

LITTERA
SCRIPTA
MANET

VISIBLE LANGUAGE

The Journal for Research on the Visual Media of Language Expression

Volume V, Number 1, Winter 1971

VISIBLE LANGUAGE

Volume V, Number 1, Winter 1971

- 5—12 *Visible Language*: The Journal for Research on the Visual
Media of Language Expression
A Report from the Editor
- 13—32 Calligraphy—An Aid to Cartography?
A. S. Osley
- 33—48 The Development of Vidifont
Rudi Bass
- 49—58 Creating a Mundurukú Orthography
Marjorie Crofts
- 59—66 Type Design Classification
Walter Tracy
- 67—74 Comment: Not Since Babel
Edmund Carpenter
- 75—81 Comment: The Role of Script in Describing the
Languages of the World
John Lotz
- 82—89 Correspondence
- 90 The Authors
- 91—92 Abstracts of Journal Articles in French and German
- 93—96 Back Numbers of *The Journal of Typographic Research*

Visible Language, Volume V, Number 1, Winter 1971. Published
quarterly (Winter, Spring, Summer, and Autumn) by the Journal,
c/o The Cleveland Museum of Art, Cleveland, Ohio, USA 44106.
Copyright © 1971 by *Visible Language*.

the visualist restricting his characterization of the oral medium of language as an unending stream of a university president's commencement address—hardly typical of the tribal world-communication medium lauded by Carpenter and McLuhan. The McLuhanites (Ongians?) do their own invaluable insights a disservice when they thrust a full-blown description of the variety, the range, and the relationships of oral expression against a straw man: visible language in its most unsophisticated form. In *its* simplest form, speech is also a single-sensory, linear system of abstract language symbols.

Edmund Carpenter ends his article (pp. 67–74) with the appeal of print to society's "drop-outs," "The hippies have discovered print, something totally new to them." But the glass is still dark. Carpenter is referring here to written literature, but in using "print" in this context he calls up all the Carpenter/McLuhan connotations surrounding that word. The hippies' discovery of print wasn't a "delightful reversal" of what one would predict; it was inevitable! What revolutionary movement within the memory of man hasn't utilized visible language expression? But in a curious lapse, the hippies' manipulation of the *medium* is ignored. Linguistic definitions of "script" and "writing" and "print" have difficulty in fitting in revolutionary communiques—or concrete poetry, or Picasso's discovery of print. When the hippies' cohorts in the French student uprising slashed the walls of Paris with their own interpretation of the visible language medium—what was the message?

Whenever social historians attempt to suggest the few most significant intellectual achievements of man, nearly always the one mentioned first is "writing"—or some related reference to man's initial development of a visible language. This Journal represents what could be the first concerted effort to organize our investigation of every respect of this visual medium of language expression.

Merald E. Wrolstad, Editor

1. "Letterform Research Needs Definition and Direction: A Report from the Editor," III (April 1969), 115–126.
2. "Writing" in A. R. Meetham (ed.), *Encyclopaedia of Linguistics, Information and Control* (Oxford: Pergamon, 1969).
3. "Visual Language from the Verbal Model," III (October 1969), 345–70.
4. "Writing' and 'Alphabet'," II (April 1968), 226.

Calligraphy—An Aid to Cartography?

A. S. Osley

Calligraphic analysis goes beyond general styles of writing and kinds of writing materials used; it attempts to isolate the characteristic features of a script and the scribe's personal performance. Specimens from various periods of Gerard Mercator's cartographic work are examined and compared, including a map recently discovered that, after calligraphic analysis, can be identified as almost certainly by Mercator. The importance of calligraphic analysis for determining cartographic attributions is discussed.

My experience in the world of cartography is that of an amateur. My justification for undertaking this paper is that in all branches of knowledge today the frontiers between the various disciplines are less closely guarded and patrolled than in the past and contributions from over the frontiers have no longer to be smuggled in, but are freely accepted by the authorities. There should be no balance of payments problem in the world of knowledge.

The question mark in my title is deliberate; I want merely to suggest certain ideas, not to be dogmatic. And I use the word "calligraphy" in a rather strict sense. The hand-written word can either be informal—as when we write letters, laundry lists, or notes of a telephone conversation; or it can be formal—as when a scribe writes an illuminated address, a designer lays-out a book-jacket, or an artist letters display notices for the goods in a department store window. The qualities of handwriting are speed and idiosyncrasy. It is usually easy to distinguish one man's informal hand from another. Indeed, it is often claimed that we can read character in handwriting. The mark of calligraphy, on the other hand, is that it is impersonal, deliberate, and in conformity with a model. It is also usually done on ruled lines and adjusted carefully to make an agreeable pattern on a page. Specimens of calligraphy of a particular age

13

may therefore appear to an untrained eye to “look all alike.” But careful analysis by a trained eye can reveal significant differences.

The examples which I have chosen are taken mainly from the fifteenth and sixteenth centuries; partly because this is a period rich in examples of calligraphy; partly because there lived at this time the unique example of one who was not only a fine cartographer but a master calligrapher in his own right—I mean, of course, Gerard Mercator; and partly because I happen to be familiar with the styles used in those years.

Calligraphic analysis goes beyond the obvious features of the general style of writing and the kind of materials used, though these things in themselves can provide valuable evidence. It attempts to isolate the minute but characteristic features of a script (the way, for example, an *i* is dotted), or the scribe’s difficulty—perhaps due to age or physical disability such as arthritis—in forming certain letters, or his partiality for a certain kind of ampersand or a particular type of punctuation. None of the individual features is necessarily conclusive—it is important to keep this in mind—but a number of them in combination may make an irresistible chain.

Perhaps I can illustrate my point most clearly by letting you see an expert at work. As you know, one of the most famous records in British history is the Domesday Book, a detailed register of the lands of England drawn up by order of King William the Conqueror between 1086–87. Superficially, the record appears to be in one handwriting. It is of interest to historians to know whether this is so. In 1952 a distinguished calligrapher, Mr. Alfred Fairbank, was asked to examine the book. Here is an extract, which he has permitted me to make from his unpublished report:

“The writing has the appearance of having been executed at some speed and it lacks the precision of some late Caroline hands. I hoped therefore to find signs of the personal failures (or idiosyncrasies) of the writer or writers due to the speed at which the script was written. I found such evidences and they seem obvious enough when indicated for any person to identify. They point to a conclusion that the whole book was written by one man.

“The two most significant failures, which appear throughout, are to my thinking expressions of personality and not characteristics of the script when written quickly:

- (a) There is a tremble or wobble, occurring intermittently and not regularly, in the ascenders, though not similarly in the descenders.
- (b) The writer lacks a good sense of scale and alignment. As regards scale, *o* and *i* are often much smaller than *n* and *m*. As regards alignment, a failure is often evident where *om* occurs in words, and a further feature is that the *m* in such instances tends to fall below the line progressively.”

Mr. Fairbank was also able to prove, because he could himself write the style rapidly, that the Domesday Book could have been written in a year, a thing which some earlier historians had doubted.

The examples of late fifteenth-century calligraphy in Figures 1 and 2 can be used to demonstrate an elementary form of the analytic

Figure 1. Manuscript by Bartolommeo Sanvito (British Museum, MS. Harl, 2528).

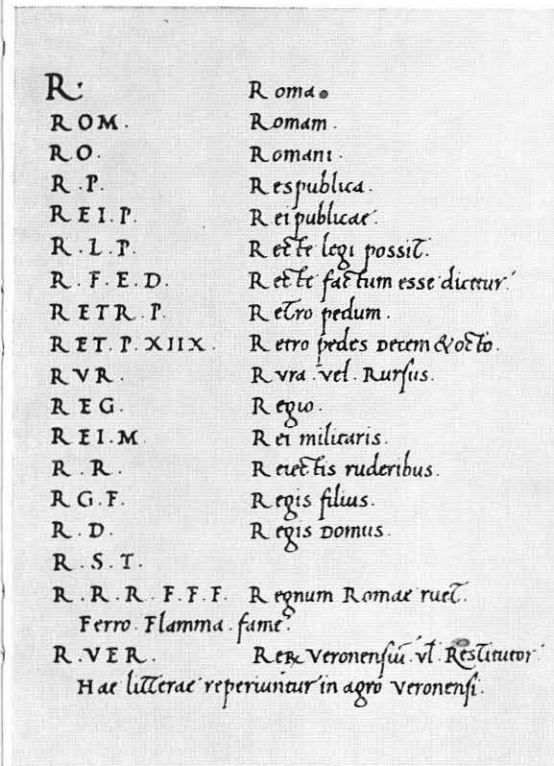
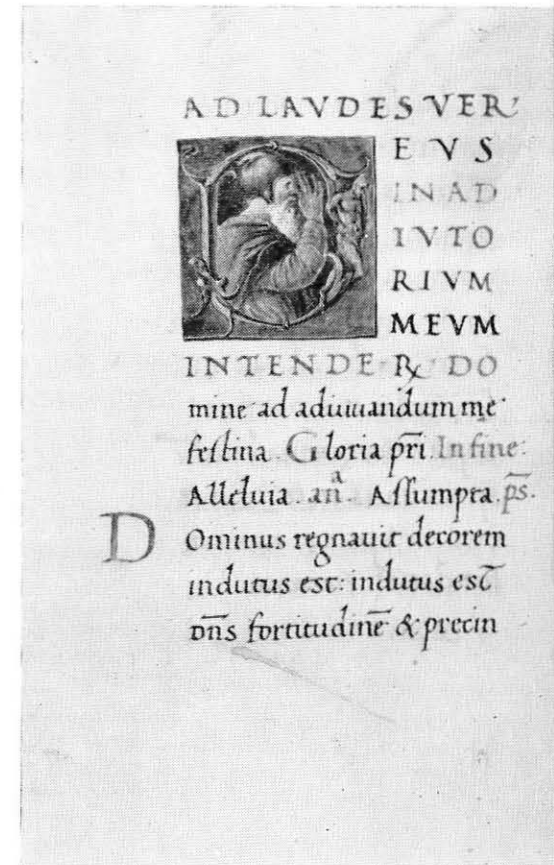
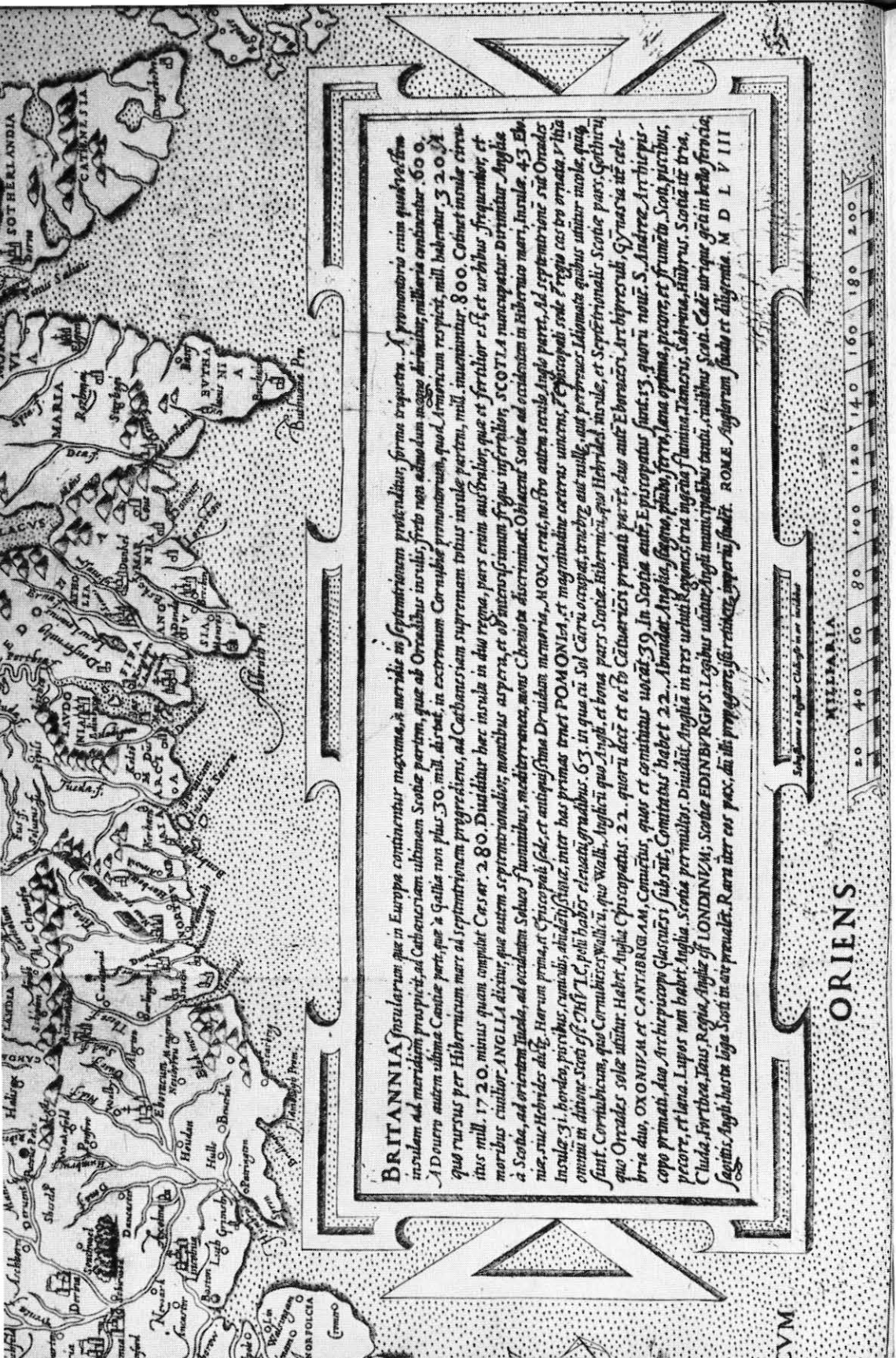


Figure 2. Manuscript by Bartolommeo Sanvito (British Museum, MS. Add. 20927).





BRITANNIA singularum que in Europa continentur maxima, à meridie in septentrionem protenditur, forma triquetra. A promontorio enim quod est in insulam ad meridiem prospicit, ad Cæticam ultimum Scocie partem, que ab Orcadibus insulis, fretis non admo dum in eodem diuisibus, miliaria continentur. 600. AD eorum autem ultima Cæticæ parte, que à Gallia non plus 30. mill. distat, in extremum Cornubiæ promontorium, quod, Italicum respicit, mill. habetur. 320. Et quo rursus per Hibernicam mare ad septentrionem prægressus, ad Cæticam supremam totius insule partem, mill. inueniuntur. 800. Cæticæ insule circum itus mill. 1720. minus quam compleret Cæs. ar. 280. Diuiditur hæc insula in duo regna, pars enim austrius, que et fertior est, et urbius frequentior, et moribus ciuilior. ANGLIA dicitur, que autem septentrionalibus, montibus aspera, et obuiosissimum fretum inserrit, SCOTIA nuncupatur. Diuisiuntur Anglia à Scocie, ad orientem Iudea, ad occidentem Sæuo fluminibus, mediterranea, mons Cæuopa diuisiunt. Obiacent Scocie ad occidentem in Hibernico mari, insule. 43. Eboracæ, sive Hibernides dicitur. Harum prima, et Episcopatus sede, et antiquissima Druidum memoria, NONA erat, nos sro astra scribo Angliæ partem, ad septentrionem sive Orcaas Insule. 31. hordea, piscibus, cumulis, abundat. Intra, inter has primas tenet POMONIA, et magnitudine cæteris, unicus, et Episcopatus sede, et regio cas tro armata, et hinc omnia in ditione Scoti est. THYLL, poli habet et uisitat, gradibus. 63. in qua r. Sol Cætra occupat, trunbz aut nulle, aut perperas. Idemata quibus utitur uocab, quip sunt Cornubiæ, que Cornubiæ, quo uocab, Angliæ quo Angli, et bona pars Scocie, habetur. quo Hebrides, insule, et Septentrionalis Scocie pars, Gothuru quo Orcades sole uidentur. Habet Anglia Episcopatus. 22. quoru dicit et of to Cæuopæ primati partem, duo aut Eboracæ, Art bipresuli, Gymasia uic celebria duo, OXONIUM et CANTIBRIGIAM, Conuictus, quos et conuictus uocant. 39. In Scopia aut, Episcopatus sunt. 13. quoru noui. S. Andree, Archiepiscopo primati. Duo Archiepiscopi Gloucestri subrat, Comitatus habet 22. Abundat Anglia, fægna, plura, ferre, lana optima, pecore, et frumta. Scoti, piscibus, pecore, et lana. Lupos non habet Anglia, Scocie per multos. Diuidit Angliam in tres ueluti Regnes: tria ueluti flumina Itamæru, Sabrua, Hæbrus, Scotia uel tria, Cluda, Forthæ, Itas, Regia, Anglia est LONDINIUM; Scocie EDINBURGVS. Legibus utitur Angliæ municipibus tantu, ciuibus Scoti. Cæd utique gæu in bello feruua, Scotia Angli, hæc in lege Scoti in aue preualã. Rara iter eos pæc. du illi propagare, sibi reditæ, imperu fudã. ROME. Anglorum studu et diligentiã. M D L V III

ORIENS



process. In Figure 1 we notice two special features: the broken-backed *t*, in which the crossbar is placed at the top of the letter; and the contraction *R*. When we examine Figure 2, these features are repeated. There are other more minute similarities: notice, for example, the correspondence of the *g* and the ampersand. Our suspicion that the two manuscripts were written by the same hand proves to be correct. Both are by the scribe Bartolommeo Sanvito of Padua. The second example is written in a rather shaky, uncertain fashion. This permits us the further conjecture that the scribe may have written it in old age, although we should require other independent evidence before making an actual claim.

When we come to the early maps that are engraved and reproduced by the copperplate process, the problem grows more complicated. For the formal script of the map-designer often passes through the hands of an engraver, who may add something of his own style as he copies the manuscript model before him. As the art of engraving an elegant script took some years to develop, the addition was not necessarily an improvement. Many of the engravers of the sixteenth century were humble artisans about whose lives nothing is known and whose activities might warrant further research. Some do, however, stand out; and their engraving on the whole probably improved the designer's original manuscript. Consider two examples by Sebastian de Re of Chioggia, whose work should be more widely valued than it is (Figs. 3 and 4). Another engraver of comparable quality is the Belgian who worked in Italy, Jacobus Bossius (Fig. 5).

To turn now to Mercator, who is a crucial figure in this story; he and his work will occupy the rest of my paper.

Gerardus Mercator was born early in the morning of Friday, March 5, 1512, at Rupelmonde in Flanders. His parents had recently moved there from the small village of Gangelt in Germany to stay with his uncle Gisbert. This uncle, who was a priest, superintended the boy's education. He sent him to school at s Hertogenbosch (Bois-le-Duc), the same school that Erasmus had attended nearly fifty years before. At the age of 18 he was entered in the University

Figure 3. Cartouche engraved by Sebastian de Re of Chioggia (from a Lafreri map of Britain, 1558).



Figure 4. Cartouche engraved by Sebastian de Re of Chioggia (from Salamanca's map of Greece, in a Lafreri atlas).

of Louvain. The university was the intellectual center of humanism in the Low Countries at that period. Mercator studied the humanities and philosophy. He took his Master's degree, probably in the autumn of 1532. About this time, he—like many students both before and after him—developed religious doubts; he found that he could not reconcile the biblical account of the origin of the universe with that of Aristotle and other authorities. He began to reflect on the beginnings of life and the birth of civilization—themes that were to occupy his thoughts for the rest of his life. His mind was clearly taking a scientific bent.

Louvain University was, however, not a comfortable place for this kind of independent speculation; even to question Aristotle could kindle suspicions of heresy. Between 1532 and 1534 Mercator used to go off by himself to Antwerp, and perhaps to Mechlin, and these visits aroused some comment from people at Louvain. But Mercator overcame his doubts and emerged with strong Christian convictions, which remained with him.

Mercator was in no position to devote himself wholly to elevated philosophic contemplation. He was a poor man who had yet to make his way in life. From 1532 to 1536 he drove himself on with relentless concentration, often going without food and sleep. He recalled, nearly fifty years later, how he attended the lectures of Gemma Frisius, but found that, through his ignorance of geometry, he was wasting his time. With Gemma's guidance and private tuition, however, he quickly mastered the subject. He went on to acquire a thorough command of astronomy as well as geography. More remarkable still, perhaps, he became a superb engraver, an outstanding calligrapher, and one of the leading scientific instrument makers of his time—all this by the age of 24.

In 1534 Mercator married Barbara Schellekens; and in due course they had six children. He worked with Gaspar a Myrica on

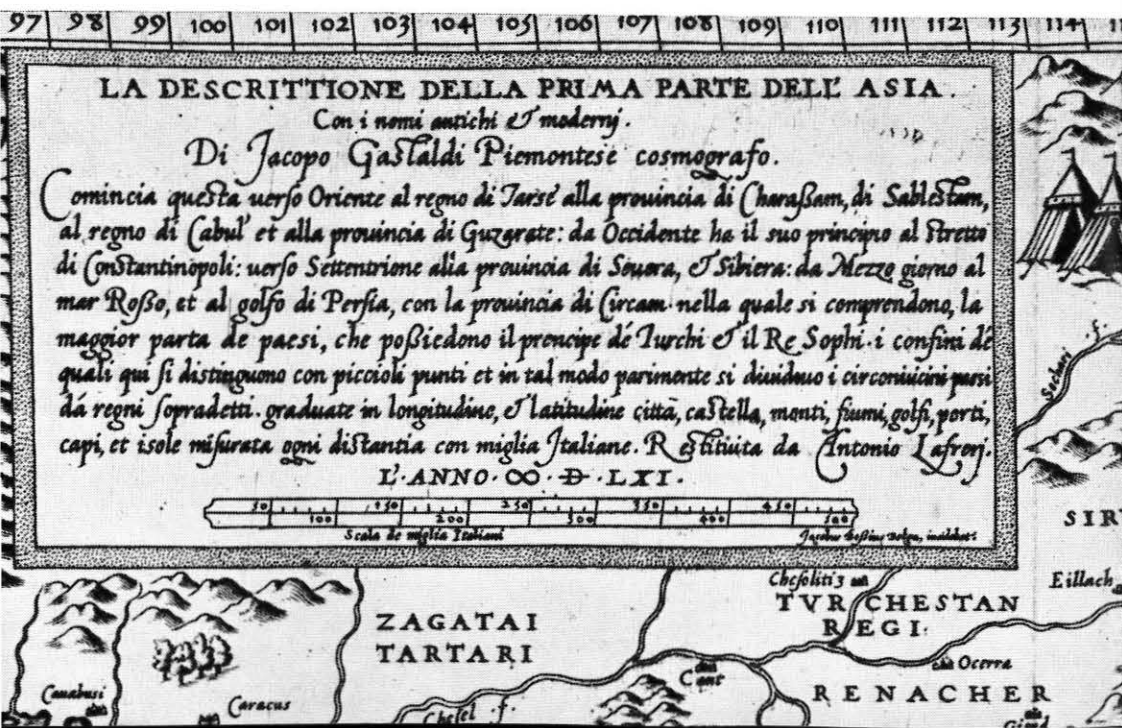


Figure 5. Cartouche engraved by Jacobus Bossius Belga (on a map of Castaldi of 1561 in a Lafreri atlas).

Gemma Frisius's second terrestrial globe (1535–36) and on its counterpart, the celestial globe of 1537. Having earned great fame as an instrument maker, Mercator now laid the foundations of his reputation as the foremost geographer of the century. His first map is of Palestine (1537); then came the heartshaped map of the world (1538); the map of Flanders (about 1540); his terrestrial globe of 1541; and his celestial globe of 1551. His little treatise on italic script, *Literarum latinarum . . . scribendarum ratio*, was published at Louvain in 1540.

Suddenly, in 1544, he was arrested while travelling in the province of Waas, brought to Rupelmonde and imprisoned on a charge of heresy. He was one of 43 inhabitants of Louvain to be involved in this affair. His absences from Louvain on surveys for his maps were held against him. The matter was brought before the Governor of the Netherlands, Mary of Hungary. But the authorities at Louvain backed Mercator so firmly that he was cleared and released after about seven months. Five of the accused were executed.

Mercator resumed his former way of life. At some point in 1552, he decided to quit Louvain and to take up permanent residence at Duisburg, then in the Duchy of Cleve. One attraction was that in Germany he would find a more tolerant attitude to religious questions. Another, perhaps even stronger, was an appointment as court "Cosmographer" to Duke Wilhelm of Cleve and the possibility of becoming professor in the new university that the Duke was planning to found at Duisburg.

Mercator seems to have adapted himself without difficulty to his new life. He began a long and intimate friendship with his neighbor Walter Ghim, who composed a Latin *Life of Mercator*. From his home in Duisburg, he kept up an extensive and regular correspondence with scholars and scientists all over the world. In 1554 he completed the map of Europe which he had started at Louvain. In 1564 he produced a map of the Duchy of Lorraine and one of the British Isles. During these years he developed his famous solution for representing the earth's sphere on a plane surface ("Mercator's Projection"). This enabled a mariner to steer his course over long distances by straight lines without the continual adjustment of compass readings. He used this projection in his map of the world of 1569. For the rest of his life he was mainly occupied by his great Atlas.

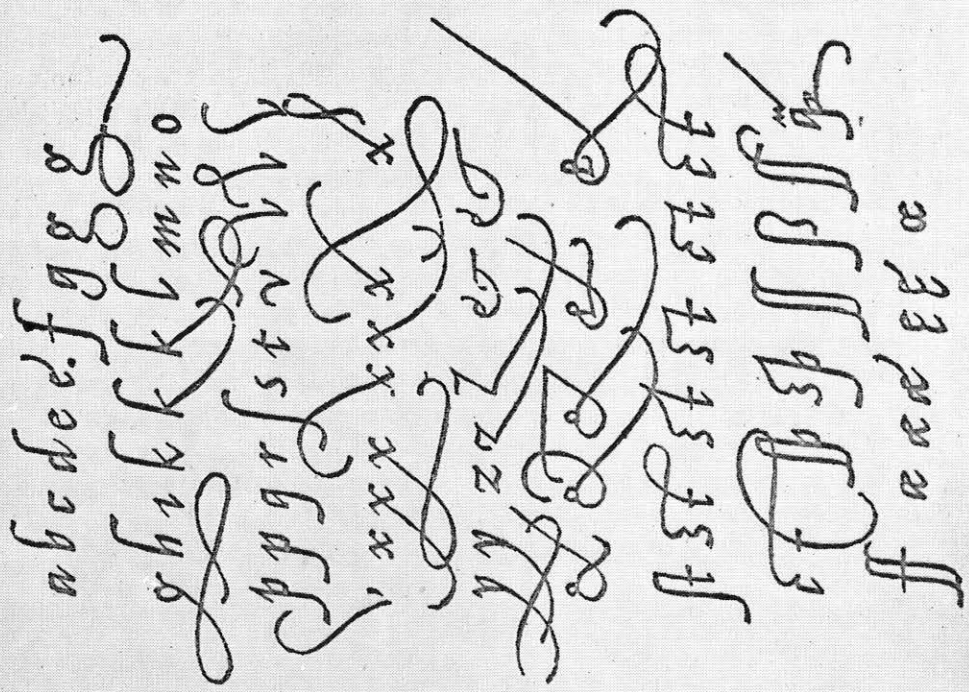
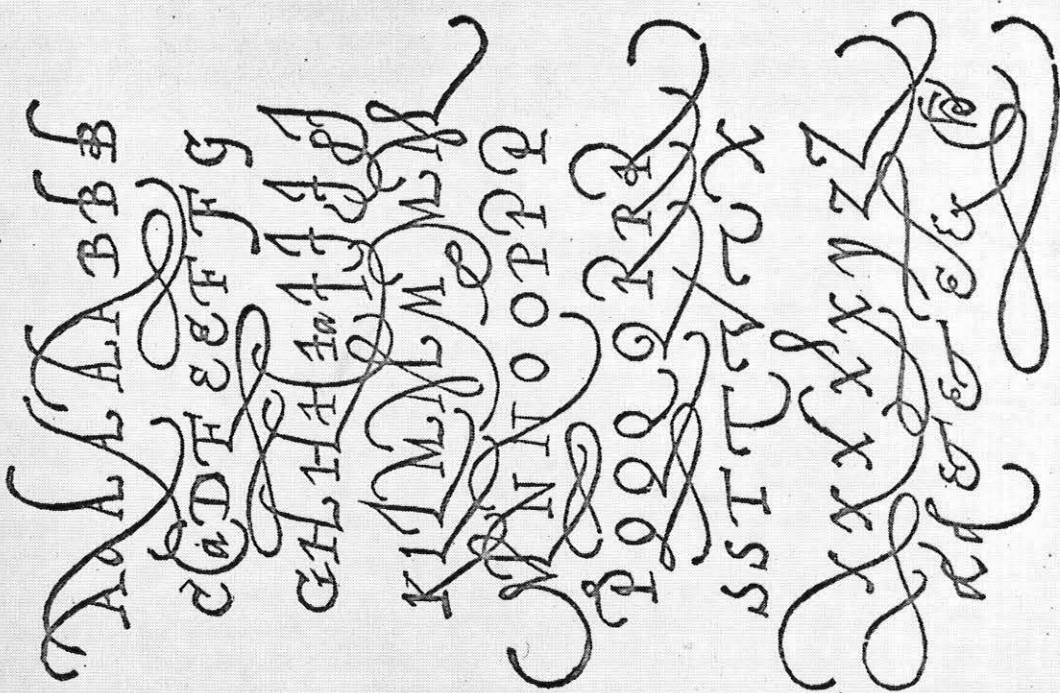
Walter Ghim gives an attractive account of Mercator's closing years:

"From the time when Gerard Mercator came here to live, I saw a lot of him because we were friends and neighbors, but I never found him idle or unoccupied; he was always busily engaged in reading one of the historians or other serious authors, of whom he had a fine stock in his library, or in writing or engraving, or was absorbed in profound meditation. Although he ate and drank very little, he kept an excellent table, well furnished with the necessaries of civilized living. He took the greatest care of his health. If he did have anything wrong with him, he repaired immediately to his good friend, Dr. Solenander. In debate, he displayed a most acute and well-trained mind; in the work of his profession, he was indefatigable. In time of good fortune and prosperity, he behaved with moderation; in adversity, with great patience." On May 5, 1590, he was attacked by paralysis in his left side. The end came four years later.

Mercator has left us specimens of work from all periods of life, so that we can see exactly how his hand developed over a span of more than fifty years. This information is supplemented by many manuscript letters that have survived from his correspondence. From this abundant material we are able to identify the characteristics of his hand with great certainty.

A good starting point is his textbook on lettering (Fig. 6), which I have mentioned. In this he gave instructions, with several examples, for writing his version of the italic or chancery script, which had been perfected in Italy at the beginning of the sixteenth century. His textbook was first published at Louvain in 1540 and went into five main editions. This little treatise is much prized by modern calligraphers. It is perhaps the clearest and most complete exposition of the subject, and stands comparison with the classic writing-books of the Italian masters of the sixteenth century (e.g., of Arrighi,¹ Tagliente,² and Palatino³). It is unique in that the author not only composed and wrote out the text and illustrations, but also engraved the whole work most skilfully on wood blocks.

Mercator introduces into his model two important modifications that are hardly ever found in formal italic lettering before 1540—namely, the letter *k*, in which the more commonly used upper bowl is



replaced by a diagonal line; and the letter *y*, in which the second stroke—the long curving down-stroke on the right—is introduced by an upward diagonal flick, instead of coming in with a bend from the right. Other points to bear in mind are the rather aggressive top of the letter *c*; the first version of letter *g*; the varieties of the ampersand; and the generous lengths of the ascenders and descenders.

The capital letters also have some typical fingerprints: *B* and *D*, with the ends projecting a little untidily from asymmetric curves; *F* and *T*, in which the cross-piece at the top droops downward; the various versions of *I*; the rather ornate *M*; *V*, in which the left stroke is curved and the right stroke rises straight and tends to be exaggerated. There are many others. If we look back at the three examples of Sebastian de Re and Bossius Belga (Figs. 3–5), we shall not find these features regularly appearing.

Between 1540 and 1550 Mercator pruned his style and adjusted his script so that he could inscribe long passages of descriptive matter on copper plates. Compare, for example, the lettering on his map of Flanders of 1540 (Fig. 7) with that of his map of the British Isles of 1554 (Fig. 8). Yet the script of the latter is basically the same. We see typical features: the *y*; the three separate ampersands in the first paragraph; the characteristic shapes of *c* and *g*; the flourished *M*; the drooping *T*; the proportions of the ascenders and descenders. Notice also the diphthong *Ae* in the word *Aegyptum*, which is exactly the same as that in the writing book. There is also the overall character of the hand—neat, regular, meticulous and, at the same time, natural and easy.

This rapid and incomplete survey has, I hope, shown that we can acquire a fully-documented picture of Mercator's script from a study of his many productions. Our knowledge enables us to gain some insight into his activities. For example, at the age of 23, he worked with Gaspar a Myrica on Gemma Frisius's globe of about 1535. Both men were employed as engravers. It is clear that, whatever else he contributed, Mercator executed the lettering, although it might reasonably have been supposed that Gaspar a Myrica, an experienced goldsmith, was the natural choice. Again, the lettering on the scientific

Figure 6. From Mercator's writing book *Literarum Latinarum . . . scribendi ratio*, Louvain, 1540.

Figure 7. From Mercator's map of Flanders, 1540.

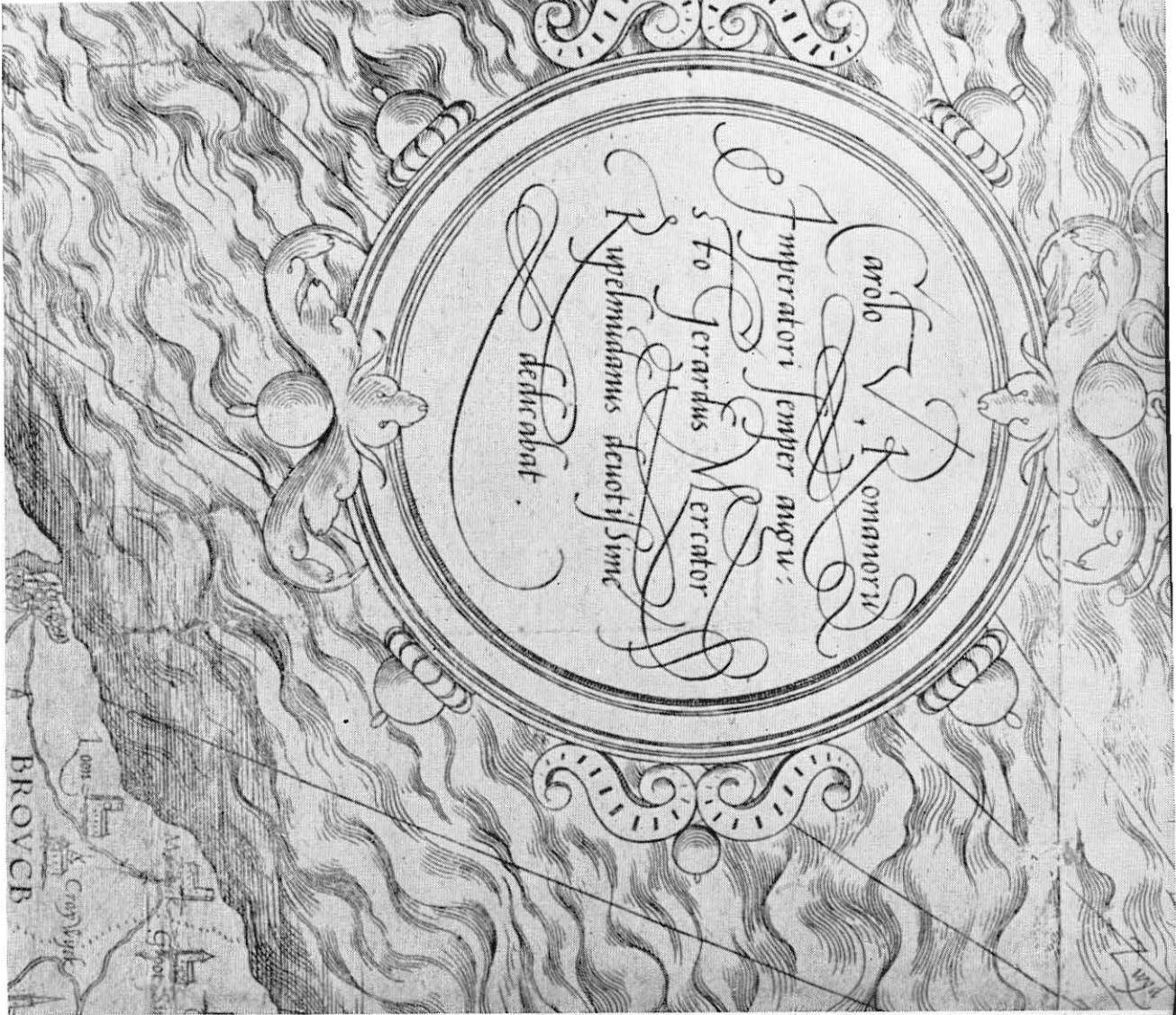


Figure 8. From Mercator's map of the British Isles, 1554.

Gerardus Mercator lectori salutem

Obtulit mihi candide lector amicus quidam singularis hanc Britannicarum insularum descriptionem, multa sane diligentia & summa fide congestam, rogans ut pro nostro modulo concinnatam in multa exemplaria diffunderem, quod cum amico denegare nollem, & a tam absoluto & doctorum hominum conspectu digno opere manum subducere iniquum iudicarem, eam tibi qualem accepi exhibeo, illustratam tamen earum rerum expositionibus quæ maxime ad particularem regionum cognitionem geographo necessariæ sunt, tu gratè quod damus accipe & fruire

Origines primorum colonorum

Tres præcipuè gentes has insulas primum incoluerunt, Scoti Britanni & Picti. Scotorum antiquam valde originem Hæctor Boethus ex patrijs scriptoribus refert, Gathelum videlicet filium Cecropis primi regis Atheniensium cum maiorum imperium & correptiones impatienter ferret, collecta inuenum valida manu in Ægyptum fugisse, cum Mose Aethopicam expeditionem, quam Josephus libro. 2. Antiq. cap. 30. enarrat, fecisse, Pharaonis filiam Scotam nomine, sororem eius qui mari Rubro obrutus fuit uxorem accepisse, deinde plagis Ægyptiacis territum cum uxore, liberis & promiscua multitudine Græcorum Ægyptiorumq; anno ante Christum 1556 in Numidiam appulisse, inde repulsum in eam quæ post Lusitania est dicta transmisse, Bracharam ibi condere cepisse, demiq; & hinc ex pacto cum Iberis facto excedentem in eam quæ post Galatia dicta est sedes transtulisse, & constituto ibi regno suos ab uxore Scotos vocasse, Brigantium nunc Compostellam extruxisse, misisse autem hinc duce filio Hiberio coloniam in insulam exinde Hiberniam dictam, habitam tamen iam tum ab agrestibus quibusdam, ubi cum inualuissent multitudine & potentia Scoti, primus ipsis ab Iberia missus Simon Brechus ex posteritate Gatheli rex datus est anno ante Christum natum 695. Ex Hibernia deinde anno 562 ante Christum propagati Scoti in Albionis septentrionalia, quibus anno ante Christum 333 accesserunt Picti regnum cum ipsis partiti, sed his anno Christi 829 deletis soli Scoti eas terras quas hodie Scotia continet obtinuerunt Hæc ex Boetho compendio desumpta Scotiæ originis narratio est, in qua quæ a Simone Brecho deinceps dicuntur credibilia sunt, & item forte quod ex Iberia in Hiberniam venerint Scoti, nam & Tacitus in vita Agricolæ Iberos veteres huc traiecisse, hinc sedes occupasse colligit, Ptol: in meridiano latere Hiberniæ similiter Brigantes Ibericam haud dubie nationem, ponit, at Scotiæ nomen inde allatum esse valde dubium est, nulla enim nec regni nec nominis Scotici in dictis Hispaniæ partibus mentio fit ab Hispanis scriptoribus, Gatheli vero res gestæ & tempora (siquis interim fuit) nullo modo credibilia mihi videntur, nupsia enim apud probatos rerum Hispanicarum scriptores inuenio Græcos ante Herculem Alcmenæ Hispaniam accessisse, quin eam partem Iberiæ in qua Scoti primùm conuersæ dicuntur, post dirutam Troiam demum commemorat a Græcis duce Diomede Idae filio, & iterum aduentu Vhsis occupatam fuisse, quod tempus 400 circiter annis Mose posterius fuisse constat.

instruments produced in the workshop started by Gemma Frisius at Louvain and later run by Arsenius proves that Mercator must have exercised considerable influence in this enterprise since his script is employed as a model.

Another useful point that we can establish is that, up to and including his great Map of the World of 1569, Mercator engraved all his own work. Thereafter he relied more on other engravers, working closely to his models. The maps in the Atlas of 1595 show evidence of at least three engravers. His son and pupil Arnold, who helped him later in life at Duisburg wrote an italic hand based on his father's.

Some time ago my attention was drawn⁴ to several annotations in the margins of the famous manuscript of the Gospels, the *Codex Argenteus* now preserved in Uppsala. The annotations are actually in two separate hands. When I obtained photographs, my curiosity was aroused by one of them. The proportions and the general look of the letters were familiar. There were also interesting details (Fig. 9); e.g., the characteristic abbreviations; the capitals *C*, *J*, and *E*; the amper-

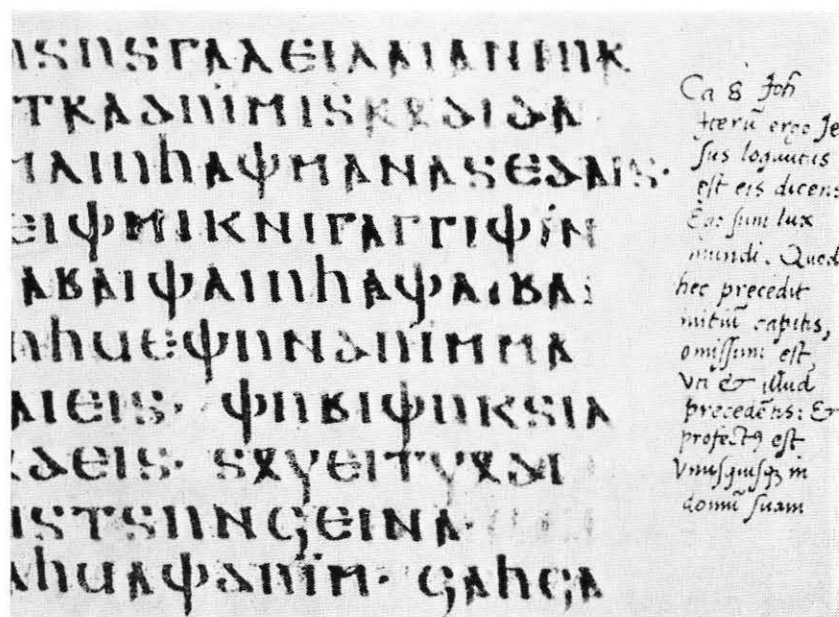


Figure 9. From the *Codex Argenteus* at Uppsala.

sand and the small *v* and *g*. On enquiring into the history of the Codex, I learned that in the 1570's it spent part of its troubled life in the Abbey of Werden near Cologne and that the Abbot had asked for assistance in sorting out the order of its leaves. Two men then living in the neighborhood were in fact involved in the matter: the scholar George Cassander, who had "discovered" the manuscript, and I was not surprised to learn that the other was his friend Arnold Mercator, the son of Gerard. The characteristics of the script resemble those of the elder Mercator pretty closely. We know that at this period Gerard Mercator was studying the New Testament, and was composing a commentary in Latin on the first part of St. Paul's Epistle to the Romans.⁵ It seems to me, therefore, quite likely that Arnold Mercator sought his father's advice and that the latter annotated the Codex for him. The other hand is probably that of George Cassander.

Until recently, it seemed unlikely that further important specimens of Mercator's work would await discovery. But in 1967 a schoolmaster, while on holiday in Brussels, bought an old atlas. It contains several known maps by Mercator and Ortelius as well as two original manuscript maps. The latter are lettered in a calligraphic hand suitable for engraving. There are also handwritten titles to the maps, added by the compiler of the atlas. A calligraphic analysis yields interesting results.

The general style, arrangement, and size of the script in the two manuscript maps is very similar to that of the maps in Mercator's Atlas (Fig. 10). On examination, details of the script betray many correspondences with Mercator's work (particularly that shown in Figs. 6 and 8). There is, of course, the typical Mercator *y* and *k* (not seen in the portion shown here); the forward bending *C* (e.g., in *Cupara*, *Corla*, *Casale*); the *B* with its projecting lines (e.g., in *Bonden*, *Bononia*); the flourished *A* (e.g., in *Adese*); the asymmetrical *D* (no clear example here); the drooping *F* and *T*, (e.g., *Ferraria*, *Faenza*, *Trezenta*); *G* in, e.g., *Galera*, *Gelso*, etc.; the flourished *H* in *Humana*; *I* in *Imola*; *L* in *Legnano*, *Laba*; *V* in *Volana*. A convincing detail is the contraction in *hodieque*, which is precisely that in *hicque* in Figure 8, line 21. The proportions of *J* and the long sibilant—and, in general, the ascenders and descenders—are those favored by Mercator; the doubled *s* (e.g., in *Cassiano*) is identical with his model. Over and above these tangible details of similarity (of which only a few are



Comerwallia & Wallia, regni
Anglici residuum.

BRITANNI

ca. insule, Anglia
cum Scotia, & Hy
bernia.

Clarissimo viro D Joanni
Molano Studijse iuuetutis
Rectori vigilantissimo.

Brome.

GRONLAN

dia, Islandia, Frislandia.

Figure 11. Lower left-hand, from a letter of Mercator to Molanus dated July 27, 1576; upper left-hand and right-hand, from a manuscript attributed to Mercator.

Figure 10. From a manuscript map attributed to Mercator.

mentioned), we must take into account the overall effect of the script—its professional appearance, legibility, sustained regularity, and unforced mastery of the chancery hand. In our assessment we must also remember that these manuscript maps were probably copied at speed; the frequent placing of the dot to the right of its parent letter *i* is an indication of this. These and other points establish a strong case for considering Mercator the author of the manuscript maps, particularly as, of all the other engravers and cartographers of the time, there seems to be no one (with the possible exception of his son Arnold) whose hand is so similar that he could be regarded as a candidate for the authorship.

This conclusion is reinforced by a study of the other hand-lettering in the atlas. This is larger and more like handwriting than the former which, as I said, was intended for engraving (Fig. 11, right-hand and upper left-hand).

We can approach our analysis from at least three angles:

(a) First, by comparison with other known maps of Mercator. Here I draw your attention to the words *insularum* (line 2) and *Scotia* (line 19) in Figure 8 and their close similarity with the words *insulae* and *Scotia* on the right-hand side of Figure 10. Other similarities will be found on close examination.

(b) Secondly, by comparison with the models in the writing book (Fig. 6). Typical similarities are the *y* in *Hybernia*; the diphthong in *BRITANNIcae*; and the long sibilant in *residuum*, *insulae*, *Islandia*, and *Frislandia*; and two varieties of ampersand; the *g* in *regni* and *Anglia*; the capital *C* in *Cornwallia*; the *I* in *Islandia* and the *F* in *Frislandia*—all these in the space of a few words.

(c) Thirdly, from examples of his personal correspondence of the period. Unless he was approaching a prince or other important dignitary, Mercator usually wrote his letters in the workaday script that he was taught at school, the “secretary” hand as it is called. But when he addressed his letters, he felt the need for a touch of greater formality and clarity, so he often wrote the address in a deliberate chancery hand. The titles on the newly discovered atlas are written with the same intention and in the same way. The lower left-hand portion of Figure 11 is an address written on the letter that Mercator

wrote to Molanus on July 27, 1576. The three pieces in Figure 11 seem clearly by the same hand.

Calligraphic evidence, then, provides us with a strong chain of reasoning to identify Gerard Mercator as the compiler of the atlas and as the author of the two manuscript maps which it contains.

It can be fairly argued that this method is not totally scientific and lacks the precision which can be obtained, for example, in criminology by electronic scanners. This is undoubtedly true and it is obviously desirable that calligraphic evidence should be backed by other evidence. I would only make two points. First, instances can be cited where the same attribution has been made independently by more than one scholar using this method or where an attribution made solely on calligraphic evidence has been subsequently validated by other means. Secondly, that in the last analysis, we may be forced back to imponderables, in which even a computer will not help. Here, as in other arts, the great masters leave an indefinable mark of authenticity. When we see a canvas or hear a piece of music for the first time, we may experience an instantaneous recognition, which makes us say, “Only Rembrandt could have painted this” or “Only Beethoven could have written these bars.” I personally think this to be also true of Mercator.

The application of calligraphic analysis to cartography is, of course, beset with a great practical difficulty: the technique demands a detailed knowledge of historical hands, a very sharp eye, and a flair for discovery. Such a combination of qualities exists only in a handful of dedicated scholars whose interest is concentrated on palaeography and does not ordinarily extend to cartography; on the other hand, most cartographic scholars will scarcely have the time to acquire the technique of calligraphic analysis and to keep abreast with the constant discoveries in a relatively unexploited field. But I do not think we should regard the gap as unbridgeable.

1. Ludovico degli Arrighi: *La Operina . . . da imparare di scrivere littera Cancellarescha*. Composed about 1522 but exact date of publication not certain, Rome.
2. Giovanniantonio Tagliente, *Lo presente libro*. Venice, 1524.
3. Giovambattista Palatino, *Libro . . . Nel qual s'insegna à Scriver ogni sorte lettera*. Rome, 1540.
4. By Herr Rolf Kirmse of Duisburg.
5. Unpublished manuscript in the University of Leiden.

This article is a slightly revised and expanded version of a paper read at the Third International Conference on the History of Cartography at Brussels in September 1969. Grateful acknowledgements are made to the Trustees of the British Museum, the National Maritime Museum at Greenwich, the Plantin-Moretus Museum at Antwerp, the University Library at Uppsala, and Mr. T. R. Varekamp of Amsterdam, for help with photographs. Some material in the article was previously published in *The Journal of the Society of Italic Handwriting* and in *Mercator* by A. S. Osley (London: Faber and Faber, 1969).

The Development of Vidifont

Rudi Bass

Television news broadcasting requires alphanumeric composition processes that do not depend on handsetting or photographic preparation. Vidifont, a synthetic video version of the CBS News 36 alphabet, was especially designed for television requirements: (1) proportional-width and proportionally-spaced letterforms for legibility and maximum character count, and (2) a unique grid structure to reproduce ovoid letter curves and angle strokes. The development of Vidifont is outlined and illustrated; esthetic values in electronic letterform design are discussed.

Research into the factors that govern the acuity, perception, and legibility of type on television was begun at CBS in 1966. Comparative tests made on the closed circuit monitor led, under my direction, to the design of CBS News 36 (Bass, 1967). Although the characteristics of this typeface are based on the requirements of television reproduction, it is essentially a font to be composed by hand and to be "seen" by a video camera. The source of the CRT image remains a graphic product, whether reflective artwork or projected slide.

Television, and news broadcasting in particular, needs typesetting processes that do not depend on handsetting and the photographic preparation of typographic images. The computer-driven character generator creates and transmits letters without mechanical or optical typesetting and printing and without "taking a picture" of graphically prepared letterforms. Since television offers a ready interface for such video-compatible electronic character generation, it seemed desirable to transfer the applicable design characteristics of our special font to an electronic alphabet.

With the completion of the original CBS News 36 font, the Graphics Department of CBS News began a study of synthetic video alphabets. Such alphabets should not be confused with graphic letters designed for optical character recognition or for computer-driven optical type-