

THE American Surveyor

A FOOT IN THE PAST... AN EYE TO THE FUTURE Winter 2007

Rocky Mountain High

Texas-New Mexico Boundary

Perhaps the most incorrect of any land line

RTN-101: OnGrid

An initiative in support of RTN development

Layout Technology

Combining laser and RTK for precision staking

The Art of



When I first laid my eyes on the Lewis Michael compass illustrated here, words could not describe the emotions I felt. I was looking at one of the most beautifully engraved examples of the 18th-century colonial instrument maker's art. I have been collecting colonial antiques for decades and had never seen an example of craftsmanship that touched me on a personal level as did this instrument. Little did I know that I was embarking on a wondrous journey that would include volumes of historical information and admiration of extraordinary craftsmanship that is seldom enjoyed by students of 18th-century Americana.

Those of us that savor the beauty and historical significance of colonial antiques find unique qualities displayed in their design and craftsmanship. It is easy to find information on various disciplines such as clockmakers, silversmiths, and cabinetmakers. One area that is very seldom studied is that of the colonial instrument maker.

When I speak of "instrument maker," I am primarily referring to the maker of surveying instruments that were necessary to record and divide the vast amounts of land

>> By Jeffrey Lock

Colonial Surveying Instruments



Close-up of fleur-de-lis from brass compass by David Main, dated 1800. Note the three birds incorporated into the design.

that made up the early colonies. The surveyors would measure and mark boundary lines for farms, villages, towns, and roads. There happens to be an astonishing beauty in the instruments of surveying, especially those of the 18th century.

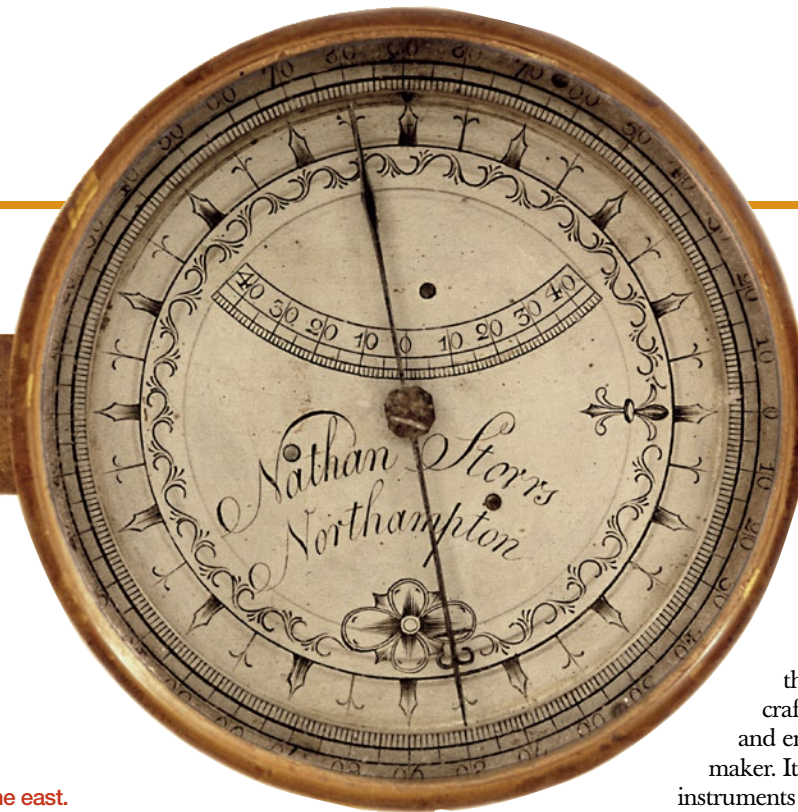


Engraving detail from mid-18th-century semi-circumferentor by Nathan Deane.

Instruments for this purpose were initially imported from England, with a few coming from the European continent. It took several decades before instruments were constructed in the colonies for use by the local surveyors. In the first quarter of the 18th century a small group of colonial craftsmen began

producing surveying instruments. By the mid-18th century more instrument makers became proficient and began supplying instruments for the ever increasing demand. The majority of these early instrument makers drew upon the designs of the English instruments. The style of engraving the brass

Brass compass face by Nathan Storrs of Northampton, Massachusetts (circa 1795). Note pen nibs around perimeter and dogwood blossom at the east.



In direct contrast to the professional English maker, the majority of the instruments crafted in the colonies were made and engraved by the instrument maker. It is very easy to distinguish instruments by the same maker exhibiting a consistent, individualistic engraving style that was common to the instruments fabricated during that maker's entire career. Maturation of metalworking and engraving style can be seen as one studies all the examples of a particular maker; the number of mistakes made in the engraving lessens as the instrument maker became more proficient in his craft.

Upon studying these instruments, the common, endearing characteristic from

surface with the decorative points of the compass was heavily influenced by the instruments brought from England. This influence was not dogmatic; it was merely inspirational. The colonial instrument makers desired to produce their own particular style that was not a direct copy of English instruments. The styles of numbering, engraving, and decorating became quite particular to a given maker and, as a group, individualistic to the colonies.

As a general rule, English instruments were produced by professional instrument makers who had access to professional engravers as well as very accurate methods of dividing the needle ring. An example is this late 17th-century instrument constructed around 1665 by an English maker for Sir Thomas Colleton, one of the original proprietors of the Carolinas. This instrument is a large theodolite, extremely well made, and in exceptional original condition. The extraordinary circumstance regarding this instrument is that it still retains the original octagonal, walnut case that was built specifically for this theodolite. Very few instruments brought into the colonies at such an early date still remain. This may be one of the only instruments that can be directly associated with a first-generation proprietor from the 17th century.

However, early brass instruments are quite rare prior to 1750. As the colonial makers began constructing instruments for the local surveyors, the majority of them were made out of wood indigenous to New England. Despite the added cost, brass quickly became the material of choice due to its ability to hold up to the rigors of the surveying environment. Wood was much more easily damaged; the sight vanes, for example, could be broken or the wood of the compass body could warp and crack.

Brass in the colonies was a controlled commodity and many of the makers advertised for used brass from kettles and flatware to melt down, providing the raw materials for production of their instruments. Therefore sockets, sight vanes, and items of this nature were made on quite a small scale which was sufficiently strong to produce the desired rigidity but not of the massiveness of the English instruments from the same period where brass was much more available.




Portion of engraved face of brass compass by John Dupee, Boston, dated 1756.

these makers was their naïve engraving style and the conservative manner in which brass was utilized. Many of these makers were obviously not professional engravers and literally taught themselves to engrave. Brass as a material is more difficult to engrave than copper, which was more commonly used in book printing and map plates. Copper is a softer material that lends itself more readily to engraving with a burin; brass is a somewhat harder material and the casting processes in these early days did not necessarily produce a brass of totally uniform hardness.

One finds that when you are learning to engrave it is very easy to draw out a design, but when you attempt to engrave that same design, the ease by which it was drawn is no longer the case when it comes to engraving the pattern in brass. But it is this naiveté in engraving style that makes these instruments from the 18th century such valuable historical pieces. It shows a provinciality that one will find in the English countryside instruments, which would be seldom, if ever, found in the compasses made in the cosmopolitan areas such as London. Brass instruments, however, by makers such as Greenough and Dupee of Boston, show a level of engraving sophistication that is less exact but more endearing because of its inexactitude. It is these endearing qualities of these instruments that provide the focal point for the study of these makers and their early attempts at producing instruments that the Colonial surveyors were interested in purchasing. In the machine age of the 1820s and later, instrument engraving quality was reduced to merely a token decorative aspect that suffered greatly in comparison to the early instruments where the engraving was considered to be an integral part of instrument design. The craftsman of this early period expressed himself in an artistic manner. The majority of the professionally-made instruments in the colonies exhibited a high level of engraving incorporating the signature,

Brass surveying compass by Anthony Ham (Philadelphia, circa 1750). Ham was one of the most proficient instrument makers in the Colonies at this early date.

and sometimes the date and location of the instrument maker.

The Lewis Michael compass that caught my eye originally, I found out much later, was made by one of the foremost instrument makers of the Colonial period. Lewis Michael apprenticed with Benjamin Rittenhouse, another leading instrument and clockmaker, and practiced his crafts of silversmithing, watchmaking, clockmaking, and instrument making in York and Somerset counties of Pennsylvania. His instruments are extremely desirable and very hard to find on the open market. I stumbled across this exquisite compass at a local antique show and made an emotional decision to purchase it knowing absolutely nothing about the field in general and Lewis Michael in particular. As we all know, our instincts often provide the most reliable information. 



Author Note: If you would like more information on this subject and would like to read other articles more specific to the construction details of these instruments, please visit www.colonialinstruments.com.

Drawing on more than 30 years' experience in the restoration field, **Jeffrey Lock** has focused on colonial instruments from the 18th century and the techniques that were used for their construction. His continuing research has uncovered unusual instruments that will be discussed in future articles.