



# NAWCC NEWS

National Association of Watch and Clock Collectors  
Atlanta Chapter 24  
August, 2011

## Bernie Tekippe on Pendulums - Quality Evolution and Practical Practices

by Tom Noesges

Bernie Tekippe presented a detailed history and an interesting analysis of the clock pendulum and how and why it became the timekeeping basis for most clocks since about the year 1660 until 1930.

**History** - Until the discovery of the pendulum, people used the location of the sun in the sky or its shadow on an earthly object, burning candles, sand glasses or water dripping into a

vessel to determine how much time had passed. The point was that our predecessors were looking for a way to measure the amount of time consistently.

The two major operational characteristics that contributed to the popularity of the pendulum as the accurate timekeeping device were: (1) The reliability of its repetitive motion and the ability to control its frequency, or speed, by controlling the length of the pendulum rod - shorter rod, faster swing - longer rod, slower swing; and (2) once started, the pendulum swings for a very long time using very little energy.

The formula for time given by Bernie is  $(\pi \sqrt{\text{Length} / \text{Gravity}})$ . Considering that pi is fixed at 3.14159 and gravity is fixed at 9.807 m/s<sup>2</sup> or ~22 mph/s, the only variable is the length. Therefore, by varying the length of the pendulum rod, we change the time period per swing.

**Pendulum Quality** - To compare the quality of one pendulum design to another, one needs only to determine how long a pendulum will swing. The formula for this

is referred to as the Quality Factor or "Q" of the pendulum. "Q" is defined as the number of periods the pendulum will swing before the distance (amplitude) of the swing decays by half, multiplied by 4.53. "Q" was not identified until about 1920 by the electronics industry. If we want a pendulum to swing for a long time, we use the lightest suspension spring and the heaviest bob. This will, in fact, increase the "Q" of the pendulum.

Bernie pointed out some of the major obstacles impacting clock accuracy:

**Circular Error** - this means that if you swing the pendulum further, it will swing slower. This should encourage clockmakers to build clocks with narrow amplitude. An increase in degrees of amplitude of one degree will slow the pendulum 1.6 seconds per day, 2°=6.6s/d, 3°=14.8s/d. To compensate for the reduction in pendulum speed as the result of an increase in amplitude, simply shorten the length of the pendulum rod.

**Temperature Error** - this means that the length of the pendulum rod will expand (lengthen) with heat, thereby slowing the clock. Knowledge of this phenomenon resulted in the development of many temperature compensating devices such as Invar (a steel/nickel alloy invented 1896 by Charles Édouard Guillaume) and mercury filled bobs. An Invar rod will only lengthen about 0.0015" even at a temperature increase of 40 degrees Fahrenheit.

**Escapement Error** - this is the amount of drag the pallets put on the pendulum through constant contact with the escape wheel. The goal of clockmakers for the last several hundred years has been to design an escapement that has the least amount of drag, thereby freeing the pendulum to do its job of accurate timekeeping.

**Barometer Error** - this refers to the slowdown in swing due to the buoyancy of the bob floating on the air, when the air becomes denser. As barometric pressure decreases (e.g., in mountainous areas), and the air becomes thinner, the swing would speed up.

The overall quality of the timekeeping is determined by the quality of the escapement (the least drag) combined with the quality of the pendulum (highest Q Factor). The most accurate clock has the **narrowest pendulum swing**.

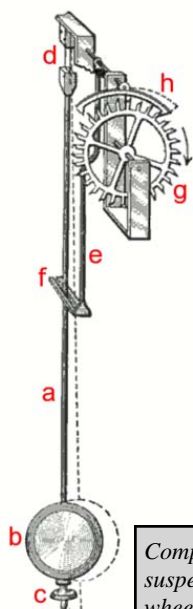
**Practical Things A Clockmaker Can Do:** One of the practical things a clockmaker can do to improve the accuracy of a clock is to use the *heaviest bob* and the *thinnest suspension spring* that will hold the weight of the bob. Doing so will result in a clock that depends more on the stored energy of the pendu-

(Continued on page 2)

Photo by Peter G. Schreiner III



Bernie Tekippe



Components: (a) rod, (b) bob, (c) regulating nut, (d) suspension spring, (e) crutch, (f) crutch fork, (g) escape wheel, (h) pallets on the verge/anchor



Mercury Pendulum

## Minutes of NAWCC Atlanta Meeting: June 5, 2011

- ◆ President George Waterhouse called the meeting to order following a lively auction led by Brooks Coleman.
- ◆ George Waterhouse asked that guests and visitors introduce themselves. Guests were Fred Von Oelschlaeger of Santee, GA; Kyle Brown, grandson of Chris Brown; Amy & Bret Cade of Grayson, GA; and Bruce and Cheryl Copeland of Bogart, GA. The Copelands and Fred Von are the newest members of Chapter 24.
- ◆ Tom Noesges read the Minutes of the April 3, 2011 meeting. The Minutes were unanimously approved as read.
- ◆ Donna Kalinkiewicz gave the Treasurer's Report, including our account's beginning balance, receipts, expenses and ending balance.
- ◆ Old Business
  - ◆ Pete Schreiner gave an update on the Department of Natural Resources, Capital and Mansion clock projects. The mansion clocks are all running. According to Pete there was an issue with one clock stopping; this problem was solved by getting someone else to wind it. Anyone interested in the details of other clocks, please see Pete.
  - ◆ Bernie Tekippe gave an update on the plans for the Mid-South Regional Convention scheduled for Labor Day 2011. The Regional will not be open to the public although we will have a Road Show on Saturday to provide appraisals. The Exhibit will be open to the public. We are looking for more volunteers for the Mart and Registration.
- ◆ New Business
  - ◆ Warren and Kathy Brook have accepted the positions of host and hostess for visiting members and guests to our meetings.
  - ◆ The board agreed that new members joining mid-year will be charged a reduced dues of \$8.
  - ◆ Several of our members receive the newsletter by both email and snail-mail. A survey form was passed around to encourage all members to update their contact information and opt-in to email-only newsletters, thereby saving the club money.
  - ◆ George Waterhouse submitted a request to National for BOD approval to hold the Atlanta hosted 2015 National Convention in Chattanooga.
  - ◆ George Waterhouse asked for a volunteer to submit information to National for publishing in the Chapter Highlights. Renee Coulson accepted the challenge.
- ◆ Program
  - ◆ Jae Martin showed a Ships Clock in Show & Tell (see article in this newsletter).
  - ◆ Jae introduced Brooks Coleman and his Show & Tell Ingraham Black Mantle and Birdie novelty clock (see article in this newsletter).
  - ◆ Jae introduced George Waterhouse and his Gel Stain in Tips, Hints, Products & Procedures (see article in this newsletter).
  - ◆ Jae Martin shared his knowledge on the Butterworth ButterBearing in Tips, Hints, Products & Procedures (see article in this newsletter).
  - ◆ Jae Martin introduced Bernie Tekippe and a lecture on Pendulums and Clock Accuracy (see article in this newsletter). ■

### Bernie Tekippe on Pendulums

(continued from page 1)

lum and will necessarily result in a higher Q factor and hence a more accurate timekeeper.

Another practical thing to do is to make sure the top of the suspension spring is held firmly in the bracket so that the spring will *spring* rather than *wiggle* in its bracket, causing pendulum wobble. Pendulum wobble will affect accuracy and can be eliminated by using a *wider suspension spring* and then making sure the bracket and crutch are properly squared-up.

Lastly, ensure that the *verge is located* at approximately the same place where the *suspension spring bends*. Doing so will avoid the crutch riding up and down the rod and introducing additional friction which will negatively affect accuracy.

Bernie showed us several long case pendulums and the pros and cons of their designs. ■



### GROANER by George Waterhouse

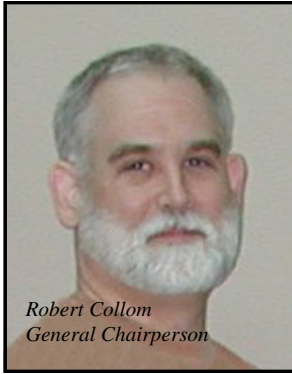
A little old man in the city living in a tenth-floor apartment had an antique grandfather clock. He had owned it a long time and was

naturally very fond of it, but the clock had stopped running and he couldn't get a repairman to come to his apartment to fix it. The clock repairman down the street said he'd fix it but that he didn't make house calls. So the old man made an appointment to have his clock fixed.

He dragged the clock out of his apartment, barely clearing the doorway, and carried it down the hall stopping every ten feet to rest until he reached the elevator. In the lobby, he and the clock encountered the revolving front door, but after struggling for half an hour, he finally got it to the street. Then he struggled down the street with it, again stopping every ten feet or so to rest, and trying to time his stops in order not to block the entrance to any shop. As luck would have it, there was a bar between his apartment building and the clock repair shop, and it was his sad misfortune to be lugging the heavy clock past the bar when the bartender threw a drunk out the door and right into him. The drunk and the old man with his clock were knocked to the ground and smashed.

In his despair, the old man took off his shoe and started beating the drunk on the head with it, saying over and over, "You damned old drunk look what you've done. You've ruined my priceless clock." The drunk, trying to fend off the old man's shoe attack, finally mumbled, "Well, why don't you wear a wristwatch like everybody else?" George apologized to his groaning audience saying, "I just read em, I don't write em." ■





Robert Collom  
General Chairperson

## Atlanta 2015 National Convention Status *by Robert Collom*

Our General Chairperson, Robert Collom reported earlier in July that the NAWCC National Headquarters has approved our proposed location of Chattanooga, TN for the 2015 National Convention. We're on our way folks!

■

## Treasurer's Report *By Donna Kalinkiewicz*

Fifty-three members enjoyed our June, 2011 meeting. Six guests signed our Guest sheet.

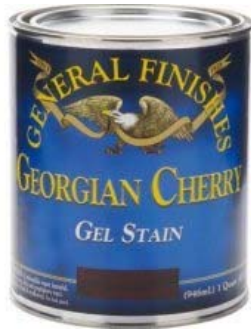
We deposited \$41 from membership dues and \$75.50 from the 50/50 raffle. Dan Maddox had the winning ticket and donated his \$75.50 back to the chapter. Jae Martin had items in the auction for the proceeds to be donated to Chapter 24. Those items gave us another \$95.

A 2010 road atlas was left behind. Donna will have it at the August meeting at the name badge table. Please see Donna if you left it behind.

Please keep us informed of address, phone and email changes. If we don't have your correct information, you just might miss something. ■

## Tips, Hints, Products & Procedures

**Gel Stain/Finish** – George Waterhouse (famous in our club for his wood refinishing work) suggests using General Finishes Gel Stain and Topcoat for wood finishes where you don't want to use varnish. Just wipe it on with a clean cloth and you're assured of professional quality results without brush marks. The stain will dry to the touch in minutes. If you want a darker color, just apply another coat of stain in about six hours. The special formula repels dust between coats. No sanding is needed between coats and there is no unpleasant smell. Once you're satisfied with the color, apply General Finishes' Satin Gel Topcoat Finish.



**Butterworth's ButterBearing** – Jae Martin suggests trying the ButterBearing. They can be found at: [www.butterworthclocks.com](http://www.butterworthclocks.com). Jae stated that these are not clock bushings, but are used instead of clock bushings. Although he has not personally tried this product, he will do so, and is interested in hearing of anyone's experience with the bearings.

This is a low cost system for pivots with a size from 0.50-9.00mm. You will never file, polish, or pivot an arbor again. The condition of the pivot is immaterial. The brass sleeve inside the inner ring is reamed to size for the pivot. The inner ring turns with the pivot against the ball race and with the outer ring. The hole is drilled in the plate for the bearing the same as it would be for a bushing. It appears that the approximate cost is \$3 per bearing. ■



ButterBearing

## Show & Tell

**Seth Thomas Ship's Clock** – Jae Martin brought us a Seth Thomas Ship's clock c. 1913. He told us this clock was unusual in that the balance wheel is at the bottom and the winding arbors are located at the top.

**Brooks Coleman** showed the club a beautiful Ingraham Black



Seth Thomas Ship's Clock

Photo by Peter G. Schreiner III



Photo by Peter G. Schreiner III

Ingraham Black Mantle

Mantle for which he had refinished the case. Brooks used Ace Hardware's (17015) black paint for the clock, and a Pilot gold pen he purchased with his own money

at Office Depot for the 1,000 little dots. The hardware on the clock was painted with a gold paint from Ace. He said his dream was to do the quality of work such as Rick Mangum someday.

**Brooks Coleman** showed us a Birdie Clock that he'd bought at a garage sale and he just thought it was too neat to not show to us.

**2011 Mid-South Regional Door Prize** - Bernie Tekippe showed us the 1904 Ansonia Belgium model to be given away as the door prize at the 2011 Mid-South Regional in Chattanooga, TN scheduled for Labor Day, September 1, 2, & 3, 2011. The little restoration work that the case, hardware and movement needed by this clock was done by Bernie. The clock is a time and strike, has a beautiful open escapement and a very thick flawless beveled glass over the perfect porcelain dial with Roman numerals. The clock is designed in the manner of the French clocks of this period.

Bernie acquired this clock at an estate sale and felt its appearance was in keeping with the theme of the convention—French. The clock is valued at \$600.00. ■



Birdie Novelty Clock

Photo by Peter G. Schreiner III



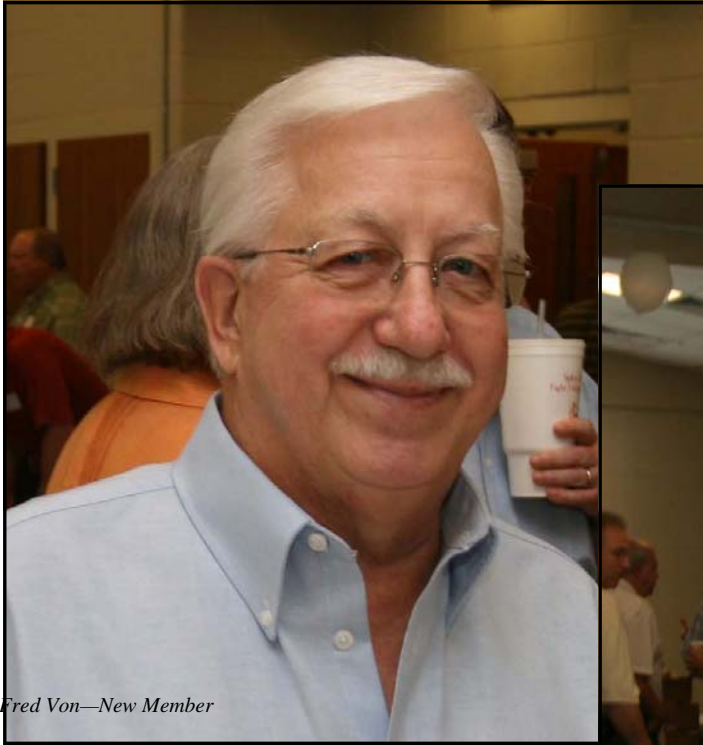
1904 Ansonia Belgium Clock

Photo by Peter G. Schreiner III



## Atlanta Guests and New Members

The members and officers of Atlanta Chapter 24 were tickled pink to have the following folks join our general meeting this past June. Please go out of your way to help these folks feel at home here in Atlanta. Guests or new members having any questions about our chapter of the NAWCC, please contact any officer listed in this newsletter or Kathy or Warren Brook at warrenb104@aol.com. ■



Fred Von—New Member

Photo by Peter G. Schreiner III

## Up-Coming Programs & Presentations

**PLEASE bring clocks, watches and other items of horological interest to share with your fellow members. Call Jae Martin (770) 813-8140 and tell him what you would like to bring. Don't be bashful or feel that you're endorsing the item. This is an opportunity to share your experience—small or great!**

**August 2011**

**New England Handcrafted Wooden Movement Tall Clocks** by Philip E. Morris, Jr. - From 1712-1807, the earliest wooden clocks were handcrafted across New England. Using examples of these clocks from his new book, *American Wooden Movement Tall Clocks: 1712-1835*, Philip will discuss these early clocks and their makers. ■



Amy & Bret Cade

Photos by Peter G. Schreiner III



Cheryl & Bruce Copeland—New Members

Photo by Peter G. Schreiner III



Kyle Brown

Photo by Peter G. Schreiner III





## Classified Section

This area is dedicated to advertising for Chapter 24 members. Of course, it's free

### WANTED WANTED WANTED WANTED WANTED

⌚ One of the clocks from the Lapham-Patterson house in Thomasville needs a two vial mercury pendulum (not faux) for a French H&H (Japy Freres) movement. If you have this pendulum or even possibly know where one can be acquired, please contact Pete Schreiner PGS3@Mindspring.com or call (404) 633-4772.

⌚ Two matching brass weights 4" long, 1.75" diameter, 3 to 3.25 lbs each for a Gustav Becker Vienna Regulator. Contact Warren Brook at 678-777-3333.

### FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE

⌚ Howard figure 8's 6 thru 10 S.T.#11 D.D. wall all real beauties. William Byrd bbyrd1243@bellsouth.net

### SERVICES SERVICES SERVICES SERVICES SERVICES

⌚ Woodcarvings - new or replace to match - Classic carvings - rare woods - Contact Fred Von - fredvon@windstream.net or fredvon59@yahoo.com - Also view web-site: www.fredvonstudiosllc.com

If you would like to place an ad in this space for your items needed, services you offer or horological items for sale, contact Tom Noesges - email Thomas@Noesges.com or call (770) 262-0883.



### NAWCC Atlanta Chapter 24 Officers and Directors

George Waterhouse	President	ClockDoc35@yahoo.com	(770) 939-5799
Jae Martin	Vice-President	Info@clockgalleryinc.com	(770) 813-8140
Thomas M. Noesges, Jr.	Secretary	Thomas@Noesges.com	(770) 262-0883
Donna Kalinkiewicz	Treasurer	DMKTimes2@Att.net	(770) 321-1057
Christian H. Brown	Past President	Browncg@Bellsouth.net	(770) 962-7480
Brenda Wiggins	Director 2011	Brenda232@Comcast.net	(770) 979-5197
Peter G. Schreiner III	Director 2012	PGS3@Mindspring.com	(404) 633-4772
Robert Collom	Director 2013	RobertCollom@gmail.com	(770) 715-9957

## Next Meeting of Chapter 24

Sunday, August 7, 2011 - 9:30 AM until 1:00PM



**FROM THE SOUTH (IN TOWN):** Take I-285 to Exit 39B which is Highway 78, continue on 78 to Exit 7 onto Hugh Howell Road. After this exit, immediately turn right onto Lilburn-Stone Mountain Road. After 0.2 mile, turn right onto Old Stone Mountain Road. Continue to the intersection of Rockbridge and Five Forks Trickum. Turn left on Rockbridge Rd. The Aquatic Center is two blocks north on left.

The Atlanta Chapter of the NAWCC typically meets the first Sunday of February, April, June, August, October and December. As part of the Mid-South Group, it also sponsors the regional meeting in Chattanooga on Labor Day Weekend each year, in rotation with the Alabama and Tennessee chapters.

**FROM THE NORTH-WEST:** Take the I-85 east exit from I-285. Exit 99 and turn right on Jimmy Carter (Hwy 140). Continue and bear left onto Rockbridge Rd. Aquatic Center will be on right—two blocks before Five Forks Trickum Rd.

**FROM CUMMING / HALL COUNTY:** Take Exit 101 Indian Trail / Lilburn Rd NW off southbound I-85. As you cross Hwy 29 Lawrenceville Rd, Indian Trail becomes Killian Hill Rd. Turn right onto Five Forks Trickum Rd.

Turn right onto Rockbridge Rd. Aquatic Center is two blocks north on left.

**Tom Noesges, Secretary**  
**NAWCC Chapter 24**  
**5211 Willow Creek Overlook**  
**Woodstock, GA 30188**

Membership paid through...