

## HOTEL RESERVATIONS

Philadelphia in June is a very desirable place to visit and rooms at the Sheraton are in demand. We advise early hotel reservations to avoid disappointments.

Write:

Reservation Office  
Sheraton Hotel  
1725 John F. Kennedy Boulevard  
Philadelphia, PA 19103

Mention NAWCC Convention — Remember parking is included in the room rates.

Double room — \$17.00 to \$22.50 per day  
Single room — \$17.00 to \$22.50 per day  
Suites — \$37.00 up per day

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# HOROLOGICAL TOUR OF PHILADELPHIA

by James W. Gibbs

(Part III)

Naturally, in a city as important as Philadelphia has been since Colonial times, there abounds a veritable treasure trove of choice antiques including clocks and watches. The difficulty is that aside from those already enumerated, the remainder are so scattered as to preclude another tour. For the restless, the venturesome, or the dedicated specialist we draw attention to a few more choice clocks.

For the devotees of big clocks we suggest a visit to the Old Customs House wherein there is an Isaiah Lukens gallery clock hitherto restored by members of Philadelphia Chapter, No. 1. This is in the area of Independence Hall (whose clocks and bells have been described in the BULLETIN), Carpenter Hall, the Maritime Mu-

seum — the essence of historic Philadelphia. At Head House, in the center of the best restoration of Society Hill, there is an Isaiah Lukens tower clock also restored to running condition by members of "Big One."

For those who wish to combine erudition with a visit to the quintessence of American clocks, a visit to Drexel Institute of Technology is indicated, where reposes a David Rittenhouse Astronomical-musical clock which merited for its maker an unusually laudatory communication from Thomas Jefferson.

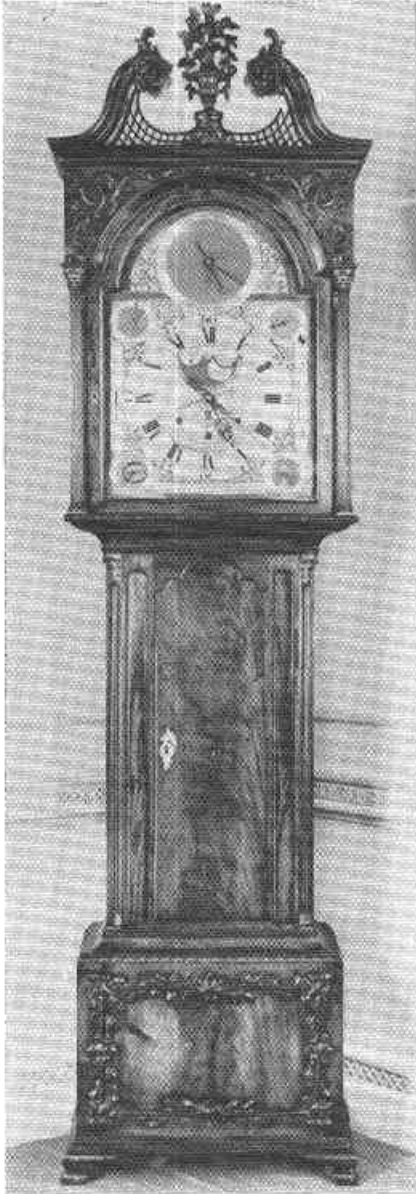
The following description of the clock and its history, and the letter from Jefferson, a scientist of no mean proportion, to Rittenhouse, give the lucky visitor to the Silver Anniversary Convention an unusual insight into

the creative genius and stature of a most famous horologist in the best sense of the word.

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### THE RITTENHOUSE CLOCK

The finest clock made by David Rittenhouse, noted Colonial astronomer,



The David Rittenhouse Astronomical Clock

er, is owned by Drexel Institute of Technology and is on display in the Art Gallery there. The case of the clock is about eight feet high and is made of beautifully-grained, finely-finished mahogany.

It is obvious from the photographs that the clock furnishes much more information than the passing hours, minutes, and seconds. This additional information is obtained from various dials driven by the clock. They show:

(a) The planetarium at the top gives the position of the six planets with respect to one another and to the signs of the zodiac. (At the time the clock was made the planets Uranus, Neptune, and Pluto had not been discovered.)

(b) In the upper left corner is a dial which shows the position of the sun and of the moon in the zodiac. The sun is represented by a golden sphere at the end of a hand or rod which revolves around the center of the circular scale of zodiacal signs. The moon is represented by a small sphere fastened to the end of a hand which revolves about the same center. The moon-sphere is half-black and half-white and it rotates on its axis as it revolves about the center. The rotation and position of the moon-sphere are so adjusted that the phase of the moon can be found by noting how much of the white portion of the sphere is visible when looking at the face of the clock.

(c) At the left, below the sun-moon dial, is a small knob fastened to a sliding bar whose position determines the striking of the clock. The settings possible are marked: "Silent"—"I H"—"Quar'y" (quarterly).

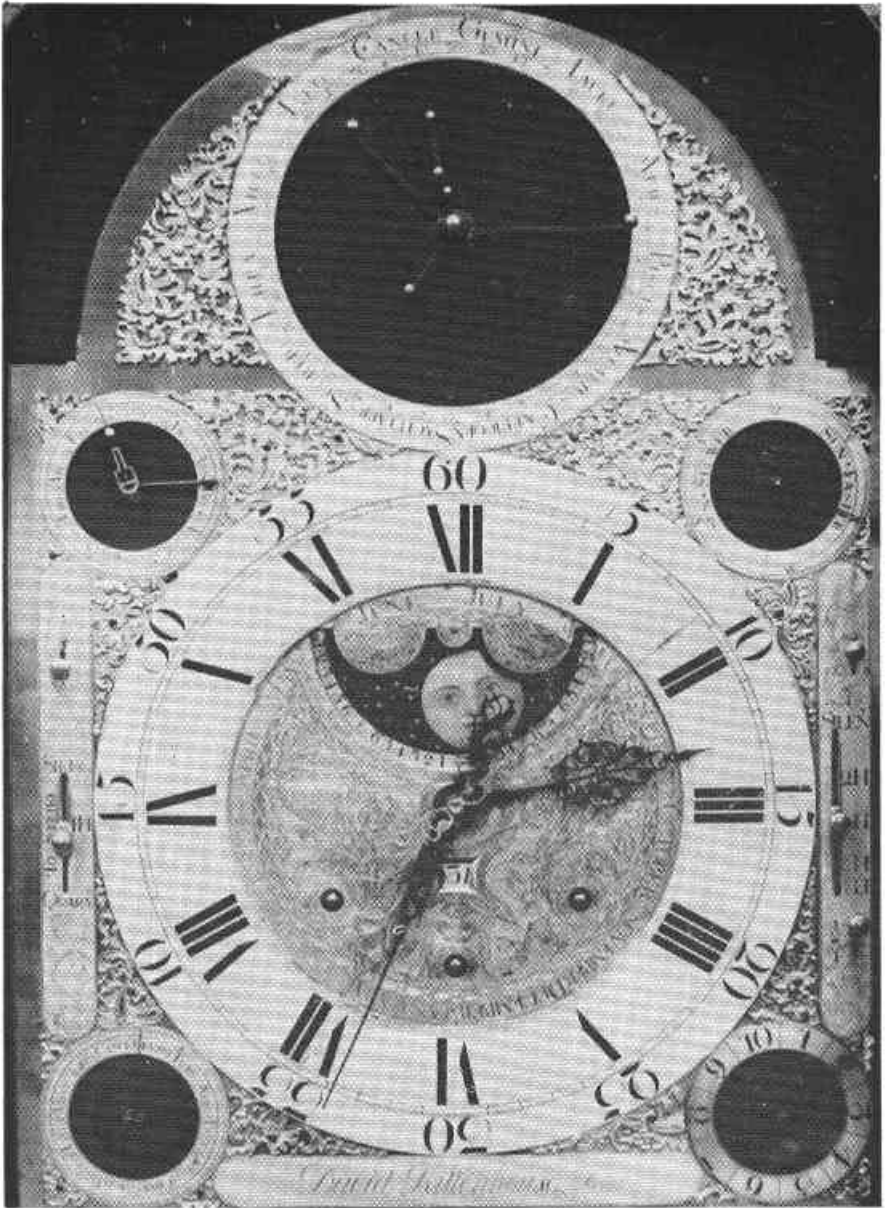
(d) In the lower left-hand part is a circular scale of the signs of the zodiac. There are two shafts, one within the other, at the center of the scale. The one shaft is attached at one of the foci on a bar which is the major axis of an elliptical ring. This ring represents the moon's orbit about the earth and the major axis of the ring is the line of *apsides*, that is, the line drawn from *apogee* to *perigee*. The line of *apsides* makes one complete rotation in 18.6 years. The hand shows the position of the

moon with respect to the signs of the zodiac.

(e) The dial in the upper right-hand corner gives the equation of time, that is, the difference between solar or "true" sun time and mean

solar time as this varies throughout the year.

(f) Below the equation-of-time dial is a knob on a rather long sliding bar. The position of this bar determines how often the chimes of the clock will



Dial of David Rittenhouse clock

play. The settings possible are marked: "Silent," "2 H," "1 H," "½ H," and "¼ H." The chimes play one or more tunes each time they operate. There are ten different tunes built into the chiming system. Musically-trained persons have recognized some of these as portions of old English folk tunes. (Guy Marriner)

Below this scale is another short one with the numerical markings: "1," "2," "3," and "4." The setting of the knob on a short slide-bar alongside of one of these four numbers determines the number of tunes played. The weight which drives the chiming system must be wound up quite frequently if the system is set for the maximum chime playing. The maximum is four tunes every quarter hour.

(g) At the lower right is a circular dial with the numbers one to ten. These are the numbers of the different chime tunes. A pointer indicates which one of the ten is being played. (There is a list of the titles of the tunes.)

(h) There are four beautifully filigreed hands on the face of the clock. The long black hand is the minute hand; the short black one, the hour hand; the long gold-colored one, the seconds hand; and the short gilded hand indicates both the month of the year and the day of the month. The day of the month is obtained either by counting the number of day divisions passed over by the small hand since the beginning-of-the-month mark, or by reading the date number seen through the small square window below the center of the face of the clock. A manual adjustment of the date dials must be made every leap year to take care of the extra day.

There is a *lunarium* above the center of the face of the clock. The phase or appearance of the moon at the particular time is that which appears on the clock. The semi-circular scale along the lower edge of the *lunarium* is divided into four equal parts and each of these parts has seven equal spaces. Each space represents a day. The quarter at the extreme left of the semi-circle is titled "Before the New" and then succession towards the right the titles are: "After the

Full," "Before thee Fulle" (*sic*), and "After the New." The letters of these titles are in rather fancy script and it is likely that what appears as misspelling is in fact a rather full curlicue. The moon on the clock face in the picture stands at about 6½ days before full. Finally at the bottom of the face is the name plate bearing "David Rittenhouse Fecit."

The whole clock was put into good running condition by members of the Astronomy Department of the Franklin Institute in 1940. Unfortunately, the pendulum is not temperature-compensated so that the clock is not a high precision timekeeper. Nevertheless, it does quite well if it is hand-adjusted occasionally.

The history of this clock is given in George W. Childs' (1829-1894) "Recollections" (Lippincott Co. 1890). On pages 67-68 he writes about his clocks. He says, "I have a collection of nearly fifty in various places, and it has been said that a whole history of clock and watchmaking might be written from a study of them. The most important clock in my possession is the one constructed by David Rittenhouse, the great astronomer, for a rich citizen of Colonial Philadelphia. It now stands in my office. Barton, in his 'Life of Rittenhouse' gives its interesting pedigree. There is attached to it the mechanism of a musical clock, besides an accurate little planetarium, placed on its face above the dial-plate. It was made for Mr. Joseph Potts, who paid six hundred and forty dollars for it; in the spring of 1774 it was purchased by Mr. Thomas Prior, who refused General Sir William Howe's offer of one hundred and twenty guineas for it, shortly before the evacuation of Philadelphia in 1778, and another offer of the Spanish Minister of eight hundred dollars, made with a view of presenting it to his sovereign. After Mr. Prior's death, in 1801, it became the property of Professor Barton, the biographer of Rittenhouse, and from him passed into the possession of the late James Swain, at the sale of whose effects I bought it in October 1879."

Although the clock was made for Mr. Potts, it is not certain that he

actually bought it because it was too expensive. In any event he did not keep it long, but purchased a much less elaborate one from Rittenhouse, instead.

Mr. Childs was mistaken in calling Professor Barton the biographer of Rittenhouse. Judge William Barton (fl. 1775-1815), who once owned the famous clock, wrote the "Memoirs of the Life of David Rittenhouse" and published it in 1813. Professor Barton was Benjamin Smith Barton, the brother of William Barton.

William and Benjamin Barton were two of the eight children of Thomas and Esther (Rittenhouse) Barton of Lancaster, Pa. Thomas Barton (1730-1780) was an Episcopal clergyman who came to the Colonies from Ireland. His wife was the sister of David Rittenhouse.

William Barton was their oldest child. He was born in Lancaster about 1754. He married Elizabeth Rhea. Judge Barton and his family first lived in Lancaster and later in Philadelphia.

Benjamin Smith Barton (1776-1815) was born in Lancaster. He became noted as a botanist and physician, and succeeded to the chair of theory and practice of medicine at the University of Pennsylvania following the death of Benjamin Rush in 1813.

Thomas Barton was an Anglican with rather strong British sympathies. He knew Washington and many other Revolutionary officers well because he had served as the chaplain of the forces which captured Fort Duquense in 1758. Because of his loyalist feelings, he moved from Lancaster to New York City in 1778. He died in that city in 1780, and was buried there. Following this, his widow continued to live with a nephew by the name of Samuel Bard, who was the personal physician of General George Washington. (See William Barton in Allibone's "Dictionary of Authors.") Dr. Samuel Bard was born in Philadelphia. For a time he lived in New York City but he spent his later years in Hyde Park.

(M. R. Wehr — March 1955)

The following is die-stamped into the edge of the door of the clock case

in the upper right-hand corner (door open):

DAVID RITTENHOUSE  
DECEE<sup>b</sup> JUNE 26, 1796 a 1<sup>b</sup> 50

(Letter from Thomas Jefferson to David Rittenhouse shortly after Rittenhouse became State Treasurer of Pennsylvania.)

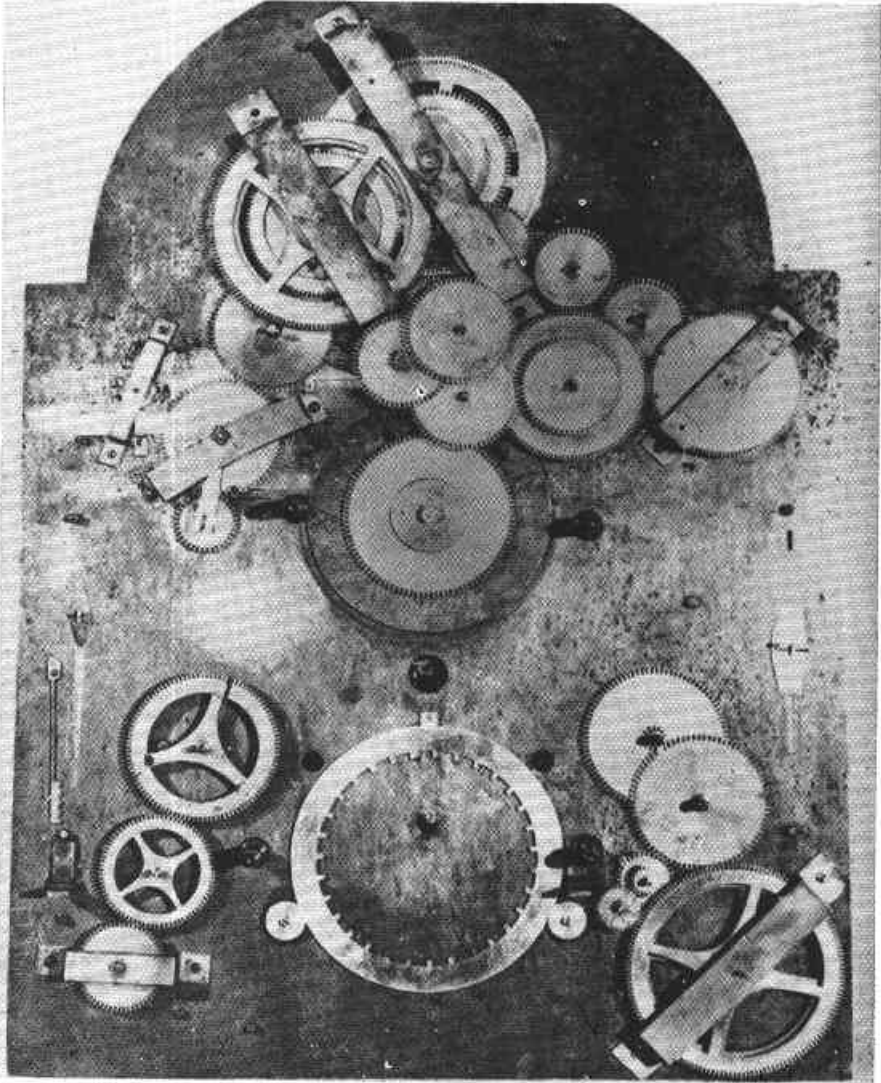
Monticello in Albemarle, Virginia,  
July 19, 1778

Dear Sir,

*I sincerely congratulate you on the recovery of Philadelphia, and wish it may be found uninjured by the enemy. How far the interests of literature may have suffered by the injury or removal of the Orrery (as it is miscalled), the public libraries, and your papers and implements, are doubts which still excite anxiety. We were much disappointed in Virginia generally, on the day of the great eclipse, which proved to be cloudy in Williamsburg, where it was total. I understand, only the beginning was seen at this place, which is in latitude 38° 8' and Longitude West from Williamsburg, about 1° 45' as is conjectured; eleven digits only were supposed to be covered. It was not seen at all till the moon had advanced nearly one-third over the sun's disc. Afterwards, it was seen at intervals through the whole. The egress particularly was visible. It proved, however, of little use to me, for want of a time-piece that could be depended on; which circumstances together with the subsequent restoration of Philadelphia to you, has induced me to trouble you with this letter, to remind you of your kind promise of making an accurate clock, which being intended for astronomical purposes only, I would have divested of all apparatus for striking, or for any other purpose, which by increasing its complication might disturb its accuracy. A companion to it, for keeping seconds, and which might be moved easily, would greatly add to its value. The theodolite, for which I spoke to you also, I can now dispense with, having since purchased a most excellent one. (Editor's note: A theodolite is an instrument for measuring horizontal and vertical angles.)*

*Writing to a Philosopher, I may hope to be pardoned for intruding some thoughts of my own, though they relate to him personally. Your time for two years past has, I believe, been principally employed in the civil government of your country. Though I have been aware of the authority our cause would acquire with the world from its being known that yourself and Doctor Franklin were zealous friends to it, and am myself*

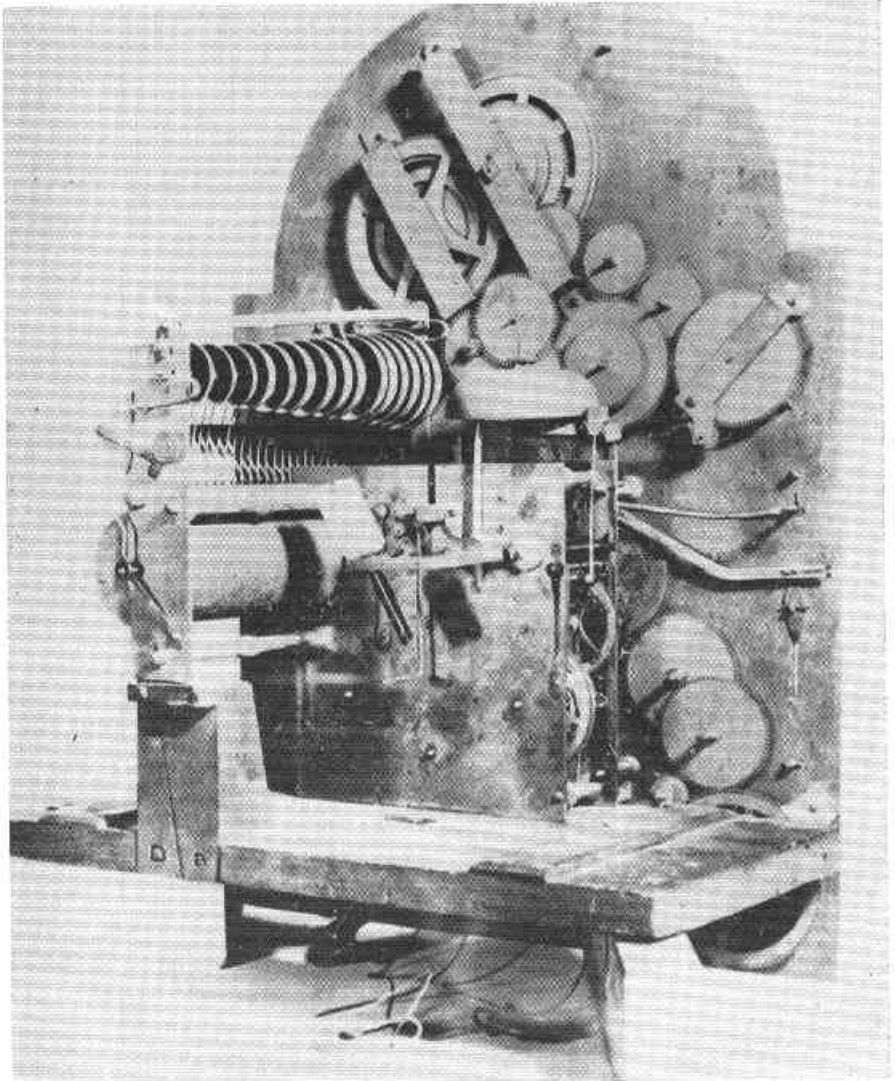
*duly impressed with a sense of the arduousness of government, and the obligation those are under who are able to conduct it; yet I am also satisfied there is an order of geniuses above that obligation, and therefore exempted from it. Nobody can conceive that nature ever intended to throw away a Newton upon the occupations of a crown. I would have been a prodigality for which even the conduct of Providence might have*



The motion work of the astronomical complications on the dial-plate of the Rittenhouse clock

been arraigned, had he been by birth annexed to what was so far below him. Co-operating with nature in her ordinary economy, we should dispose of and employ the geniuses of men according to their several orders and degrees. I doubt not there are in your country many persons equal to the task of conducting government: but you should consider that the world has but one Rittenhouse, and that it never had one before. The amazing

mechanical representation of the solar system which you conceived and executed, has never been surpassed by any but the work of which it is a copy. Are those powers then, which, being intended for the erudition of the world, are, like air and light, the world's common property, to be taken from their proper pursuit to do the common-place drudgery of governing a single state, a work which may be executed by men of an ordinary sta-



View of the Rittenhouse movement from the back

*ture, such as are always and everywhere to be found? Without having ascended Mount Sinai for inspiration, I can pronounce that the precept, in the decalogue of the vulgar, that they shall not make to themselves the 'likeness of any thing that is in the heaven above,' is reversed for you, and that you will fulfill the highest purpose of your creation by employing yourself in the perpetual breach of that inhibition. For my own country in particular, you must remember something like a promise that it should be adorned with one of them. The taking of your city by the enemy has hitherto prevented the proposition from being made and approved by our legislature. The zeal of a true whig in science must excuse the hazarding these free thoughts, which flow from a desire of promoting the diffusion of knowledge and of your fame, and of one who can assure you truly that he is with much sincerity and esteem your most obedient and most humble servant.*

*Thomas Jefferson*

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In passing it is interesting to note that Jefferson's letter was written exactly one month after the liberation of Philadelphia and the evacuation of Valley Forge by General Washington and a body of men which, during the six months' encampment, had been transformed from a raggle-taggle mob to well-drilled, disciplined Continental Army. The author is a Commissioner of Valley Forge State Park and hopes many of the visitors will visit this shrine.

**YES!**  
**Philadelphia**  
**Is Ready,**  
**and Willing,**  
**and Able!**

**All That**  
**Is Needed**  
**Is For You**  
**To Make**  
**Reservations**  
**Early**

**SILVER JUBILEE CONVENTION**  
**JUNE 19, 20, 21, 22, 23, 1968**

**PHILADELPHIA-SHERATON HOTEL**

**1725 JOHN F. KENNEDY BLVD., PHILADELPHIA, PA. 19103**

**COME!**