Chapter 1: Introduction

- *Clock making in colonial America*
- *Evolution of the trade*
- *Why restore*
- *Restoration philosophy*
- *The types of clock work*
- *Essential restoration tools*

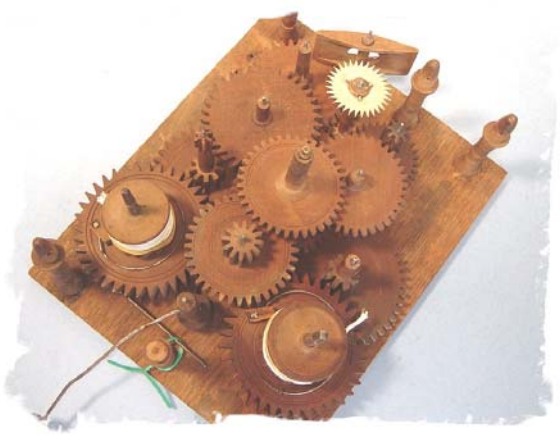
Overview: From the earliest days of the colonies, clock making held a special position in American industrial history and played an important role in the nation's transition from a dispersed agrarian society to an urban manufacturing powerhouse. Unfortunately, 150 to 200 years often takes a severe toll on historic artifacts such as clocks and hundreds, if not thousands, are permanently lost each year.

The on-line chapters that follow were created to support those who purchased the paperback version of ***Extreme Restoration*** which is published with black and white photographs. Chapters two through fourteen provide full color versions of the books images and are intended to allow close study of certain color-critical concepts and techniques. This chapter (chapter one) which covers the background and evolution of clock making in America is presented in its original form complete with text.

Clock making in Colonial America: In the fledgling United States of the late 1700's over 75% of all Americans worked in agriculture or agriculture related endeavors. As such, knowing the precise time was just not a high priority.

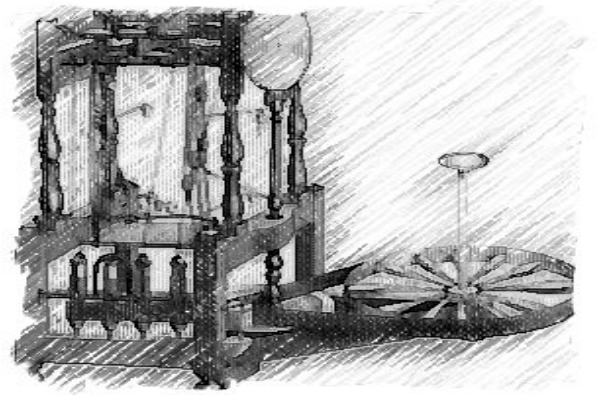
Work usually began each day before dawn, initiated by the needs of livestock, and ended some time after dusk when it was no longer possible to work in the fields.

In many towns and villages, the primary (if not only) clock was in the tower above the town hall. Until the 1830's clocks were a rare and relatively expensive personal item which was only built upon order. Each part of the clock movement (gears, shafts, plates) had to be hand fashioned from various types of wood. Wood was used almost exclusively in clock making because of the lack of American foundries. Importing metals such as brass and steel would have made these early clocks prohibitively expensive.



Normally, the clock maker provided only the movement. The customer then took the completed movement to a local cabinetmaker to have a clock case made and the movement fitted.

Evolution of the trade: The industrial revolution, which began in England in the early 1700's, brought with it steam power, large scale machinery and the concept of mass production. The primary benefactor of this "first" industrial revolution was Britain's textile industry.



It wasn't until the early 1800's that the industrial revolution took root on American shores. It began following the "Report on Manufactures" produced in 1791 by Secretary of the Treasury, Alexander Hamilton. This report called for an American industrial revolution as a means to build the strength of the young nation and protect its recently won freedom from Britain.

Industrialization in the United States, once started, advanced at an even more rapid rate than in Britain. Early American industrialist theorized and developed a concept of manufacturing in which specialized machinery was designed and optimized to produce only a single type of part. This approach meant that very uniform parts could be produced in high volumes in minimal time. Combined with the specialization of labor concepts fostered in Britain earlier, America could begin to turn out large quantities of uniform quality goods at low cost.

Early adopters of this system, which came to be know simply as "The American System", included manufacturers of axes, shovels and (in New England) makers of clocks.

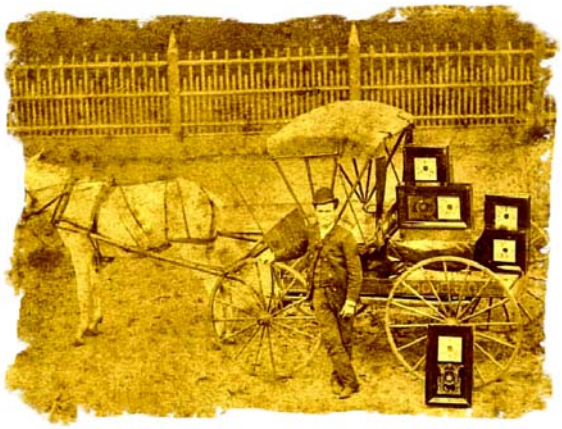
The American system of mass production quickly caught on and total output of business and consumer goods grew at a tremendous rate. The demand for raw materials (brass, steel and zinc) was such that foundries quickly rose across the American landscape. This provided the low cost metals needed to further fuel America's industrial output.

During the first quarter of the 19th century (around 1836), Noble Jerome, brother of well know clock maker Chauncey Jerome, took advantage of the newly available low cost metals and patented a brass and steel clock movement that could be produced at a much lower cost than hand made wooden movements. This point effectively marked the beginning of a golden age in American clock making. Between 1835 and 1900, clock making, like many American industries, progressed at almost breakneck speed. The original 30-hour weight-driven brass movement designed by Nobel Jerome was adopted by many, if not most, clock makers. Using the American System of manufacture, annual production volumes grew from the thousands to the hundreds of thousands. Designs evolved at an equal pace. The 30-hour brass movement

quickly led to an 8-day movement. As American steel makers perfected spring steels, weight driven movements were replaced by spring movements which could be fitted into smaller, more stylish cases. Patents for new or "improved" clock designs were being issued on a regular and non-stop basis.

By 1850, clock making had evolved from cottage industry to large scale manufacturing and mass production. The US census in this year lists over 900 clock makers and over 600 clock manufacturing plants.

With so many companies forming to produce brass clocks, it is natural that competition would be fierce. Benefits of this included constant innovation, an unusually broad range of designs and very reasonable prices. On the other hand, companies rallied and failed as the economy shifted, partnerships went sour or one competitor simple outmaneuvered another. A number of companies and partnerships existed for only a year or two making their clocks rare, if not significant, today.



As availability increased, prices declined and distribution channels grew. Department stores, dry goods stores and most traveling peddlers carried a variety of clocks for sale throughout every borough and village in the nation.

During this period the number of clocks designed and built in the United States grew into the millions. Wall clocks, floor clocks, shelf clocks and alarm clocks of almost any conceivable design were produced. Stately wooden clocks as well as outlandish novelty clocks were produced in volume. The price for a good quality American clock was now low enough that every household could purchase one. And, with the nation's rapid shift from farming to manufacturing jobs, millions of families now needed to know the correct time.

The demand for clocks continued to drive the industry right into the 20th century, although by the early 1900's mergers and failures had reduced the number of mass producers to a dozen or so. With this consolidation of makers, came a consolidation of designs. The wild ride of clock making in the 1800's had come to an end replaced by a more utility oriented design emphasis.

The legacy of the golden age of American clock making is broad and deep. This period produced literally thousands of beautiful designs in wood, brass and semi-precious stone. The craftsmanship and artistry shown in many of these designs reflect both the pride of workmanship common in this era and skills which have become all but lost today. The American clock is considered by many to be the first mass produced consumer good in the United States making it both sociologically as well as culturally significant today.

Why Restore: The quantity of clocks produced in America in the 1800's was quite large but the remaining examples of this important part of our country's industrial heritage declines each year. Realizing that most of these clocks were not expensive and were purchased, not as heirlooms, but as home appliances, it is not surprising that most were used only until they were no longer reliable or could be replaced by a more "modern" clock. Many beautiful clocks were relegated to attics, basements or simply scrapped.

Why restore these old clocks? For some people, simply looking at the beauty and craftsmanship of a mid-19th century American clock with rich veneers such as rosewood and ash is reason enough to want to rescue and restore every remaining example of this period. An equally important motivation is the historical significance of these clocks. Clocks from the early to mid 1800's reflect some of the earliest products of the industrial revolution which transformed the United States from agrarian colony into an industrial and financial world leader. Another reason many people collect and restore clocks is the history they are often able uncover while researching a

particular clock model. With so many different makers during the 1800's it is not surprising that many have interesting histories. Old city registries, census data and historical information collected by other restorers frequently paint a vivid picture of the manufacturers and the times.

There are many reasons for developing an interest in these early clocks, but the fact of the matter is that the number of remaining examples declines each year. One hundred and fifty years takes its toll on brass and wood even when given normal care. The combined effects of insects, moisture and neglect add further to the loss. If only pristine original examples are sought and collected, then the annual losses of these historic artifacts will continue to climb.

Aggressive action by dedicated restorers can salvage many of even the worst remaining examples. Extreme restoration focuses on those clocks that are in the poorest condition and require extensive, yet accurate, restoration to avoid their loss forever.

Restoration Philosophy: The mention of restoration to a group of clock collectors is sure to raise controversy, disagreement and lively debate. How, exactly, an antique clock should be best preserved is open to as many interpretations as there are collectors.

At one extreme are those who feel that nothing more than basic cleaning of the case and movement should ever be undertaken and the piece presented in its as-received condition. This approach has particular merit when the clock in question is in reasonably sound condition or has known historic importance. Unfortunately, this criterion would preclude the many thousands of clocks that will obviously require extensive work to make them sound and serviceable. Many unique and/or rare examples will be lost using this guideline.

At the other extreme are clocks that have been totally rebuilt, modified or "enhanced" beyond that which it was when new or had a "modern" finish applied. Unfortunately, what this approach often produces is a new clock that has some old parts. It is far from an accurate representation of the original product and the historic value has been totally lost.

So, how can these clocks be saved without losing their authenticity and historical value?

Types of Clock Work: The book *Conservation of Clocks and Watches* published by the British Horological Institute defines work performed on antique clocks in three basic categories:

- ***Conservation*:** Conservation is the approach most commonly taken by museums when dealing with historical artifacts. Conservation is the act of stabilizing the artifact to prevent further deterioration. Generally conservators do not undertake to repair or bring the artifact closer to its original state. In the case of clocks, conservation would be interpreted as lightly cleaning the case, glass, movement, labels, etc. but otherwise leaving the piece in the as-received condition.

This approach would be particularly applicable to a clock with great historical significance or extreme rarity.

- ***Restoration:*** Restoration is defined as work undertaken to make the artifact close to its original condition using period-correct materials to the greatest extent possible. Under the code of ethics of the BHI, any and new parts must be clearly identified as such.

Restoration of a clock would attempt to bring its condition close to original both mechanically and structurally. Correct period materials such as veneer, glues, glass, etc. would be employed as needed. Artistic items such as painted tablets and dials would be repaired as necessary to bring them to a correct representation of the originals.

It should be obvious that there is a significant difference between conserving and restoring a clock.

- ***Repair:*** Repair, as defined by the BHI, is the act of bringing an artifact into a sound, functional condition without regard to materials utilized. Modern finishes, metals and methods are employed as necessary to complete the needed work.

Repair is an approach more appropriate to a contemporary or vintage clock. Utilizing modern materials on an antique clock has the affect of negating its historic value.

Conservation of Clocks and Watches provides a number of insights and opinions regarding the limits of work that can be performed within the various definitions given and is a worthwhile investment if you wish to understand what is and is not generally acceptable practice when working with antique clocks.

Somewhere along the continuum from strict conservation to straight repair is the point where the maximum number of clocks can be accurately restored and preserved. The chapters that follow will not present a firm definition of restoration. Each collector and restorer will have to determine how much repair, reconditioning and/or modification are acceptable to their taste. This book does however, attempt to provide techniques that will create a restored clock which could be inspected by a knowledgeable collector or restorer 100 years from now and not cause disappointment or frustration.

Regarding the material compiled and presented here. The reader is likely aware that there are numerous books on clock repair focusing primarily on repair of the movement. There are an even greater number of books detailing the techniques for finishing wood. With a little research, books covering various techniques such as gold leafing and tortoise shell finishing can be located.

The determined restorer can locate information sources for many of the numerous skills needed to accurately restore an antique clock. However, there appears to be no single volume which brings together all of the needed techniques in an accurate, clock-specific context. ***Extreme Restorations*** has been created to address the need for "clock-restoration-specific" techniques for the various processes used in the original manufacture of these clocks.

It is hoped that this book will motivate many of those interested in antique clocks to take a closer look at those examples of American clock making which are in the worse condition and rapidly approaching the scrap heap and loss forever. Through the careful application of various recovery techniques, even these neglected examples can be correctly restored to sound, near-original condition.

Proper restoration, like the original production of these clocks, involves a very wide range of skills and crafts. Cabinet-making level woodworking skills must be combined with the vision needed to recreate missing parts. Correct finishing, involves not only wood finishing, but accurate artistic painting and restoration of dials and other surfaces. Gilding, or gold leafing, of certain surfaces is necessary to match original designs. Restoration or recreation of finishes such as the faux tortoise-shell, popular on column clocks of this era, is also frequently needed.

The restorer must also possess or acquire additional skills not needed by the original makers of the clock. For example, the label of the clock is one of the most important parts for accurately identifying and dating a clock. Unfortunately, this piece faces the most aggressive attacks by time and complex chemical action. Understanding the causes for label deterioration and the proper steps for its restoration and preservation requires an archivist's or conservator's understanding of paper production techniques and the inherent problems caused by various manufacturing processes.

Finally, knowledge of the basic clock works used during this period, as well as how to safely disassemble, inspect, repair and reproduce missing components, is essential.

In ***Extreme Restoration***, each phase of restoration is addressed in its own chapter with examples and details of recommended techniques. Sources for materials and additional information are provided throughout each chapter. Numerous photos are used to ensure that each technique is clear. Finally, at the end of each chapter, the techniques are applied to the "project clock". The same clock is used in each chapter to demonstrate how much can be accomplished even when starting with a worse-case example.

The techniques described throughout the book do not represent the only means to accomplish the repairs being described. There are likely as many ways to perform a given repair as there are dedicated restorers. The techniques shown in the book are those that have been developed by the author and, over time, have proven reliable while remaining as

true as possible to the manufacturing techniques originally used.

It is hoped that Extreme Restorations will provide the information needed to allow the reader to complete accurate, high quality restorations and will become a frequently consulted reference in the restorer's library.