PRACTICAL USES OF ASTRONOMY.

TRUMAN HENRY SAXFORD.

I.

Astronomy, as a promoter of material progress, acts directly through its capacity of measuring time, distance, and direction.

Any one can tell roughly what time of day it is, looking at the sun. A little practical knowledge of the phenomena of apparent solar motion enables this to be done with greater accuracy; and with astronomical instruments, sun-time can be reckoned within a fraction of a second. But sun-time, though closely connected with the material phenomena we see around us, is not regular; some sun-days, from noon to noon, are longer than others; and a sun-clock, going exactly to correspond with the sun, would be a very complicated machine, would sometimes be fast and sometimes slow of an ordinary clock whose days are all equal. To-day (January 19) a sun-clock would be eleven minutes slow. It is not everybody who could afford a sun-clock, or watch; and for that and various other reasons it is usual to employ a simpler machine, like our ordinary clocks and watches.

There is a kind of time whose days are practically of equal length—star-time. This is the time astronomers use; a star-clock is in every observatory. It is set right when it goes wrong by observations on the stars, and a skillful astronomer can tell its time pretty nearly without any instruments by simply looking at the heavens on a clear night, and more closely still with proper instruments.

But this kind of time has its inconveniences, not the least of which is that it is not adapted to regulate the hours of a household, for a star-clock has the bad habit (in domestic affairs) of gaining a day every year, two hours a month, about half an hour a week. I do not know whether an astronomer ever tried the experiment of getting up and going to bed, of breakfasting and dining, at the same star-time through the year. If he did so, his present hours (January 19) would be, in common time, breakfast at 11 a.m., and others to correspond. This might do for some; but the same people would find it disagreeable, when May came, to breakfast at 4 a.m. The astronomer, however, does not need to be at work at the same star-time through the year; on the contrary, he must distribute his work through the different star-hours; and, as a rule, the most work is accomplished by an observer who takes either the first half of the night or the early evening and early morning for his observations; the more an observer can in two hours observation give himself two days work in calculation, the "reduction of observations" being more difficult than making them. An observation of the moon, which it takes three or four minutes to make, is estimated at Greenwich to cost a pound sterling in calculations. So that, finally, the astronomer regulates his life by ordinary time. It is, however, necessary for him to work much and intensely by night, and his habits have to be, in some degree, those of an owl; he is not always an early riser.

But, on the other hand, his star-time regulates all the watches and clocks of the community; and now-a-days this point is growing in importance. The habits of modern society are growing in importance; in large factories, in railway establishments, and in schools, punctuality and regularity are seem to have great money value; and a city is often much benefited by exact time, which is nowhere obtainable except from an observatory.

There is a calculation necessary to get star-time, and another to change star-time into common time; and these are among the first problems of practical astronomy which a pupil should learn to solve.

The streets of the city have been (mostly) laid out according to the "points of the compass;" and, in fact, the compass needle varies in direction from year to year. Perhaps the word "compass," in the phrase first quoted, does not mean, primarily, the magnetic compass, but the "compass of the horizon." Be that as it may, our streets run nearly, if not quite, north and south, or east and west. This was ascertained by astronomical observations; and any old land survey, where re-surveyed on the loss of fixed boundaries, must be fixed anew with reference to the local north.

The United States Land Office has for many years conducted its surveys in the West in the same way, rather roughly, it is true, but still in a better manner than was done in New England. We have not the many-cornered townships, counties, and States of New England, save in unavoidable cases.

I believe that between the British Possessions north-
THE VOLANTE

THE SENIORS

Where are the Seniors? Nowhere. What are the Seniors? Nothing. Do you doubt it? Let the facts speak for themselves.

Only a few years ago, some of us did well remember when we were in the junior class, because it was a new and exciting experience for us. Yet, in those days, the junior class had no bright attractions in common with the senior year presented. Not only for the reason that then, so many of us were too young to realize the advantages of a college education, but also because we had no dreams and ambitions in our future. But now, we know that the senior class is the one that will continue the best of our college life.

However, many seniors have found that their college years have been a time of growth and development. They have learned to be responsible for their own actions and to take pride in their accomplishments. The senior year is a time of reflection and preparation for the future.

ABROAD

Fifty American Colleges admit women. The class of '79 at Bowdoin numbers 28. You may have heard that Professor Hamilton wants a new clock for the chapel. The most interesting event of Bowdoin's last year was the departure of the class of '79 to Knox College.

Williams is Alma Mater to thirteen college presidents. There are one hundred students in Drew Theological Seminary. The Michigan State Agricultural College at Lansing has 841 students.

The elective system at Harvard extends now to the Sophomore year. In the University of California, attendance on chapel exercise is voluntary.

Of the Williams alumni fifty-three have gone into the Foreign Missionary work.

The number of students at Beloit is 56 in the college classes and 143 in the Preparatory Department.

Amerist has immortalized the venerable philosopher, Thomas Jefferson, and has given him an LL D.

The Seniors at the North Western have adopted a class banquet in the form of a square set of dark canvas, bearing the legend "79."

Oberlin College has considerably over a thousand students.

There was considerable small-pox excitement at Lawrence University, and the President of the University, Dr. M. C. Griswold, has charge of the Department.

Williams College alumni lost $277,500 by the Chi.

The President of the new University at Cincinnati has been offered to Herbert Spencer, but it is said that he declined it.

The '74 boys at Williams amuse themselves by throwing hymn books at each other's heads during chapel exercises.

The Duke of Devonshire has given as the subject for the English poetry prize at Cambridge, England, "The Destruction of Chicago."

President White, of Cornell, has recently visited Oberlin College for the purpose of studying the subject of coeducation of the sexes.

The class of '79 at Michigan University have decided to employ Notman & Fraser, of Toronto, as their class photographers. The senior class contains 84 members.

Dr. W. R. Wood, President of the University of Illinois, in a short pithy article to the Chicago Tribune, says that Illinois is to be united to Knox College.

Wooster University, Ohio, has 20 students, and no President. Dr. W. Dr. Williams, formerly of the Presbyterian Theological Seminary of this city is now at Wooster.

The December number of the Tripod has appeared and looks "hip." The Tripod and Volante ought to be "hip" and "cool," and the copy of both was definitely scolded by the October blazes.

Dr. W. R. Wood, President of the University of Illinois, was taken place at Ann Arbor. The lower classes are divided into departments according to their ability as students. This does not seem to be a bad system.

Two or three weeks since one of the main buildings in Ann Arbor, "Henry Grady Hall," was burned to the ground. The building will take $8,000,000 to replace the building, work upon which is to commence in the spring.

An exchange reports that Dr. McCoo of Princeton College was vexed when the Sophomores, returning from their winter vacation, held a meeting with the head of "Jimmy." "Jimmy," and "Come on, my fine Scotch laddie, The Palladium, issued annually by the societies at Ann Arbor, recently appeared. As a frontispiece it contains a fine picture of the President of the University, Dr. W. R. Wood, who was formerly President of the University of Illinois.

The young ladies at South Hadley have had the following notice: "In order to order a copy of 'Prometheus Unbound,' "'Inquired a student at an Ithaca book store, and was given the following answer: "I have a copy of Prometheuus and have it bound as cheaply as possible." - Era.

"Have you got any copies of 'Prometheus Unbound,' " 'Inquired a student at an Ithaca book store, and was given the following answer: "I have a copy of Prometheuus and have it bound as cheaply as possible." - Era.
We are confident that we express the general sentiment of college when we say that the institution stands even higher now in the esteem of those who enjoy its privileges than it did when the building was a blank so that we seem to have entered upon a new departure in our history.

This view of things has been brought about by a variety of concurrent causes. Under the management of the President, through the medium of the Board, and under the guidance of the faculty, the college has been directed and fostered toward the financial ground upon which the college has been built.

We are informed that the suburban property purchased last summer after the inevitable temporary depression, has since then its value, and is selling satisfactorily. The conduct of domestic affairs is characterized by business promptitude and thorough economy. In the Department of instruction all the chairs are abundantly filled, and new officers have been added to the corps. The voluntary assumption by the Faculty of extra duty in the Preparatory Department, a measure whose expediency we regret, but at the same time can not deny. It is, however, a further proof of the loyalty to the college, shown immediately after the "Tenth of October," when, notwithstanding the apparent hope of carefully matured plans for final relief, the destruction of the stores of provisions, and warm invitations to pecunious necessities elsewhere, the Professors determined to be the last to give up supply.

The general appreciation of the improvement in our affairs, has its evidence in the greater. quantities of attendance and in the character of recitations. Who "cuts," or "bolts," or "skips?"

"Stolen from Room C, a door nut."

"Missing: A water pitcher with a broken neck."

"From Room B, a looking glass."

"Will the one who borrowed my pocket-knife please return, &c."

A monkey-wrench unaccountable disappeared from its pleasant quarters, last vacation, and its master lost its return address.

"Nearby the college are a few of the phenomena that appear, from time to day, placated on the face of our College."

Very suggestive they are of various ideas and trains of thought, and some perhaps will make you laugh. Others may make you sigh.

We wonder if the gentle thief whose fingers have been away "beautifying" the varnished doors of the residence halls, who asked us to his den last week, to show a floor shovel belonging to the three dimes paid for, and this polished surface how the face of annotated heads that one had rested there. Then will the future visitor to this student's secret lair and pleasure the joy of his vamir by meaning glances, about his dealings. If, in the researches ever follow stolen property, this surely will be blessing, for it has found its place of greatest beauty. So that the inner result of the best results, if it speaks at all, is said to do a word of commentary on the mistakes of the children, the one who should be power of his thinking. So his voice, with that rare good sense of a sound mind is necessary, sought for such a one in the A latter manner, and having found him, he—well see the notice."

The Volante.

JANUARY, 1879.


ZUMA—circ. up. your内. H. S. single copy, 6 cents.

THE VOLANTE.

THE VOLANTE is the successor of the College Times. It is, however, more immediately the organ of the students than the latter, being not the experiment of public spirit in a few, but the voice by adoption of the Student's Association of the college. Its editors are chosen from the Senior Class; its publishers are elected at large. The corps of conduct, care for all, counsel the students of their duty to their paper, which is surely support first, secondary second, literary third, moral. Miers, Snowdon, Tucker, editors, and Miers. Davidson and Rome, builders of the Times during last year, set a glorious example of enterprise and self-sacrifice, with an abundant lack of remuneration. It is to be feared that the way in which they tried not hold out to the present conductors of the Volante such pleasing illuminations as will induce a flourishing future.

The Volante has no policy to enforce against the will of the college community. Its office and its endeavor will be in the higher sense to please. While not shrinking from the treatment of questions upon which the public may be inclined for his will be in the expression of honest opinions and criticism without censure, nor be allowed to be compromised with any class of people connected with the college, the officers, alumni and undergraduates, and especially are such friends requested from members of the Faculty.

The delay of this initial number of the Volante has been occasioned by circumstances of circumstance, over which it grieves us to confess we had not control. The hot snap of October 8th withheld its rather toward the 9th. In the dark days that followed, when suspension seemed inevitable, plans for probable modification in the upper, or college journalism. Subsequent resignations, financial inability of friends and patrons—all joined made the appearance of a long term.

The vacancies left by Miers, Grose and Egbert have been occupied this term happily filled by the services of Messrs. Sampson and Haber; our friends come to aid us; the University prosperous; and we are enabled to present No. 1. Many alumni will receive this copy, with this invitation to a long term of friendship. The length of the present edition of this work, the question of whether the result of the discussion of the topics suggested in the Volante, the two columns of a heavy matter, is that his morals cannot withstand the allusions of the water pitcher, and the broken one at that. It also
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COURSES OF STUDY.

Two courses of study are pursued in this institution—a Classical and a Scientific—which are substantially the same as those pursued in other leading American Colleges.

ASTRONOMICAL DEPARTMENT.

The Astronomical Department of the University is the Dearborn Observatory. Its objects are to make direct researches in science co-operate in the application of astronomy to geography and other useful purposes; and to train students in practical astronomy preparatory to such applications. The instruments of the Observatory are the great Clark Refractor, of 18½ inches aperture; the Meridian Circle (by Ressold & Son) presented by the Hon. W. S. Gurnee; a Howard Clock, and a Bond Chronometer. The work is done chiefly in co-operation with the German Astronomical Society and the Bureau of United States Engineers.

TERMS AND VACATIONS.

The year is divided into three terms and three vacations. The first term consists of fifteen weeks; the second (which began on Jan. 8) and the third of twelve weeks each. The Christmas vacation is two weeks, the Spring vacation one week, and the Summer vacation ten weeks.

COMMERCIAL INSTRUCTION.

To meet the practical wants of the different classes of students, the Trustees have made arrangements for regular instruction in Penmanship, Book-keeping, and other branches essential to a good commercial education.

ELECTIVE STUDIES.

Students may reside at the University and pursue studies, for a longer or shorter time, in any of the classes, at their own election; subject, however, to the regulations of the Faculty.

LECTURES.

In connection with the regular recitations, lectures are delivered on the following subjects: Chemistry, Natural Philosophy, Geology, Astronomy, Anatomy and Physiology, Zoology, Mental and Moral Philosophy, Greek History and Literature, Roman History and Literature, Verbal Criticism, and History of the English Language.

RHEOTRICAL EXERCISES.

The College Classes have exercises in Composition once in three weeks. Instruction in Elocution is given to all the students, and declamations are required of all.

DEGREES.

The Degree of Bachelor of Arts is conferred upon all students who have completed the prescribed Classical Course of study, and passed a satisfactory examination therein; and the Degree of Bachelor of Science upon all who have completed the Scientific Course, and passed a similar examination.

SOCIETIES.

There are three Societies in the University, conducted by the students—two Literary, and one Religious.

ILLUSTRATIVE APPARATUS.

The Lectures on Chemicals and Natural Philosophy are illustrated by modern apparatus. There are, also, moderate facilities for the illustration of Zoology, and other branches of Natural History.

The Library, to which the students have free access, contains about five thousand volumes, and is constantly increasing by valuable additions. Students will also have access to the very valuable theological and miscellaneous library formerly belonging to the late Professor Hengstenberg, of Berlin, now placed in the University buildings.

LOCATION, BUILDINGS, Etc.

The location of the University is in the south part of Chicago, directly on the Cottage Grove avenue line of the Chicago City Railway. The site was the gift of the late Senator Douglas, and is universally admired for its beauty and healthfulness. The building is unsurpassed for the completeness of its arrangements, especially of the students' rooms, which are in suites of a study and two bedroom, of good size and height, and well ventilated.

Through the liberality of the different railroads which centre in Chicago, classes have had the privilege of making frequent excursions into the country, in order to examine rock strata, and to collect specimens in Natural History. These explorations have extended, during past years, to Dubuque and Burlington, Iowa; to Kewanee, LaSalle and Quincy, Ill.; to the Wisconsin River, and along the Mississippi River, from McGregor to St. Louis.

BOARD AND ROOMS.

Students are furnished with board in the University Hall, at cost, which, during the past year, has been $4 per week. Students who may prefer it, can obtain board in families on reasonable terms, or they may form clubs and provide for themselves.

EXPENSES PER ANNUM.

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<th>Item</th>
<th>Cost</th>
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<tr>
<td>Board from $1.50 (in Clubs) to $4 per week</td>
<td>$60.00 to $100.00</td>
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<tr>
<td>Tuition</td>
<td>50.00 to 50.00</td>
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<tr>
<td>Room rent</td>
<td>15.00 to 20.00</td>
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<td>Incidents</td>
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<tr>
<td>Library fee, fifty cents per term</td>
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Total: $132.50 to $232.50

At the University, students furnish their own fuel and lights. The use of Kerosene is prohibited in the University building. Gas costs about fifty cents a week for each room, and fuel from $10 to $20 per annum for each student. Washing, sixty cents per dozen.

PREPARATORY DEPARTMENT.

Connected with the University is a Preparatory Department, in which the Professors of the University charge of the instruction in the studies belonging to their several departments. The studies have been arranged in a course of three years for classical, and two years for scientific students.