Astronomy and Mechanical Genius.

The history of astronomy for the past fifty years has been entirely unlike the history of the same science as presented by any previous epoch. The spring, the force, the energy, with which it advanced within that brief period, distinctly manifest that some separate general cause characterized the last fifty years, which did not exist, at least in degree, at any previous epoch. Some facts might serve to illustrate the question. For example previous to the commencement of the present century, there was scarcely an observatory in existence which published its records. Few, indeed, existed at all; and those existing were rather two or three private establishments than establishments of a great public character. Greenwich was the solitary observatory whose regular records extended much beyond the commencement of this century. Now, instead of observatories being strange things, why, there was scarcely a third-rate town in any country in the civilized world without its establishment of that description. Many of them, indeed, have no funds for the publication of their records; but they were still furnished with excellent instruments, and were more or less efficient. The question he would ask was, what was peculiar in the beginning of the century to give rise to that extraordinary spur in regard to the progress of the science? Doubtless we have had one or two men ofeminent genius—such as Sir Wm. Herschel—and the labors of such a man could not pass away without a distinct, and clear, and permanent mark upon the sciences which he had cultivated; but still he belonged to one nation, and the advance has characterised the entire scientific world. In the first place, the immense advance of observatories was characteristic of the early portion of the present century in its relation to astronomy; because mechanical genius came powerfully to the aid of practical astronomy. Previous to that time, instruments of various power, and with different glasses, had been used to unveil the celestial motions and aspects. They were well made, but were without any large or comprehensive object, and with reference only to the limited and single purpose they had been designed to fulfil. The instruments were planned, not by men of mechanical genius, butby astronomers, and were only intended to fulfil their immediate use. Still, though they were not by any means perfect, they were able, to a certain extent, to correct their own errors—a great principle, the adoption of which has met most eminent success in the case of Lord Rosse's telescope. Unless such a revolution had been accomplished, not one step could have been taken towards the completion of those marvelous discoveries regarding the celestial mechanism, the laws of the siderial universe, and the double and multiple stars which had surrounded the beginning of the century with imperishable luster. Immediately upon the back of the revolution in the structure of the instruments, there came another in the mode of their use—an idea that was introduced by the celebrated Bessel. He determined to test the instruments by a comparison with nature itself, and this was effected by placing them against some fixed point; and so, after a long and minute inquiry, it was discovered whether they were correct or not, or rather their errors were discovered. But not only were the rude metallic instruments subjected to examination in that way, and their errors discovered, but the astronomical discoverer himself was subjected to examination in the same way, and his errors discovered—not his casual errors, but the errors to which, from his nature, from some peculiarity with reference to the structure of his senses, he was also subjected in observing—termed, in astronomy, personal equation. No single observation, however, could be perfectly accurate; and hence no observation or result was supposed to be correct unless after a great number of observation had been made upon it, although most extensive analytical theory, derived from the highest analytical mathematics, was applied to the solution of complex problems, and was generally known as the method of squares. He thought they might draw from these facts at least one general conclusion—was it possible to omit observing that the entire success, or at least the rapid advances of astronomy had been traceable, if they are traceable to any general cause, to the aid it had received from other branches of inquiry? The signal advance of the mechanical arts and the prevalence of mechanical genius gave the first step, and something like metaphysical or analytical observation followed it up In conclusion, rude and vulgar as mere mechanicism is often termed, he had no doubt that the electric telegraph, or at least similar machinery, would yet be made to increase the accuracy of their observations, in as far as times was concerned, at least ten-fold. It was hoped, also, that light might be made to mark down the phenomena of the instant; and he had himself heard Mr. Airy, the Astronomer Royal, express his conviction at the late meeting of the British Association, that the whole of the phenomena at present done by the eye would at no distant date be accomplished by light—by the daguerreotype. The breaking down of the supposed barriers between the different sciences, and their common interfusion, was an emphatic illustration and a pre-eminent characteristic of the present age. He had no doubt that the farther we advanced, the more firmly would the truth be impressed upon us—that the rapidity of the advance of knowledge would depend upon the aid taken by one science from another. It seemed to him that the most memorable feature of our times was unquestionably its correct appreciation of that far-seeing truth; and it was from that circumstance that the type and scientific representative of our age would stand out in all time coming—Alexander Van Humboldt.

[The above is an extract from a recent lecture of Prof. Nichol, the eminent Astronomer, taken from the Glasgow "Daily Mail."

Correspondence from Siam, East India.

BANGKOK, SIAM, Aug. 3, 1850.

MESSRS. MUNN & Co.—In the Scientific American, for May 19, 1849, there is an article headed "A Royal Siamese Machinist," in which it is stated that His Royal Highness, T. N. Chaufa Kromakun, (sometimes called T. Momfanoi,) had built a small steamboat. It appears, from the said article, "that the engines and boat was built under the most indefatigable and persevering exertions on his part, and the Siamese can now boast of having running on the Menam river, a steamboat, every portion of which has made and manufactured there, and entirely by natives." Were this statement true, the Prince and the Siamese might well "boast," but, in fact, it is only about half true. The munificent present said to have been given to the Prince by the King, was less than $150; and, although "His Majesty has honored him with his command to have another steam-vessel constructed, sufficiently large to be capable of proceeding to Singapore," yet it has never been built. The copper, said to have been ordered for new boilers, never came, and it is probable that those who received the order, feared to execute it, lest they should never get their pay.

The article closes with the statement that "the workmanship of even the most minute part of the engine is truly admirable, and reflects the greatest credit on its royal constructor, who had every portion of it made under his own immediate superintendence and constant inspection, and by workmen all *self-taught*, being His Highness's body servants and retinue!" In building said engines, I was often consulted, and my instructions followed. We occasionally find self-taught mechanics in enlightened countries, who are good workmen; but to suppose that self-taught men among the heathen can build steam engines, is out of the question.

But neither the Prince nor his servants are self-taught. When I came here, in 1843, I brought with me a small slide lathe, and after setting itup, turnedsome iron and madeseveral tools for the Prince, and finally sold it to him. The Prince then requested me to aid him in building a machine shop, lathes, tools, &c., which I did, and instructed the Prince and his servants in the use of tools, and aided in making some small machines. This was done in 1844. After the shop and tools were completed, the Prince wished to build a small steamboat. I made a model for engines of wood, but the Prince wanted something better, and I remitted about $200 to England, and procured a working model, with boat complete. When the vessel, which brought the model, arrived off the bar, the Prince could not wait for the vessel to come up to the city, and urged me to go in the rains to get it. Wishing to please the Prince, I complied with his request, although it made me quite unwell for several days.

It would be natural to suppose that a rich Prince, after having received so much attention and aid, would endeavor, in some way, to reward his benefactor. The time spent in assisting the Prince could not be estimated at less than $500, but all that was ever given by way of remuneration, were a few trifling presents, worth, altogether, about $25. I tried very hard to get the pay for the steamboat model, soon after it arrived, but the Prince put it off from time to time, and I did not get it until after about two years.

Enclosed is a short notice of the Prince's boat, and a new machine shop, taken from the Bangkok Calendar for 1849.

I have received the Scientific American from Vol. 2, regularly, and am much pleased with it. Wishing you abundant success in your efforts to circulate mechanical information, I remain, yours truly,

J. HASSETT CHANDLER.

[We here publish the two extracts spoken of above:—

STEAMBOAT.—In our Calendar for last year (1848) we stated that H. R. H. Prince T. Momfanoi had established a Machine Shop. The individual who aided the Prince in establishing his shop, sent to England and procured a working model of a steamboat, from which the Prince has recently built a small Steamer. The engines are neatly made, and are an exact copy of the model. No suitable materials for a boiler could be made or procured in Siam, and the boat does not sail very fast. Materials have been ordered for a new boiler and we may yet see a steamer sailing on the Menam at a fair speed.

NEW MACHINE SHOP.—We are happy to announce the establishment of another Machine Shop in Bangkok. It has been built by Mai Mot, son of a Siamese Nobleman. This man has shown much skill and good taste in making and arranging the tools for his shop. He has received some assistance from the indivdual who aided the Prince in establishing his. An engine lathe has been built under the superintendence of this person for the use of the shop, which would do honor to any similar establishment in Europe or America. Mai Mot has made some improvements in the Electrotype the past year which, if known abroad, would do him much honor. These improvements are a source of encouragement, and we hope the Siamese will not only improve in mechanics but in religion.

[We have, here, two sides to a story, and we believe that the above, from our correspondent, is the correct one—it has the stamp of truth upon its face.

Chaldean Agriculture and Drainage.

At a recent meeting, the Farmers Club, Eng., the secretary read the following very interesting letter, which he had received from Mr. Kennet Loftus, formerly of Newcastle, and now in the East, assisting in the survey of the limits of Turkey and Persia:—"Dizful, Persia, August 3. 1850.—Sir,—While making some investigations at the seldom-visited Chaldean ruins of Sinkara, in the interior of Southern Mesopotamia, I ascertained a fact that may not prove uninteresting to the farmer. As lately a member of the Newcastle-upon-Tyne Farmers' Club, I beg to submit to your judgement if it be worthy to be mentioned at one of the meetings. There is an old saying, that 'nothing is new under the sun,' and truly such would appear to be the case. Will it be credited, that the learned nation of the Chaldeans used draining tiles of precisely the same form and materials as the farmers of our own enlightened land of Britain have only a few years ago adopted for the more complete drainage and consequent improvement of their land? Observing several brick-built square holes, of about four inches in diameter on the surface of these curious ruins, I carefully examined one of them, and discovered that it formed the entrance to a drain of considerable depth. On removing the bricks, I found a cylindrical and well-baked pipe or tile, of reddish clay, a yard in length and five inches in diameter at the centre, tapering slightly towards the extremities. It rested nearly horizontally, with one end over the aperture of a large bell-shaped clay pot, exactly resembling those used in English gardens, and known by the name of 'rail pots.' The other end of the pipe was met by a spout-formed tube of similar material, but in a sort of curved shape. The 'rail pot' was about one yard deep, and a foot and a half wide at the base. The shaft of the drain was lined with large cylinders of baked clay, four inches in thickness and about three or four feet high; they are piled one upon another, firmly fixed together, and thus formed a continuous pipe from the bottom to the top of the drain. They were in most instances, as perfect as when they were there deposited many centuries ago. Around the exterior of the drains was a wall of brick, which retained the cylinders in their position, and preserved them from external pressure and injury. How effectually the Chaldees must have kept the rats from their drains! I observed similar cylinders in wells here, and also at the neighboring ruins of Warka. Are cylinders of this description made use of at home, for the purpose of lining drains and wells? If not, could they be so advantageously employed?

Fall of a part of the Horse-Shoe at Niagara Falls.

On Tuesday evening last, says the Niagara Fall Iris, our citizens were startled by hearing a loud and terrible noise, resembling, as near as we can describe it, the heavy booming of artillery, in quick succession, which shook the earth very sensibly. It proved to be a part of the Horse-Shoe Fall, on the Canada side, which had fallen, carrying away about ten rods of the rock in length, by four in width. The canal boat, which had been lodged for the last few months on the brink of the rock which has fallen, and which has excited the admiration of all who beheld it, was also carried over with the rock. It is now in the whirlpool, two miles down the river, dancing attendance to the freaks of that great mælstrom. The crash occurred about 7 o'clock in the evening; and it is indeed providential that it fell at such an hour, and at this season of the year: had it been in the summer, when so many thousands of strangers are here, there undoubtedly would have been persons crushed to death; for it is precisely the spot where so many continually passed, and where so many have stood to contemplate the grandeur of nature, and behold the waters of the mighty cataract above them rushing terrifically over their heads, that is now filled with the masses of rock which have fallen from above. The loss of this portion of the rock has not in the least diminished in appearance the view of the falls, but has added to the scene, which looks grander and more sublime, if possible, than ever.

Spontaneous Combustion of Cotton.

The destruction of cotton in this city, by fire originating in cotton stores, has become so great as to demand serious attention. The loss from this cause, in eleven fires occuring here and in Brooklyn, during thirteen months, has been estimated at about a million and a quarter of dollars. Hence there is a disposition among Insurance Companies to increase the rate on cotton risks.

Experienced underwriters entertain the opinion that fire arises spontaneously in cotton stores, and strong circumstantial evidence can be produced in support of their opinion.

Wealth of Trinity Church.

The Corporation of Trinity Church, of this city, is the richest in this country, and may be said to be amongst the richest churches in the world. Its property is estimated, if we are correctly informed, at from twelve to sixteen millions of dollars.