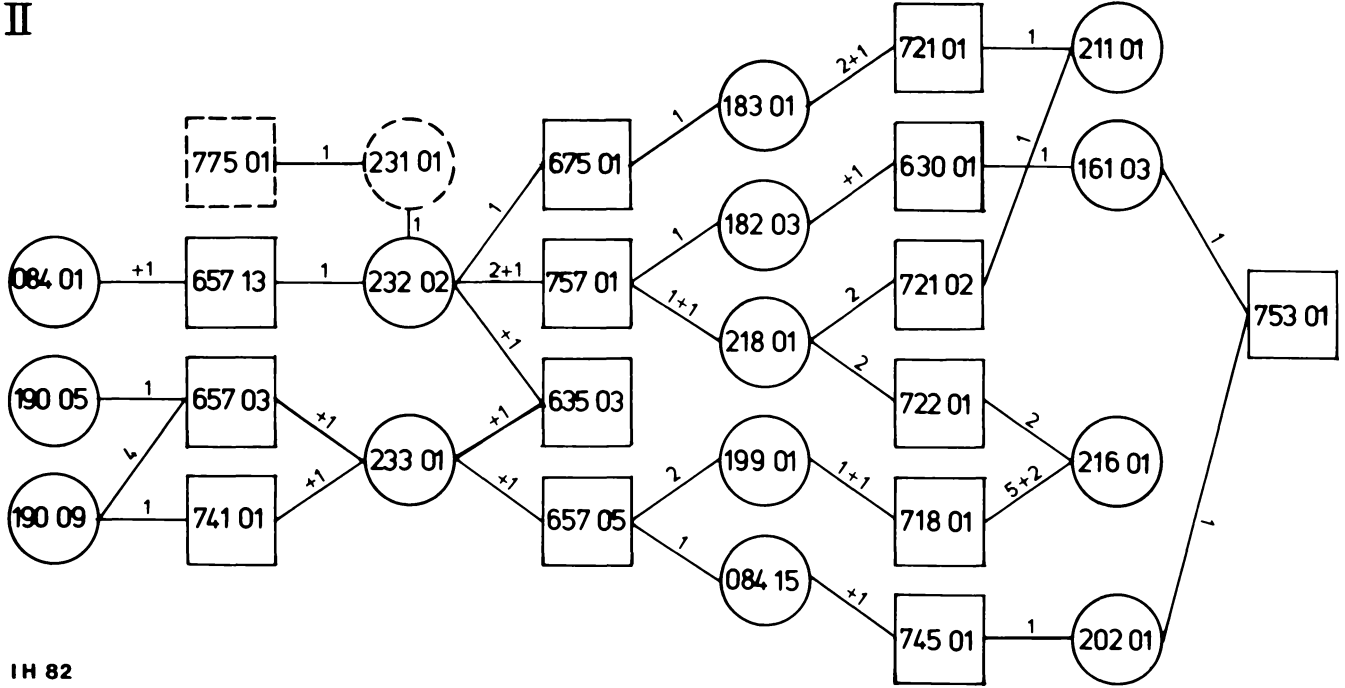
the KMK's collection there is a Västerås örtug, obverse variety 069, struck for Hans (1497–1501). The reverse is struck from die 544 01, the same die that occurs on more than 2,100 anonymous örtugs of the Västerås find.

There are two anonymous örtugs struck in Västerås bearing the arms of the house of Natt och Dag, which have been interpreted as alluding to Svante Nilsson Sture (1504–12). One specimen is in Uppsala University's Coin Cabinet, the other in a private collection in Gothenburg. Both coins have a reverse belonging to the above-mentioned variety no. 544, which in its turn includes a die used for striking a Hans örtug.

6. Die-chain II. Anonymous half-örtugs /Hans /Natt och Dag arms.

As mentioned in section 3, the Västerås find includes on the one hand an uncirculated, largely die-linked mass of some 12,000 coins, and on the other hand some 4,000 circulated coins. The various die-chains within this material show an extremely complicated pattern of die-links. Die-chain II (representing approximately one fifth of the circulated coins) contains a large number of links, but a small number of coins in each combination, quite the opposite to chains I and III where certain combinations are represented by several thousand coins. The die-chain of circulated coins includes 275 dies and just over 700 coins. For practical reasons a diagram of this size cannot be presented here. Die-chain II therefore presents only a small section comprising 30 dies and 52 coins. The KMK's systematic

II



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collection has been used as control group. The specimens coming from this collection have been marked on chain II by a + before the number. Cf. Fig. 7.

The half-örtugs in die-chain II were all struck in Västerås, with one exception: a die-link between the mints in Stockholm and Västerås. Two obverses struck for Hans, 232 02 and 231 01 are linked. The obverse 231 01 is further linked to a reverse 775 01 struck in Stockholm (Inger Hammarberg *SMPM* 4). Die-chain II shows the links between three groups of half-örtugs: first, those struck for Hans (1497–1501); secondly, anonymous half-örtugs with the *Natt och Dag* arms (alluding to Svante Nilsson Sture 1504–12); and thirdly, completely anonymous half-örtugs. The diagram shows the same connection as that seen in die-chain I, between anonymous coins and those of the period 1497–1512.

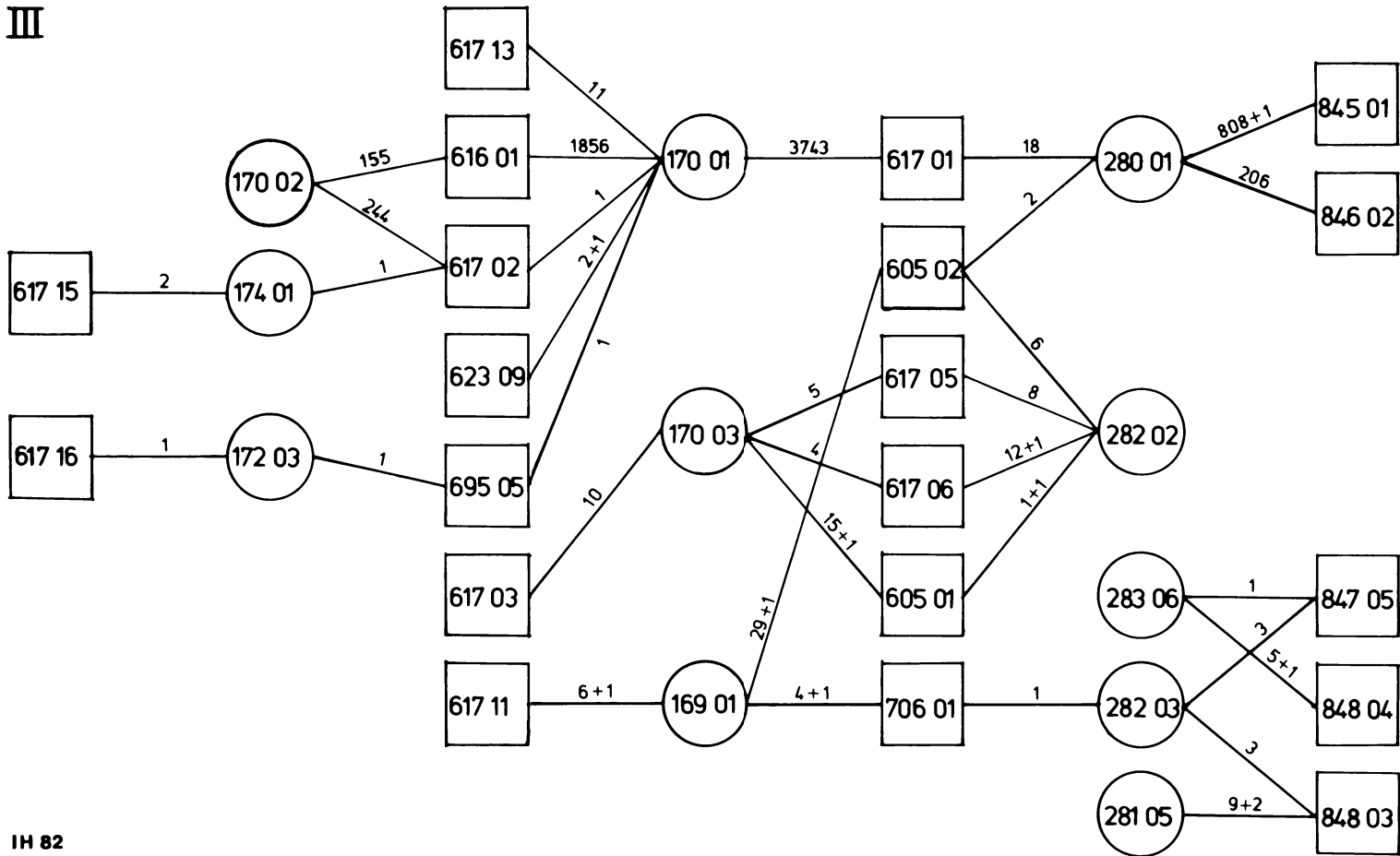
The obverses 232 02 and 233 01 give *Hans* as the authority in whose name the coins were struck. These are linked to reverses 635 03, 657 03, 657 05, 657 13, 675 01, 741 01 and 757 01. The *Natt och Dag* arms appear on the obverse of some coins and on the reverse of others: the obverses 084 15, 161 03, 183 01, 199 01, 202 01, 211 01, 216 01, 218 01 in combinations with the reverses 718 01, 721 01, 721 02, 722 01, 745 01 and 753 01. As to the *anonymous* coins, there are links between obverses 084 01, 084 15, 161 03, 182 03, 183 01, 190 05, 190 09 199 01, 218 01 and reverses 630 01, 657 03, 657 05, 657 13, 675 01, 741 01 and 757 01. The location of the die-links in the diagram illustrating die-chain II gives a probable dating with the earliest links to the left, although due to the fact that we lack a chronological basis for the anonymous coins, in this die-chain, a different order is also conceivable.

The trefoil, used as an accessory symbol on variety 544 in die-chain I, appears as a punctuation mark on variety 190 and 199 in die-chain II.

7. Die-chain III. Anonymous half-örtugs/ Ritter

Die-chain III represents 33 die-links between 6,061 anonymous half-örtugs and 1,083 half-örtugs bearing the inscription STEN STURE RIT, i.e. Sten Sture the Younger (1512–20). The coins were struck in Västerås and are mainly uncirculated. The corresponding die-identified half-örtugs (11 specimens) in the systematic collection of the KMK have been distinguished by an + before the number. Cf. Fig. 7.

There are six anonymous obverse dies, 169 01, 170 01, 170 02, 170 03, 172 03 and 174 01, and five obverse dies struck for Sten Sture the Younger ("Ritter"), 280 01, 281 05, 282 02, 282 03 and 283 06. The reverse dies can



be divided into three groups. Nine reverses, 616 01, 617 02, 617 03, 617 11, 617 13, 617 15, 617 16, 623 09 and 695 05, are linked with anonymous obverses. Six reverses, 605 01, 605 02, 617 01, 617 05, 617 06 and 706 01, are linked to both anonymous obverses and Ritter obverses. Finally, five reverses, 845 01, 846 02, 847 05, 848 03 and 848 04, are only linked to Ritter obverses.

The strongest connection between the anonymous coins and the Ritter coins is seen in the reverse die 617 01. This reverse is linked to the two most important obverses in this chain: the anonymous 170 01 and Ritter 280 01. As mentioned in section 4 above die 170 01 is that most frequently used in the Västerås find. More than one third of the coins in the hoard, 5,614 specimens, were struck from this single die, 3,743 in combination with reverse die 617 01. 1,034 specimens were struck with the Ritter die 280 01, of which 18 were with the reverse 617 01. The reverse die 617 01 is the one most frequently represented in the Västerås hoard, with 3,761 coins.

The large proportion of uncirculated coins found in die-chain III indicates that both the anonymous coins and the Ritter coins were struck during a limited period. The Ritter coins cannot have been struck before 1512 when Sten Sture the Younger became regent. It is likely that all the coins included in die-chain III can be dated between 1512–20.

8. Analyses of the silver and gold contents of the coins

The results of the analyses of 104 örtugs and half-örtugs by *scanning electron microscope* are reported in *SMPM* nos. 5 and 6 and have been discussed briefly above.

Trace element analyses were made of 9 örtugs and half-örtugs together with two lumps of silver, at the Royal Institute of Technology (Kgl. Tekniska Högskolan), Department of Analytical Chemistry, in the autumn of 1976. One of the lumps of silver was found together with the coins in the Johannes quarter in Västerås and the other was said to have its provenance in the Sala silver mines north of Västerås (Fig. 3). Both lumps showed a silver percentage of 99 %. The presence of 25 elements was recorded. The 11 pieces analysed, two lumps of silver and 9 coins, showed widely varying contents not only of copper and silver, but also of gold, calcium, chlorine and sulphur. Of the 11 pieces, 3 have higher gold contents: 0.2–0.7 %, whereas the remaining 8 show lower gold contents: 0.004–0.060 %. Three gold values were obtained for the lump of silver from Västerås: 0.062 %, 0.060 % and 0.060 %. The lump of silver supposedly coming from Sala showed the values: 0.19 %, 0.19 % and 0.18 %. Contemporary sources

mention the fact that ore from Sala contained gold (Granström 1940, p. 481 ff.). The origin of the two lumps of silver, one relatively rich and the other poor in gold, has not further been investigated.

During 1976–77, 121 örtugs and half-örtugs were submitted to *neutron activation analysis* in Kjeller, Norway. The analysed coins belonged partly to the Västerås hoard and partly to the systematic collection at the KMK. The copper, silver, gold and zinc contents were recorded. The proportions of zinc showed only very slight variations. The proportions of copper and silver agree well with the results obtained earlier with the scanning electron microscope. Our attention is therefore mainly directed towards the gold contents of the coins. As we have seen, the trace element analyses performed at the Royal Institute of Technology had already indicated that the material might be arranged into groups according to the gold contents. The 121 coins can be divided into 5 groups with the help of the percentage figures for the gold contents:

1.	0.001–0.0099	23 specimens	median 0.008
2.	0.01 –0.099	23	0.043
3.	0.10 –0.19	13	0.15
4.	0.20 –0.63	61	0.43
5.	1.08	1	–

The chronological distribution over the groups is shown on Table C. Coins with the date 1478 have high average gold contents and they are all to be found in groups 3–4. All the coins of Hans which were analysed, whether struck in Stockholm or Västerås, have high gold contents, group 4. The low and very low gold contents, groups 1–2, are found in coins bearing the Natt och Dag arms, and dated to the period 1504–12. However, high gold contents also occur during this period. All the Ritter coins which were analysed have low or very low gold contents; with the exception of one coin which belongs to group 3. The 61 anonymous coins analysed have either very low (8)-low (12) gold contents or high (39)- very high (1) gold contents; only one coin belongs to group 3. In the analysed material the dividing line between high and low gold contents falls in the period 1504–12. The difference in gold contents between the Hans and Ritter coins observed above, implies that the study of gold contents is a useful aid in dating anonymous coins. The anonymous coins have been shown to have both high and low gold contents. In die-chain I and II both groups 1 and 4 are represented. As we have seen in sections 5 and 6 above, die-chains I–II can be dated to the period 1497–1512. In die-chain III, which belongs to the period 1512–20, group 2 is represented.

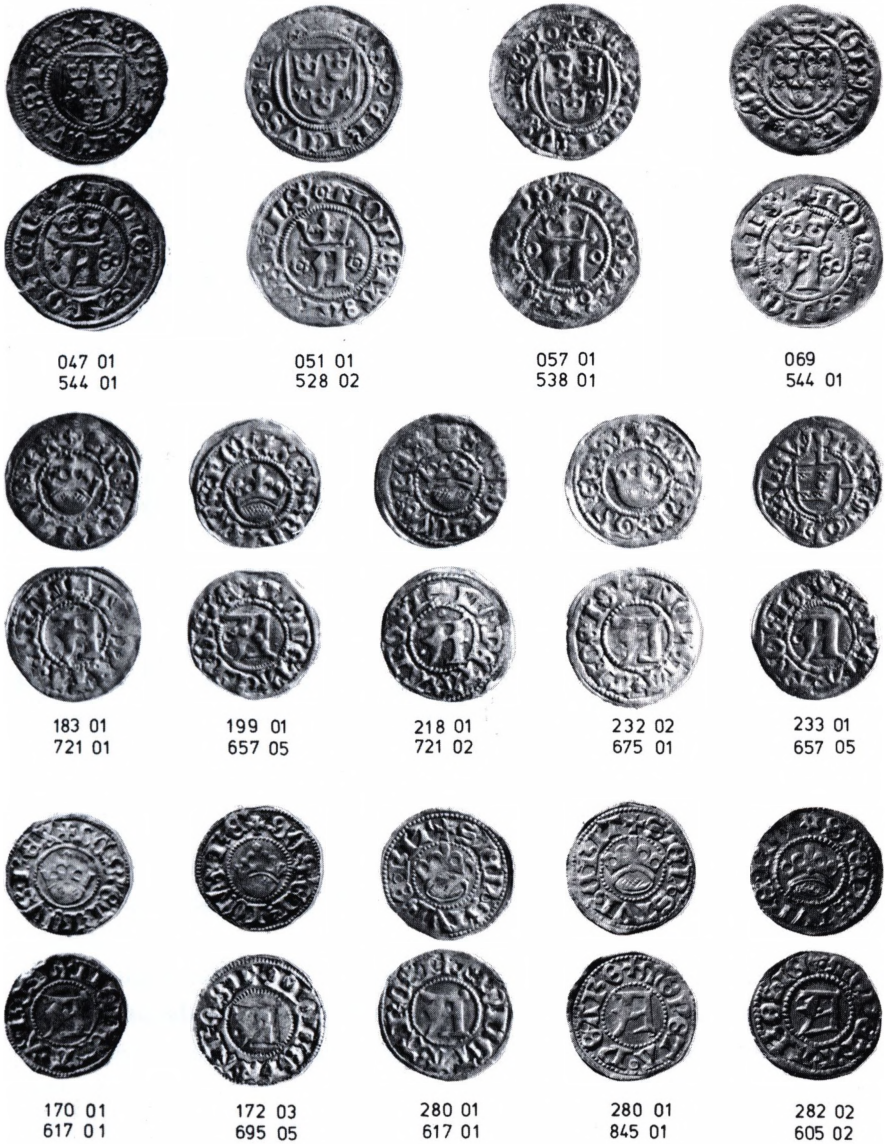


Fig. 7. The four coins in the top row belong to die-chain I, the five in the next row to die-chain II and those in the bottom row to die-chain III. The numbers indicate the coin's variety and die number. All coins are struck in Västerås.

The örtugs in the top row are anonymous SCS-coins, except for no. 069/544 01 which was struck for Hans 1497–1501. This coin is from the KMK's collection. The half-örtugs in the central row are anonymous SCS-coins, except for no. 233 01/657 05 which is struck for Hans 1497–1501. Coin no. 183 01/721 01 and no. 218 01/721 02 can be dated to Svante Sture 1504–12 by their coat of arms. The half-örtugs in the bottom row are partly anonymous SCS-coins (the two coins on the left), and partly Ritter coins 1512–20 (the three remaining coins). *Photo Gunnel Jansson and Jüri Tamsalu.*

	1	2	3	4	5
<i>Örtugs</i>					
SCS, 1478, Stockholm			1	2	
Hans 1497–1501, Stockholm				2	
Hans 1497–1501, Västerås				1	
RITTER 1512–20, Stockholm	1	2			
SCS-, Stockholm				6	1
SCS-, Västerås	3	2		8	
SCS-, Åbo		1		3	
<i>Half-örtugs</i>					
SCS 1478, Stockholm			10		
Hans 1497–1501, Stockholm				6	
Hans 1497–1501, Västerås				8	
SCS (1504–12), Västerås	3	1		3	
RITTER 1515, Stockholm	2				
RITTER 1512–20, Stockholm	8	5	1		
RITTER 1512–20, Västerås	1	3			
SCS-, Stockholm				12	
SCS-, Västerås	5	6	1	10	
SCS-, Åbo		3			
Total of analysed coins	23	23	13	61	1

Table C.

Distribution of analysed coins between the gold-content groups 1–5.

At all three mints, Stockholm, Västerås and Åbo, both the high and low gold contents are represented. In the analysed material the anonymous coins from Stockholm belong exclusively to groups 4 and 5.

9. Conclusion

Previously all anonymous coins from the Sture period had been attributed to Sten Sture the Elder (1470–97, 1501–4), except for the anonymous coins bearing the Natt och Dag arms and/or a ring-cross, which were attributed to Svante Nilsson (1504–12). From the die-chains found during the research project between 1972–82, it has become clear that a considerable proportion of the anonymous coins were struck at a later period.

The find-spot in the Johannes quarter is situated barely 100 m south of the place where we suspect the medieval mint of Västerås lay. In a well

known letter to the Regent Svante Nilsson in Stockholm dated 27 April 1511, Canon Arvid Siggesson of Västerås mentions that the mint workshop and the tools had been destroyed by a fire so that minting had to be moved to another location in the town until the mint could be rebuilt (the *Sturearkiv* no. 1185). The 12,000 or so uncirculated coins in the hoard, which were probably wrapped up in small bags, and the large lump of silver both indicate some sort of connection between the mint and the find-spot. We know from another letter that coins to the value of 200 marks could be struck in about four days, i.e. 4,800 örtugs or 9,600 half-örtugs (letter from Castellan Olov Jonsson of Västerås to the Regent Svante Nilsson in Stockholm, 20 July 1508; the *Sturearkiv* no. 989). It would seem logical to assume that the uncirculated örtugs and half-örtugs in the Västerås hoard, most of them struck from just a few dies (die-chains I and III), were produced during a very short time, possibly within a few days, during the period 1512–20.

Speaking *against* such a hypothesis is the existence of an örtug struck for Hans (1497–1501), the reverse of which is linked to die-chain I. The theory that all the uncirculated coins in the Västerås hoard – both örtugs and half-örtugs – were struck under Sten Sture the Younger (1512–20) therefore requires a second hypothesis as follows: The only known die-link between an örtug in the Västerås hoard and a Hans örtug is contemporary with the uncirculated örtugs in the hoard; i.e. it was struck with a 15–20 year old reverse die from Hans' reign that was reused under Sten Sture the Younger.

Speaking *in favour* of the hypothesis that all uncirculated coins in the Västerås find can be dated to the period 1512–20 is the economic crisis that prevailed under Svante Nilsson (1504–12). In the written sources complaints are voiced about the lack of coinage, e.g. in Dec. 1504 (*Sturearkiv* no. 663), July 1505 (no. 888), Dec. 1505 (no. 1643), Oct. 1507 (no. 1397), July 1508 (without no.), July 1510 (nos 219,1145), Jan. 1511 (no. 1159). By the end of 1509 the mint had actually run out of silver and work was discontinued (Nov. 1509, no. 1462, Febr. 1510 without no., cf. Hammarström 1956, p. 129 f). It seems plausible also to attribute the large number of uncirculated örtugs to Sten Sture the Younger's reign. There may be a connection between certain economic initiatives taken during the *early years* of his reign, such as the privileges granted to the silver mines at Sala in 1512 and the striking of Sweden's first heavy coin in the same year. The over 7,000 uncirculated half-örtugs in the hoard, see die-chain III, must in any case have been struck for Sten Sture the Younger. Alternatively the uncirculated coins may have been struck *at the end* of Sten Sture the

Younger's reign, which would fit chronologically with the two terminal coins of this hoard, the Danish klippings of 1518–22.

During the extensive research carried out on the dies of the circulated coins (die-chain II shows only about one-tenth of all the die-links), no connection could be established with die-chain III. No identical dies or varieties were discovered. The lack of a connection is even more remarkable considering that there is a chronological overlap between the circulated coins and the uncirculated ones in die-chain III. Die-chain III includes all Ritter coins struck in Västerås.

The most plausible explanation for the formation of the Västerås hoard seems to be the following: 1) a mass of coins consisting of örtugs and half-örtugs, fresh from the mint, was set aside at some time during the period 1512–1520; 2) in 1518 at the earliest, but possibly later in connection with the liberation war of 1521–22, the uncirculated coins, a lump of silver from the mint (of which the silver contents correspond to c.370 örtugs) together with some 4,000 coins taken from those circulating at the time, were hidden under two floor-tiles in a building, situated in the centre of Västerås.

Among the coins in die-chains I and III which were analysed, there are none with high gold contents. Even the lump of silver has a low gold content (group 2). This strengthens the impression that the large mass of uncirculated coins in the Västerås hoard were struck and more or less immediately hidden away for some specific reason unknown to us. If the minting of these coins were not part of the usual routine, it is less surprising that an old die should have been used. During the latter part of the Sture period, the örtug seems to have been a rare denomination, contrary to the stipulations in the mint-contract (cf. Thordeman 1936, p. 46, 49 f., and Lagerqvist 1970, p. 143, 149). If örtugs were seldom struck, it would have been quite natural to reuse old dies.

This review of the 1972 Västerås hoard and its significance for our knowledge of the monetary history of Sweden during the Sture period has had to be presented summarily. Many interesting aspects have not even been touched upon. For a more detailed discussion it will be necessary to publish the catalogues described in section 4 above, so that reference can be made to each coin's variety and die number, provenance, silver and gold contents etc. The responsibility for the publication of these catalogues has been assumed by the Royal Coin Cabinet.

Translation Beatrice Ringborg, Stockholm

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SMPM = *Sveriges Mynthistoria, Preliminära Meddelanden* (stencilled booklets).

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