

expression of opinions from those who are anxious for it to fulfill the best hopes of its promoters, and Professor Cooper leads the van of those who, with hopes and fears, already see danger ahead, and would be in time with their council.

The advice of Professor Cooper is most excellent, but in part it appears to us somewhat superfluous; that "the first President of the University of Texas should be pre-eminently an organizer, conversant with the best systems both in America and Europe, and alive to the growing demands of the age, and that the instructors should be the best men, sought without regard to section or creed," are recommendations which involve principles universally acknowledged; if the appointments are not made to accord with these principles, it will not be from ignorance that such a course should be followed.

But alas, academical appointments, like those in political life, are often influenced by "interest" and at some times by "expediency." As an instance of the latter class, we may refer to a case in which a most eminent American Naturalist was a candidate for the chair of Natural History in a Northern University. His high claims over other candidates for the position were admitted, and he was told informally that he had been appointed. The professor was preparing for his new home, when he received the very sudden announcement that another of the candidates had been finally selected for the position. The explanation of the mystery was very simple. The University, or College, was supposed to be filling the chair of Natural History, as Professor Cooper would desire, "with the best man without regard to creed or section," but unfortunately there was a want at the establishment for a man to do ministerial duties; the result was that the trustees, in filling the chair of Natural History, rejected the eminent Naturalist, and selected from among the candidates the one who had the greatest capacity for prayer.

For our part, we believe that such complications suggested by Professor Cooper, are not to be anticipated; when the buildings are ready, the right men to fill the positions in the faculty will be forthcoming. The establishment of a University in America, is no new experiment, and the experience of the past will be a valuable aid to those who will organize the University in Texas.

As a rule, the management of the Universities and Colleges in the United States, is one of the redeeming points which has done much to restore confidence in the institutions of this country; the selection of Professors is also usually judicious, and among the corps of instructors, the number of those who do honor to the position they occupy is fortunately great, and no

American now has need to leave his native shores to obtain a thorough knowledge in any department of science.

TYCHO BRAHE'S NEW STAR.

On November 11th, 1572, Tycho Brahe noticed a new and very bright star in the constellation Cassiopeia. Afterwards it appeared that this star had been seen before at various places in Europe, and Tycho, in order to fix its position, and to determine whether it moved, began a series of measures with his sextant, by which he connected the position of the new star with nine known stars in the same constellation. The new star shone with a wonderful brightness, being brighter than the planet Jupiter, and, according to some reports, it was visible in full daylight. In January, 1573, its brightness began to wane, and in May of the same year it was only of the second magnitude, or as bright as Polaris. It remained visible to the naked eye, however, until March, 1574.

This star was also remarkable for the changes of color that it exhibited. At first it was white, then it became yellow, and, finally, red. But in May, 1573, it was again of a dull white color, and remained so until it disappeared.

Although many cases have occurred of new stars blazing out for a short time, and then fading away beyond the sight of the naked eye, such as those of 1866 and 1876, yet Tycho's star, on account of its brilliancy and its long duration, is the most remarkable of any star of this kind of which we have any authentic record; and his observations of it have been carefully reduced and discussed by several astronomers. Professor D'Arrest, of Copenhagen, made a very complete catalogue and chart of 212 stars, which are within a distance of ten minutes from the position of Tycho's star. This catalogue is for the year 1865, and it will serve for a standard of reference in case Tycho's star should again blaze out. Mr. J. R. Hind, of England, by the reduction of a part of Tycho's observations, found the position of the new star to be for 1865,

$$A.R. = 4^{\circ} 16' 48'' : Decl. = + 63^{\circ} 23' 5''.$$

(Monthly Notices, Royal Astronomical Society, Vol. 21, p. 233.) From a more complete reduction of Tycho's observations Argelander found for 1865,

$$A.R. = 4^{\circ} 19' 58'' : Decl. = + 63^{\circ} 23' 55''.$$

(Astronomische Nachrichten, Band 62, p. 274.) This position agrees very well with that of a small star of the 10 $\frac{1}{2}$ th magnitude, which is No. 123 of D'Arrest's catalogue. The position of this small star for 1865 is,

$$A.R. = 4^{\circ} 19' 30'' : Decl. = + 63^{\circ} 22' 54''.$$

When we remember that Tycho's observations were made without the aid of telescopes or of any magnifying power, we may consider the difference of these positions as within the limits of the probable error of his determination. We conclude, therefore, that Tycho's star is still visible in our telescopes, and that its brilliant appearance in 1572 was only an extreme case of the variations of light that are frequently happening among the stars.

John Goodricke, an English astronomer, who in 1782 determined the period of the variability of the famous star Algol, thought that Tycho's star might be the same as the new stars reported to have been seen in the years 945 and 1264. This would make the period of its variability between 300 and 320 years, and hence this star should re-appear in the latter part of the present century. Goodricke's conjecture seems to be very uncertain, since the reports for the years 945 and 1264 are extremely vague. It will be seen that if we assume the period of the variability of Tycho's star to be 315 years, five such periods would carry it back to near the beginning of the Christian era. Astrologers and others have not been slow to catch at such analogies, and to base predictions on these uncertain data; and thus we have it asserted that Tycho's star is identical with the star of Bethlehem, and that it will re-appear in the year 1887, with wars and social revolutions. Of course it is impossible to reply to such assertions. Wars and social revolutions are continually going on, and such grim predictions are as safe therefore, as it is to say, that to-morrow the winds will be variable, or that we shall have "rain in areas;" or snow next January. The only wonder is that intelligent people are imposed on by such assertions.

At the present time more than a hundred variable stars are known to astronomers, and every year increases their number. Many of their periods are well determined, but what causes the variations of light we do not know. The so-called new stars may be only extreme cases of the variable stars, and the appearance of one is an interesting astronomical phenomenon which should be carefully observed. There is a rich field for observation and for study.

A. HALL.

WASHINGTON, D.C., Nov. 29, 1886.

NEW YORK ACADEMY OF SCIENCE.

We direct special attention to the excellent course of lectures provided by the New York Academy of Sciences, to which non-members are admitted free, on making application to the proper authorities.

The lecture for Monday next, December 6th, will be delivered by Professor W. Boyd Dawkins, F. R. S., of Owens College, Manchester, England, the subject being "The Man of the Caves."

We understand the present will be the only opportunity for hearing Professor Dawkins lecture in this country on a subject on which he is a specialist. We anticipate a large attendance.

The present efforts of the executive of the New York Academy of Science, under the presidency of Professor Newberry, to provide a course of free lectures of the highest order, should be fully recognized by all interested in Science and we advise those who would avail themselves of the opportunity to address Professor D. S. Martin, of 235 West Fourth street; or Professors W. P. Trowbridge and Alexis A. Julien, both of Columbia College, N. Y., as these gentlemen constitute the Committee on Lectures.

HISTORICAL NOTES ON GAS ILLUMINATION.

At the present moment when the public is all impatient to see the electric light perfected for general illuminating purposes, it may be interesting to note a few particulars descriptive of the early days of gas, when it struggled into existence for the same purposes.

In looking over a few somewhat ancient scientific papers I found much relating to the subject, and will now reproduce these historical facts in the order in which I found them.

It appears that in the British Museum there is preserved a paper (Ascough's Cat. 4437), entitled "Experiments Concerning the Spirit of Coals, in a Letter to the Hon. Mr. Boyle, by the late Rev. James Clayton, D.D., B. Mus." These experiments were undertaken by him in consequence of his having observed that the gas, issuing from certain fissures near a coal pit at Wigan, in Lancashire, took fire when a burning candle was presented to it. He therefore distilled coal, and obtained first "phlegm," afterwards a black oil, and then "an inflammable spirit," which he collected in bladders. By pricking these bladders he was able to ignite the gas at pleasure. Hence it is evident that the discovery of the carburetted hydrogen gas took place previous to the year 1664.

So states a paper, No. 66, in the *Philosophical Journal*, by Mr. John Webster, "*On the Discovery of the Inflammable Gas from Coals*;" the date of the paper is not before me, but its republication, in the form I found it, was in 1807.

In the *Phil. Jour.*, No. 67, the subject is again mooted by a Mr. Hume, who states that in the forty-first volume of the *Philosophical Transactions*, p. 59, is a "sheet-paper," which appears to have been read before the Royal Society in January, 1739, as "A Letter to the Hon. Robert Boyle, from the late Rev. John Clayton, D.D., in which is described how the discovery originated, and also some of the effects produced by this gas or 'spirit' of coal."

Mr. Hume further draws attention to the difference in the Christian names given to Mr. Clayton, in the first instance "James" and the second "John," and draws the very probable conclusion that the same person is referred to in both papers, and states, "At any rate, the merit of this discovery can be no longer claimed by any living person."

This remark was called forth on account of the public papers of that day, 1808, being much taken up with the proposal of a Mr. Winsor to light cities with gas. It appears that Mr. Edward Heard also obtained a patent in June, 1806, for "Obtaining inflammable gas from pit coal, in such a state that it may be burned without producing any offensive smell."

There was money in this patent, for Mr. Winsor was organizing a large company, which was not to buy the patent, but to pay a royalty as a license for the exclusive right to make use of it. As usual in such cases there was a great outcry, and the attempt was made to break down the patent by asserting that the invention was not new, one Nicholson taking the ground that the patent was invalid, because the inflammable nature of coal gas was demonstrated by "Boyle" before 1691; and he further stated that Lord Dundonald used gas from coal to give light many years ago, and that a Mr. Murdock also put it in practice upon a large scale in 1792 and 1798, so that it was absurd for Mr. Winsor to claim the invention for the public use of gas.

To parry these attacks Mr. Winsor published a small pamphlet, and boldly asserted that it was true that the inflammability of coal gas had been long known, but that no one had purified gas, and thus made it fit for general illuminating purposes, until he took out his patent in 1804. He also accused others, who were in the field, of having obtained their knowledge from him.

Mr. Winsor had to contend against other difficulties; for, at that date, the statute law of the realm prohibited more than five persons holding a patent as joint property, and it was held that as the shareholders of the proposed company would share the profits, they would be joint holders of the patent. To this Mr. Winsor replied that he retained the patent himself and merely sold the right to use it. To show the poor prospects for gas illumina-