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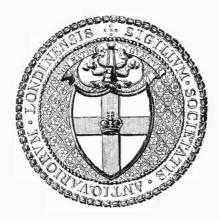
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# On the Early Use of Arabic Numerals in Europe

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Communicated to the Society of Antiquaries by

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FROM

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THE object of this paper may best be described by explaining how it came to be undertaken.<sup>1</sup> The date 1481, which occurs (Table XLIV. 15) on an Italian medal of the Sultan Mahomet II, by Constantius, happened to be called in question. On inquiry it became clear that there was no reason to suspect this particular date on the ground of the forms of the numerals. But it was equally clear that there were other problems of the same kind more difficult of solution, and that the only way to approach them with any hope of success was to collect and classify as large a mass as possible of securely dated instances of the use of these so-called Arabic numerals. As always happens, the material proved to be a thousand times more plentiful, and by no means less difficult of verification, than he who light-heartedly undertook the research had supposed.

I do not wish to depreciate the work of my predecessors, to even the most casual of whom I am indebted more than I can say; but of a systematic treatment of this subject I have found no example in English, and only one, of a limited sort, in a foreign language.

What is now offered, in the shape of over 780 classified examples, is nothing more than a *vindemiatio prima*. In no one of the numerous classes in which, with full sense of the inadequacy of the classification, I have arranged the materials, can I claim to have collected anything like a fully representative series. And it would have been absurd to attempt, within the limits imposed by time and space, to envisage more than one aspect of the question. The whole problem as to the source through which these Indian numerals, if they are, as they seem to be,

<sup>1</sup> The bare references which are made here and there to friends and correspondents, who have assisted in the collection or verification of material, are wholly inadequate to express the measure of my indebtedness; and some kind offices may, I fear, have escaped even that meagre acknowledgement. Nevertheless I must content myself here with a brief *gratiarum actio* to those who have placed me under very special obligation, such as Mr. C. R. Peers, to whose encouragement the completion of the paper is mainly due; Mr. J. A. Herbert, who from the beginning spared no pains to note material which might be (and always was) of service, and gave me particular facilities for working at it; Mr. Max Rosenheim, whose knowledge of German seals, coins, and medals has been of great service; Dr. Kurt Regling, of Berlin, who has taken infinite pains in connexion especially with my inquiries about German seals, a subject on which I also owe much information to Dr. August Ritter von Loehr of the Vienna Museum; Prof. David Eugene Smith, of Columbia University, a recognized high authority on the archaeology of mathematics; Herr Lockner of Würzburg, to whom I owe some of the material from that neighbourhood; Mr. Mill Stephenson, who has noted examples from brasses; Dr. George Macdonald, of the Scotch Education Office, to whose inquiries are due some interesting examples from Scotland; Mr. H. B. Walters, who has placed his great knowledge of English bells at my disposal; and M. J. A. Blanchet, whose bibliographical notes on the subject have been very useful.

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Indian, came to the West, has been avoided except for an incidental reference. That problem is the subject of numerous learned monographs. The present paper has nothing to do with these numerals before they were established in the West, but, once so established, seeks to show their chronological and local distribution in a somewhat clearer fashion than is possible without a large collection of grouped facsimiles. It is perhaps unwarrantable to call them facsimiles. Only a highly skilled draughtsman could do justice to the *nuances* of the forms. But for reasons into which it is unnecessary to enter, nothing better was to be had than the rude penmanship which is reproduced in these Tables. "And with this swerd," let me hope with Chaucer, "shal I slen envie."

In some ways it would be best to let the Tables, with the brief descriptive notes, speak for themselves. A few general remarks, however, may be of service, to explain the classification, to note certain instances which are omitted from the Tables, and to indicate certain lines on which further research might, one hesitates to say with profit, be made.

And first, as to the limits of the inquiry. As a general rule, I have tried to sweep into my net everything earlier than 1500 that came my way. But after that date I have exercised selection. Sometimes I have gone far into the sixteenth century; other Tables will show little after about 1510. The fact is that the instances become innumerable after 1500, and many reasons conspired against including much after the time when the use of Arabic numerals had become universal.

Secondly, since it has been quite impossible to verify everything, the mere fact of my inserting any example in the Tables must not imply that I guarantee its existence at the present time. I fear that much that Gough or even Wright described may have disappeared by now.

The first thirteen Tables deal with manuscripts, under which heading are included a few dates on drawings. These manuscript instances are arranged for the most part according to their date; but it has seemed convenient to make here and there certain departures from strict chronological sequence. Notably, in Table I are grouped together the earliest instances of the numerals as used practically in the modern manner, and also a number of examples of the forms assumed by the Boethian *apices*. These signs, used in reckoning on the abacus, although clearly for the most part, if not altogether, derived from a similar source to the signs used in algorism, assumed highly fanciful forms, and did not develop logically. Also, as the method with which they were associated ceased eventually to be used, and as they never occur outside manuscripts, they lack interest from the point of view of this paper; yet it seemed desirable to record those instances which were found in the course of search for other things.

In the remaining Tables (II–XII) the examples from MSS are grouped as far as possible century by century; certain Tables contain groups which stand on the

border lines and might be given by one authority to the end of one century, and by another authority (or by the same authority at a different time) to the beginning of the next. But within each century or chronological group an endeavour has been made to keep the MSS. of local schools together. Thus in Tables VIII foll. all the fifteenth-century instances are collected, but the English are kept together in VIII and IX, the German in X, the Italian in XI. This plan has the advantage of sometimes bringing out local characteristics very clearly, such as the 7-like German 5, the English o of the middle of the fifteenth century, shaped like a Greek  $\phi$ , the early upright Italian 4, and so on. Table XIII gives a few instances of Arabic numerals from Greek MSS.

The dating of these MSS., it should be stated, is not based on the forms of the numerals. They have been dated, for the most part by expert palaeographers, either according to substantial evidence, or by the general style of the writing. Nearly all the British Museum examples have been submitted to members of the staff of the Department of MSS., whose monumental forbearance under exceptionally trying circumstances it would be unpardonable not to record.<sup>1</sup>

The traps which beset the unwary in the dating of the MSS. are of course innumerable. The assumption that the date given for the composition of a work is the date at which the MS. was written, is obviously hazardous; incautiousness in this matter has produced not a few " early" instances of Arabic numerals. Such are the dates 1136, 1217, and perhaps 1245, which have been read in MSS. supposed to be contemporary.<sup>2</sup>

The numerals are first found in MSS. of the tenth century, but they cannot be said to have been at all well known until the beginning of the thirteenth.<sup>3</sup> During all this early period there is, perhaps naturally, considerable uncertainty in the forms, as a glance at Tables II and III will show. One group, of the end of the twelfth or the beginning of the thirteenth century (Table II. 5, 6), seems to be derived from an Eastern Arabic source, whereas the derivation of the more usual forms from Western Arabic is fairly well made out. But even here (cp. the 3 in Table II. 6, third row) one finds a fusion of the Eastern and Western forms.

In tracing development, especially in MSS, one is hampered by the fact that

<sup>1</sup> This applies especially to Mr. J. A. Herbert, whom I have mentioned above; but my warm thanks are also due to Dr. G. F. Warner and Mr. J. P. Gilson. I hasten to add that for any blunders of statement or interpretation which may be found in this and in the other sections of this paper, I alone am responsible.

<sup>2</sup> 1136: E. de Terreros y Pando, *Paleografía Española* (1758), p. 102, pl. 12 (530 of the Arab era). This is the date of the composition of the original work; the MS., so far as one can judge from an indifferent facsimile, appears to be of the thirteenth or fourteenth century. 1217: Terreros y Pando, p. 97, pl. 2. The script is certainly later. 1245: MS. Bibl. Strozzi, mentioned in nearly all the old treatises on the subject without verification, but doubted by modern authorities.

<sup>3</sup> Tassin and Toustain, *Nouveau Traité*, iv, p. vii, describe a fine MS. of the eleventh century, containing the works of the Benedictine Guido d'Arezzo, who gives the numerals in a treatise on the art of reckoning. I have not succeeded in verifying this.

a scribe, copying from a MS. of a century or so before his time, may, if he is not familiar with the notation, reproduce forms which had really gone out of fashion. If he were much accustomed to use Arabic numerals he would be less likely to do this. This I think is the explanation of a very puzzling set, or rather sets, of numerals in a MS. of the late thirteenth century (Table V. 1). I confess that had I come across this MS. at the beginning of my search, I should have thought twice before going on. Here we have in use, alongside of a fully developed form of 2, a form like a pruning-hook, of which the only other instances which I have found are in MSS. of the twelfth, or, at the latest, early thirteenth century (Table II. 2, 3). Then there is a very curious form of 3, like the pruning-hook 2 with an extra line through it, alongside of a well-developed modern 3. To complete our perplexity comes a fully developed upright 7, beside the ordinary lambda-shaped form. The MS. contains elaborate astronomical tables, and the solution of the confusion probably is that the scribe was compiling from various MSS. It might be said that, if that were so, we should find the peculiar forms confined to certain columns, and not used along with the ordinary forms; but if he were familiar with only these ordinary forms he would be likely to intrude them here and there.

The upright 7 occurs in the tenth-century MS. which comes at the very beginning of the Tables; also in the two MSS. already mentioned as showing the pruning-hook 2 (Table II. 2, 3; in the latter we have also the lambda-7); in a MS. at Siena which has been dated to the thirteenth century (Table IV. 8); in an Italian MS. at Florence (Table VII. 16) which is generally admitted to be of the early fourteenth century, and which also shows the upright 4 and is, indeed, so far as the numerals are concerned, extraordinarily advanced. After that, I have failed to find any instances until after 1400 (see Table XI). Yet we need not say in despair that there is no rule; these upright 7s are quite exceptional, and the occurrence of one in a MS. is prima facie reason for suspecting a comparatively late date. If these exceptions serve to impress upon us the truth that scientific exactitude is not attainable in palaeography, they will do no harm.

The forms that afford the best criteria are 2, 4, and 7; next comes 5, but it is the most freakish of all figures, and therefore a little untrustworthy. The others are practically negligible.

Allowing for exceptions, it may be said that the three-stroke form of 2, as opposed to the old 7-shaped form, does not appear before the second half, and is quite rare before the end, of the thirteenth century. The transition is well seen in an English MS. of about 1300 (Table V. 7). By the middle of the fourteenth century the old 7-shaped form has practically disappeared (see, however, Table VI. 9). As to 4,' there are a few examples in which a slight lifting of one of the legs

' Mr. George Macdonald, of the Scotch Education Office, calls my attention to a form of 4 resembling + used in certain Scotch accounts, e.g. those of the Lord High Treasurer in the Register House, Edinburgh, where the 4 in 1545 is so made, or Andrew Halyburton's Ledgers (1493-1503).

gives to the old form an appearance of the modern (*e.g.* Tables IV. 2, VI. 16) These are, however hardly misleading. The Florence MS. (Table VII. 16) has already been mentioned. The transition to the upright form begins very gradually after the middle of the fifteenth century in England (the latter half of Table VIII shows this clearly). Italy, however, is far ahead of other countries in this respect, showing a fully developed modern form both in monuments and in MSS. quite early in the fifteenth century.<sup>1</sup>

Of 7 I have already spoken.

5 shows many fantastic forms, but the general essential of the sign is the same. A curious intrusion of a Roman V into the Arabic series is shown in an early thirteenth-century MS. (Table IV. 2). This is of interest in connexion with the probability that what we call the Arabic 5 was an adaptation of the late Roman form.<sup>2</sup>

The 7-shaped German form of 5 is well illustrated in Table X. In MSS it is superseded early in the sixteenth century by the more modern form; elsewhere it lasts longer. It is of course an intelligible development from the older form; but as soon as the upright 7 became established, it had to disappear. The instances analysed in Tables X and XXII illustrate the conflict.

The series given in Table XIII from Greek MSS. are derived partly from Eastern Arabic, partly from Western sources. No. 2 is exactly the same as the series in the eleventh-century Chartres MS. (Table I. 7). Nos. 3 and 8 are purely Western in appearance, save for the inverted 7 in the latter. Nos. 1, 4, 5, and 6 point to an Eastern Arabic origin; note the circular form of 5 in two of them, and with some of the forms (2, 3, 4, 5, 7) compare those in the Berlin MS. (Table II. 6).

After the MSS. I have placed series from British monuments. Although the material is scanty, and I have by no means collected all the known instances, it is not out of a mere false patriotism that I have placed them first. The Wells numerals (Table XIV. 1) are among the most interesting, and probably the earliest to be found anywhere outside MSS., even if we allow that fashions of epigraphy are apt to change more slowly in monumental than in manuscript work. The upright 7 from Elgin (XIV. 4) may possibly be traced to foreign influence; it is certainly early for this island. The tendency to assimilate numerals to letters is noticeable in dates such as that of 1503 from St. Cross (Table XIV. 12) or that of 1534 from Eccleston (Table XIV. 20), and more especially in some of the brasses in Table XVI. The h-shaped 5 is found reversed in a date in Brading Church, Isle of Wight, which has been read Mld13, but which, as Mr. Peers points out, is really **A** (for Anno) 1513. (See Supplementary Table, LI. 13.)

<sup>1</sup> A Heidelberg MS. from Kloster Salem shows the rivalry between the old and the new form in the years 1494 (1499, the scribe using one form, the miniator another. *Anzeiger für Kunde d. Deutschen Vorzeit*, 1867, p. 161.

Found, e.g., on coins of Justinian I, struck in A. D. 541-2 (W. Wroth, Brit. Mus. Catal. of Imperial Byzantine Coins, i. p. 31, no. 56).

Pages could be filled with instances of doubtful, misread, or misinterpreted dates on English monuments. I have relegated some of them to a footnote.' Next follow the examples from Germany and German lands, more especially

Next follow the examples from Germany and German lands, more especially Austria. The evidence from the latter country is very plentifully published in the *Mitteilungen der kaiserlich-königlichen Central-Commission für Erhaltung und Erforschung der Baudenkmale*, the first series and the Neue Folge, which I have abbreviated as *M.C.C.* and *M.C.C.*, *N.F.* I have found no periodical giving such plentiful illustrations of monuments from Germany, with the result that examples of the use of Arabic numerals may seem to occur more frequently in Austria, as compared with Germany and other countries, than is really the case. Italy, for instance, is, I fear, poorly represented in my Tables, although a great deal of evidence exists, to my knowledge, in an unpublished form. Of the two countries, Germany and Italy, it is racially characteristic that while the Germans seem to

<sup>1</sup> The Helmdon mantelpiece, a stock subject for discussion in the eighteenth century (Philosophical *Transactions*, 1731, i, fig. 55, at p. 190), supposed by many to bear the date 1133, cannot from its style have been earlier than the late fifteenth century. There was a somewhat similar oak chimney-piece at Widgel Hall, Herts., perhaps of 1516 (op. cit. 1735, p. 119), though the 16 has been explained as 1. G. The most ludicrous things have been written about a cruciform arrangement of figures at Castle Acre Priory (J. H. Bloom, Castle and Priory at Castle Acre, p. 25), which might conceivably be meant for 1480, but is certainly not so early. The figures 1393 on a brick illustrated by Mr. Rider Haggard in A Farmer's Year (1906), p. 323, and since presented by him to the British Museum, appear from their style to date from the seventeenth century at the earliest. The iron scutcheon plate on the south door of the nave at Rendcombe Church, Gloucestershire, has six signs, of which the first, second, fourth, fifth, and sixth might be read as 10 417; but the third can hardly be explained as a figure. See Arch. Journ. vi. 291. A curious puzzle is presented by the date 1410 which was published in the Antiquary, xxxviii, p. 258, as from the brass of John de Campden in St. Cross, Winchester. No such date is to be seen on that brass, and all inquiry has failed to elicit an explanation. Either the facsimile given is a clever invention, for the forms are most plausible, or the person who sent it to the Antiquary has confused his notes as to the provenance of the date. It ought to be inquired into, as, if genuine, it (with the Fountains seal, Table L. 6) is the earliest English instance of the kind, saving the Wells numerals.

1485 occurs on a brass (of John Pulter) in a slab on an altar-tomb (of earlier date) in the north chapel of Hitchin parish church. The forms (modern 4 and 5) show that the numerals are later than the alleged date [Rubbing communicated by Mr. Murray Kendall]. The date 1489 given by Haines from a brass at Fressingfield, Suffolk, as being in Arabic numerals, is in Roman. 1490 on the brass of Wm. Fordmell, Vicar of Borden (Belcher, *Kentish Brasses*, i, p. 12), cannot be contemporary.

1265 on a bell at North Wootton near Wells (W. E. A. Axon, *Proc. Manchester Lit. and Phil. Soc.* 1876, pp. 173 ff.) is for 1625, as, Mr. H. B. Walters assures me, is proved by the work. The date 1489 on the bell at Eglingham, near Alnwick, also mentioned by Mr. Axon, is in Roman numerals. The signs which have been read 1508 on a bell at Rayleigh, Essex (Deedes and Walters, *Church Bells of Essex*, p. 40), are probably not numerals at all; the third sign looks like u or n. The reading I h u s (for *Jesus*) has been suggested, but is unlikely. I h n s for *Johannes* seems to have even less in its favour.

English dates which I have not found time or opportunity to verify or use, but which should be included in any corpus, are 1483 and 1494 from Fountains, 1489 and 1494 from Ripon, all with the old forms of 4 (*Notes and Queries*, ser. iv, p. 375). Mr. H. B. Walters informs me that early dates (for bells) occur on bells at Greystoke, Cumberland (1524), Wood Ditton, Cambridge (1544), and Elmley Castle, Wores. (1559, now recast). Mr. G. L. M. Clauson has kindly procured for me rubbings of the dates on brasses in Eton College Chapel, viz. 1525, 1532 (Thomas Smith), 1545 (T. Edgcumb), and 1560 (Robert Stokins). The last shows the o with a slanting stroke through it.

be ahead in the practical use of the numerals, the Italians lead the way in the development of their forms. The fact that France produces hardly any examples cannot, I think, be wholly due to the accidents of search or publication.

German examples are also well represented because it happens to have been a German who published the most elaborate study of the whole subject which has hitherto appeared. Mauch, in his articles in the *Anzeiger für Kunde der Deutschen Vorzeit*<sup>1</sup> for 1861, deals very fully with the German evidence, drawn from architectural monuments, seals, etc. He has, however, little to say about MSS., and even his monumental instances are mostly drawn from a comparatively limited district. His articles are, nevertheless, the only serious attempt known to me at a systematic treatment of the subject.<sup>2</sup>

It is hardly necessary to mention the date 1007 on a gravestone at Katharein near Troppau, since it is universally rejected.<sup>3</sup> But the following require to be dealt with:

1299. This, which appears to be a sculptor's mark on a gravestone of the Count of Katzenellenbogen, in the Schlossgarten at Biberich, seems to be very doubtful. [The only illustration I have seen is in Hefner-Alteneck, *Trachten*, i. Taf. 27.] I have not included it in my Tables.



Fig. 1. Date at Weissenburg.

Fig. 2. Date at Pforzheim.

1327 (fig. 1). On the church at Weissenburg im Nordgau (Mittelfranken). The contemporaneity of this is with justice doubted by Mauch (*Anzeiger* (1861), p. 81). Cp. the 1439 of Table XVIII. 4.

1371 (fig. 2). Schlosskirche, Pforzheim. See *Anzeiger*, 1861, p. 83. The evidence as to this is highly unsatisfactory. Herr E. Wagner of Karlsruhe, who kindly made inquiries for me, elicited the fact that an inscription in memory of Luitgard Golndenerin with this date is now painted on the wall of the church; but it is uncertain whether it was always painted on the wall, or whether when the church was restored in 1880 the plaster was laid over the possibly still existing slab. The inscription is given by Gehres, *Kleine Chronik von Pforzheim* (Carlsruhe, 1811), p. 30. It is clear that the forms as they now stand are useless; but even those given in publications earlier than 1880 seem to me very doubtful for the date.

1398. This supposed date at Constanz is not contemporary, the context showing that the inscription cannot be earlier than 1462. See J. Marmor in *Anzeiger*, 1861, p. 268 f.

<sup>1</sup> Hereafter usually referred to simply as *Anzeiger*.

<sup>2</sup> Some information may also be gained from Denzinger's articles in the Archiv des histor, Vereus von Unterfranken und Aschaffenburg, ix (1847), pp. 163, 178.

M.C.C. xi (1866), p. xlvii; Anzeiger (1876), p. 34.

The dated German seals are among the most interesting and also the most treacherous examples with which we have to deal. In Germany and in Austria, in the second half of the fifteenth century, it became quite the fashion for any person or corporation, to whom a grant of arms was made, to place the date thereof on a seal.<sup>1</sup> There are, however, undoubted instances of the practice in the four-teenth century, which will be found in the Tables. Here we may deal with a few doubtful or otherwise interesting examples.

1235 (pl. XIX, no. 1). Seal of Gottfried von Hohenlohe. See Anzeiger, 1861, p. 48; 1866, p. 265; 1871, p. 261 f.; Albrecht, Die Hohenlohe'schen Siegel des Mittelalters, no. 6; Fürst Hohenlohe-Waldenburg, Sphragistisches Album, Beilage A zu Hohenlohe; G. A. Seyler, Abriss der Sphragistik, p. 28. No original impression is known; but there are or were two examples of the matrix in the Fürstlich Hohenlohe-Neuensteinsches Kunst- und Raritäten-Cabinet in Kirchberg a. d. J., one in copper, the other in silver; both 0.5 cm. thick and smooth at the back. Both matrices are the same, but one is better engraved than the other. One of these matrices seems to be mentioned as early as 1644. No other seals of the thirteenth century dated in this fashion are known. The work is extremely good. It has been suggested, in explanation of the early occurrence of these numerals, that Gottfried was frequently in Italy. That is no explanation, since the numerals would be as surprising in Italy as in Germany. The Trinity College, Cambridge, MS. (Table III. 1), supposing it to be rightly dated, shows that the forms of 2 and 3 are just possible in the first half of the thirteenth century. But I have found no other instance of this form of 2 so early. If the last figure is a 5 (and it can hardly be, as Seyler reads it, a 3 reversed, seeing that the engraver had just made one the right way), I can find no parallel to it until the sixteenth century, when it is furnished by the Brensbach date of 1526 (Table XXII. 12). The possibility of this seal being a forgery of the sixteenth century must therefore not be overlooked.

It is strange that there are extant two matrices and no ancient impressions. 1320. Trostberg (pl. XIX, no. 8). The wax impression from the Germanisches Nationalmuseum, Nürnberg, shows clearly that we have to do with a sixteenthcentury seal. With the looped forms of the numerals compare those in

'A list of dated seals from 1369 onwards is given by Mauch in *Anzeiger* (1860), pp. 13 ff. See also E. Melly, *Beitrage zur Sigillographie*, and the various volumes of the *M.C.C.* referred to in the descriptions of Tables XXII–XXVI. Outside Germany early seals with Arabic numerals are very scarce, if indeed they occur at all before the sixteenth century. England, curiously enough, offers an isolated example as early as 1410 (Table L. 6). G. Demay, *Inventaire des Sceanx de la Normandie* (1881), p. vii, gives 1503 (Philippe de Clèves, Seigneur de Ravenstein), 1511 (Denis, Abbé de Loos), and 1515 (George, Duke of Saxony) apparently as the earliest instances of the use of Arabic numerals for this purpose known to him ! For some information as to German seals (which, however, reached me too late for incorporation) I have to thank Dr. E. Gritzner of Weimar ; he notes, for instance, the seals of the city of Munich of 1478, and of Weissenhorn in Bavaria ("S' civium in Wessenhoren 1476"). Dr. Theodor Hampe has kindly enabled me to obtain reproductions of a certain number of seals in the Germanisches Nationalmuseum at Nurnberg.



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Table XXII. 4, 15. The seal is mentioned in *Anzeiger* (1866), p. 265; by G. A.
Seyler, *Abriss der Sphragistik* (1884), p. 28, and elsewhere, without suspicion.
1408. "Sigillum Universorum Civium in Marchekk." Melly, *Beiträge*, pl. i.

1408. "Sigillum Universorum Civium in Marchekk." Melly, *Beiträge*, pl. i. and p. 37. Melly says "the work shows that the date 1408 cannot refer to the making of the seal, but to a renewal of the grant of arms, or else, more probably, it arose from an engraver's mistake for 1480".

1410. Gars. Written 14x (with the old form of 4). M.C.C. xix, p. 88. Not contemporary.

1439? (pl. XIX, no. 2). Seal of Otto von Henneberg, Germ. Nationalmus., Nürnberg. This is the identification given in *Anzeiger* (1859), p. 250, but the date is queried. The last digit looks like a 4. Further, Otto V, the only one who can be in question, was only two years old in 1439. He died in 1496. The date may be 1484. The inscription is "S. oct. von Gots gnade gve und her v. henbg".

1449. Markt Veldkirchen. *M.C.C.*, p. cxxxiv. This has the modern 4, and looks altogether more modern than the date.

MCCCCA = 1470. Print from seal of Plebanus John of St. Moritz in Augsburg. On this, which is interesting from the point of view of notation, see below (p. 150).

1488. On a seal of the city of Baden (Lower Austria) commemorating the siege by the Turks in 1529. The date is meant for that of the Wappenbrief, but should be 1480. It has the upright 4. A similar seal with the right date, 1480, was engraved in 1566. M.C.C. ix, p. v.

Table XXVII records a few German examples from miscellaneous objects, some quite late, but interesting because of their fantastic forms.

The reproductions of examples from German paintings (Tables XXVIII, XXIX), as of those of Italy and the Low Countries, have been taken for the most part from the facsimiles in the official catalogues of the collections mentioned. These sources, supplemented by a few notes of my own from actual pictures, ill represent the mass of interesting material which this class of objects affords.

In Table XXX woodcuts, metal-engravings, and printed books have been lumped together, perhaps not very scientifically.<sup>1</sup> The list of examples from printed books might of course have been made enormously larger, but with doubtful profit.

Among the German coins and medals I have not included the Schaumünze of Maximilian and Mary of Burgundy bearing the date 1479, and the ages (19, 20) of the pair, because it is a later reproduction, based on the contemporary medal by Candida.

<sup>1</sup> My thanks are due to Mr. Pollard and Mr. Scholderer for information with regard to early printed books, both German and Italian. I am assured that the mark of Caxton, which appears to combine an ancient 4 with a modern 7, should not be regarded as embodying a date.

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The series of Swiss coins, and of coins, jetons, and medals of the Low Countries, are in various ways interesting; the former (Table XXXIV. 1) as affording the earliest known instance of a Western coin proper with date in Arabic numerals; <sup>1</sup> the latter as showing a fairly continuous run of dates from the last quarter of the fifteenth century onwards, and illustrating the reluctance of the old forms of 4 and 7 to disappear.

The forms of the numerals 2, 3, 4, 5, which occur on certain *rifacimenti* of the famous late fourteenth-century medal of Constantine seem to me to belong to the early sixteenth century, and to be Flemish. Cp. *Num. Chron.*, 1910, pp. 115 f.

In connexion with these examples from the Low Countries I may notice the puzzling dates on the Flemish tapestry of the "Triumph of Chastity" in the Victoria and Albert Museum, to which Mr. Maclagan has directed my attention. The date 1507 (with the lambda-7) is quite normal, and suits the style of the work. But on the same piece is a date which can as it stands only be read as 1570 (with



Fig. 3. On a painting by Jean Foucquet.

the modern 7). As there is considerable space between the 7 and 0 it may be that the bottom stroke of a Z-shaped 2 was omitted in weaving, as Mr. Maclagan suggests, in view of the carelessness or illiteracy that is elsewhere perceptible in the inscriptions. The date would then be 1520, representing the date of the completion of the work. Other explanations suggest themselves (as a mistake of 1570 for 1507); but they are less probable.

Table XL includes a few medals, some of which are French, others perhaps Italian, while even in those which are certainly French Italian influence is strongly felt. French evidence is again curiously lacking. It is convenient here to note the graceful instance (1456) from the portrait by Jean Foucquet in the Liechtenstein Collection, which, since it hardly admits of tabulation, is reproduced in fig. 3. Another early date, 1461, is said to occur on a portrait by Nicolas Froment in the Uffizi.

Tables XLI and XLII are compiled, as I have already indicated, chiefly

<sup>1</sup> The earliest occurrence of a date in Arabic numerals on a coin is found in the reign of Roger of Sicily, 533 A.H. = 1138 A.D. See E. v. Zambaur, *Contributions à la Numism. Orientale, Num. Zeitschr.*, xxxvi, p. 83. But this occurs as part of an Arabic inscription. I owe the reference to Mr. J. Allan.

from official catalogues.<sup>4</sup> Table XLIII is mainly from Fortnum's *Majolica*.<sup>4</sup> Tables XLIV and XLV, on the other hand, are nearly all compiled from original medals, plaster casts, or good photographic reproductions. Research has confirmed much that seemed doubtful in this group; thus the Carrara medals, dated 1390, are now generally admitted to be contemporary.<sup>3</sup> The incised dates on Table XLIV. 5, 6 cannot be doubted. The appearance of the old form of 4 in Table XLIV. 12, 13 is explained in the notes to the Table.<sup>4</sup>

Table XLVI, which it might have been hoped would be large, is rather inadequate. A certain number of additions will be found in Supplementary Tables L and LI. On the other hand, Italy affords one of the most striking instances of the necessity of some such collection as I have endeavoured to make: the date 800 on the sarcophagus of Pagavus Petrasanta at Milan, which is obviously and without question of late origin.<sup>5</sup> I notice also the date 1322 on a piece of artillery (which was in existence at Mantua down to 1849) as being exceedingly doubtful in the form illustrated and accepted as genuine by Rocchi.<sup>6</sup>

A curious problem is presented by the 1 40 reproduced in fig. 4. The numerals are incised on the sole of the right sandal of a statuette of Marcus

<sup>1</sup> The date 1391, on a painting by Spinello Aretino, will be found in the Supplementary Table L. 5, having been recently sent me by Mr. A. H. S. Yeames. 1464 is to be seen on a painting by Antonazzo Romano at Rieti (*Rassegna d'Arte*, 1909, p. 43) and on the banner with Our Lady protecting Perugia painted by Benedetto Bonfigli (Heywood, *Perugia*, at p. 299).

<sup>2</sup> l have not included the two examples of 1519 on two pieces of Gubbio ware (Fortnum, p. 29) because of their suspiciously modern appearance.

<sup>3</sup> See especially Guiffrey in *Rev. Num.* (1891), pp. 17-25, and J. von Schlosser in *Jahrb. d. kunsthist.* Samml. des A. H. Kaiserhauses, xviii (1897), pp. 64 ff.

<sup>4</sup> This table of Italian medals may claim to be fairly representative ; but I have not been able to verify the following : 1455, Franc. Sforza (Armand, *Mcdailleurs italiens*, ii. 26 1, perhaps not contemporary); 1460, Borso d'Este (Heraeus, pl. lii. 1); 1467, plaquette by Enzola (Armand, i. 46. 13); 1490, Unknown woman (Armand, iii. 183 D); 1498, Gioacchino della Torre (Armand, ii. 71. 10); 1498, Gianfrancesco della Rovere (Armand, ii. 106. 22); not to mention some later than 1500. The dates 1488 on a medal of Francesco Accolti and 1498 on one of Ser Ceccone de' Baroni, and indeed the medals themselves, are false. (See *Rev. Num.* (1895), p. 460, and *Burlington Magazine*, Oct. 1909, p. 31.) The 8s in the date on the Accolti medal are like a recumbent  $\infty$ , a shape which comes in towards the end of the sixteenth century. See Table XII. 13.

<sup>5</sup> F. Burger, *Gesch. des florent. Grabmals* (Strassburg, 1904), p. 34. Mr. A. H. S. Yeames has kindly reported to me a number of interesting examples; those of which I have been able to obtain clear photographs are entered in the Supplementary Tables. The others are from the armorial tablet in the Court of the Bargello at Florence : 1437, 1439, 1445, 1448, 1456, 1463, 1475, 1487. Other instances which I have noted, but not yet succeeded in verifying satisfactorily (even to the extent of learning whether they are in Arabic numerals at all), are : 1456, bust at Berlin, inscribed ALEXO DI LVCA MINI (Venturi, *Storia dell' arte ital.*, vi, p. 636, doubts the inscription); 1461, Berlin, terracotta copy of a Madonna by Bellano (Venturi, p. 487, suspects this inscription); 1475, tomb of Lorenzo Roverella, in church of San Giorgio di Ferrara, by Ambrogio da Milano (*ib.* p. 620); Cremona, Duomo, fragment of tomb of S. Arialdo, signed zo. ANTONIO. AMADEO. F. OPVS. 1484 (*ib.* p. 901).

" L'Arte, ii (1899), p. 348.

Aurelius on horseback, a copy of the famous statue on the Capitol.' The statuette (which is in the Vienna Museum) has been ascribed to L'Antico,<sup>2</sup>



Fig. 4. The date 1470 on a bronze statuette of Marcus Aurelius, Vienna Hofmuscum.

although the date creates serious chronological difficulties. However, in his splendid monograph <sup>a</sup> on L'Antico, which has just appeared, Dr. H. J. Hermann definitely discards the attribution to L'Antico, chiefly because of the date. He urges that the figures must represent a date, not an inventory-number, since few

Itofmuseum. collections at that period could have contained so many as 1470 objects of this kind. I may add that an inventory-number would be incised after the object had been acquired for the collection, whereas these figures have the appearance, at least in the photograph, of having been incised in the soft material of the original model. It is just conceivable that it was an opus-number, incised by the artist at the last moment before casting. The point, however, which chiefly concerns us at present, is this : if this is a fifteenth (*a fortiori* a sixteenth) century *Italian* bronze, how come these archaic forms to appear on it; forms that had long vanished from Italian arithmetic, unless the evidence marshalled in this paper contains even more serious gaps than I had suspected? There is nothing northern about the style of the bronze, although it is difficult to judge of such a matter in a close copy of an antique. Perhaps the most probable solution is that it is the work of a northern artist who had settled in Italy, but had not acquired the Italian style of writing.

Dr. Hermann points out that the statuctte may well be connected with the repairs to which the statue was subjected in the reign of Paul II. These were begun in 1466, and as the work was still unfinished in 1470,<sup>4</sup> the statuette may well be connected with the restorer's task. But whatever be the explanation of the numerals, analogies must be found before we can accept them as having been incised by an Italian in the fifteenth or early sixteenth century.

The Italian engravings and printed books do not offer much of interest, but the Italian reproduction of a German date in Table XLVII. 8 is worth noting. An important example of the year 1461 was recently brought to my notice by Mr. A. M. Hind, and will be found in Table LI. 1.

Table XLVIII should be used with great caution, both the authorities on which it is based, Rottiers and Belabre, being untrustworthy. But I could not bring myself to exclude the evidence from this outpost of Western culture. Italian influence was evidently strong there. As the knights left the island in

- <sup>3</sup> Jahrbuch der kunsthist. Sammlungen des A. H. Kaiserhauses, xxviii (1910), pp. 268, 271.
- \* E. Müntz, Les Arts à la Cour des Papes, ii. pp. 27, 92 ff.

<sup>&</sup>lt;sup>1</sup> I am obliged to Ritter A. von Loehr for the photograph from which the illustration is made.

<sup>&</sup>lt;sup>2</sup> See, for instance, J. von Schlosser, Werke der Kleinplastik in der Skulpturensammlung des A. H. Kaiserhauses, i, p. 4, pl. x.

1522, it is improbable that any of their inscriptions were restored; the more is the pity that good facsimiles are wanting.

At the time when Arabic numerals were beginning to make their way into common use, and even before that, some people had realized the extraordinary obstacle that the Roman system of notation placed in the way of progress. Greek numeration, which is as much superior to Latin as it is inferior to Arabic, is sometimes used in Western MSS. Thus in the Libri Catalogue (Sotheby's, 1859) we find :

(a) No. 298 and pl. III. St. Cyprian, saec. VIII-IX (not VII-VIII as in the catalogue), numerical signs according to the ancient Greek alphabetical system.

(b) No. 299. St. Cyprian, now in the Bodleian. Greek numerals, P for 100, C for 110 (instead of 200), *stigma* sometimes for 7 (instead of 6). Both these are certainly Western MSS.

(c) No. 760 and pl. XXI. Pancratii martyris officium et passio. Saec. X. Greek letters up to  $\Pi$  with numerical values.

The Greek system, however, never found favour in the West. Still less did the invention (or conveyance) of an Englishman, John of Basing, who is said to have introduced "Greek" numerals. As a matter of fact they were nothing of the kind. Matthew Paris (*Chronica Majora*, ed. Luard, v. 285) is the authority for the statement. His system was a combination of a constant vertical with varying horizontal or slanting lines. With certain exceptions, multiplication by ten was indicated by reversing the sign; thus J = 8, L = 80. There was a special sign for the cipher. John of Basing's system falls into the same class with the semaphore-like system which some old writers call Chaldaean, and which seems to have been used by astrologers.<sup>1</sup>

Finally, a few notes on certain peculiarities of notation may not be out of place.

The change of direction in writing numerals, from the old one of right to left to the modern one of left to right, is illustrated by a few cases. One is given by Hale, *Domesday of St. Paul's* (p. xiv): "Tabula Registri de Visitatione Maneriorum per Robertum Decanum, anno domini M. cc. XXII." Here the folios are numbered with Arabic numerals, written originally from right to left, the numbers being afterwards struck out, and a fresh series written in nearly the same character, but from left to right. Uncertainty as to whether they are contemporary with the date given has prevented their inclusion in the Tables.

The mixture of Roman and Arabic numerals is very common. In addition to instances which will be found in the Tables, I give the following from MSS.:

B.M. Royal 10 E. III f. 294: caution dated ao dni mo cccc'o 6'. English.

B.M. Royal 12 C. xv f. 264: owner's signature, anno dni mº 400. English.

<sup>1</sup> See G. Friedlein, Die Zahlzeichen und das elementare Rechnen der Griechen und Romer, Erlangen (1869), p. 12 and pl. i. For other artificial systems see Wattenbach, Anleitung zu lat. Paläogr.<sup>4</sup>, p. 103.

B.M. Sloane 2478 f. 35 b.: mill' cc' 66°; cf. ff. 15, 15 b.

B.M. Harl. 2316. m<sup>°</sup> cc<sup>°</sup> 58, m<sup>°</sup> ccc<sup>°</sup> 43, &c. English mid. XIV.

Mabillon (*de re Dipl.* t. xv, p. 373, ed. 1681) gives the following example ("cx cod. Cavensi in cujus initio monachus Benedictinus crucem ferens pingitur") of chapter numbering: 1. 2. 3. 4. 5. 6. 7. 8. 9. x. x1. x2. x3. x4. xxx. xxx1. 302. 303. xxxx. 401. 405.

I. 5. IIII. = 1504. See Jakobs u. Ukert, *Beiträge zur älteren Litteratur oder* Merkwürdigkeiten der herz. öff. Bibl. zu Gotha (Leipzig, 1835), ii. I. 64 note. M. CCC. 35 = 1335. Id. i. 2. 208.

1.4.LXIII, 1.4.LXX, 1.5.6 (= 1506): see Wattenbach, *Lat. Paläogr.*<sup>4</sup>, p. 104. For the omission of o in the tens' place see Table XVIII. 2.

M. CCCC. 8 II = 1482, Wattenbach  $^{4}$ , p. 104.

An unusually interesting example is the woodcut representing the seal of John, priest of St. Moritz in Augsburg, with date A<sup>o</sup> M<sup>o</sup> cccc 7 (the 7 being of the *lambda* form). The original block of this is in the Hof-Bibliothek, Munich. Prints of these were used by John as an ex-libris, *e.g.* in books of *circa* 1472 and 1475. The date thus appears to be meant for 1470; the years of the decade might be added by hand. It cannot mean 1407. Libri, *Mon. ined.*, pl. lii; Schreiber, *Manuel*, 2039; *Catal.* 42.

The example from Mabillon shows the notation 302 for 32. Of the same kind is the date anno dni. 1000. 300. 80. 4° in a MS. in the Plimpton Collection (D. E. Smith, *Rara Arithmetica*, p. 444). The forms 610 (for 16) and the like (see note on Table IV. 1) are curiously systematic, evidently assuming that the numbers would go up to 100 at least. Less logical, but easily to be understood, are the following :

15011 on a majolica tile in the Civic Museum, Turin. Wallis, Italian Ceramic Art: the majolica pavement tiles of the fifteenth century, fig. 66.

15013 (for 1513). S. Antonino of Florence, Summula confessionis, printed at Paris.

15013. Date in colophon of *Confessionale* of S. Antonino, printed at Paris. Communicated by Prof. Pernice from a copy at Greifswald (No. 910). See Wattenbach<sup>4</sup>, p. 105.

As a modern parallel to these it may be worth mentioning that in a recent letter from a resident in Rome I read that "the Vittorio Emanuele Monument, like everything else, has got to be ready for the celebrations in 19011".

Readers who use the Tables which here follow are reminded that a certain number of examples, received too late for incorporation, will be found in the Supplementary Tables XLIX ff.

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IV. MSS.: XIII CENT. (continued).

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17														2	3	9-	4	6	$\wedge$	8	9	ų p	mid. XV.
Ī	21													2	3	هر	9	G	Λ	8	9	Ð	mid. XV.
	22 1												1	222	733	498	4	G	Λ	8	99	٥ø	mid. XV.

VOL. I.XII.

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X. MSS.: XV CENT. (continued). (GERMAN.)

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9	ΠV	2	3	88	44	66	Λ	8	9	0	c. 1458.
10	11			22	Y	66		885			1468.
11	i	22	33	R	7	66	Λ	8	9	0	c. 1463-73.
12	1		3	8			Λ				1473.
13	,			4		i 		8		0	1480.
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18	1			X	5			: : : :	9		1495.
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20	1			4				8	9		1498.
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XII. MSS.: XVI CENT.

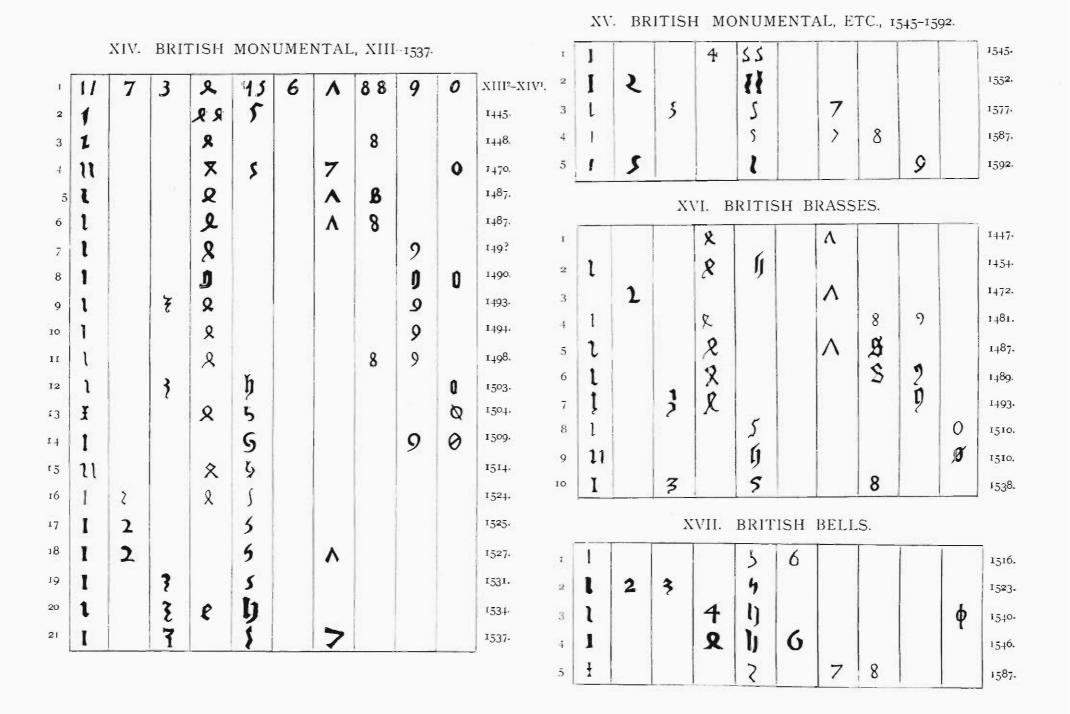
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3	]]]			٥	1) 	v		8		0	1508.
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8	J	2	3_	4	55	6	7	8	9	0	c. 1515.
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10		]				,			0	0	c. 1524.
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12	<u>і</u>	~~~	RR	4	55	6	7	8	9	0	1545.
13	I	2	3	4	5	6	77	00 07		0	с. 1560.

XIII. MSS.: GREEK.

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7	1	z	ξ	$\sim$	4	6	7	8	9	0	XV.
8	1	Z	3	&	Ч	6	V	8	9	٥	XV.

XI. MSS.: XV CENT. (continued). (ITALIAN.)

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5	11	22	3	22	4	G	Λ	8	9	0	1444.
6	1	2	33	4	555	6	7	8	2	0	c. 1420-44.
7	1	22	3	4	5	6	7	8	9	0	с. 1456.
8	t	2	3	9	455	6	7	8	9	υ	XV.
9	1	2	3	4	9	5	7	8	29		XV.
10	11	2	3.33	44	59	6	7	88	2	0	XV <sup>1</sup> .
u	I		5	4			<				1473.
12	I			4			<	8			1478.
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14	111	222	33	44	445	6	7	8	2972	0	с, 1476.
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י7	1	r	23	44	55	66	7	8	9	0	c. 1490.



XVIII. GERMAN. MONUMENTAL, 1388-1477.

XIX. GERMAN: MONUMENTAL, ETC., 1477-1495.

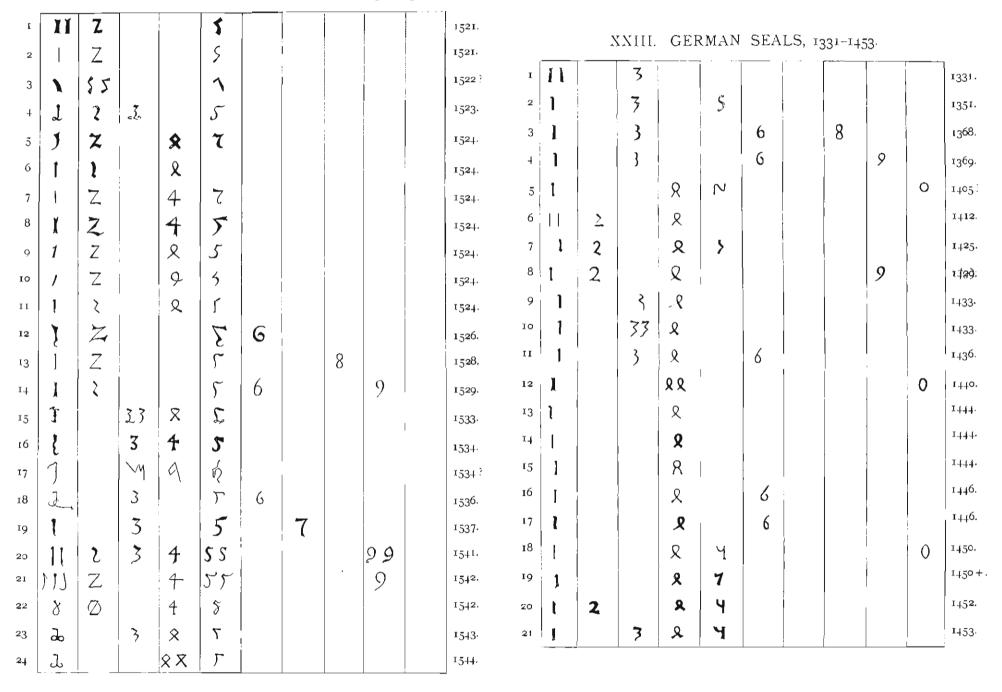
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9	l			8	J						1454-	10				8	ł			8	1		τ <b>484.</b>
10	1			-2	7			1			1454.	11	I			R		6		8			1486.
11	3			8	5			8			1458.	12		2				66		8		1	1486.
12	Ι			22		6					1464.		1	2		) L		00					1
13	)			8-	z	6	1				1465.	13	ł			Ŷ			$\land$	8			1487.
14	Ň			8		6			i		1466.	14	I			l l				8			14 <b>87</b> .
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18	Ĵ			9			7			0	1470.	ĺ	1			<u>२</u>		!			1		т <b>191</b>
19	1	1	}	Q	1		$\land$				1473.	19				<b>x</b>				ĺ	2		1491.
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п	)			2				8	9		1498.	11	1				5		$  \wedge  $			U	1507.
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19	1				9					0	1500.	19	μ.		3		5						1513.
20	]]				8		1			0	1501.	20	11		3		5						1513.
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#### XX. GERMAN MONUMENTAL, ETC., 1495-1503.

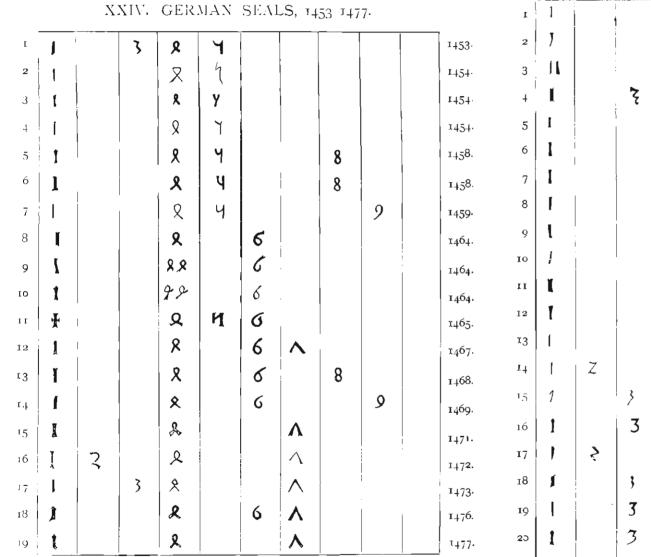
XXI. GERMAN MONUMENTAL, ETC., 1504-1520.

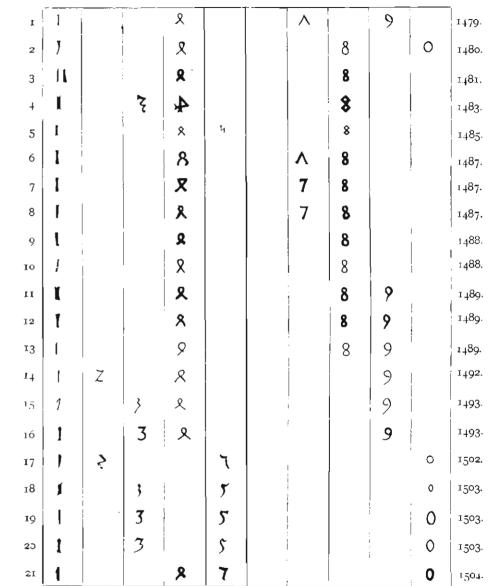
#### XXII. GERMAN MONUMENTAL, ETC., 1521-1544.

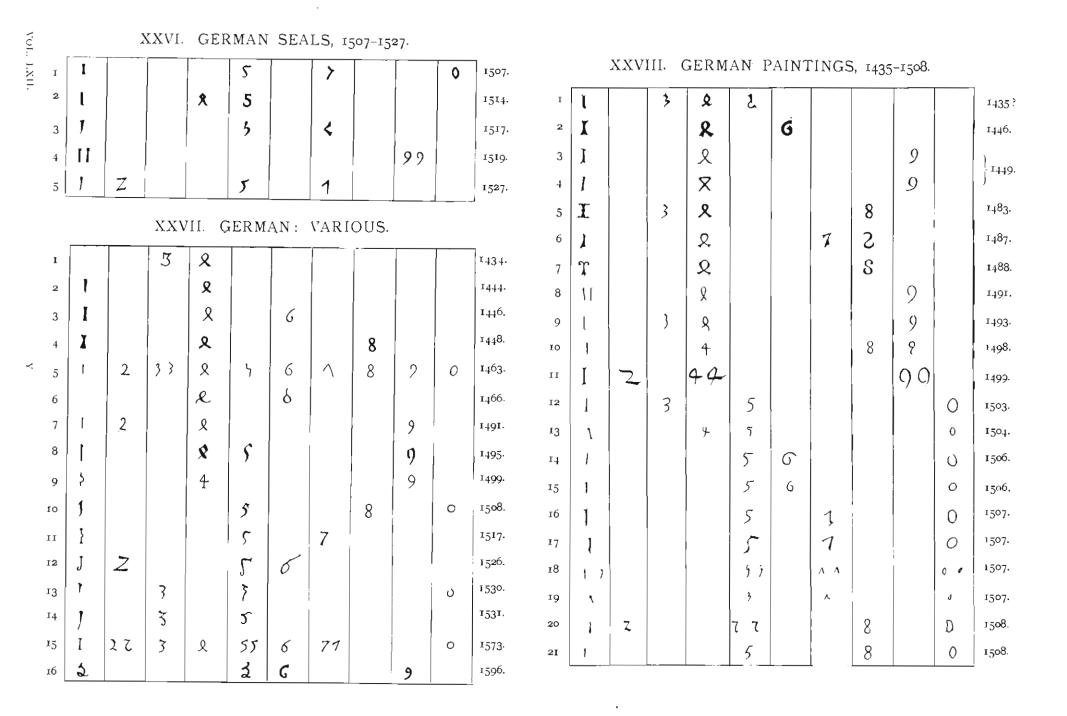


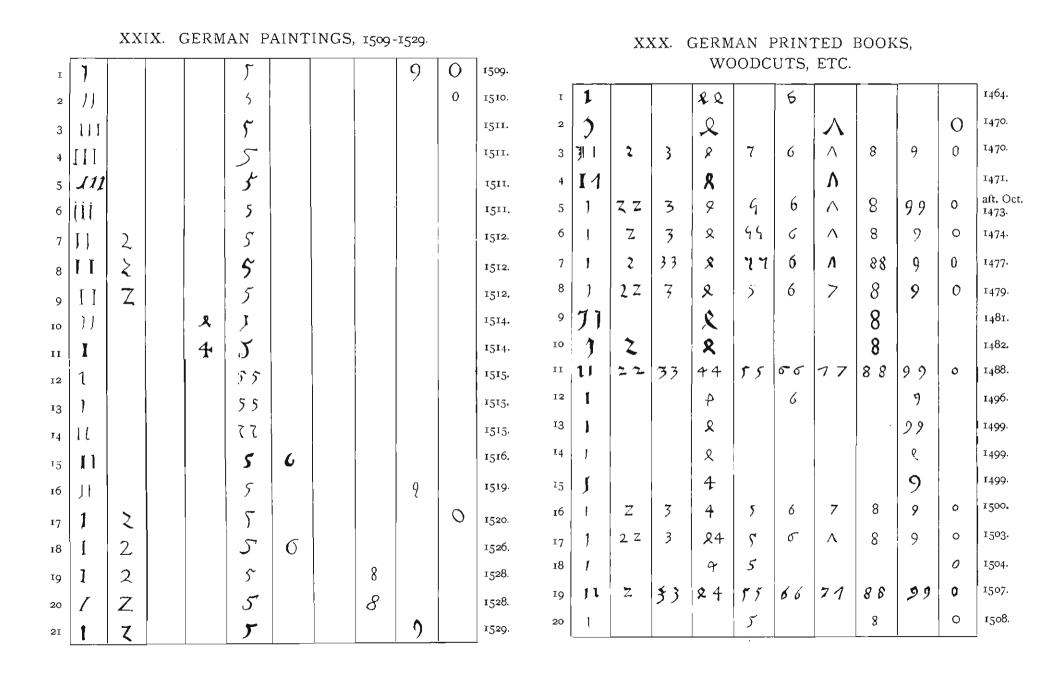
XXV. GERMAN SEALS, 1479-1504.

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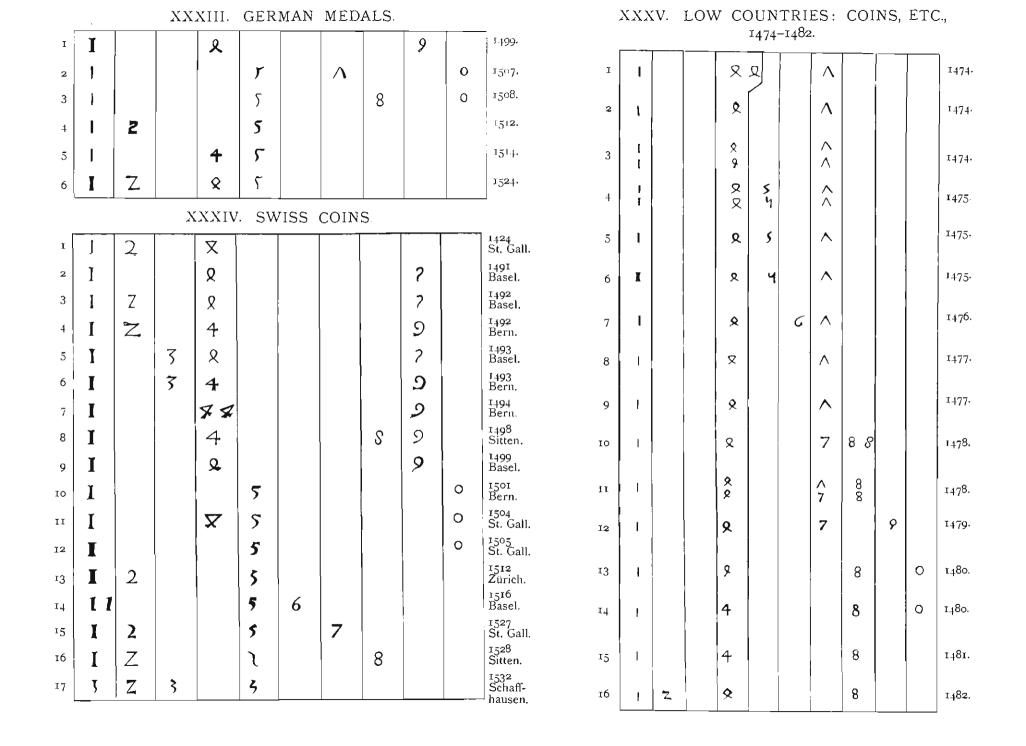






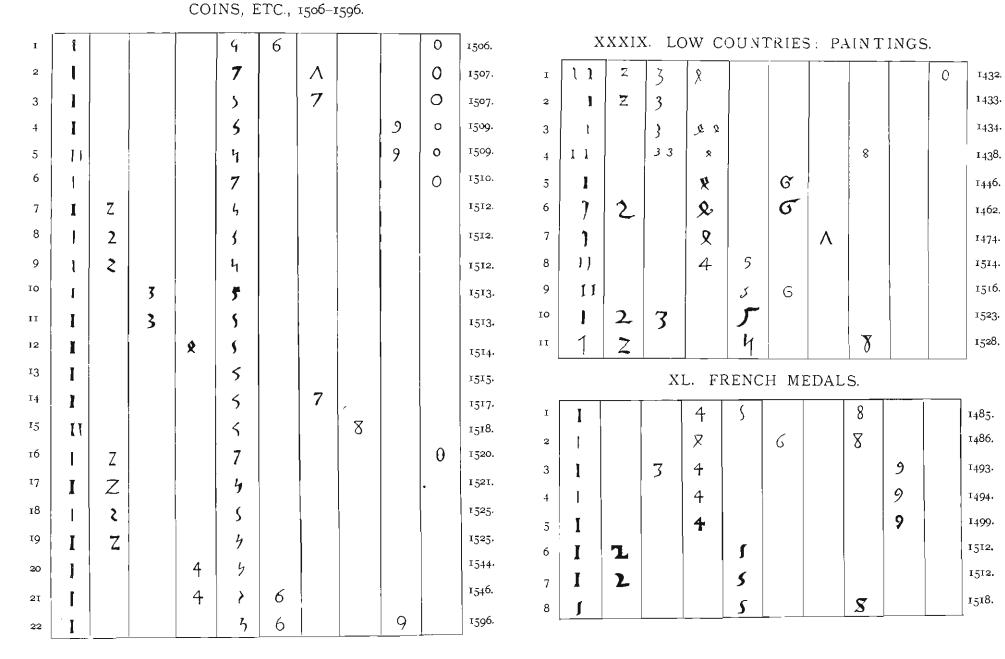


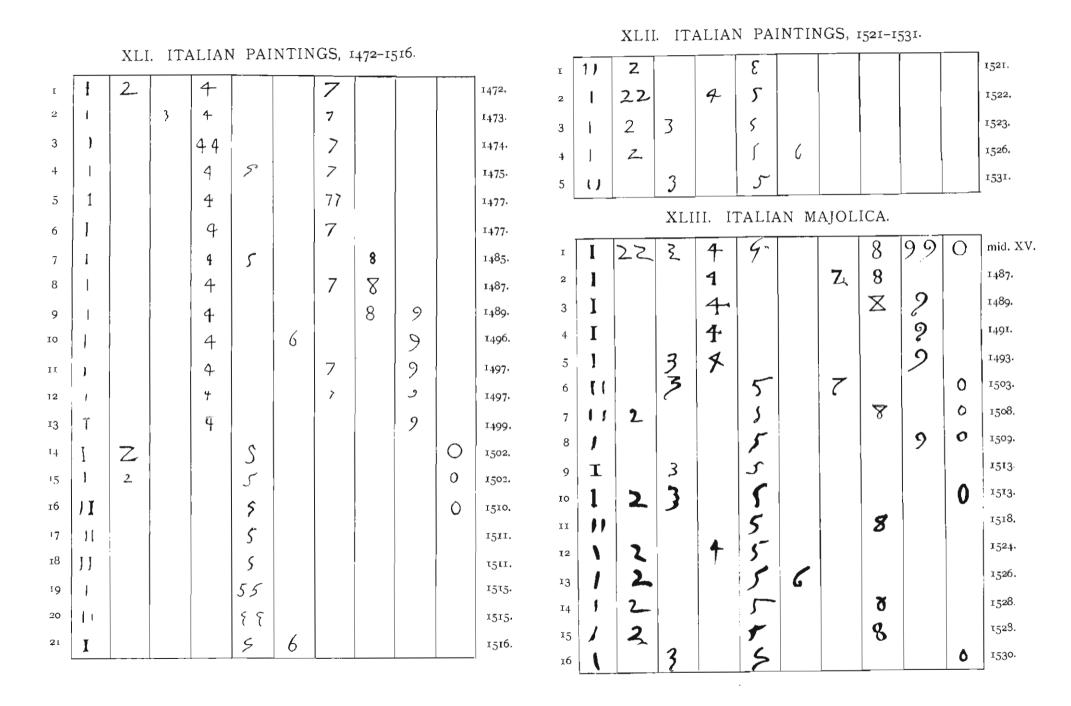
		XX	XI.	GER	MAN	1 CC	DINS	, 148.	4-150	<b>∔</b> ·				XX	XII.	GEI	RMAN	СО	INS,	1505-	-1514.		
I	1			4				8			1484 Austria.	I	1				5					0	1505 Hungary.
2	T			4		G		8			1486 Austria.	2	I				7	G				0	1506 Goslar.
3	1			8				8	Q		1489 Hungary.	3	1				۲	6				0	1506 Bavaria,
+	1			4				8	2		1489 Cologne.	4	,				5	لم				0	1506 Baden.
5	I	z		8					9		1492 Frankfurt a. M.	5	ſ				r	G				o	1506 Lubeck.
6	X	2		৫					2		1492 Aachen.	6	1				7		7			0	1507 ? Hungary.
7	ţ			8			л		9		1497 Brandenburg- Anspach.	7	I				5		>			0	4507 Frankfurt a. M.
8				8					9		1499 Bremen.	8	Ŧ				r					0	1508 Isny.
9	i				7					0	1500 Jülich u. Berg.	Ū	l				5			8			<sup>1511</sup> Bremen.
10	ī				5					ο	1501 Brandenburg- Anspach.	9	ſ				7	:					
11	ſ	Z			7					ο	1502 Lübeck.	10	ł	z			۲						1512 Münsterberg.
12	ı			٩	٦					0	1504 Mainz.	II	I	Z			2						1512 Lorraine.
13	I			ه	٣					0	1504 Hesse.	12	I		ŧ		5						1513 Salzburg.
14	I			4	5					0	1504 Brandenburg- Anspach.	13	1			۶	5						1514 Hungary.
15	1			x	5					0	1504 Salzbnrg.	14	Ι			4	5						1514 Nördlingen.

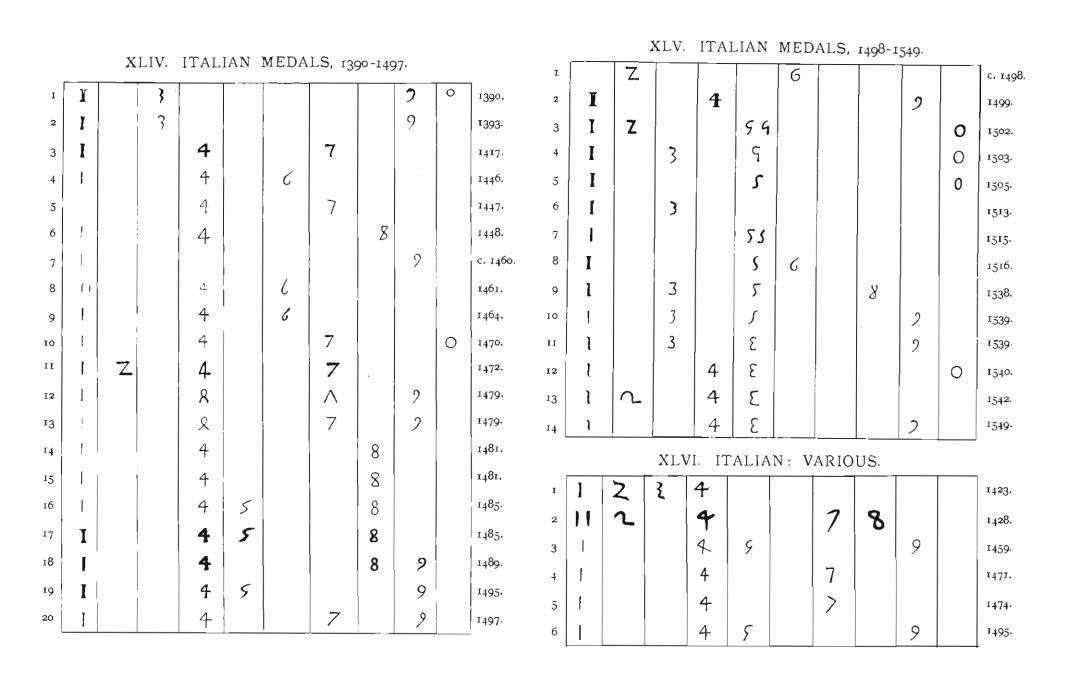


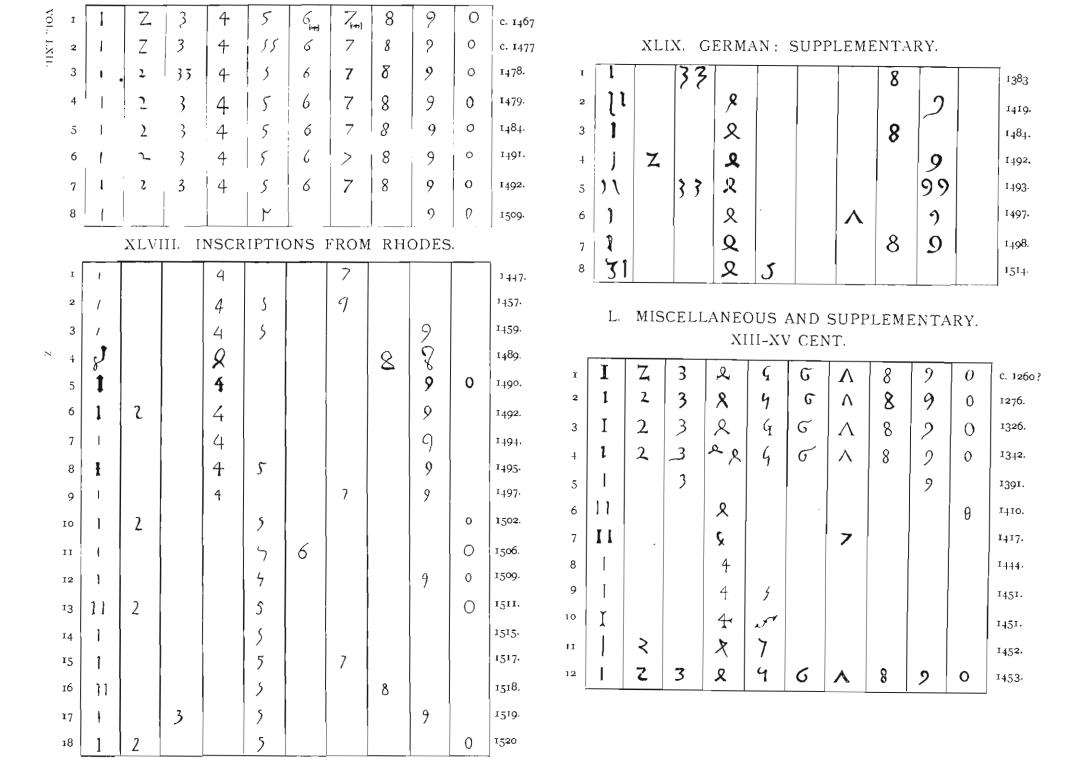
XXXVI. LOW COUNTRIES: COINS, 1482-1490.																								
r	1	z		\$				8			1482.XXXVII. LOW COUNTRIES: COINS, ETC., 1491-1505.													
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XXXVIII. LOW COUNTRIES :









XV-XVI CENT.											
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5	1			X				8	9		1489.
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7	1	2		X					9		1492.
8	1	2		8		6 1			6)		1492.
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16	)		3		5					0	1530.
17	11		3		1						1531.

LI. MISCELLANEOUS AND SUPPLEMENTARY. VU VUL CENT

### DESCRIPTION OF THE TABLES

TABLE I. MSS.: EARLIEST FORMS AND BOETHIAN APICES.

1. 976. Escorial d I 2. Codex Vigilanus, written in the year 976 in the monastery of Albelda near Logroño. See P. Ewald, Neues Archiv der Gesellsch. f. ält. deutsche Geschichtskunde, viii (1883), p. 357. The forms are described as the Indian figures, quibus designant unumquemque gradum cuiuslibet gradus. Quarum hec sunt form(e) : 987654321. Ewald connects the form for 5 with the Roman V. Since he does not say that the year 976 is that of the Spanish era, we must assume that it is of the usual Christian era, **2**. X c. Zürich, Universitätsbibl. (St. Gall MS.). See Pertz, Archiv, vii (1839), p. 364. Cp. G. Friedlein, Gerbert, die Geometrie des Boethius und die indischen Ziffern (Erlangen, 1861), pl. vi. 13. From fol. 50' of Angilberti carmen de Karolo M. Pertz describes these as the earliest Arabic numerals known to him. 3. 1077. Vat. 3101. A. Berthelot, Mélanges de l'École franç. à Rome, v (1885), p. 193. 4, 5. XI c. Erlangen (ex Altdorf), 288. See Friedlein's Boethius (1867), p. 397 (forms used in the text

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of the MS.); also Friedlein, Gerbert, &c., pl. vi. 1, 2; Woepcke, Mém. sur la propagation des chiffres indiens (Paris, 1863), p. 49 (after Mannert); H. Hankel, Zur Gesch. d. Math. (1874), p. 325; Cantor, Math. Beitrage zum Kulturleben der Volker (1863), p. 200. 6, 7. XI c. Chartres. See Chasles, "Aperçu hist. sur l'origine et le développement des méthodes en Géométrie" (Mém. de l'Acad. roy. de Bruxelles, xi, 1837, p. 467). See also Friedlein, Gerbert, &c., pl. vi. 3, 4. 8. XI c.-XII c. Reg. Vat. 1661. Liber Abaci. A. Berthelot, Mélanges de l'École franç. à Rome (1885), p. 193. Dated XI c. by Pertz, XII c. by Berthelot. **9**, **10**. XII c. (beginning). Paris, anc. fonds latin no. 7193 (ex Colb. 4313). De abaco. Natalis de Wailly, ii, pl. vii a. 11. XII c. (?) B.M., Arund. 343 (original burnt in 1865; the date cannot therefore be verified). From T. Wright, Essays on Archaeological Subjects, ii, p. 65. 12. XII c. Vat. 3123. A. Berthelot, Mélanges de l'Ecole franç. à Rome (1885), p. 193. 13. XII c. (2nd half). Bibl. Alessandrina (Rome), no. 171, fol. 1. The apices of Boethius used without abacus, and with position values. E. Narducci, *Mem. Accad. Lincei*, Cl. sci. fis. &c. (1877), p. 503 f. 14. c. 1200. Louvain. See Lethaby, Proc. Soc. Ant. 1906 (xxi), p. 201. 15. c. 1200. Paris, MS. Fonds St. Victor 533. Regula Abaci. See Chasles in Comptes Rend. de l'Acad. des Sciences, xvi (1843), p. 238. 16. 17. Paris, 7377 c and 7185. Boethius. These series have been pub-lished by Cantor in Zeitschr. f. Math. u. Physik, iii, pl. iv, and in his Math. Beiträge zum Kulturleben der Volker (1863), p. 206 (fig. 41). The variation between the facsimiles throws doubt on their accuracy. Cp. also Friedlein, Gerbert, &c., pl. vi. 5 and 6. Date and provenance are 18. Date not ascertained. From a MS. belonging to Dr. Mead. See *Philosophical* 1735, plate ii (at p. 122).
19. 20. XV c. Vat. 4539 : table following letter not stated. Transactions, 1735, plate ii (at p. 122). to Constantine on the abacus; and forms from text of Liber Abaci. A. Berthelot, Melanges de l'Ecole franç. à Rome v (1885), p. 193. 21. Temp. Leonis X. B.M., Lansd. 842 B, fol. 57 b. Italian. De ratione abaci.

#### TABLE II. MSS.: XII-XIII CENT.

1. XII c. (early). Vat. 1890, f. 140; fragment of Conradi Urspergensis chronicon, probably written in neighbourhood of Salzburg. Pertz, Archiv d. Gesellsch. f. ält. deutsche Geschichtskunde, v (1824), p. 160 and pl. i. 4. Wattenbach, Anleitung zur latein. Paläographie<sup>4</sup>, p. 102. 1. Prou, Manuel, p. 156. 2. 1143. Vienna, Bibl. Palat. Computus. T. Sickel, Mon. Graph., Fasc. viii, 3. End of XII c.—beg. of XIII c. Munich, Tab. 16; Wiener Sitzungsber. xxxviii. 171. cod. lat. 14733 (cod. Emmeran. G. 117). Böhmer, Fonles rer. Germ. iii, p. lxv; Pertz, Mon. Germ. SS. xvii, p. 578 and plate at p. 184; Wattenbach<sup>4</sup>, p. 102. Written by Hugo of Ratisbon, who appears as a witness 1207-1216. 4. c. 1200. Heidelberg (Salem), ix. 23. Cantor, Zeitschr. f. Math. u. Physik, x. 1; Wattenbach<sup>4</sup>, p. 102. 5. XII c. (end). W. Schum, Exempla Codicum Amplonianorum Erfurtensium (Berlin, 1882), no. xiii, p. 7. From the astronomy of 6. XII c. (second half). Berlin, cod. lat. fol. 307, ff. 6, 9, Albumazar. Probably German. 10, 28. Astronomical tables. French. See Bethmann in Pertz, Archiv, viii. 832; Wattenbach<sup>4</sup>, p. 103; V. Rose, Verzeichnis d. lat. Hdschr. der kgl. Bibl. zn Berlin, ii, p. 1177, no. 956. The figure which is given by the earlier authorities as 2 is interpreted by Rose as 4, and vice versa. So far as the 2 is concerned, the earlier interpretation is confirmed by the preceding MS. in this table and by Arabic analogy. Dr. Regling has very kindly examined the MS. for me, but this point was not in question at the time.

#### TABLE III. MSS.: XIII CENT.

1. XIII cent. (1st half). Trinity Coll., Camb. (M. R. James, *Catal.* ii, no. 940, p. 355). The numerals are given under the words *Igin, Andras, Ormis, &c., with the Roman equivalents written after each. From drawing by Mr. Z. N. Brooke.* 2. c. 1230-50. B.M., Eg. 2261, f. 225 b. Algorism. English. 3. XIII c. B.M., Add. 25031. English. 4. 1246. B.M.,

Royal 8 A. VIII, f. 105. Note of purchase of the book. English. 5. XIII c. (about middle). B.M., Royal 3 A. v. f. 67 b. English. Dated by some to late XIII or early XIV. 6. XIII c. (2nd half). B.M., Arund. 292, f. 107 b. English. The numerals are drawn laboriously, as if they 7. XIII c. (2nd half). B.M., Arund. 332, f. 68. Joh. de Sacrobosco. were unfamiliar. 8. XIII c. (after 1264). B.M., Add. 27589, f. 28. Algorism. English. English (Durham). 9. c. 1280. S. C. Cockerell Collection, English Bible (probably York). Cp. Proc. Soc. Ant. xxi (1906), p. 201 (where the forms have been somewhat schematized). **10**. XIII c. (late). B.M., Royal 12 E. xxv, ff. 32-59. This scribe uses Roman numerals for all above 9, also sometimes ix. The early form of 2 occurs only once (f. 33). Probably English. 11. XIII c. (late). B.M., Harl. 2385, ff. 26-31 b. Probably English. 12. XIII c. (late). B.M., Royal 12 E. XXIII, 13, 14. XIII c. (end). B.M., Royal 12 C IX. Joh. de Sacrobosco, Comf. 2. English. putus. Probably English. The diagrams (14) are in a different hand, perhaps that of a more skilled mathematician than the copyist of the text.

### TABLE IV. MSS.: XIII CENT. (continued).

1. XIII c. (beg.). B.M., Royal 8 B. XIX. English or French. Contemporary quirenumbering. The first 13 quires (of 8 leaves each) are numbered i', ii', . . . xiii' on the last page of each quire; then come 410 = 14 (f. 112 b). 510 (f. 120 b), 610 (f. 128 b). **2.** XIII c. (early). B.M., Royal 15 B. IX, f. 77 b. Algorism. English or French. Note the Roman V. By some authorities dated as early as XII cent. 3. XIII c., before 1271. Paris, anc. fonds latin, 7198; kalendar on f. 8. French. N. de Wailly, El. de Pal. pl. vii. Cp. Lethaby, Proc. Soc. Ant. 1906 (xxi), p. 201. 4. XIII c. (end). B.M., Harl. 3647, ff. 2 foll. (compotus manualis), 17 5, 6. XIII c. (about end). B.M., Harl. 4350, ff. 16, 6 b, &c. French. (algorismus). French. 7. 1256. Paris, lat. 16334 (Analysis and index of works of St. Augustine). Prou, Manuel, pl. xviii. No instance of o occurs in the facsimile.
 8. XIII. c. Siena (Bibl. Com.). Anzeiger für Kunde d. Deutschen Vorzeil, xviii (1871), p. 261; W. Wattenbach, Anleitung zur lateinischen Paläographie<sup>4</sup>, p. 102. 5; Prou, Manuel, p. 156. 9, 10. 1272. B.M., Harl. 531, ff. 1, 7, 30, 32 (dates and numerals in text of Sacrobosco). German. 11. c. 1260-1270. B.M., Royal 12 E. IV. Provenance uncertain Evidently an exercise in ornamental figuring. A peculiar form of 2 occurs on f. 4 b. 12. XIII c. Libri, Catalogue (Sotheby's, 1859), p. 145, no. 665, pl. xxiv and xxix. Mathematici veteres. Not of 1170 as stated. Probably English. Mixture of Arabic and Latin numerals. Wattenbach<sup>4</sup>, p. 102.

### TABLE V. MSS.: XIII-XIV CENT.

1. XIII c. (end). B.M., Royal 7 F. VIII, ff. 182-188. Works of Roger Bacon. English, after 1268, probably towards end of XIII c. Astronomical tables. More than one system of numerals used; it would appear that we have tables compiled from various sources. **2**. Beginning of XIV c. (temp. Edw. I-II). B.M., Cotton Vesp. A. 11, fol. 2. "Calend. Rogeri Baconis." Probably English. Might conceivably have been written in the closing years of the XIII cent., but beginning of XIV is much more probable. **3.** Late XIII or early XIV (more probably the former). B.M., Royal 8 C. IV, f. 36 b. Joh. de Sacrobosco. Probably English. c. 1300. B.M., Add. 35179 English. 5. c. 1300. B.M., Royal 12 F. xv, f. 142. Probably English. Evidently an exercise in writing the numerals. 6. Early X XIII c.). B.M., Cotton Vit. A. 1, f. 25 b. Carmen de Algorismo. English. 6. Early XIV c. (possibly late 7. Late XIII or beg. XIV c. B.M., Royal 10 B. VII. Fishacre. English. See ff. 6 b foll., 226 b foll., 285, 327. 380. Shows the transition from the old to the modern 2. 8. End of XIII or beg. of XIV c. B.M., Harl. 505, ff. 5 b-14. English. 9. End of XIII or beg. of XIV c. B.M., Harl. 3735, f. 51. Algorism. Probably French. 10. XIII-XIV c. B.M., Add. 30380. Joh. de Sacrobosco. German.

#### TABLE VI. MSS.: XIV CENT. ENGLISH.

1. c. 1320-1330. B.M. Royal 12 E. XXI, ff. 74 foll. English. **2.** XIV c. (early). B.M., Sloane 2478, ff. 15, 15 b, 27, 35 b. English. 3. XIV c. B.M., Royal 13 B. vi. Pagination. 4. XIV c. (early). B.M., Roval Later form of 2 occurs on f. 302. English (Lincoln). 12 E. 1, ff. 159–165 b. English. **5**. 1334. B.M., Royal 2 C.v. Note (English) of the lending of the volume (Nich. de Gorram, Postille in Psalterium) to Mag. Th. Duraunt. **6**. XIV c. (early). B.M., Harl. 13, ff. 31, 75. Astronomical tables. English. 7. c. 1330-1340. B.M., 8. XIV c. B.M., Harl. 3353, f. 76 b. Algorism. Harl. 7322, ff. 152 foll. English. 9. XIV c. (mid.). B.M., Harl. 2316, ff. 2 b-11 b. English. 10. XIV c. B.M., English. Cotton Cleop. B. vi, f. 237. Sacrobosco. Probably English. 7 D. xxi, f. 174 b. Algorism. English. 12. c. 1350, pro 11. XIV c. B.M., Royal 74 b. Algorism. English. **12**. c. 1350, probably. B.M., Royal 12 F. XVII. **13**, **14**. Late XIV or early XV. B.M., Cotton Vesp. E. VII, f. 5 (Diameter terrae); English. f. 9, Kalendar by Thomas Somur from nativity of Richard 11; therefore perhaps soon after 1367, but may be early XV. 15. 1380. B.M., Royal 2 B. VIII, ff. 1, 2 b. Psalter, with 16. 1381. B.M., Burn. 310. Gesta Kalendar by John Somour, composed 1380. English. 16. 1381. B.M., Burn. 310. Gesta Britonum of Nennius, written at Finchale by a Breton, Guillermus du Stiphel. English. 17. XIV c. (late). B.M., Harl. 80, f. 46 b. English. 18. XIV c. (first half). Cod. Magl. Cl. VII, no. 17, f. 33 b; on a tablet held by figure of 'Arismetica'. Perhaps English. Formerly assigned to XI c. (!). C. Paoli, Arch. Stor. Ital. (IV Ser., vol. 7) 1881, pp. 277-280.

### TABLE VII. MSS.: XIV CENT. FRENCH, GERMAN, ITALIAN, ETC.

I. XIV c. (early). B.M., Burn. 275, f. 667 (= 336). Illumination (first row). French. Other forms (second row) in the text passim. 2. 1301 (just after). B.M., Royal 12 C. XVII. Algorism. French. 3. 1311. B.M., Sloane 3097, ff. 61–63 and elsewhere. Liber de conservacione vite humane, completed die innocencium 1311 (f. 61). French. **4**, XIV c. (late). Paris, anc. fonds latin 7277. N. de Wailly, ii, pl. vii c. M. Omont writes that the MS. is after 1367 and before 1420, and was written in the N. of France or neighbourhood thereof, probably at Tournai. 5. XIV c. (early). B.M., Add. 11284, ff. 2-8. Written at Cambron Abbey in Flanders. Both forms of 2 6. 1303. Sigmaringen MS. Anzeiger f. Kunde occur, but the old form more commonly. d. Deutschen Vorzeit, 1867, p. 239; Wattenbach 4, p. 102. 7. XIV c. (early, after 1303). B.M., Arund. 268, ff. 41 b-67. Mathematical treatise. German. 8. c. 1350. Salzburg MS. (cod. Iuvaviensis S. Petri v<sup>a</sup> 7, fol. 124 b). Treutlein, *Gesch. uns. Zahlzeichen*, plate, no. 8. 9. XIV c. (end). Berlin, lat. fol. No. 322. Wattenbach<sup>4</sup>, p. 102, no. 7; Prou, *Manuel*, p. 156. 10. XIV c. (early). B.M., Royal 12 C. XVIII. Astrology. Provenance uncertain (some northern 11. c. 1325-30. Icelandic. Algorismus. Hauksbók, ed. by Finnur Jonssón, p. 417. country). 12. 1315 or 1325. Endorsement on an English warrant dated Feb. 4, 1325; written (13 x 5) by an Italian. Possibly a mistake for 13 xx 5. *Arch. Journ.* vii, p. 85. **13**. 1327. B.M., Arund. 115. Italian. **14**, **15**. XIV c. B.M., Harl. 3814, ff. 4, 3 b, 5 b, 11 b. Probably 16. XIV c. (beg.). Florence, Bibl. Naz., fondo Conventi soppressi, Badia Fior., Italian. 2616. C. I, from which MS. Boncompagni edited the Liber Abaci of Leonardo of Pisa. Anzeiger f. Kunde d. Deutschen Vorzeit, 1871, 261, and private communication from Sig. Enrico Costa. 17. 1382. B.M., Add. 37495. Italian. Geoffrey de Vinsauf.

#### TABLE VIII. MSS.: XV CENT. ENGLISH.

1. XV c. (beg.). B.M., Cotton Vit. C. XIV, ff. 124 foll. English. Ornamental style. 2. XV c. (early, Hen. V at latest). B.M., Royal 12 E. XXII. English. The I is exceptional. 4. XV c. (early). B.M., Add. 3. c. 1410-1415. B.M., Add. 33784, ff. 4-7. English. 24194. Chapter numberings and index. English. 5. XV c. (early). B.M., Harl. 5369, 6. XV c. (1st half). B.M., Add. 1772?. English. f. 270 b. 7. XV c. (1st half). B.M.,

Harl. 1288, ff. 34-59. English. 8. 1418-1431. B.M., Eg. 889, f. 52 b. English. 9. XV c. (prob. 1st half). B.M., Sloane 513, f. 58. English. 10. 1431. B.M., Harl. 937. Kalendar. English. 11. After 1431. B.M., Harl. 5396, ff. 207 b foll. English. 12, 13. 1429-1446. B.M., Add. 7096, ff. 71 ff. (Curteys, Bury St. Edmunds Register) and Add. 14848 14. c. 1445. B.M., Harl. 3742, f. 227 b (Apologetica defensio (do., index). English. astronomice veritatis, by Peter Card. Cambrai), ff. 238 b, 239 (John of Norfolk in artem progres-sionis). English. 15. 1445. B.M., Add. 11814, at end. English. 16, 17. 1449, 1454. B.M., Royal 10 B. VII. Cautions. English. 18. c. 1456. B.M., Sloane 4029, ff. 1-183 b. 19. XV c. (mid.). B.M., Sloane 1616, ff. 125 b, 129 b, and chapter numberings. English. Probably English. 20. XV c. (mid.). B.M., Royal 6 E. 111. Pagination. English. Cp. 21. XV c. (mid.). B.M., Arund. 384, ff. 95 foll. English. Sloane 1616. 22. XV c. (mid.). B.M., Cotton Jul. D. VII, f. 45 b. English.

### TABLE IX. MSS.: XV CENT. ENGLISH, ETC.

1. XV c. B.M., Add. 24059, f. 22 b. Algorism. English. 2. XV c. B.M., Royal 12 E. I, f. 8 b. Algorism, doubtless English. 3. XV c. (c. 1450-60). B.M., Sloane 213, f. 124. English accounts-table. 4. XV c. B.M., Royal 10 B. IX, ff. 61 b, 67, 68, 122, 122 b. Paragraph numbering and dates (1451-1459). English. 5. c. 1460. B.M., Royal 8 D. I, f. 216. English. 6. 1467. B.M., Royal 6 D. II. English. Cp. Casley, *Catalogue*, pl. xvi. 7. 1482-1485. B.M., Royal 12 G. I. Astronomical tables by Lewis Caerleon. English. 8. 1482 (?). Univ. of Edinburgh. Scotch (?) Kalendar, calculated for 1482. J. Leslie, *Philosophy of Arithmetic*, p. 115. 9. 1483, 1485, 1488. B.M., Royal 7 E. v. Cautions, English. 10. 1488. B.M., Royal 14 C. VII, fly-leaf. Cp. Casley, pl. xvi. English cursive. 11. Betw. 1427 and 1460. Paris, anc. fonds latin, no. 7295, f. 86b. Astronomical MS. (provenance not stated). N. de Wailly, ii, pl. vii d. 12. XV c. (1st half (?)). Kalendar. From T. Wright, *Essays*, ii, p. 71, no. 3. The reference "B.M. Sloane 2927" there given is wrong, and I have not been able to find the MS. 13. 1454. "Ex cod. S. Germani, no. 531." Mabillon, *de Re Dipl.*, t. xv, p. 373 (ed. 1681). 14. 1460. "Ex cod. S. Germani, de imit. Chr. Magistri Iohannis Gerson." Mabillon, *ibid*.

### TABLE X. MSS. ETC. : XV CENT. GERMAN.

1. c. 1422. B.M., Add. 15107, f. 207 b, &c. Written at Lauben, near Görlitz in Saxony, 422. 2. c. 1420. B.M., Add. 15107, f. 215. Written at Lauben, near Görlitz in Saxony, in 1422. 3, 4. Betw. 1426 and 1430. B.M., Add. 15108, ff. 4 b, 90. German (Erfurt). about 1420. 5. 1430. Libri, Catalogue of the collection of manuscripts (Sotheby's, 1859), No. 936. German, 6. c. 1442. Plimpton Coll. Sacrobosco. German, copied by Hainricus 26 June, 1430. Muglinchk. The numerals are from a coloured illustration, representing Algorismus teaching a pupil the numerals from a sort of hornbook. D. E. Smith, Rara Arithm. p. 450 and pl. viii. 7. XV c. B.M., Add. 15107, ff. 36, 36 b. German. 8. XV c. B.M., Harl. 3843, f. 119. Sacrobosco. German. 9. XV c. B.M., Harl. 3843, ff. 25 a, 39 b, 40, 53 b, 99 b. Probably about 1458 (which date occurs frequently). The fork to the right-hand leg of the four is unusual. German. 10. 1468. B.M., Arund. 148. German (Erfurt). Postille Nicolai de Lyra, ff. 106 b, 192, 236 b, 283 b, 391 b. On fol. 192, 1458 is perhaps a blunder for 1468, as all the MS. seems to be contemporary. **11**. c. 1463–1473. B.M., Add. 19909, f. 236 b. German. 12. 1473. B.M., Add. 19909, f. 250 b. German. Herolt, Promptuarium. 13. 1480. Admonter Hüttenbuch. German. M.C.C., N.F. xx, p. 236. 14. XV c. Heidelberg (l'al. Germ. 342). German. From Wattenbach<sup>4</sup>, p. 102, no. 8. Cp. Prou, Manuel, p. 156. Contemporary pagination. 15. 1493. Drawing by Albert Dürer, Albertina. Child Jesus holding globe. Lippmann, 450. 16. 1494. Drawing by Albert Dürer, Albertina. Bacchanal rout.

Lippmann, 454.
17. 1494. Drawing by Albert Dürer, Albertina. Battle between Tritons (after Mantegna). Lippmann, 455.
18. 1495. Drawing by Albert Dürer, Albertina. Venetian lady. Lippmann, 459.
19. 1497. B.M., Royal 6 A. VIII, f. 121. Cp. Casley, pl. xvi. German.
20. 1498. Drawing by Albert Dürer, Albertina. Armed horseman. Lippmann, 461.
21. 1500. Drawing by Albert Dürer, Albertina. Nürnberg lady in ball dress. Lippmann, 464.

### TABLE XI. MSS.: XV CENT. ITALIAN.

1. c. 1400-1416. B.M., Royal 12 D. VII. Italy or S. France (script looks Italian, initials and borders rather French). 2. 1427. B.M., Harl. 3161, f. 143 b. Bologna: Lactantius. 3. c. 1400-35. Plimpton Coll. Italian Arithmetic. D. E. Smith, Rara Arithm. p. 440. 4. 1440. 5. 1444. B.M., Add. 18041, ff. 204 b, 205. B.M., Add. 14095, date at end. Italian. Italian, begun at Perugia, finished at Pavia in 1444.
Arithmetic. D. E. Smith, *Rara Arithm.* p. 448.
Arithmetic. D. E. Smith, *Rara Arithm.* p. 460.
KV c. B.M., Add. 8784, ff. 50 b. Arithmetic. D. E. Smith, Rara Arithm. p. 460. 9. XV c. B.M., Eg. 853. Italian. 10. XV c. (first half). B.M., Add. 51. Italian. 10363. Italian. Treatise on Arithmetic. On ff. 223–229 are tables from 1418–1444. May have been written as early as 1418. 11. 1473. Left-handed. Drawing by Leonardo da Vinci 12. 1478. Left-handed. Drawing by Leonardo da Vinci (Heads). Uffizi. (landscape). Uffizi. 13. c. 1475. Plimpton Coll. Italian, Arithmetic by Luca da Firenze. D. E. Smith, Rara Arithm. pp. 469, 471. 14. c. 1476. B.M., Add. 22317. Italian Kalendar, ff. 90 b foll. In this MS. the S-shaped form of five occurs exceptionally (e.g. f. 98, f. 103). 15. 1478. B.M., Add. 18041. Letter (Italian) from Pavia, inserted at f. 39. 16. 1480. B.M., Add. 35310, f. 366. Italian Breviary, written at Piacenza. **17**. c. 1490. Plimpton Coll. Italian treatise on elementary mathematics. D. E. Smith, *Rara Arithm.* p. 476.

### TABLE XII. MSS.: XVI CENT.

1. 1503. Owner's inscriptions in copies of the Confessionale of S. Antonino of Florence (of 1499) and Lochmaier's Parochiale (of 1493), in the Wolgaster Bibliothek, Greifswald (no. 456). In the second case the date is written 1053. Tracings communicated by Prof. Pernice. 2. 1504. Drawing by Albert Dürer, formerly in the Lanna Collection. Adam and Eve. From the Dürer Society's Reproduction. **3**. 1505–1510. Various dates in vol. ii of the Works of Johann Butzbach (Bonn MS. 356). Fol. 1, incipit feliciter 1.5.6° (for 1506); 48<sup>b</sup>, a<sup>o</sup> dītī 156<sup>o</sup>; 138<sup>B4</sup>, 1.5<sup>o</sup>5; 144<sup>Ab</sup>, 15<sup>o</sup> x (= 1510). Drawings communicated by Dr. H. Willers. See Böcking, *Opera Hutteni*, Supp. vol. ii, p. 438. **4**. 1508. B.M., Royal 2 B. XIII. Note on fly-leaf. English. Casley, pl. xvi. 5. 1510. B.M., Royal 7 E. v. Caution. English. 6. 1513. Drawing by A. Dürer, Vienna Hofmuseum, Ambraser Sammlung (Siren as candle-bracket). M. C. C. viii, p. 127. 7. 1514. Drawing of a crozier (German). See M. C. C. 8. c. 1515. Drawings attributed to Andreas Coner (Roman archiiii, p. 190 and pl. vi. tectural sketchbook) in the Soane Museum. Papers of the British School at Rome, vol. ii (ed. T. Ashby). The hand is Italian. **9**. 1517. Drawing by Wolf Huber in the Guildhall Library, London. From the Vasari Society's Reproduction, part III, 28. **10**. 1523. Codex des Znaymer Stadtrechtes. Illuminated. M. C. C. xv, p. 92 and pl. i. 11. c. 1524. Ouodlibetarius, MS. Erlangen, no. 1463. From Friedlein, *Gerbert*, &c., pl. vi. **12**. 1545. Plimpton Coll. Italian, written by "Ludovicho Alt de Salispurga". Business arithmetic. D. E. Smith, *Rara Arithm.* p. 485. The numerals are rather Italian than German. **13**. c. 1560. Plimpton Coll. Italian commercial arithmetic (Florentine). D. E. Smith, Rara Arithm. p. 489. With the recumbent 8 compare the forms in a MS. of 1684 (*ib.* p. 441), or in the date 1628 as signed by the Dutch painter Pieter de Grebber on a picture at Stockholm (no. 448).

### TABLE XIII. MSS. : GREEK.

1. XIV c. Neophytus. From Friedlein, Gerbert, &c., pl. vi. 9. See P. Tannery, Le scholie du moine Néophytos sur les chiffres Hindous. Rev. Arch. iii. sér. 5 (1885), pp. 99–102, where this note on the *àpiθµoi lvδικοί* or περσικοί is described from two Greek MSS. at Paris, 1928, f. 15 (XV cent.), and 2350, last folio (XVI cent.). 2. XIV c. Maximus Planudes. Friedlein, Gerbert, &c., pl. vi. 10, from an excerpt. On the MSS. of the  $\psi\eta\phi\phi\phi\rhoía$  see C. I. Gerhardt, Das Rechenbuch des M. P. (Halle, 1865); cp. Tannery in Rev. Arch. 1886 (i), pp. 357 ff. 3. XIV c. Cod. Marc. 534 (formerly 303). Maximus Planudes,  $\psi\eta\phi\phi\phi\rhoía$ . Villoison, Auced. Gr. ii, p. 153 and plate at p. 267. This and the next MS. were kindly examined for me by Mr. W. Miller. They come from Cardinal Bessarion's library. 4. XV c. Cod. Marc. 639 (formerly 323). Maximus Planudes,  $\psi\eta\phi\phi\phi\rhoía$ . From Villoison, Auced. Gr. ii, p. 153 and plate at p. 267. This and the next MS. were kindly examined for me by Mr. W. Miller. They come from Cardinal Bessarion's library. 4. XV c. Cod. Marc. 639 (formerly 323). Maximus Planudes,  $\psi\eta\phi\phi\phi\rhoía$ . From Villoison, Auced. Gr. ii, p. 153 and plate at p. 267. Must be earlier than c. 1470, since it was in Cardinal Bessarion's library. 5. Planudes, according to Tannery, Rev. Arch. 1886 (i), p. 359. 6. XV c. Cod. Marc., fondo Nani, 255, fol. 182 b. Scholium (in same hand as text) on Tetrabiblos of George Pachymeres. Rev. Arch. 1886 (i), p. 357. 7. XV cent. Paris, fonds gree 2428. Tannery, Rev. Arch. 1886 (i), p. 359. 8. XV c. Paris, supp. gree 387. Copied from a XIV c. MS. ? Rev. Arch. 1886 (i), p. 359. The forms are purely Western, but for the inverted 7.

### TABLE XIV. BRITISH MONUMENTAL, ETC.

1. Series of numbers from Resurrection images on West front of Wells. Somersetshire Archaeol, and Nat. Hist. Soc. Proc. xxxiv (1888), p. 62; Proc. Soc. Ant. 1906, xxi, p. 201. Mr. Lethaby has shown that the 2 is of the 7 shape; the numerals cannot therefore be later than the early XIV cent. The only difficulty is caused by the second form of 5. This is hardly possible in the XIII-XIV century. It may be a misread 3 or 6, and should be reexamined. 2. 1445. Tower of Heathfield Church, Sussex. *Journ. Brit. Arch. Assoc.* ix, p. 433; Wright, *Essays*, ii, p. 76. Is this contemporary? The form of 5 seems very modern examined. for the date. 3. 1448. On wooden lych-gate, Bray Church, Berks. Arch. Journ. 1850, p. 75. 4. 1.170. Elgin Cathedral. Tomb of first Earl of Huntly in St. Mary's aisle. Rubbing in Library of Soc. of Antiquaries. Communicated by Mr. J. Cooper Clark, of Ladyhill. Both 5 and 7 look foreign. 5. 1487. Belfry door of Piddletrenthide, Dorset. Wright, Essays, 6. 1487. Wooden door at Arminghall. Wright, Essays, ii, p. 77. ii, p. 85. 7. 149? Beverley, on pavement near S. side of Earl of Northumberland's Monument. Gough, Sep. Mon. ii. 2, p. 309. The last figure is broken away. **8**. 1490. Colchester. The lower part of the 4 being defaced, this has been read as 1090. Wright, Essays, ii, p. 78. **9**. 1493. Stone in wall of cottage in remains of episcopal manor-house at Bishop's Waltham, Hants. Arch. Journ. 10. 1494. Tower of Hadley Church, Middlesex. Wright, Essays, ii, p. 79. 1850, p. 76. 11. 1498. On a shield in the hall of Milton Abbey. Wright, Essays, ii, p. 86. 12. 1503. St. Cross. On stone. This occurs twice, once in the Porter's Lodge, once in the "Nun's Room". Arch. Journ. 1850, p. 76; Journ. Brit. Arch. Assoc. ix, pl. xxxiv. 13. 1504. Arms of James IV of Scotland. On a buttress projecting from the W. side of the crowned tower of King's College, Old Aberdeen. Proc. Soc. Ant. Scot. xxiii, pl. i (p. 80). Communicated by Mr. W. Kelly. 14. 1509. Stone from London Bridge, found in 1758. Wright, Essays, ii, p. 80. 15. 1514. Milton Abbey Church. Wright, Essays, ii, p. 86. 16. 1524. On tabernacle at Kinkell Church near Inverurie. ANO. DNI. 1524. MEORARE A. G. The initials are those of Alexander Galloway, "Official" of Aberdeen and Rector of Kinkell. Trans. Aberdeen Ecclesiol. Society 1889 (1890). From a photograph communicated by Mr. W. Kelly. There is or was another stone dated 1525 in the same place. **17**. 1525. On the screen of Winchester Cathedral. Journ. Brit. Arch. Assoc. ix, p. 434. **18**. 1527. Stoke Charity, Hants; Waller tomb. Ib. p. 435. **19**. 1531. Stone from E. battlements of vestry of church at Enfield. Gough, ii (1),

p. 140, pl. xlix\*. 20. 1534. Beam in roof of Eccleston Church, Lancs. Communicated by Mr. C. R. Peers. The assimilation of numerals to letters is very marked. 21. 1537. Wooden seat in Aldham Church, Suffolk. T. Wright, *Essays*, ii, p. 81.

#### TABLE XV. BRITISH MONUMENTAL, ETC. (continued).

1545. Scratched on stone in choir, Winchester. Journ. Brit. Arch. Assoc. is, p. 435.
 1552. From the Half-Moon Inn, near Magdalene College, Cambridge. T. Wright, Essays, p. 82, after Gough.
 1577. Date 1573 on tomb of Robert Blounte, Astley, Worcs., made in 1577 by John Gildon of Hereford.
 1587. Slab of a member of the Walweyn family, in floor of S. aisle of Colwall Church, Herefordshire.
 1592. Ashford Church. T. Wright, Essays, ii, p. 82, after Gough.

### TABLE XVI. BRITISH BRASSES.

1447. Thomas Fortey, Northleach, Glo'ster. From rubbing in the Soc. Ant. Library.
 1454. Eleanor Coke, wife of William Bramble and Richard Warbulton, Ware, Herts. From rubbings in the Soc. Ant. Library and by Mr. C. R. Peers.
 1472. Ingylton, Thornton, Bucks. From a rubbing in the Soc. Ant. Library. Cp. T. Wright, *Essays*, ii, p. 77.
 1481. Wm. Yelverton, Rougham, Norfolk. From J. S. Cotman.
 1487. Sir Wm. Pecche, Lullingstone, Kent. From rubbing in the Soc. Ant. Library. Cp. Belcher, i, pl. lxxv, no. 145.
 1489. Thos. Gilbert, Allhallows, Barking. From rubbing in the Soc. Ant. Library. Cp. T. Wright, *Essays*, ii, p. 78.
 1493. Houghton Conquest, Beds. From rubbing in the Soc. Ant. Library. B. 1510. John and Roger Yelverton, Rougham, Norfolk. From Cotman.
 1510. Wm. Bysse, Fellow of Merton. Merton College Ante-chapel, Oxford. From a rubbing.

#### TABLE XVII. BRITISH BELLS.

1. 1516. Isleham, Cambs. From a rubbing by Mr. H. B. Walters. 2. 1523. Leaden Roothing, Essex. 3. 1540. Stanstead Mountfitchet, Essex. 6th bell, now recast. From a rubbing belonging to Mr. H. B. Walters. 4. 1546. Felstead, Essex. Clock bell. From a rubbing belonging to Mr. H. B. Walters. 5. 1587. Turton Tower bell. From Old South-East Lancashire, vol. i (1880), p. 122.

#### TABLE XVIII. GERMAN MONUMENTAL, ETC.<sup>1</sup>

1. 1388. Ulm. Tombstone of Cunrat Riter. Verhandl. des Vercins f. Kunst u. Alterthum in Ulm u. Oberschwaben, vi (1874), pp. xiv f.; Anzeiger, 1876, 35; Wattenbach, Lat. Pal.\*, p. 101. The stone was found some feet deep in a cemetery which had not been used since 1530. 2. 1406. Salteins, Vorarlberg. Inscription on tabernacle. M.C.C., N.F. xxii, p. 31. The 3. 1414. Pettau. Inscription on a bracket. M.C.C., N.F. vi, date is written +146+. pp. cxii, cxiv. 4. 1439. Nürnberg. Lorenzkirche. Anzeiger, 1861, 49. 5. 1441. Freising. Choir-stalls from Stiftskirche of St. Veit. M.C.C. viii, p. 250. An excellent instance of the sort of date that can be read 1001. 6. 1446. Pettau. Stall. M.C.C., N.F. vi, p. cxliv. 7. 1451. Wiener Neustadt. Gravestone of Anna Roll, wife of Johann Roll, who was Bürgermeister of Neustadt 1467-1471. Ströhl, Herald. Atlas, text to pl. lxvi, fig. 4. The date of Roll's tenure of office does not of course prove that the date is 1471 rather than 1451. 8. Würzburg, Dom. Coat of arms of Jörg von Bebenburg. Salver, Proben des hohen Teutschen Reichs-Adels, Taf. XVII. 65. 9. 1454. Grätz. Tombstone in Franciscan monastery. M.C.C., 10. 1454. Nördlingen. Over porch of tower of Georgenkirche. Anzei-N.F. xvi, p. 75.

' See also Table XLIX.

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ger, 1861, 153. The reading 1474 has been suggested; but this form of 7 is not likely at so early a date (see nos. 15-22 in this Table, and 1, 2, 13, 14 in the next). 11. 1458. Ulm. Oak singing-desk by Jörg Sürlin. Anzeiger, 1861, p. 49. See Berichte des Kunst- und Alterthumsvereins von Ulm und Oberschwaben, 1844, p. 17. 12. 1464. Villach. On choir-stall 13. 1465. Feldkirch. On a house in in church. M.C.C. xv, p. 173; cp. iii, p. 127. Marktgasse. M.C.C., N.F. viii, p. lxxi. 14. 1466. Friesach. Stone built into a house. M.C.Č., N.F. xxii, p. 169. 15. 1467. Wiener Neustadt. Gravestone of Empress Eleonora in Cistercian Abbey of Neukloster. By Nicolaus Lerch of Leyden, M.C.C. xiv, p. 103. 16. 1470. Garsten. Tomb of Rudolf von Losenstein in the Losenstein Chapel. M.C.C., N.F. v, p. xliii. The monument bears the dates 1449 and 1470; the latter is probably the date of its erection or of the death of Rudolf's wife Magdalena. 17. 1470. Ulm. Carved on a roof-beam on N. side of nave of the Minster. Anzeiger, 1861, 231. Rather 1470 than 1450. since the short stroke of the doubtful sign turns so definitely downwards. 18. 1470. Hall. Katharinenkirche. Anzeiger, 1861, 85, 153. This has also been read 1450, but 1470 is to be preferred for the same reason as in the preceding example. 19. 1473. Ulm. Cut in stone 20. 1474. Vienna. Graveover door of Dürftige-Stube in the hospital. Anzeiger, 1861, 84. stone of Margaretha Kelbel. Ströhl, Heraldischer Atlas, Text zu Taf. LXVI, fig. 5. 21. 1476. Kralitz. Tomb of Vitus de Kralitz. M.C.C., N.F. xxvii (1901), p. 117. 22. 1477. Krems (Lower Austria). Over S. doorway of Church of the Piarists. M.C.C. xi, p. 133.

### TABLE XIX. GERMAN MONUMENTAL, ETC. (continued).

1. 1477. Gravestone of Eustach Frodnacher at Pulgarn. M.C.C., N.F. v. p. cxxix. 2. 1479. Marble slab of Sigmund von Eytzing, in parish church of Waidhofen a. d. Ybbs. 3. 1480. Tabernacle, St. Lorenz, Lorch. M.C.C. xiii, p. 179. M.C.C., N.F. i, p. xxxiii. 4. 1480. Brass of Archbishop Jacobus de Senno. Gnezen. From Creeny, Monumental Brasses 5. 1481. On statue of St. Leonhard in church at Kundl (Tirol). M.C.C., on the Continent. N.F. xvi, p. 149 (fig. 7). **6**. 1481. On tabernacle at Röthis (Vorarlberg). M.C.C., N.F.7. 1482. Brass of Bishop Rudolphus, Breslau. From Creeny, op. cit. 8. 1482. XXII, D. 32. 9. 1484. Arms of Kilian von On the so-called Fischkasten at Ulm. Anzeiger, 1861, 83. Bibra, in the Dom, Würzburg. From Salver, Tab. VII. 21. 10. 1484. Builder's inscr., chapel of St. Agatha on Christberg (on the pass to Dalaas in the Klosterthal). M.C.C. N.F. 11. 1486. Tombstone of Eitzinger family in parish church, Drosendorf. M.C.C. v, p. 67. xvii, p. clv. 12. 1486. Brass of Ernst, Duke of Saxony, at Meissen. From Creeny, op. cit. 13. 1487. Inscr. on tabernacle at Damüls (Vorarlberg). M.C.C., N.F. v, p. 68; xxii, p. 32. 14. 1487. Gravestone in Church of St. Lorenz, Lorch. M.C.C., N.F. v, p. cxxix. **15**. 1488. Brass of Cardinal Nicolas de Cusa, at Cues on the Mosel. From Creeny, op. cit. **16**. 1488. Gravestone at Friesach. M.C.C., N.F. viii, p. 114. 17. 1490. Choir-stalls, Spitalkirche, Stuttgart. Anzeiger, 1861, 231. 18. 1491. On corbel under tabernacle in church of the Benedictines at Ödenburg. M.C.C. viii. p. 343. 19. 1491. Builder's mark in church at Hüttenberg (Kärnten). M.C.C., N.F. xxiii, p. 110 and plate. **20**. 1492. On tomb of King Kazimierz Jagiellończyk at Krakau, by Veit Stosz. M.C.C. xiii, p. li. 21. 1493. Gravestone of Anna Hoffer at Schwatz. M.C.C., N.F. xxiii, p. 40. 22. 1493. Gravestone of Johann Lenberg in church at Reichersberg in the Innviertel. M.C.C., N.F. v, p. xcvii. 23. 1495. On tabernacle at Egg (Vorarlberg). M.C.C., N.F. xxii, p. 33. The doubtful figure has been read as 7, but I think there can be no doubt that it is a 5.

### TABLE XX. GERMAN MONUMENTAL, ETC. (continued).

1. 1495. Marble tombstone of Jeronimus Schrenck, at Loiben. M.C.C., N.F. xvii (1891), p. 61, and Beilage v, fig. 2. 2. 1496. On stone panel from the castle at Grätz. M.C.C.,

**3**. 1497. On wooden aumbry niche at Biecz. M.C.C., N.F. xix, p. 229. N.F. xx, p. 51. 4. 1497. Landeck on the Inn : under shield of Oswold von Schrofenstein on S. wall of church. M.C.C., N.F. xvi, p. 27. 5. 1497. Landeck. Gravestone. M.C.C., N.F. xvi, p. 27. 6. 1497. Landeck. Under shield of Oswold von Schrofenstein. M.C.C., N.F. xvi, p. 28. 7. 1497. Stone in gable of Church of St. Ruprecht in Bezirk Strassenfuss. M.C.C. vii, p. 188. 8. 1497. At Kuttenberg in Bohemia, in the tower-chamber of the old Münsterberg house. M.C.C. vi, 318. The 7 seems to be clear. 9. 1497, written m·cccc·97. Tomb of Wolfgang Hellcampf at Efferding in Hansruckviertel. M.C.C., N.F. vi, p. xlvi. The doubtful figure might possibly be meant for a 5. 10. 1497. Dates on the tombstone of ]örg von Teuffenbach (died 1497) and his family at Teuffenbach in Steiermark. M.C.C., N.F. xvii, p. 226, and Beilage xv, fig. 3. **11**. 1498. Brass of Bishop Uriel, Posen. From Creeny, op. cit. 12. 1499. St. Jacob's, Villach. The dates 1487 and 149? occur on the gravestone of Wolfgang and Jeronima Leininger; the former died in 1499, the latter in 1487. M.C.C. xix, p. 144. 13. 1499. Grätz, Hausmark on outside of Dom. M.C.C. xix, p. 122. 14. 1499. Gravestone at Ungarisch-Hradisch. M.C.C., N.F. xxiii, p. 102. 15. 1499. Tabernacle in Leechkirche, Grätz. M.C.C. iv, p. 219. 16. 1499. Tombstone of Eitzinger family at Drosendorf (not earlier than 1501). M.C.C. xvii, p. clvi. 17. 1499, written 1499. Signature of Veit kirche, Grätz. M.C.C. iv, p. 219. Stosz on relief of Kiss of Judas in Church of St. Sebaldus, Nürnberg (on the scabbard of one of the Orientals). Anzeiger, 1862, 403. This is rightly explained as a date by Lepkowski, M.C.C. xii, p. lxxxv. 18. 1500. Arms of Georg Fuchs von Wunfurt. Dom, Würzburg. Salver, 19. 1500. Arms of Barth. von Reie. Dom, Würzburg. Salver, Tab. V. 14. Tab. III, 8. 20. 1501. Arms of Georg von Giech. Dom, Würzburg. Salver, p. 146, 2. 21. 1502. Gmünd, Spitalkirche. Anzeiger, 1861, 231. 22. 1502. Arms of Albrecht von Bibra. Dom, Würzburg. Salver, Tab. V. 15. **23.** 1503. Cilli (Styria). Gravestone of a Hohenwarter. *M.C.C., N.F.* vii, p. lxxv.

### TABLE X XI. GERMAN MONUMENTAL, ETC. (continued).

1. 1504. Partschendorf. Tombstone on outer wall of church. M.C.C., N.F. xxv, p. 43. 2. 1505. Taufers. Tombstone of Anna Wiltpolt. M.C.C., N.F. xxi, 256. 3. 1505. Seben-4. 1505. Brass of Eberard von Rabenstein, stein. Gravestone. M.C.C., N.F. xi, p. xlii. 5. 1506. Font in church on the Heerberg. Anzeiger, Bamberg. From Creeny, op. cit. 6. 1506. Rankweil, on crossbeam of bell-frame in the "Dicker Thurm". 1861, 232. M.C.C., N.F. xxi, p. 241. **7**. 1506. Landeck. Porch of church. M.C.C., N.F. xvi, p. 24. **8**. 1506. Landeck. Stone font. M.C.C., N.F. xvi, p. 25. **9**. 1506. Gmünd. In side chapel of parish church. Anzeiger, 1861, p. 232. **10**. 1506. Tombstone of Heinrich and Anna von Guttenberg at Wolfsberg (Kärnten). M.C.C., N.F. xviii, p. 111. 1507. Salzburg. Gravestone. M.C.C., N.F. xi, p. lxviii. 12. 1507. Nassenreith, near Imst, Tirol. Stone font. M.C.C., N.F. xviii, p. 65. 13. 1508. Klosterneuburg. Gravestone. M.C.C., N.F. 14. 1509. Laterns, Vorarlberg. Inscription on tabernacle. M.C.C., N.F. xxii, xiv, p. 51. p. 32. **15**. 1510. Wooden Todtenschild, from Salzburg, of "Georg Stöckl von Schwarzcek". *M.C.C.*, *N.F.* xxv, p. 107. **16**. 1510. Kufstein, Tirol. Tombstone of Kaspar v. Thurn. Ströhl, Herald. Allas, Text zu Taf. LXVII, fig. 5. 17. 15x1. Sebenstein. Gravestone. M.C.C., N.F. xiii, p. xlvii. 18. 1513. Gurkfeld. Tablet in Church of St. John. M.C.C., N.F. xviii, p. 124. **19**. 1513. Langenzenn. Relief of Annunciation by Veit Stosz. Mutt. Germ. Nationalmus. 1908, Taf. IX. **20**. 1513. Steier (Upper Austria). Tombstone of 20. 1513. Steier (Upper Austria). Tombstone of Meister Wolfgang Tenk. M.C.C. xvii, p. li; N.F. xvi, p. 153. 21. 1516. Cilli, parish church. Tomb of Jakob Neuburger's two wives. M.C.C., N.F. xvi, p. 254, and Beilage xx, fig. 3. 22. 1520. Schönberg near Vöklabruck. Monument of Caspar von Perkheim in the Marienkirche. M.C.C. xv, p. cxvii. 23 (and XXII. 18, 23, 24). 1520, 1536, 1543, 1544. Luggau (Kärnten). Hauszeichen-dates on church. M.C.C., N.F. xxvi (1900), p. 19 and plate.

#### TABLE XXII. GERMAN MONUMENTAL, ETC. (continued).

1. 1521. Maria Feicht (Kärnten). Shield on vaulting of organ-gallery. M.C.C., xiii, p. 77. 2. 1521. Tarnów. Marble inscription on monument (in Italian style) of Barbara Tarnowska. M.C.C., N.F., xix, p. 73. **3.** 1522 (?). Ringenhain (Friedland). Builder's inscription in St. Magdalen's. M.C.C., N.F. xxii, p. 154. **4.** 1523. Nurnberg, Germ. Nationalmus. Bronze epitaph of Mertin Stengel. Mitt. Germ. Nationalmus. i, p. 185. Cp. the forms on the "1320" seal of Trostberg (above, p. 144). **5.** 1524. Römhild, Old Henneberg Schloss. Keystone of a small pointed-arched door. *Anzeiger*, 1863, 324. **6.** 1524. Friesach. Tombstone of Coloman Brunmeister. "M.D.24. die 21", &c. *M.C.C.*, *N.F.* vi, p. cx. **7.** 1524. Feldkirchen. On a house. (Painted or carved?) *M.C.C.*, *N.F.* xxii, p. 170. **8.** 1524. Olmüz. Builder's inscription in St. Michael's. *M.C.C.*, *N.F.* xix, p. 131. **9.** 1524. Latsch (Vintschgau). Builder's date in church. M.C.C., N.F. xxiii, p. 213. 10. 1524. Maria Feicht (Kärnten). Stone musicgallery in church. M.C.C., N.F. xxiv, p. 107. 11. 1524. Prusinovic (Mähren). Gravestone. M.C.C., N.F. xix, p. 34. 12. 1526. Brensbach Evangel. Church. Date under the arms of Philip the Magnanimous on the pulpit. Archiv f. hess. Gesch. v, pt. 2, art. xii. Important in its bearing on the forms seen on the seal of Gottfried von Hohenlohe (p. 144). 13. 1528. Salzburg. Tombstone of Hans Reuter von Klebing. [Reference mislaid.] 14. 1529. Enns im Traunviertel, Austria. Gravestone of Erasmus Paumkirchner. M.C.C., N.F. vii, p. cviii. 15. 1533. Wolfsberg. Tombstone of G. von Streitberg. M.C.C., N.F. xviii, p. 150. Note the two forms of 3, one of which might almost be taken for a 2. The 1 is somewhat confused with the preceding ornamental stop. 16. 1534. Clay water-pipe from Bochtitz. M.C.C., N.F. 17. 1534. Weikelsdorf near Zeitz. On a pillar of the church (beginning of XXI, D. 50. XVI cent.). Anzeiger, 1863, 322. The interpretation is not quite sure, the inscription being a freak. There is a still worse instance in the church at Langendorf, near Zeitz (*ib.* p. 323), which has been read 1531 or 1571, although it is difficult to make anything at all out of it. 19. 1537. Regensburg. Sandstone slab outside Church of St. Emmeran. 18. See XXI. 23. L. Day, Lettering in Ornament, after Gerlach u. Schenk, Monum. Schriften. **20**. 1541. Nürnberg. Bronze epitaph. L. Day, Lettering in Ornament, p. 54, after Gerlach u. Schenk, Bronce-epitaphien der Friedhöfe zu Nürnberg. 21. 1542. Brunn. Tombstone (in Dom) of Michael of Regensburg and his wife, bearing dates 1519 and 1542, all probably of the latter date. M.C.C., N.F. xix, p. 133. 22. 1542. Raigern. Gravestone of Abbot Ambrosius. M.C.C., N.F. xxi, p. 123, where the date is described as 1542 corrected to 1540; from the illustration it would appear that the last sign is merely a 2 with ornamental serifs. 23. 24. See XXI. 23.

### TABLE XXIII. GERMAN SEALS.

1. 1331. City of Heidingsfeld am Main. Anzeiger, 1859, 249. In the illustration there given it may be noted that the numerals are somewhat weak in appearance, and not symmetrically placed with regard to the design; are they a subsequent addition? 2. 1351 (pl. XIX, no. 5). City of Ulm. Germ. Mus., Nürnberg. "Sigillum secretum civium in ulma 1351." Anzeiger, 1859, p. 250; Verhandl. des Vereins für Kunst u. Alterthum in Ulm u. Oberschwaben, vi (1874), pp. xiv f. 3. 1368. Johann I, Landgraf zu Leuchtenberg. Anzeiger, 1859, 373. Impressions in the K. bayer. Reichsarchiv. 4. 1369. Hermann der Rot von Ulm. Anzeiger, 1861, 153; 1869, 326 (illustrated). It is noted that the form of the shield is unusual at this time. 5. 1405 (pl. XIX, no. 4). This is apparently the date on an obscure seal of the city of Wimpfen in the Germ. Mus., Nürnberg. The legend appears to be "S. Secreti (sic) Oppidi Wimpfensis 1405". The 5 is like a modern 2 set on its side. This may be the seal which is described in Anzeiger, 1859, p. 250, as reading 1426. 6. 1412 (pl. XIX, no. 6). Johann, Abbot of Kaisersheim. Germ. Mus., Nürnberg. Anzeiger, 1859, p. 251. "Sigillum iohannis

abbatis in cesarea h (?)." The date 1412 is in the field. This is Johann Scherb, eighteenth abbot, 1405-1423. 7. 1425. Propst Ulrich in den Wengen. Anzeiger, 1861, p. 82. 8. 1429 (pl. XIX, no. 3). Bishop Albrecht II of Eichstädt. Germ. Mus., Nürnberg. Anzeiger, 1859, p. 251. 9. 1433 (pl. XIX, no. 7.) Monastery of St. Oswald. Germ. Mus., Nürnberg. "1433. s. conventus monasterij s. oswaldi canonicorum regular." In Anzeiger, 1859, p. 251, this is described as a seal of the Monastery of Niederaltaich. St. Oswald's, however, was an Augustinian house, near Gravenau in the diocese of Passau, though it seems to have been in some way dependent on the Benedictine house at Niederaltaich. On this seal the arms of the house are simply [az.] a fess [arg.]; above the shield is a raven holding a ring in its beak. Sibmacher, *Klöster*, p. 67. Taf. 83, gives a later version of the arms showing two shields accolles, viz. az. a fess arg., and arg. on a mount a raven holding a ring in its beak 10. 1433. City of Stuttgart. "S. civium in Stuotgarten." (tincture not stated). Anzeiger, 11. 1436. City of 1861, p. 84. See Pfaff in Würltemb. Jahrbücher, 1854. 2, p. 178. Heidelberg. In use on documents from 1436 to 1501. See A. von Weech, Siegel der badischen Städte, pl. xviii. 12. 1440. City of Grätz. M.C.C. xvi, p. cxl. Cp. J. Wartinger, Privilegien der Hauptsladt Graz (1836), p. ii. 13. 1444. Seal of a member of the family of Riedtheim. Germ. Mus., Nürnberg. Anzeiger, 1859, p. 250. The name is there given as Ludwig von Rietheim, which I cannot decipher on the impression before me. Possibly the name is Ulric (Udalric), since an Udalric of Riedtheim was in existence at this time (Bucelinus, Germania Stemm. vol. i, under Riedtheim). 14. 1444. Seal of Monastery of Holy Trinity, Wiener Neustadt. Jahrb. k. k. Centr.-Comm. für Erforsch. u. Erhalt. der 15. 1(44)4. Seal of city of Wetzlar, Germ. Mus., Baudenkmale, iii (1859), p. 238. Nürnberg. "Secretu civitatis wetzlariësis ad causas 1[44]4." Anzeiger, 1859, p. 250. 16. 1446. Seal reading "Nicolaus Grünwalt pp. ad(?) Sot (?)". Germ. Mus., Nürnberg. Anzeiger, 1859, p. 251 ("Kloster Grünwald"). 17. 1446. Albert VI of Austria. M.C.C. 18. 1450. Seal of Imperial Landgericht (provincialis burggraviatus) in xv, p. 37. Nürnberg. Germ. Mus., Nürnberg. Anzeiger, 1859. p. 251. This is given (wrongly) as 1420 in Anzeiger, 1861, p. 230. 19. 1450 +. Friedrich III. No space allowed for the fourth numeral. Cp. the book-plate of 1470 of Johannes, priest of St. Moritz in Augsburg 20. 1452. Seal of the Provincial of the Franciscan Order for Austria and (above, p. 150). Styria. M.C.C. xix, p. 260. 21. 1453. City of Krems. Melly, no. 46, pl. viii; M.C.C. xvii, p. xxiii.

#### TABLE XXIV. GERMAN SEALS (continued).

1. 1453. Dominican Convent of St. Peter in Wiener Neustadt. M.C.C. xv, p. cxxviii. 2. 1454. City of Ulm. B.M., Birch, Catal. of Seals, no. 21,521 (misread 1457); on a document of 1520 (B.M., Add. Ch. 26725). 3. 1454. Seal of Heinrich Mühlbach of Judenburg. M.C.C., 4. 1454. Kurfürst Friedrich I von der Pfalz. Germ. Mus., N.F. xxii, p. 26, fig. 18. 5. 1458. Friedrich III. M.C.C. xvi, p. 31. Nürnberg. Anzeiger, 1859, p. 250. **6**. 1458. 7 1459. Friedrich III as Archduke of Austria. Wiener Neustadt. M.C.C. xvi, p. cxcv. From a wax cast of an impression in the Germ. Mus., Nürnberg. Cp. the illustration in M.C.C. xvi, p. 23, where the 5 is drawn somewhat differently. 8. 1464. Friedrich III. M.C.C. xvi, p. 31. 9. 1464. City of Vienna. M.C.C. xi, p. xi (Beibl. no. 16). 10. 1464. City of Oppenau, in use 1474-1609. A. von Weech, Siegel der badischen Städle, pl. lxxxv. A later version of this seal was evidently made towards the end of the century; it bears the same date (but with the upright 4), and occurs on documents from 1499 to 1622. 11. 1465. City of Cilli. M.C.C. xvi, p. cii. 12. 1467. Knittelfeld. M.C.C., N.F. iv, p. lxx. 

 13. 1468. Markt Aspang. M.C.C. xvi, p. lxii.
 14. 1469. Grein. M.C.C. xix, p. 89.

 On a document of 1473. Cp. Melly, p. 71, no. 149, pl. iv.
 15. 1471. Gottschee. M.C.C., N.F. xii, p. clix.

 16. 1472. Landgericht of the Grafschaft Rotenfels. Anzeiger, 1861, p. 83.

The original matrix is in the Maximiliansmuseum at Augsburg. **17.** 1473. Krautheim. In use 1503–1521. A. von Weech, *Siegel der badischen Städte*, pl. vi. **18.** 1476. Gmünden. *M.C.C.*, *N.F.* iv, p. lxix. **19.** 1477. Gurkfeld (Krain). *M.C.C.* v. 328. Cp. *M.C.C.* xix. 89, which is a XVI cent. reproduction.

### TABLE XXV. GERMAN SEALS (continued).

1. 1479. Augustin Adlof of Judenburg. M.C.C., N.F. xxii, p. 26. On a document of 2. 1480. Amalie, Duchess of Bavaria, daughter of Friedrich the Mild. O. Posse, 1480. Die Siegel der Wettiner, pl. xxiii. 4.3. 1481.Provost of Monastery of St. Nicolas inRotenmann.M.C.C. xix, p. 252.4. 1483.City of Freiburg i. U.Anzeiger, 1873, 94. 5. 1485. Rector of University of Cologne. Silver matrix in the Victoria and Albert Museum. Cp. Sibmacher, Wappenbuch, i. 8, Taf. XVIII, 3 (illustration inexact). The bottom stroke of the 5 is shortened by part of the design. 6. 1487. Krems. Melly, Beitrage, no. 48, pl. ix. Cp. M.C.C. xvii, p. xxiv. 7. 1487. Dominican Convent of St. Mary, Neukloster. M.C.C. 8. 1487. Monastery of St. Nicolas in Rotenmann. M.C.C. xix, p. 253. xix, p. 246. 9. 1488. City of Judenburg. M.C.C. xvii, p. clix. On a document of 1603, but may be contemporary with the date it bears. 10. 1488. Monastery of St. Paul in the Lavantthal. M.C.C. xix, p. 261. 11. 1489. Benedictine Monastery of St. Lambrecht. M.C.C. xix, p. 242. 12. 1489. Benedictine nunnery at Göss (Styria). M.C.C. xviii, p. 318. 13. 1489. City of Bautzen. Germ. Mus., Nürnberg. Misread 1444 in Anzeiger, 1859, p. 250. It may pos-14. 1492. Hans Hohewarter of Judenburg. M.C.C., N.F. xxii, p. 26. sibly be 1484. 15. 1493. Seal of Hans Stahl of Judenburg. M.C.C., N.F. xxii, p. 26. 16. 1493. Dro-17. 1502. Brilon (Westphalia). Philippi, Westphal. sendorf. M.C.C., N.F. iii, p. cxxiii. Siegel, pl. 97, 10. 18. 1503. Frauenbruderschaft im Spitale zu Wien. M.C.C. xvi, p. lxii. **19.** 1503. Vienna. *M.C.C.* xviii, p. 219. **20**. 1503. Heidelberg. On documents from 1502 (!) to 1601. A. von Weech, Siegel der badischen Städle, pl. xviii. 21. 1504. Regular Canons, S. Veit, Pöllau. M.C.C. xix, p. 250.

### TABLE XXVI. GERMAN SEALS (continued).

1. 1507. Stephan Bär of Judenburg. M.C.C., N.F. xxii, p. 26.
 2. 1514. Tübingen.
 Pfaff, Württemb. Jahrbücher, 1854, 2, p. 147.
 3. 1517. Reuchen. In use 1517-1522.
 A. von Weech, Siegel der badischen Städte, pl. lx.
 4. [15]19. Two seals of Hermann V,
 Abp. of Cologne. Ewald, Rheinische Siegel, i, pl. xxvi. 7; xxvii. 1.
 5. 1521 (or 1527).
 Heidelsheim. In use 1570-1579.
 A. von Weech, Siegel der badischen Städte, pl. xlvi.

### TABLE XXVII. GERMAN: VARIOUS.

1. 1434. "Anno doi milesimo cccc 34". Window in St. Leonhard's, Tamsweg. M.C.C. xix, 2, 4. 1444, 1448. On a stole and pallium, with the motto of Friedrich III, at pp. 77, 80. Tököle. M.C.C., N.F. vii, pp. 72, 73. 3. 1446. Bell at Neuberg. M.C.C., N.F. xxiii, p. 122. The date 1440 occurs on a bell in the church ad S. Ioannem decoll. in Zeben (M.C.C. xvii, 5. 1463. Figures and date on a portable sundial found at Hörnstein, Lower Austria. p. iii). *M.C.C.* xvi, p. clxxx. **6**. 1466 (M466). On the bottom of a paten. *Anzeiger*, 1861, p. 190. 7. 1491. Mark on the eagle of the Merchants' Schützengild of Breslau. M.C.C. vii, p. 52. 8. 1495. Pall of the Holzschuhers, in the Germanisches Nationalmuseum, Nürnberg. Mitt. Germ. 9. 1499. On sword of the Hochmeister Siebenhirter of the Order of Mus. 1895, p. 99. St. George. M.C.C. xviii, pp. 310 (fig. 11), 315. 10. 1508. Bell in St. Michael's Chapel, Rankweil. M.C.C., N.F. xxi, p. 241. 11. 1517. Glass-painting in the Germanisches Nationalmuseum, Nürnberg. Kalalog - (1898), no. 260, p. 33 and pl. xi. 12-14. 1526, 1530, 1531. German pottery (plates in the Germanisches Nationalmuseum). Anzeiger, 1875, p. 238. 15.

1573. Date and figures on a metal gauge (German) in the British Museum. A late survival of the old 4. **16**. 1596. German pottery. *Anzeiger*, 1875, p. 268. Very similar forms occur on a plate dated 1593, *ibid*.

### TABLE XXVIII. GERMAN PAINTINGS.<sup>1</sup>

1. 1435. Altar-piece by Lukas Moser at Tiefenbronn. Anzeiger, 1861, pp. 49 and 83: Jahrb. der kunstgesch. Gesellsch. f. photogr. Publikationen, v (1899). It has been read 1431 and even 1451; the latter is highly improbable. If the artist wished to vary the form of his 1, he would be more likely to ornament the numeral on its first than on its second occurrence; the first numeral is often decorated, like an initial letter. The fourth numeral here is thus probably not 1, and it can hardly be anything but 5. 2. 1446. Heraldic painting ("Handregistratur" of King Friedrich IV), Vienna. Ströhl, *Herald. Atlas*, pl. xxviii. 1449. D. Pfenning. Vienna, 1396. **5**, 1483. Hungarian School. Budapest, 9. 3. 4. 6, 7, 1487, 1488. Paintings on side-altars in St. Martin's Chapel near Ludesch. M.C.C., N.F. xviii, 8. 1491. Monogrammist R. F. Vienna, 1398. 9. 1493. Dürer. Portrait p. 236. of himself, formerly in the Felix Collection. Cust, Dürer Engravings, p. 21. 10. 1498. 11. 1499. Dürer. Portrait of Hans Tucher. Grand-Ducal Dürer. Portrait. Prado. 11. 1499. Dürer. Portrai Museum, Weimar. From Dürer Society's Reproduction. 12. 1503. Dürer. Vienna, 1442. 13. 1504. Lucas Cranach the Elder. Berlin, 564 A. 14. 1506. Dürer. Berlin, 557 F. 15. 16. 1507. Dürer. Vienna, 1444. 1506. Dürer. Dresden, 1870. 17. 1507. Dürer. 18. 1507. Albrecht Altdorfer. Berlin, 638. The date occurs twice on the Berlin, 557 1. 19. 1507. Albrecht Altdorfer. Berlin, 638 A. Note the 3-like form of 5. picture. 20. 21. 1508. Dürer. Vienna, 1446. 1508. Meister des Marienlebens. Cologne, 141.

#### TABLE XXIX. GERMAN PAINTINGS (continued).

 1. 1509. Hans Schäuffelein. Portrait. German. Mus., Nürnberg. Mitt. Germ. Mus., 1895, p. 65.
 2. 1510. H. Schäuffelein. Prag, 609.
 3. 1511. Hans Burgkmair. Berlin, 584.
 4. 1511. Hans von Kulmbach. Berlin, 596 A.
 5. 1511. H. Schäuffelein. Berlin, 560.
 6. 1511. Dürer. Vienna, 1445.
 7. 1512. Dürer. Vienna, 1447.
 8. 1512. Baldung. Berlin, 603.
 9. 1512. Jörg Breu. Berlin, 597 A.
 10. 1514. Monogrammist I. M. Prag, 177.
 11. 1514. Hungarian School. Budapest, 5.
 12. 1515. Altdorfer. Vienna, 1422.
 13. 1515. Baldung. Vienna, 1424.
 14. 1515. L. Cranach the Elder. Vienna, 1453. In spite of the difference between the second and fourth numeral, both probably represent 5.
 15. 1516. Baldung. Prag, 27.
 16. 1519. Dürer. Vienna, 1443.
 17. 1520. Hans Brosamer. Vienna, 1477.
 18. 1526. Dürer. Vienna, 1448.
 19. 1528.
 L. Cranach the Elder. Stockholm, 1080.
 20. 1528. Wolf Krodel. Vienna, 1472.

### TABLE XXX. GERMAN PRINTED BOOKS, WOODCUTS, ETC.

 1. 1464. Woodcut. Dodgson, Catalogue of Early German and Flemish Woodcuts in the British Museum, i (1903), A. 25.
 2. 1470. Block-book, Biblia Pauperum. (B.M., I B. 3.)
 3. 1470. Rolewinck, Sermo in festo praesentationis beate Marie Virginis. Cologne, (B.M., I A. 3102.) The first figure 1 is of course merely a capital letter I.
 4. 1471. Block-book, Biblia Pauperum. (B.M., I C. 5.)
 5. 1473 (after October). Fasciculus Temporum. Cologne. (B.M., I B. 3805.)
 6. 1474. Regiomontanus, Nürnberg. (B.M., I A. 7888.)
 7. 1477. Fasciculus Temporum. Cologne. (B.M., I B. 3128.)
 8. 1479. Fasciculus Temporum. Cologne. (B.M., I C. 4371.)
 9. 1481. Woodcut by Hans Schauer. Dodgson, Catalogue, i. A. 120.
 10. 1482. Woodcut. Dodgson, Catalogue, i. A. 123; Schreiber, Manuel, 1881.

<sup>1</sup> See also Supplementary Table L. 11.

11. 1488. Woodcut in Augsburg Boethius. D. E. Smith, Rara Arithmetica, p. 26.
12. 1496. Woodcut : Andechs or Munich. Dodgson, Catalogue, i, p. 120. 128.
13. 1499. Woodcut by Mair of Landshut. Dodgson, Catalogue, i, p. 149. 145.
14. 1499. Woodcut by Mair of Landshut. Dodgson, Catalogue, i, p. 149. 143.
15. 1499. Woodcut by Burgkmair. Schreiber, Manuel, 2022; Catal. 40, pl. xv.
16. 1500. Johann Widman, Behennd vnd hüpsch Rechnung (Commercial Arithmetic). Pforzheim. D. E. Smith, Rara Arithm., p. 37.
17. 1503. From Reisch, Margarita Philosophica. Freiburg, 1503. Woodcut in the 1507 Cut title-page.
18. 1504. Dürer. Nativity (B. 2).
19. 1507. Woodcut in the 1507 Algorithmus (Leipzig). D. E. Smith, p. 88.
20. 1508. Dürer. Copper engraving, St. George on Horseback.

#### TABLE XXXI. GERMAN COINS.

All from specimens in the British Museum, except no. 15, which is : 1504. Salzburg, Archbishop Leonhard. Blätter f. Münzfreunde, 1909, pl. clxxxiv. 5.

### TABLE XXXII. GERMAN COINS.

All from specimens in the British Museum, except nos. 2 (from a photograph), 8 (from *Anzeiger*, 1861, 232), and 11 (from a specimen in Mr. Rosenheim's collection).

### TABLE XXXIII. GERMAN MEDALS.

1499. Ladislaus II of Hungary. Domanig, *Die deutsche Medaille*, No. 6.
 1507. Albert IV of Bavaria. Domanig, no. 32, pl. iv.
 1508. Michael Wolgemut, attributed to Dürer. The date was incised in the model. Rosenheim Collection.
 1512. Friedrich, Duke of Saxony. The date has the appearance of being punched in. Rosenheim Collection.
 1514. "Dürer's Father," attributed to Dürer. Rosenheim Collection.
 1524. Magdeburg, Cardinal Albert of Brandenburg.

### TABLE XXXIV. SWISS COINS.

All from specimens in the British Museum.

#### TABLES XXXV-XXXVIII. LOW COUNTRIES. COINS, ETC.

The numerals in Tables XXXV-XXXVIII are taken chiefly from specimens in the British Museum, supplemented by the illustrations in the various volumes by Van der Chiis on Netherlandish coins.

### TABLE XXXV.

1, 4, 8, 10 are from coins of Flanders. 2, 5, 7, 9, 11, 16 are from coins of Brabant. 3, 6, 13 are from coins of Gelderland. 12, 14, 15 are from coins of Holland.

#### TABLE XXXVI.

1, 4, 6 are from coins of Utrecht. The last might possibly be read 1487, but the distinct curve in the tail of the doubtful figure suggests that we have an analogy to the German 5; in other cases (as Table XXXVIII. 2 and 6) the form of 5 is still nearer to the modern 7. Compare also the Gelderland forms, Tables XXXVII. 15 and XXXVIII. 16. 2, 7, 14 are from coins of Brabant. 3, 5, 9, 11, 13 are from coins of Holland. 8, 15 are from coins of Friesland. 10 is from a coin of Gelderland. 12, 16 are from Flemish jetons.

### TABLE XXXVII

1. Medal of Archbishop Schevez of St. Andrews. The belief that this medal is of Flemish origin is confirmed by evidence which will be published by Dr. R. F. Burckhardt of Basel.

Schevez was out of Scotland, on a journey to Rome, at the time the medal was made. 2, 15 are from coins of Gelderland. For the "German" 5 in the latter compare Table XXXVI. 6. 3, 5, 9 are from coins of Utrecht. 4, 8, 10, 20, 21 are from jetons. In No. 10 the two forms of 4 are not on the same piece, but on two different jetons of the same year. 6 is from the Montagu specimen of the so-called "Perkin Warbeck groat", which, there can be little doubt, was struck in Flanders, and is not a coin but some sort of counter. *Medallic Illustrations*, i, p. 21, no. 3. 7, 12 are from coins of Holland. 11, 19 are from coins of Friesland. 13, 14, 17, 18 are from coins of Brabant. 16 is from a coin of Luxemburg.

### TABLE XXXVIII.

1, 4, 7, 12, 14 are from coins of Brabant. of 5 on nos. 2 and 6 has already been noticed. The last is given as an instance of a form of 5 which might easily be mistaken for 3. are from coins of Gelderland, the latter showing the "German" 5.

#### TABLE XXXIX. LOW COUNTRIES: PAINTINGS.

 1. 1432. 10 Oct. Jan van Eyck. National Gallery, 290.
 2. 1433. Jan van Eyck. National Gallery, 222. The date is written M<sup>0</sup>cccc<sup>0</sup>.33<sup>0</sup>.21 Oct.
 3. 1434. Jan van Eyck. National Gallery, 186.
 4. 1438. 31 Januarii. Jan van Eyck. Berlin, 528.
 5. 1446. Petrus Cristus. Portrait of Edward Grimston, at Gorhambury. Archaeologia, xl, p. 459.
 6. 1462. Flemish School. Portrait of a man. National Gallery, 943.
 7. 1474. Flemish School. Martyrdom of St. Erasmus. Library of Soc. of Antiquaries. Scharf's Catal., p. 13 f.
 8. 1514. Atelier of Quentin Matsys. Stockholm, 505.
 9. 1516. Gossart. Berlin, 648.
 10. 1523. Jacob van Utrecht. Berlin, 623 A.

### TABLE XL. FRENCH MEDALS.

**1.** 1485. Aimar de Prie. From the Paris specimen. I have placed this among the French medals, although it has some affinities with N. Italian work. But I can find no evidence of Aimar de Prie's having visited Italy so early as 1485. The medal has been attributed to a later date, but I am by no means sure that Friedländer (Diegeprägten Medaillen, p. 15) is not right in insisting that it was struck in 1485. 2. 1486. Charles de Bourbon. British Museum. Cast. 3. 1493. Charles VIII and Anne de Bretagne. British Museum. Struck at Lyons; the work of Louis Lepère, Nicolas de Florence, and Jean Lepère. **4**. 1494. Medal issued at Vienne on the birth of the Dauphin, Charles-Orland. See Heiss, *Niccold Spinelli*, etc., p. 53; Mazerolle, Les Médailleurs français, pl. ii. I note, as a matter of interest to numismatists, that there is in the British Museum (Dept. of British and Mediaeval Antiquities) a seal-like reproduction of this medal in cast bronze, the representation being sunk, instead of in relief. To make it, a specimen of the medal must have been taken, two wax impressions made from it, these two impressions placed back to back, the whole covered with moulding material, and the present piece cast by the *cire perduc* process. 5. 1499. Lyons medal of Louis XII and Anne de 6. 1512. François I. Trésor de Numismatique, Méd. fr. i, pl. x. 1. Bretagne. Cast. Possibly not French. 7. 1512. Florimond Robertet. Op. cit. i, pl. xliii. 3. Possibly 8. 1518. Medals of Jacques de Vitry, Pierre Girard de Rhodez, Jean de not French. Talaru, Antoine de Toledo. British Museum, etc. All misread 1515 by some old writers, owing to the peculiar shape of the 8.

#### TABLE XLI. ITALIAN PAINTINGS.<sup>1</sup>

1. 1472. Carlo Crivelli. Virgin and Child. R. H. Benson Collection. *Catal. of the National Loan Exhibition*, 1909–10, no. 71. 2. 1473. Giov. Boccato (Umbrian School).

<sup>&</sup>lt;sup>1</sup> For a painting dated 1391, see Supplementary Table L. 5; for others of 1464, above, p. 147, note 1. VOL. LXII. B b

3. 1474. Antonello da Messina. Berlin, 18 A. 4. 1475. Antonello Budapest, 74. da Messina. Louvre, 37. 5. 1477. Antonello da Messina. National Gallery, 1166. 1477. Bartolommeo Vivarini. Vienna, 10. 7. 1485. Bartolommeo Vivarini. Berlin, 6. 7. 1485. Bartolommeo Vivarini. Berlin, 1160. 8. 1487. Bonsignori. National Gallery, 736. 9. 1489. Francesco Tacconi. National Gallery, 286. 10. 1496. Carpaccio. Vienna, 7. 11. 1497. Niccolò da Foligno. Buda-pest, 82. 12. 1497. Ant. da Carpi. Budapest, 123. 13. 1499. Macrino d'Alba. Imbert Collection, *Burlington Magazine*, May, 1909, p. 115. This is not, as there stated, a portrait of the painter, the inscription implying the very contrary. 14. 1502. Lorenzo Costa. Berlin, 15. 1502. Francesco Francia. Berlin, 122. 16. 1510. Florentine : atelier of San II2. Marco. 17. 1511. Fra Bartolommeo. Borghese Gallery, 310. Vienna, 38. From La-18. 1511. Andrea Solario. Borghese Gallery, 461. From Lafenestre. 19. fenestre. 1515. Basaiti. Vienna, 1. 20. 1515. Panel (marriage tray) in Victoria and Albert Museum. Madonna and Child and two angels. 21. 1516. Fra Bartolommeo. Vienna, 41.

### TABLE XLII. ITALIAN PAINTINGS (continued).

1. 1521. Lorenzo Lotto. Berlin, 325. A similar form of 5 occurs on Venetian medals (Table XLV. 11-14). Its origin is seen in forms like those on no. 20 of preceding Table. 2. 1522. Franciabigio. Berlin, 245. 3. 1523. Andrea del Sarto. Portrait of himself. Panshanger. [National Loan Exhibition, 1909-10, no. 45.] 4. 1526. Mazzolino. Vienna, 88. 5. 1531. Lorenzo Lotto. Berlin, 323.

### TABLE XLIII. ITALIAN MAJOLICA.

1. Mid. XV. cent. Majolica roundels of the Months, by Luca della Robbia, in the Victoria and Albert Museum. These show the characteristic Italian forms of the time. The figures in the July are restored, and the fraction may possibly have once been <sup>2</sup>/<sub>3</sub>. My attention was called to these by Mr. E. D. Maclagan, who informs me that the roundels must date before about 1460, or 1464 at the latest. 2. 1487. Faenza. Fortnum, Majolica, p. 88. 3. 1489. Forlì. Plaque in Victoria and Albert Museum (490. '64). **4**. 1491. Faenza. Fortnum, p. 92. **5**. Gubbio plaque by Giorgio Lombardo in the British Museum. **6**. 1503. Faenza. Fortnum, p. 109. 7. 1508. Castel Durante. Fortnum, p. 49. 8. 1509. Callaggiolo. Fort-10. 1513. Tile in British Museum. num, p. 3. 9. 1513. Faenza. Fortnum, p. 117. Wallis, Italian Ceramic Art : the majol. pavement tiles of the fiftcenth century, fig. 91. 11. 1518. Gubbio. Fortnum, p. 28. **12**. 1524. Gubbio. Fortnum, p. 30. **13**. 1526. Gubbio. Fortnum, p. 34. **14**. 1528. Gubbio. Fortnum, p. 36. Anywhere but in Italy, this might possibly be 1524, the 4 being inverted. But a badly made o is not out of the ques-15. 1528. Gubbio. Fortnum, p. 33. 16. 1530. Gubbio. Fortnum, p. 36. tion.

### TABLE XLIV. ITALIAN MEDALS, ETC.

1. 1390. Medal of Francesco Carrara. Periodico di Numismatica, i, pl. vii. 5. Struck.
 2. 1393. Venetian medal, by Marco Sesto. Op. cit. i, pl. vii. 1. Struck.
 3. 1417. Venetian tessera, by Alessandro Sesto. Op. cit. i, pl. vii. 3. Struck.
 4. 1446. Sigismondo Malatesta, by Matteo de' Pasti. British Museum.
 5. 1447. Isotta Atti, by Matteo de' Pasti. British Museum.
 6. 1448. Antonio Marescotti, by Marescotti. Heiss, Marescotti, etc., pl. ii. 2. Incised on the model. There is no reason to doubt its contemporaneity.
 7. c. 1460. Antonio Roselli, by Bartolommeo Bellano. From the British Museum specimen. The figures 91 cannot indicate Roselli's age if, as seems to be the fact, he died, aged 85, on Dec. 10, 1466. See Semrau, Donatello's Kanzeln, p. 151.

the British Museum specimen. 9. 1464. Paul II. From the Paris specimen. Although this medal is made from one of Paul's medals of 1455, when he was Cardinal of San Marco, by reworking the model, there is no reason to suppose that it is not contemporary with the date which it bears. 10. 1470. Galeazzo Maria Sforza, probably by Caradosso. Friedländer, 11. 1472. Ercole I d'Este, by Baldassare Estense. Ital. Schaumünzen, pl. xxxvi. 11. Heiss, Niccolo, etc., pl. v. 1. 12, 13. 1479. Medals by Candida of Jehan Miette and Jean Carondelet respectively. The occurrence of the old form of 4 on these medals by an Italian is explained by their having been made at Lille and Paris. The same fact accounts for the old 7 on no. 12. But the new 7 occurs on no. 13; compare the variation on the coins of the Low Countries about this time, Table XXXV. 9 ff. 14. 1481. Alfonso, Duke of Calabria, by Guazzalotti. Heiss, Florence, i, pl. iii. 5. 15. 1481. Mahomet II, by Constantius. British 16. 1485. Bernardo Gambara. Roman School. Rosenheim Collection. Museum. 17. 1485. Fabrizio Marliano. From the Berlin specimen. **18**. 1489. Pietro Vettori. Heiss, *Florence*, i, p. 45, after Litta. The drawing may therefore be inaccurate. **19**. 1495. Lorenzo Cigliamocchi. By himself? Heiss, *Florence*, i, pl. xiii. 2. **20**. 1497. Pattern (bronze) for testoon of Lodovico il Moro. British Museum. Gnecchi, Monete di Milano, pl. xvii. 5.

#### TABLE XLV. ITALIAN MEDALS (continued).

1. c. 1498. Aless. Vecchietti. Florentine. The figures 26 give his age; he was born in 1472. British Museum. 2. 1499. Giangiacomo Trivulzio. By Caradosso. British 3. 1502. John Greudner, by Niccolo Fiorentino or his school. British Museum. Museum. **4.** 1503. Lodovico Marchese di Saluzzo and Marguerite de Foix. North Italian. 5. 1505. Ercole I d'Este. Heiss, Niccolò, etc., pl. vii. 4. 6. 1513 (written MD13). Louis XII. Probably Milanese work. British Museum. 7. 1515. Pietro Antonio da Castello. From the Paris 8. 1516. Marguerite de Foix, by "J. J. C." North Italian (Genoese?) work. specimen. British Museum. 9. 1538. Antonio Mula, by Spinelli of Venice. With the broken-topped 8 compare Table XLIII. 14. Struck. 10. 1539. Giov. Vinc. Dolci, by Giovanni Cavino 10. 1539. Giov. Vinc. Dolci, by Giovanni Cavino 11. 1539. City of Venice D. Giovanni Cavino of Padua. Struck. British Museum. British Museum. With the peculiar 5 compare that on the painting (also Venetian) by Lotto, Table XLII. 1. **12**. 1540. Girolamo Quirini. By Spinelli of Venice. Struck. British Museum. For the 5 see preceding. **13**. 1542. Venetian, by Spinelli. Struck. British Museum. For the 5 see no. 11. **14**. 1549. Girolamo Zane. By Spinelli of Venice. Struck. British Museum. For the 5 see no. 11.

### TABLE XLVI. ITALIAN. VARIOUS.<sup>1</sup>

1. 1423. Venice, monument of Tommaso Mocenigo, in SS. Paolo e Giovanni. See Friedländer, *Period. di Numism.* i, p. 146. From a squeeze supplied by the architect of St. Mark's through Mr. Horatio Brown. 2. 1428. "formato a di 17 di gienaio 1428, formato nel Gabinetto (?) di Nicholo in gesso." Scratched in the wet stucco on the back of a stucco relief in the Ashmolean Museum (Fortnum). The relief has been rashly condemned, but also defended; consulted about the inscription, both Mr. Warner and Mr. Herbert independently, and without seeing the date, pronounced it to be of the XV cent. See Bode, *Florentiner Bildhauer* (1902), p. 162; *Florentine Sculptors* (London, 1908), p. 97, where it is assigned to Luca della Robbia. Other references, kindly supplied by Mr. C. F. Bell, are M. Reymond, *Les della Robbia* (1897), p. 111; Fortnum, *Athenaeum*, Dec. 18, 1897; Bode, *Denkmäler*, pl. 191, pp. 73-74; *Rivista d'Arte*, Jan. 1905. 3. 1459. Reggio d'Emilia. On a sculptured lunette in the Museo Civico. Venturi, *Storia dell' Arte italiana*, vi, p. 816. 4. 1471. On a statue of the Madonna by Francesco Laurana at Noto (Sicily). Rolfs, *Franz Laurana*, pl. 39. 5. 1474. On a

<sup>1</sup> See also Supplementary Tables L, LI.

bust of Pietro di Francesco Mellini, Mus. Naz., Florence. Mr. Walter Ashburner, who kindly sends a note of this example, says that the whole inscription (which is *inside* the bust) is AN 1474 | PETRI MELLINI FRANCISCI FILLI MAGO MEC, and that while the second line is the work of a practised stone-cutter, the date is simply scratched in; it is, he thinks, though not part of the inscription, contemporary, perhaps done by the artist himself. **6.** c. 1495. On the Loggia di San Paolo, Florence, under the two busts by Andrea della Robbia at the West and East ends of the series on the facade. The inscription is DALL ANNO 1451 ALL ANNO 1495. (Communicated by Mr. Walter Ashburner.) The left-hand (western) portion is illustrated in M. Reymond, *Sculpt. Flor.* ii, p. 182.

### TABLE XLVII. ITALIAN. PRINTED BOOKS, ENGRAVINGS, ETC.

1. So-called "Tarocchi of Mantegna". From series in the British Museum. These are not really playing cards. The first series (according to the arrangement adopted in the British Museum) is as early as 1467; the second (see no. 2, and the 6 and 7 in no. 1) may be 10 to 20 years later. But according to Kristeller this supposed second series is really the first. Apart from other reasons against this inverted arrangement, it may be noted that the numerals in the "Arithmetic" are more likely to have been added than removed in a second series. On these engravings see A. M. Hind, Catalogue of Early Italian Engravings in the British Museum, 2. On a tablet held by figure of Arithmetic, on the so-called Tarocchi cards (one p. 224. of the copies; the original series is without it). The tablet gives the numerals from 1 to 10, and abbreviations which have been read as a date 14085, but which seem to represent a sum of money (perhaps L(ire)40 S(oldi)5). From a specimen in the British Museum. Treviso Arithmetic. D. E. Smith, Rara Arithm., pp. 5, 6. 4. 1479. Venice 3. 1478. 4. 1479. Venice, J. Marchesinus, Manimotrectus. British Museum, I A 19729. 5. 1484. Venice, Regiomontanus, Ephemerides. British Museum, I A 20533. 6. 1491. From Calander's Arithmetic, Florence, 1491. D. E. Smith, op. cit., p. 47. 7. 1492. From Pellos' Arithmetic, Turin, 1492. Smith, op. cit., p. 51. 8. 1509. Italian engraving (Paris and "Egence") after a German original which accounts for the forement to the forement the forement to the original, which accounts for the forms, especially of the 5. British Museum, v. 1-44.

### TABLE XLVIII. INSCRIPTIONS FROM RHODES.

Graffito in Phileremos crypt. Belabre, Rhodes of the Knights, pp. 186, 187. 1. 1447.  $\mathbf{2}$ . 1457. Graffito in chapel on top of tower on rampart. Belabre, p. 92. **3.** 1459. Graffito in Phileremos crypt. Belabre, p. 186. **4.** 1489. Shield on outwork of Spanish Tower, in Phileremos crypt. Belabre, p. 186. with arms of Pierre d'Aubusson. Belabre, p. 58. 5. 1490. Inscription of Cardinal Pierre 6. 1492. Inscription of Aymery d'Aubusson. Rottiers, Monumens de Rhodes, pl. lxxiv. d'Amboise. Rottiers, *Monumens de Rhodes*, pl. liii, fig. 9. **7**. 1494. Graffito in Phile-remos crypt. Belabre, p. 187. **8**. 1495. Inscription of Cardinal Pierre d'Aubusson. Rottiers, *op. cit.*, pl. lxiii. 2. **9**. 1497. Shield of Vilaraguts on a house. Belabre, p. 149. d'Amboise. Rottiers, Monumens de Rhodes, pl. liii, fig. 9. 10. 1502. Funerary slab of Thomas Newport, Spanish Tower. Belabre, p. 59.
11. 1506. Graffito in Phileremos crypt. Belabre, p. 186.
12. 1509. Slab in Street of the Knights. Belabre, p. 121.
13. 1511. Tombstone of Nicolas de Monmirel in courtyard of old Konak. Belabre, p. 164.
14. 1515. Shield of Carretto, Gate of Athanasios. Belabre, p. 66.
15. 1517. Shield of a knight. Belabre, p. 149. the Knights. Belabre, p. 108. **17**. 1519. Inscription of Jean Cheron in the Street of the Knights. Belabre, p. 109. 18. 1520. Shield on a house in the Street of the Knights. Belabre, p. 106.

#### TABLE XLIX. GERMAN (SUPPLEMENTARY).

1. 1383. Wertheim. Outside nave of the Evangelical Church. Mr. Lockner, who supplies the rubbing, questions the antiquity of the date; but the forms are excellent. 2. 1419.

Wertheim. Outside tower of Evangelical Church. Rubbing by Mr. Lockner. **3**. 1484. On a stone formerly in the possession of the Historischer Verein, now in the Fränkisches Museum at Würzburg, with a scene from St. Luke i. 26 ff. From a rubbing by Mr. Lockner. See Denzinger, p. 170. The 8 is broken away below. **4**. 1492. Wertheim. Rathaus, outside wall. Rubbing by Mr. Lockner. The form of the 1 is not clear to me. **5**. 1493. On the stone brackets supporting the figures of Adam and Eve by Riemenschneider, in the Fränkisches Museum, Würzburg. Rubbings by Mr. Lockner. **6**. 1497. On arch of passage through the Choir in the Church of St. Burkard, Würzburg. Denzinger, p. 170 From a drawing by Mr. Lockner. **7**. 1498. Very neatly cut on a pillar in the church of the Monastery of Brombach near Wertheim. Drawing by Mr. Lockner. **8**. 1514. In the Fränkisches Museum, Würzburg; armorial slab of Bishop Lorenz von Bibra, from the old Landgerichtsgebäude. From a rubbing by Mr. Lockner.

### TABLE L. MISCELLANEOUS AND SUPPLEMENTARY. XIII-XV CENT.

1. circa 1260? Astrolabe in British Museum. The style of the numerals would be equally possible, if not more probable, at a rather later date. **2**. 1276. MS. Cambridge University Library, Ii 3. 3. Treatise on the astrolabe by Macha-allah (Astrolabium Messehalle). See W. E. A. Axon, Proc. Manchester Lit. and Phil. Soc., 1876, p. 175; and W. W. Skeat's ed. of Chaucer's Treatise on the Astrolabe (E. E. T. S. and Chaucer Soc., 1872), pp. xxiv and 88 ff. Mr. S. C. Cockerell, who kindly supplied a note of the forms of the numerals, is inclined to suggest Liége or neighbourhood as the source of the MS. **3**. 1326. Astrolabe in the British Museum bearing this date. 4. 1342. Astrolabe in the British Museum, signed "Blakene me fecit anno do' 1342." Mentioned Arch. Journ. xi. 30. **5**. 1391. Painting (triptych) by Spinello Aretino at Florence (R. Galleria Antica e Moderna: Virgin and Child and SS. Paulinus, John Baptist, Andrew, and Matthew). In relief below central panel. From a photograph. Communicated by Mr. A. H. S. Yeames. The lettering is the same as on the halo of the Virgin. The inscription appears to be HOC · OPVS · PINXIS · SPINELLVS · LVCE · ATITIO · 10 1 A 1391. Mr. Yeames remarks that it may have been added or touched up at a later date, but has not that appearance. 6. 1410. Seal of Fountains Abbey. Impression attached to document of 1424 at Durham. See J. R. Walbran, Memorials of the Abbey of St. Mary of Fountains (Surtees Society, 1863), p. lxix. Communicated by Mr. W. H. St. John Hope. 7. 1417. On the under side of the base of a chalice of gilt metal with silver bowl and four small nielli around the knop. Arch. Journ. xi, p. 72 (where it is read 1517). The provenance is not 8. 1444. Florence, Santa Trinità. Inscription on sarcophagus of Giuliano Davanstated. zati. 9. 1451. Armorial tablet of Ludovico dei Caccialupi of Bologna, Podestà of Florence, 1451. Court of Bargello, Florence. 10. 1451. Flemish painting (Angel of the Annunciation), at present in the possession of the Spanish Art Gallery. Although the forms seem flatly to contradict most of the other Flemish evidence, I have included this example. The picture came from Spain. Communicated by Mr. E. D. Maclagan. 11. 1452. German painting (1580-'55; Annunciation) in the Victoria and Albert Museum. Communicated by Mr. E. D. Maclagan. The date is written on a slant. It has generally been read 1472, but there can be little doubt that the figure which has been taken for a 7 is a 5. 12. 1453. Portable brass sundial (German) in British Museum,

### TABLE LI. MISCELLANEOUS AND SUPPLEMENTARY. XV-XVI CENT.

 1461. Italian (Florentine) engraving in the British Museum (Easter Table). A. M. Hind, *Catalogue of Early Italian Engravings*, A. i. 9. Communicated by Mr. Hind.
 1467. Bruzzano, near Milan. Carved on entrance of a villa. *Rassegna d'Arte*, 1903, p. 88.
 1470. Armorial tablet of Iohannes de Panaleutiis of Cività Castellana, Podestà of Florence,

4. 1485. On Isbury's Almshouses, Lambourne, Berks Court of Bargello, Florence. 1470. (Rubbing, Soc. of Antiquaries). Communicated by Mr. Mill Stephenson. The 5, which is imperfect on the rubbing (and on the original?), is of the h-shape usual at this time in England. 5. 1489. On painted panels in south aisle of Choir of St. George's Chapel, Windsor. Communicated by Mr. W. H. St. John Hope. 6. 1491. Viennese astrolabe in the British Museum, made by "Pruder Hanns Dorn Prediger Orden von Wien anno Domini 1491". 7. 1492. Hurley, Berks. Brass of John Doyly. (Rubbing, Soc. Antiq.) Communicated by Mr. Mill Stephenson. 8. 1492. Stanford Rivers, Essex. Brass of Thos. Greville. (Rubbing, Soc. Antiq.) Communicated by Mr. Mill Stephenson. 9. 1497. Quarry in window at St. Cross. Journ. Brit. Arch. Assoc. ix (1854), pl. xxxiv; Arch. Journ. 1850, p. 76. Drawing by Mr. Mill Stephenson. 10. 1497. "Anathema" cup at Pembroke College, Cambridge. From a rubbing by Mr. Ellis Minns. On the under side of the foot. The inscription is given by Mr. Minns: "T. langton Winton eps aule pembrochie olim foci<sup>9</sup> dedit hac taffea coopta eide aule 114.9.7" and also "qui alienauerit anathema fit. lxvii. unc." See also J. E. Foster and T. D. Atkinson, Old Cambridge Plate, p. 6, no. 8. The hall-mark is of 1481-2. The top is lost. 11. 1498. Norwich, St. Stephen's. Brass of John ffrankish. (Rubbing, Soc. Antiq.) Communicated by Mr. Mill Stephenson. 12. 1499. Bell (probably Flemish or Dutch) at Swinton in Berwickshire : see First Report of Ancient Monuments Commission (Scotland), p. 49, No. 242. Communicated by Mr. George Macdonald. 13. 1513. Brading, I.W. Cut on stone in niche behind pulpit in the church. Communicated by Mr. Percy Stone. This has been read Mld13, but the M is really an A, and the top bar of this letter has run into the top of the following I making it look like I; while the supposed d is an h-shaped 5 reversed. 14. 1522. Windsor. Below the paintings on north side of Oxenbridge Chapel, St. George's Chapel. Communicated by Mr. W. H. St. John Hope. 15. 1526. Window in South Mimms Church, Middlesex. T. Wright, *Essays*, ii, p. 81. 16. 1530. E. window in vestry, Enfield, on a medallion with the arms of Thomas Lord Roose. Gough ii (1), p. 140, and pl. xlix\*. 17. 1531. On an English leaden token, probably of John Saltcot, Abbot of Hyde, 1530-1538. See Yourn. Brit. Arch. Assoc. ix, p. 432.