

**Report 2 – Houghton Library Visit****Houghton Library Visit**  
*at Harvard University***(a) Overview**

After visiting the Gallery of Historical Scientific Instruments at Harvard Science Center, we went to the Houghton Library, the rare books library of Harvard. The main objective of this visit is to see and touch the historical scientific books. This library have stored many world wide limited edition of historical scientific books.

**(b) My Inner Voice**

This is my first time to visit such unique library. The moment I entered the library, I can smell the nice book smell. I love this smell. It makes me feel comfortable to read books here. I really appreciated that I have this opportunity to read the historical science books here.

This is my first time to touch the first printed version science books in my life. Although I could not understand the Latin texts on the books, the pictures and drawings on the books are already captured my soul. I am regretted that I did not learn Latin; most of the early century historical science books are written in Latin. This library visit has motivated me to learn Latin in the near future so that I would not miss the “good” science books available in the libraries.

**(c) Room Design and Layout**

I cannot believe that there are so many well designed reading rooms and seminar rooms in a library. Each of this room has its own unique design. I believe that the architecture or the interior designers have made use of the arts and cultures which is originated in the Europe in the early centuries, in designing the layout of the room. This can be clearly seen from the decorative arts on wall and the ceilings and the lighting used in the room.

**(d) Book Conditions**

We are told that to be careful when we are turning the pages of the books because these books are printed in more than one hundred years ago. The papers in the book are very fragile and brittle now due to the humidity in the air, the exposure of direct light, the decades of environment pollution and the effects of poor storage conditions. Some of the historical science books which have serious damage needed to be sent to special books repair center to repair. Otherwise, the normal damage historical books will be sent to the books repair department at Harvard for repairing. The library staff, MJ told us that the box case can protect the book from the exposure of the direct light and water vapor in the air. But not every book has the box case. Harvard Library needs to spend a lot of money if they order box cases for every books stored in the library. Furthermore, there are limited spaces to store the books here.

I noticed that some of the pages of the books already turned brown. Moreover, some of the edge of the paper began to crackling and crumbling.

**(e) The Feel of the Books**

We are instructed avoid touching the texts or illustrations in the books, we can only touch the empty space when we are trying to flip the pages. This is to ensure that the texts and illustrations on the pages can have longer lifespan so that there is a possibility for the next generations to read these valuable science books. Moreover, we have been instructed to put on the weight on top of the page which we wanted to read without pressing the book by our hands. All the books which we read are placed on the reading rack to minimize the damage to the binding of the book. We are very excited and be very careful when we are handling and reading the historical science books here.

*Report 2 – Houghton Library Visit***(f) History of Printing and Binding**

MJ also described to us how the bindings done in the ancient times. Before twentieth century, there are chain lines appeared on the papers. These chain lines are visible if you hold the paper under a light source. This is because the paper was made in a mold where there was a thin wire mesh across the mold and thereby leaving the impression of the wire mesh on the papers. Normally, texts and illustrations are printed on both sides of a piece of large paper. The total number of pages on each paper can be varied from two to eight. Thus, the number of folding is dependent on the total number of pages printed on each page. Approximately, six pieces of printed papers or less are then folded to the required book size and bind together with the strings. After that, these thin binding parts are combined together either by sewing or applying glue to form a book. Hence, most of the good quality books are constructed by hand manually (by sewing) in the ancient times.

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**(g) The Experience of Looking at the Historical Scientific Books**

I began to read the historical science book in front of me – Galileo's Discovery. Because of I could not understand the Latin, I only managed to see all the drawings in that book. The patterns of the black spots in a sun have captured my attention.

First, I looked at the illustrations of the sunspots on the Sun sketched by Galileo. I noticed that the changes in the position of the sunspots varied from day to day. Generally, the sunspots move from top left to slightly bottom right on the Sun on the following day. From the illustrations, I believe that this is an important piece of evidence used by Galileo to support his statements that other planets are rotating around the Sun instead of sun rotating around the planets and the Sun is rotating at a constant speed.

I am strongly agree with Galileo's statement, because I discovered that the sunspots are moving at the constant speed from his illustrations. Although the motion of the sunspots seems like to be much slower when near the edge of the Sun than when near the center of the Sun, this is actually the false estimation appeared in our naked eyes. If you consider the Sun as a solid sphere, you will noticed that our naked eyes cannot see the 3-dimensional effect of the sphere from a far distance. Therefore, it appears to be the sunspots are moving slowly when near at the edge of the Sun and moving quickly when near the center of the Sun.

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The diagram above shows the perspective from an observer (notated as symbol “O”). The points A, B and C have the equal distance from the center point of the Sun. As we assume that the Sun is rotating at a constant rate, the letters represent the positions of a sunspot at equal time intervals. From the observer's perspective, the distance moves by the sunspot from A to B appears to be shorter than from B to C. Thus, it appears that the sunspot is moving faster near the center of the Sun than near the edge of the Sun. See from the mathematical view, the apparent distance moves by the sunspot from A to B observed from our naked eyes is measured by the angle A-O-B, likewise for the apparent distance moves by the sunspot from B to C. From the diagram, we noticed that the angle AOB is much smaller than the angle BOC, therefore it appears that the sunspot is moving faster near the center of the Sun than near the edge of the Sun.

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