August 8, 1961

AUGUST REPORT

HEART OF AMERICA CHAPTER

Dear Friends:

August 13th, the Second Sunday of this Month, is once more the GET-TOGETHER Day for the Heart of America Chapter of Watch and Clock Collectors. Mr. and Mrs. Richard Camden, 9814 Kentucky, Independence, Missouri, will be our hosts opening their home both for the Meeting which will begin at two o'clock, and for the Open House to be anytime after one o'clock and continuing after the Meeting. (As for directions to reach their Home, see Page Two of this Report and Map on the last Page) Mr. Camden, a research chemist by profession, has been closely associated with the problem of refinishing and working with wood (his Father was a professional carpenter and cabinet maker), and you will find their home furnished with many unusual antique pieces that he has supurbly restored to their original dignity.

As for a clock collection, Mr. Camden is a long-time collector of clocks here in Kansas City and proudly has examples of most of the various types of clocks and styles, including calendar clocks for you CALENDAR WATCHERS. Mrs. Camden's hobby is sewing and flower gardening, in addition to the clocks, and she can show you fine examples of both. The program this time will be presented by Mr. Bryant, and between his discussion and the demonstration which Mr. Camden is planning, many worth while ideas will be gleaned. Mr. and Mrs. Thomas made the mistake of going to a sale in the State of Ohio, and stopping to see the different collectors in Indiana. Being very thoughtful folks, they took pictures of everything they could see--collection wise, and he will have the pictorial review of these various collections of clocks on display Sunday at the meeting. Also, Mr. and Mrs. Vandervort attended the National Convention and promised to give a first-hand report of what is new with the National Association.

But so much for what others are going to give us. Lets talk a minute about what we are going to do for them. We need four things from everyone. First, and most important, we need you--YOU. When the opportunities present themselves to learn something, do not pass them up. Also, you help the rest of us to learn from the discussion you contribute to the Meeting. We all are teaching, and learning. Secondly, Mrs. Thomas requests of the ladies who agreed to provide door prizes for this Meeting, and those who will provide them for the next meeting in October, to please do not forget. Door prizes seem to be enjoyed as a special part of our meeting so we need more of them if we are to continue giving them, so please bring them or send them to Mrs. Thomas. The wonderful spirit demonstrated in the past seems to be growing stronger and stronger on the ladies' part, but the members enjoy it; so Thankyou, Ladies, one and all, for the splended job you are doing.

Now, the third request is that everyone please bring exhibits as these help to make the meetings educational and beneficial to all. Actually "seeing" is 100% over the "spoken word". Anyway, what's the fun of having it if you do not share it with others and help them to enjoy collecting just a little bit more. And lastly, we need SOLID tables, so if by chance you have a GOOD FOLD-UP TABLE that will fit in the car, please please bring it along. Do not stay home if you do not have one, as maybe someone else will be kind enough to bring theirs, but don't go out and rent a truck in order to bring the kitchen table--we aren't that desperate.

PRESIDENT'S REPORT

Hello, good friends:

Hope all of you are making plans and preparations to attend the August Meeting to be held at the home of the Camden's. As you already know, the Bruers will be vacationing in cool--we hope--Colorado. Our plans include a visit to Clock Manor in Denver. I'll have my Brownie along to take pictures to show at the October Meeting.

Our Secretary informs me no new names have been added to the Roster. We hope to sign up in the near future some interested people who haven't as yet made the final decision. We can certainly use a few more members, so, in your travels talk up H.O.A. Chapter and help increase our membership.

Haven't talked to any of our watch collectors recently but assume they are finding some gems to add to their collections. I know the clock collectors around here have made some fine additions to their collections. If anyone has any suggestions or ideas that would make H.O.A. more attractive to new as well as the old members, please mention them at the next meeting.

Finally, I would like to thank the Camdens for their fine hospitality. I know all of you will have an enjoyable Meeting. We will be thinking of you.

Your President, Bill Bruer

Mr. President, I think it can be truthfully said that we will all be thinking of you, and those of us who have already had our vacations will probably be just a little bit envious. Have fun! Remember, you are only young once and the next time you pass that-a-way, that clock or watch just may not still be there.....

The National Bulletin deadline is August 20th for the October Issue so we would sure appreciate it if anyone who can help us get some QUICK DEVELOPING pictures would do so. We want the other chapters to know we do exist, and our Meeting will be August 13th, just one week before the deadline. Speaking of important discoveries, we are very happy to discover on the inside back cover of the August Bulletin that one of our Chapter Members now holds a National position--Caspar A. Wagner was elected to the ranks of the Standing Committee on Membership. We extend our congradulations. We are very proud to have one of our members representing us in the National Organizational Framework.

Help--Help! Mr. Camden is very anxious to obtain a bezel for a striking Ingram Banjo spring driven clock he has. It has to be metal, eight inches in diameter, and have the two holes to wind it just a bit below the hole for the hands--just a regular bezel will do, but it must be eight inches in diameter. Anyone having an extra one willing to part with it contact Mr. Camden, 9814 Kentucky, Independence, Mo., or better still, bring it along with you to the August 13th Meeting, arriving anytime after one o'clock that afternoon.

To reach Mr. & Mrs. Camden's Home (please refer to the map on the last page of Report) follow Independence Avenue (which is Highway 24) east going through Eastern Kansas City and out through the Blue Valley Industrial District, still on Highway 24, continuing straight ahead where Winner Road goes to the right, and on up Independence Avenue into Fairmount, a small suburb of Independence, Mo., going under the first railroad, and over the second railroad, past Wilson Road turnoff on your left, and on to Huttig Avenue (approximately a half block past the angle-turnoff for Wilson Rd. and the second or third stop-&-go light past the point where Winner Rd. turned right The Standard State Bank is on the north-west corner of the intersection at Huttig Avenue. Turn left at Huttig and go one short and two real long blocks to Kentucky Ave. Turn left at Kentucky and go three short blocks past the 9900 Block and their house is the one on the north-west corner of this intersection---9814 Kentucky. This is a rather busy street but there is plenty of parking on either of the side streets going north and south at this corner, and since it is the corner house, you'll not be more than a stone throw from them. Also, unless you know your way around out there stick to the described directions as being an industrial Mid-City Area, many of the apparent through streets are not what they seem.

T-I-M-E

by Dale E. Henry

To a member of N.A.W.C.C. it would seem that a simple question of "What is Time?" is one that would be easily explained or defined. However the more one studies this subject, the more confused its history becomes and its measurement more uncertain. Lets take a look at some of the many things that have been recorded on the measurement of time as it passes swiftly by. First of all where does time begin? Scientists are always pointing out fossils that date back 200,000,000 years or more found on this Earth; but where did time begin in the Universe?

Time of Man only dates back a few thousand years and little evidence of man's history goes back to 5,000 years before the Christian Era, with only some very limited evidence that time-keeping may have existed around 3,000 B.C. Man's curiosity of light and darkness must have brought about his attempts to measure time. The gnomon (the perpenduclar point of a sun-dial which casts the shadow) casting its shadow must have been the first device for measurement of time and without light it was useless. Even today without light we would be unable to determine time. (This is covered later in this paper).

You can find a modern definition of time in your dictionary but it always leaves you with a question. After reading all you can find on time it leaves you in solemn wonder. Maybe the following definition of time is as good as any: "The Infinitesimal Measures Eternity". Having come up with a definition of the subject at hand, let us now list some of the inconsistances of time measurement.

1) 1500B.C. The gnomon, while fairly accurate, if small, did not permit close calibration; if large, the shadow outline was blurred.
2) Sundials, while fairly accurate, were accurate only when the upright was placed parallel to the Earth's axis at the particular given location.
3) Moondials, as well as Stardials, had their same problems.
4) 1400B.C. Clepsydra (Water Clocks) varied as the water declined and reduced the pressure.
5) Wax Clocks were also introduced but various waxes varied in their ability to burn faster or slower and all were affected by drafts.
6) Sand Clocks and Hour-Glasses were not accurate or uniform due to variations in marking and reading of glasses, and their accuracy also depended on the uniformity of the sand.

In later periods, the development of mechanical clocks also had their trouble spots from the very beginning. As the source of power progressed from weights to springs and electromagnetic power, development of new methods of escapements and more reliable movements were sought, as well as the effective use of newer and better materials. Watches went through the same kind of growing pains as clocks. Some of the earlier watches were even equipped with sundials so the watches could be reset.

Another very confusing media of time measurement is found in the use and development of the calendar. Calendars (the system of fixing the divisions of time as years, months, weeks, and days) were greatly effected and controlled by the whims of religion, governments, and magic. The Chinese are said to have developed a calendar or almanac during the period around 2600B.C. It consisted of twelve "Earthly Branches" which served not only to indicate the months but days and hours as well.

The development of the Roman Calendar covers the period from 738B.C. to 1752A.D. and progressed as follows: (In all of these calendars the number of days per month differs)

1) Romulus Calendar, 738B.C., had ten months and consisted of 304 days.
2) Numa Calendar, 713B.C., had twelve months with 355 days.
3) Council of Decemvirs Calendar, 451B.C., had twelve months with 355 days.

4) Julius Calendar, 47B.C., had twelve months with 365¼ days.
5) Augustus Calendar, 8B.C., had twelve months with 365½ days.
6) Gregory XIII Calendar, 1582A.D., had twelve months with 365.2422 days in it.

"In A.D. 522 when Christian holidays were set, the calendar seemed to have everything well in hand. There was, however, a trivial error in the calculation of the actual length of the year. The calendar was based on the assumption that the year is 365.25 days long. Actually, the solar year is 365.2422 days, a difference of .0078 day in a whole year; one day in 128 years. While the vernal equinox occurred on March 21st in A.D. 325, this celestial phenomenal, knowing nothing of man-made calendars, retreated to March 15th in the year A.D. 1093, and in due time if nothing had been done about it would have taken place at Christmas. The Council of Trent of 1582 authorized the Pope to rectify this unfortunate state of affairs, and after consultation with many astronomers, POpe Gregory XIII ordered that the day following Thursday, October 4, 1582, would be Friday, October 15, 1582. He changed the beginning of the year from March 25th to January 1st as Numa had instituted 2,295 years previously. The change was not followed by England and the Colonies until 1752 by which time the old Augustus Calendar of 8B.C. had accumulated another day's error. So our Country had no history between Wednesday, September 2, 1752, and Thursday, September 14, 1752. Eleven days gone with the wind! That is why the Birthday of George Washington, born February 11th on the old style calendar, is today celebrated on the 22nd."
(Time and Its Measurement)

Besides these variations in calendars there has been several other experimental calendars in use such as the "French Revolutionary Decimal Calendar" where the seven day week was changed to a ten day week and called a "Decade". Each day was divided into ten hours with each hour having 100 minutes, each minute with 100 seconds. The twelve months (each with thirty days) accounted for 360 days with five or six days added as special days of celebration on given dates, the calendar was then almost complete.

Russia also tried two other calendars. In 1929 they replaced the Gregorian Calendar with one of their own. Each month consisted of six weeks of five days each. Four days of the week were work days, the other a free day. They also added five and six holidays to the year to round it out. In 1932 they again changed their calendars. This time the month consisted of five weeks each of six day duration. In 1940, they changed back to the Gregorian Calendar.

Now if this is not enough to disturb you, there is more—— Old Mother Earth has been acting up lately. Her rotation slowed down between 1680 and 1800 by 27/100 of a second for this period. From 1800 to 1900 she gained 30/100 of a second. Then from 1900 to 1920 she again lost a bit, and since 1920, she has been gaining again—all for an average slowing down of 1/1000 of a second each 100 years. (Should you correct your clocks for this change?)

Let us take a look now at what modern science is doing about keeping up "on Time". Our official time-keeper in the United States is the U. S. Naval Observatory in Washington D.C. Each night when the sky is clear, an astronomer takes a look at the stars while the Nation's Capital sleeps. His equipment is the finest telescopes, photographic and recording devices obtainable, all fixed to a revolving base (the Earth) weighing over six sextillion tons and revolving at a speed that varies less than the works of the best clock ever made. His is the most crucial timekeeping job done anywhere, for the turning Earth is the master clock by which all other clocks are set. It is accurate to within one part in 30 millionth of a second.

Think of the Earth as a giant merry-go-round, spinning around in space among the stars. Riding around on it, you pass by the same point every time it completes a turn. As the astronomer rides around on the Earth he notes what time he passes

directly under a certain star. Carrying him on around as it turns, the rotating Earth brings him back the next night to the same position once more, and he notes again what time he passes under that same star.

The interval between any two times the astronomer passes under that same star is always the same within an extremely tiny fraction of a second. By this standard the Naval Observatory regulates its radio time signal sent out every two hours on the odd hour and heard all over the United States and the World. Those signals are accurate to within 8/1000 of a second. They are set as near as is humanly possible by the time of the Earth's turning. All the World lives by this "earth time" which astronomers call "star time" or "sideral time". It is the most nearly accurate time available. No clock or watch can match the precision with which the turning Earth brings that astronomer and his telescope back under the same star night after night through the years and centuries, always "on the dot".

But in todays split-second world, accurate time-telling is not enough. Time measuring is equally important. To provide an accurate measure of time, the National Bureau of Standards broadcasts another and far more frequent time signal that goes out each second, (omitting the 59th Second in each minute); all day and night a continuous "tick---tick---tick". That signal provides a "yardstick of time". It is just as essential in today's world as the accurate telling of time. Very short intervals of time--tiny fractions of a second--are used in numerous ways, from calibrating parking meters so you get exactly one hour for your dime, to measuring the depth of water under a ship's keel by timing an echo returning from the bottom.

With its "signal-every-second" the Bureau of Standard provides a "standard second" accurate to one part in 1,000,000, just as it also makes available a standard foot, the standard meter, the standard pound, and the standard gallon. That time-yardstick is coordinated closely with the U.S. Naval Observatory's time signals and so is based, too, on the master time of the Earth's turning. Scientists and engineers use it constantly to check their time-measuring devices.

Astronomers, probing out into the unimaginable depths of space, measure the Universe with "time in years---light years" (which means "the distance that light, flashing along at 186,000 miles per second travels in a year"). A "light-year" is roughly six trillion miles. So vast is the Universe that most of the distant galaxies of stars known to man today are 500 million light-years away. With this light zooming to us from such incredible distances, we literally turn time backwards and see into the past. We see the more distant stars not as they are now, but as they were long ago when the light from them now reaching us first started on its way. Light from some very distant stars began its journey before the human race existed on Earth. It brings to our eyes today the images of those stars as they looked then.

To furnish us this accurate time the U.S. Naval Observatory maintains elaborate equipment and a large staff of astronomers and technicians. Essentially, their job is to check the time when an astronomer riding around on the turning Earth, passes under a certain star each night. Originally that was the way it actually was done. Lying on his back, the astronomer looked upward through a telescope that pointed vertically at the Zenith, the point directly overhead in the Sky. Across the center of the telescope's lens was streched a fine hair. As the Earth turned a certain star would come into view in the telescope. When it was right on the hair-line, the astronomer would press and electric key, marking the exact time. On the next night he would do it again, and the interval between was one twenty-four hour day by star-time.

Today, it is done with even greater precision. What the astronomer really does is to see how star time compares with the average time of the Observatory's master clocks. Instead of peering at a star through the telescope, he takes four photographs of the star. Approximately eighty stars are useful for this purpose on various nights

Two pictures are taken at 45 seconds and 15 seconds before the star is due to reach the zenith and two at 15 and 45 seconds after it is due to have passed. An electrical device records the exact time these pictures are taken according to Observatory Clock Time. Then by careful measurements on the plates it can be determined whether the star reached the zenith when the master clocks said it should.

If there is any difference, the time of sending out the radio time signals is corrected to coincide with the Earth's turning. For instance if the master clocks say the star should reach the zenith at exactly 11 P.M. but it actually arrives at 1/100 of a second before 11 P.M., then the clocks are that much wrong and the next time signal is sent 1/100 of a second sooner than it otherwise would be. Of the Observatory's seven master clocks, three are run by pendulums and four by vibrating crystals. The Observatory's time signal is based on crystal clocks only, since they are the most accurate.

The master clocks are always "wrong" for once started going they are never reset. To do so would only increase their errors. But it does not matter that they are wrong since the astronomers always know just how fast or slow they are. Their error is allowed for in sending out the time signals. Even with their constant error, these master clocks are far more nearly correct than the average clock or watch that keeps time satisfactorily for you or me.

To keep them so exact, the clocks are protected from all outside disturbances. The pendulum clocks tick off their time in an insulated vault thirty feet undergound, away from vibrations and changing temperatures. Each pendulum swings in a vacuum, in a case from which the air has been pumped out, for air resistance would gradually slow down their time of swing. Each pendulum swings in a different direction, also, so that the vibration of one will not effect another. In the vault, the temperature is kept constantly within a fraction of a degree of 85 degress Fahrenheit, for changes in heat and cold could also vary the pendulum's swing. No one ever enters this vault except to make infrequent repairs, and the swinging pendulums are closely watched through a periscope from above the ground. The pendulum clocks are no longer used in time keeping. They are now employed in observations for determining positions of stars, since time enters into these calculations.

Vibrating crystals that run the other master clocks are slightly larger than an air mail postage stamp. They are sealed inside vacuum tubes, like those in your radio so that they will be vibrating in a vacuum and not be influenced by air resistance. They are kept in a temperature that varies no more than 1/100 of a degree. Electric current keeps the crystals vibrating, and once started, they vibrate continuously at the same frequency of 100,000 times per second. Clocks run by the vibrating crystals are more nearly accurate than the pendulum clocks, because the crystals are not effect by variation in the pull of gravity, which causes slight irregularities in the swinging pendulums, even in the underground vault. Even change in the level of the water table in the ground will make enough change in gravity's pull to alter the rate of the swing

References include:

"Time and Its Measurement" by Harrison J. Cowan; World Publishing Co., New York
"The Orin Bock of Time" by Francqis Le Lconnais; The Orion Press, New York
"Sun, Earth, Time and Man" by L. C. Harrison; Rand McNally Co., Chicago
"Time and Its Reckoning" by R. Barnard Way & Noel Green; Chemical Publ. Co., New York
"Time and Its Mysteries" (four lectures by New York University) by Robert A. Millikon, John C. Merrian, Harlow Shapley, and James H. Breasted; N. Y. University Press

Well, friends, so long for now and we'll be seeing you this Sunday, August 13th.

Sincerely yours,

Clement C. Wagner, Secretary