ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the computations of the following notes (which are approximate only) and for most of the observations, I am indebted to students. M.M.

Positions of Planets for June, 1874.

Mercury.

On the 1st of June Mercury rises at 5 in the morning and sets at 8h. 15m. in the evening. On the 30th, Mercury rises at 6h. 40m. A. M., and sets at 9h. 2m. P. M. This planet should therefore be seen after sunset during the latter part of June.

Venus.

On the 1st of June Venus rises at 6h. 8m. A. M., and sets at 9h. 22m. P. M. On the 30th, Venus rises at 7h. 9m. A.M., and sets at 9h. 33m. P. M.

On the 3d of May Venus and Mars were so nearly at the same point of the heavens that, in a telescope of large field, the two could be seen at the same time, giving an excellent opportunity to notice the difference of color. Both are very small at present, being far from the earth.

Mars.

On June 1, Mars rises at 5h. 6m. A. M., and sets at 8h. 12m. P. M. On the 30th, Mars rises at 4h. 36m. A. M., and sets at 7h. 42m. P. M.

Jupiter.

On the 1st Jupiter rises at 0h. 36m. P. M., and sets at 1h. 8m. the next morning. On the 30th, Jupiter rises at 10h. 51m. A. M . and sets at 11b. 18m. P. M.

On May 2 the shadow of Jupiter's fourth satellite passed across the disk of the planet, just skirting the northern edge, appearing like a small black spot. It was seen for 2h. and 15m.

On May 3 Jupiter's third satellite was occulted, that is, the planet seemed to pass over its satellite.

On May 7 the first satellite made a transit across the planet, or the satellite seemed to pass over the planet.

On May 14 the shadow of the third satellite passed across the face of the planet, as a brownish-black spot, not perfectly round. It was seen for about 3 hours.

The broad belt of Jupiter, always seen near the middle of the disk, is at present slightly rosy in color.

Saturn.

Saturn is very beautiful in the early morning, about 4 A. M. It rises at 11h. 29m. P. M. on the 1st of June, and sets at 9h. 21m. the next morning. On the 30th of June it rises at 9h. 33m., and sets at 7h. 21m. the next morning.

Uranus.

Uranus is not well situated for observation and requires a good glass. It rises at 8h. 48m. A. M. on the 1st, and sets at 11h. 10m. P. M. On the 30th it rises at 7h. 1m. A. M., and sets at 9h. 21m. P. M.

Neptune.

It is useless to attempt to see Neptune at the present time. It rises just before daylight on the 1st of June, and sets in the afternoon. On June 30th it rises a little before 1 A. M., and sets at 1h. 54m. P. M.

Meteors.

Meteors were frequent on the morning of April 28; one brighter than Jupiter was seen at 3h. 15m. A. M., starting from *Taurus*.

On the morning of May 12th, from 3 A. M. to 3h. 30m. A. M., meteors were somewhat frequent.

Sun Spots.

The record is from April 18 to May 15. The number of observations is larger than usual. Generally speaking, the spots have been of good size, rather more numerous than usual this year, and have shown little change from day to day. A very interesting series of photographs has been obtained of a group which was first seen on May 7. Reckoning by its subsequent movements, it was then about 12 hours since the sun had turned it fully in sight (or since it had entirely cleared the eastern limb to an observer on the earth). When it was half way to the center, its daily motion was about equal to its width; at the center its motion was about once-and-a fourth its width. Comparing from day to day, there were very gradual changes, so that its recognition was unmistakable. These small successive changes reached, however, such an amount that, after crossing the disk and reaching the western limb, there could be no likeness traced between its appearance then and its appearance on the 7th. It was seen during eleven days. The ingress and egress were not observed; but estimating by the rate of the passage when near the limb, it occupied twelve or thirteen days for the entire passage from limb to limb, its course being nearly a diameter of the disk. Its rate was more rapid over the latter half of its course, showing that it must have had a motion besides that due to the sun's revolution on its axis. When in the center, twenty-five constituent spots were counted on the photographed disk (which has a diameter of 3⅜ inches). It had then widened to three times its breadth when at the edge.

Faculæ were conspicuous on May 17, but have generally been infrequent.

Zodiacal Light.

This phenomenon, so seldom seen in the spring later than March, was noticed on the evenings of May 3, 5, and 8, stretching very obliquely from the northwest towards the stars of *Castor* and *Pollux*.

Barometer and Thermometer.

The meteorological journal from April 18 to May 17 gives the highest barometer, May 11, 30·41; the lowest barometer, April 26, 29·41; the highest thermometer, May 10, at 2 P. M., 88°; the lowest thermometer, April 18 and April 29, at 7 A. M., 31·5°.

Amount of Rain.

The rain which fell between the morning of April 20 and and the morning of April 21 amounted to 2·53 inches.

The rain which fell during the day of April 23 amounted to 0·43 inches.

The rain which fell during the night of May 15 and the morning of May 16 amounted to 0·33 inches.

SOCIAL SCIENCE.

The American Social Science Association is now in session in this city. Several able and learned papers have been read and discussed, from which we give below brief abstracts of the conclusions reached. President Gilman, of the University of California, spoke in reference to that State as a social study. He considers that California is rapidly becoming the center of bullion operations for the world, and that, through the resistance of the State to a paper currency circulation, it has had no share in the panics which have visited other sections of the country. California was one of the first States to inaugurate hostility toward the predominant influence of railroad corporations and monopolies. Erroneous impressions, the speaker stated, exist in the East regarding the state of society, but the future will show that in California the best forms of Christian culture and civilization are to be in the ascendant, education is to be widely diffused, and the favorable sky and soil are to render the physical conditions of life enjoyable to an immense population.

Mr. David A. Wells read a lengthy and exhaustive paper on the rational principles of taxation. It would occupy too much space for us to trace the cogent arguments adduced by the learned speaker, but the general conclusion to which his investigations lead is that the rational principle of taxation is to tax but comparatively few articles, tangible property and fixed signs of property, for in this way only can taxes be assessed equitably, uniformly, and economically; and then leave them to diffuse, adjust, and apportion themselves by the inflexible laws of trade and political economy.

Professor Benjamin Peirce discussed the subject of ocean lanes for steamships, and advocated a systematic organization of the paths of the Atlantic steamers, so as to remove the principal source of the dangers of collision. He considers that, when the number of steamers is increased tenfold, as it will be before many years, each vessel will be in direct proportion liable to destruction from the above cause. The meridian of greatest danger is that of 50° west of Greenwich, as in that locality dense fogs, squadrons of fishing vessels, and stranded icebergs abound. The speaker said that the route taken by the Cunard line reduces the dangers to the least amount, and in conclusion suggested that some provisions on the subject, introduced into marine policies, might be wise and effective. It might be well also to have the logs of all steamers examined, and to cause an adverse report to be a serious and dreaded result.

In a paper on American and European railroads, Mr. Gardiner G. Hubbard, of Boston, dealt with the question of cheap transportation. He quoted the opinion of the Senate Committee, that the only means of securing and maintaining trustworthy and effective competition between railways is through national and State ownership or control of one or more lines which, being unable to enter into combination, will serve as regulators of other lines. If two parallel routes between 400 and 500 miles apart, with the Mississippi river in the center, are extended from the Gulf to the Canadian boundary, they will embrace the best cotton, corn, and wheat lands in the world. A short canal will connect the Mississippi with the lakes. A comparatively small sum will open these routes for three quarters of the year. The Senate Committee believe that the most advantageous channels of commerce to be created and improved by the government are the Mississippi river, the northern lines by the lakes, a central line by the Ohio, through Virginia to Richmond, and the southeastern route by the Tennessee, through Alabama and Georgia to the ocean.

The first will open the Mississippi from the Falls of St. Anthony to the Gulf of Mexico. The northern line will open a navigable way through the lakes, the St. Lawrence, the Welland, Erie, and Caughnawaga and Champlain canals, and the Hudson river to New York. The other lines will open the Ohio and Tennessee rivers to their head waters, and thence connect by canals or freight railways with the ocean at Richmond or Savannah. The House Committee recommended a double track freight railway from the Mississippi river to New York, with branches to Chicago and St. Louis, and that government aid shall be given by indorsing the bonds of the company for one half the actual cost of the road, the rates of freight to be fixed and incorporated into the charter. The Senate Committee report favorably on this plan, and it is difficult to understand why they gave the preference to the Richmond route. The cost of the canal and slack water navigation, they estimate at $55,000,000, or nearly the same as that of the freight railway, and the freight charges will be nearly 10 per cent less by the latter, with a saving of from two to three weeks in time. The railroad will never be closed, while the canals will be frozen at least one month in each year. The benefits that will result from the opening of such a road to the whole country can scarcely be overestimated. The cost of transporting grain from the west will be reduced one half, which will be equal to a saving of $47,000,000 on the product of 1872. This reduction will enable us to compete with Russia for the supply of Great Britain, and give a market for all our surplus. It will reduce the price of breadstuffs to every consumer in the East, and, in an equal ratio, the freight on merchandize and manufactures to consumers in the west. The speaker admitted the inexpediency of government undertaking that which can be performed by private enterprize, but believed that this is the only way in which the needed relief can be obtained.

Dr. J. Foster Jenkins, speaking of tent hospitals, said that the tents should be made of cotton, rather than flax. They should have board floors, either covered with oilcloth, in order to prevent fluids from sinking into the wood, or, preferably, waxed or coated with paraffin. All tents should have a double roof; the ventilation will be better and they will be drier. Both should have openings near the ridge for ventilation. The heating in winter should be by stoves placed underground at the end of the tent, with pipes carried through under the floor.

FLUID EXTRACT OF CHESTNUT LEAVES.—Dr. J. Eisenmann, of Vienna, has experimented with a fluid extract made from the leaves of the European variety of *castanea vesca*, as a remedy for whooping cough which had but recently entered into the spasmodic stage, and in which the subsequent course of the disease could be well ascertained. The results were so favorable that the author calls the attention of European physicians to this remedy.

COMMISSIONER'S DECISIONS.

CLAIMS FOR THE ARTICLE AND APPARATUS IN ONE PATENT.—IMPROVEMENT IN THE MANUFACTURE OF WATCHES.

[Decided May 11, 1874.]

LEGGETT, *Commissioner:*

This applicant comes before the Office with three applications for patents, comprehending, respectively, watch case bezels, watch-case centers, and watch-case backs. In each application the article is claimed and also the die by which it is made. The Examiner requires that each application shall be divided. I had occasion to consider the matter of division of applications in the case of Murray and Wuterich. (*Official Gazette*, vol. 3, p. 559.) I do not find any reason now for departing from the tenor of the decision in that case, in which it was stated that the division of applications is a matter entrusted under the law to the discretion of the Commissioner; and that the general rule established by the Supreme Court of the United States is that but one distinct subject of invention can legally be embraced in a single patent. Nor have I any doubt that the facilitation of official examinations and the prevention of mistakes in the granting of patents renders it important to the public, and for the true interest of inventors, that the discretion of the Commissioner in enforcing the rule of unity of subject matter in each patent should be exercised to carry the operation of the rule as far as is consistent with reason and justice in every instance. But it cannot be ignored that there are some cases where two things, in one sense entirely distinct, are yet so intimately connected as to have been not only one in inception in the mind of the inventor, but to be inseparable in practical use. A die and its counterpart—the article it forms—are often of this kind. The watch bezel under consideration, for instance, could not be made to be of any use in the manufacture of watches except substantially in the manner here shown—that is, it must be struck up from ductile metal with a die. It could not be profitably cast, spun, or made by hand. Its excellence is due to its form and to its being made of a single piece. The die which is employed must, therefore, always be used to make this article. If two patents were granted, one for the die and the other for the bezel, each might defeat the other, unless the manufacturer should own both. One would always be as ineffectual without a right under the other as one half of a pair of shears without the other half. It cannot, I think, be good policy to require a division of applications in such cases. So far as the decision in the case of Murray and Wuterich may seem to sanction divisions of applications in cases of this nature, I desire to restrict its operation as authority for Examiners in the practice of the Office.

The decision of the Examiner is overruled.

COMBINATION CLAIMS.—IMPROVEMENT IN ENVELOPE COUNTING MACHINE

[Decided May 9, 1874.]

THACHER, *Acting Commissioner:*

The Examiner objects to the second and third claims "because they do not include the elements necessary to a complete coöperative, unitary result."

The claims are as follows:

2. The tilting table N, in combination with the main double inclined table B, substantially as and for the purposes described.

3. In combination with the tilting table N and main double inclined table B the combined slide and pusher plate I e, substantially as shown and set forth.

The tilting table and the double inclined table serve the purpose of furnishing a way, first in one direction and then in the other, along which the bunch of envelopes is to be passed.

These two devices, in combination with the pusher, constitute that portion of the apparatus which is necessary to force the bunches along the table, inclined first in one direction and then in the other.

These results are unitary in character. They are not, to be sure, complete; nothing short of the finished operation of the machine can be called a complete result. If a legitimate combination must contain all the elements necessary to a *complete* result, there can be but one combination claim on any machine, and it must necessarily contain all the devices found in such machine.

The Examiner fails to distinguish between a *unitary* and a *complete* result. A complete result may be the combined effect of several unitary results.

It is undoubtedly correct that a combination must contain all the essential elements necessary to secure some distinct and definable result in the operation of a machine, and such result may be called, for want of a better term, *unitary*. It is only necessary to inquire whether this is done to determine, in any given case, whether the combinations claimed are proper or not.

As stated above, in my opinion, the two claims to which objection is made do include all the elements necessary to unitary results.

The ledge, which the Examiner requires to be included in the combination in each case, is for a distinct purpose, to wit, the support of the elevated ends of the envelopes. It is, perhaps, a consequence of the tilting table and double inclined way, but is not a necessary device to the operation of those elements in the performance of the limited function ascribed to them. In fact, if the faces of the double inclined table were made somewhat wider than half the length of an envelope, no support for the outer ends of the envelopes would be required.

The decision of the Examiner is reversed.

DECISIONS OF THE COURTS.

United States Circuit Court—District of New Jersey.

IMPROVEMENT IN PILE LOOMS.—WILLIAM WEBSTER *et al. vs.* THE NEW BRUNSWICK CARPET COMPANY.

NIXON, *District Judge:*

This bill is filed against the corporation defendant for infringing certain letters patent No. 130,961, issued to William Webster, August 27, 1872, for "a new and useful improvement in looms for weaving pile fabrics."

This answer denies the infringement, and sets up as a defence a prior invention by one Ezekiel K. Davis; and that letters patent were granted to him for inventions in looms for weaving pile fabrics, dated February 9, 1869, and numbered 86,651; that the looms which the defendant had in use, and which were alleged in the bill of complaint to infringe the Webster patent, were constructed and operated in conformity to the description contained in the said patent to Davis; that defendant had a licence under said patent to use said looms, and that they rightfully and lawfully used under said licence.

The Court stated that it was a fair deduction from the testimony that Davis acquired all of his knowledge on the subject from the inspection of Webster's original drawing, made by him in the winter of 1865-6, and exhibited to Davis and others in the spring of 1868. That he did not comprehend the value of the invention, or that he did not then deem himself to be its original and first inventor, is also to be inferred from the fact that it was not claimed in his patent of the subsequent year.

The delay of Webster in taking out his patent after he had completed his invention seems to be satisfactorily explained. Under the circumstances it was not unreasonable. It is the old story of poor inventors patiently waiting at the door of rich capitalists. The Bigelow patent was about expiring and Webster's new wire motions could only be used in union with some of the patented ingredients of the Bigelow loom. As he was unable to make an arrangement with the Higginses, who were licencees of Bigelow, in regard to the adoption of his improvements, and as he could not get others, like Weaver or Beattie, to unite with him from fear of suits for infringements, he was obliged to wait, either for the death of the Bigelow patent or until the heart of capital should relent, in order to give his invention to the world under circumstances that might afford him some compensation for his years of thought and unrequited effort.

The Court gave a decree for the complainants according to the prayer of the bill, holding substantially as follows:

In a patent for a loom for weaving pile fabrics one claim was for "the lay and its rigid shuttle box, the pivoted vibrating wire trough, the reciprocating driving slide, and the latch moving thereon," and "operated by the wire box," all in combination, and the wire trough was described as vibrating horizontally upon a pivot at one end, to and from the shuttle box; and it was held that a wire trough vibrating upon a horizontal rock shaft underneath was the equivalent of the one described; and a loom with such a wire trough, but in other respects like the one described in the patent, was adjudged to be an infringement.

A patent for a combination is infringed by the use of a similar combination, although one of the elements is omitted, and another is substituted for it, unless the substituted device is a new one, or performs a function essentially different, or was not known at the date of the patent as a proper substitute for the one omitted.

Where the inventor of an improvement upon a patented machine could neither make an arrangement with the owners of the patent to adopt it nor use it without infringing the patent, nor induce others to take it up, and was poor, he was held not to have lost his right in it, although he delayed applying for a patent until another person had made the improvement and obtained a patent for it.

[*C. A. Seward* and *B. K. Curtis*, for complainants.
George Gifford and *Wayne Parker*, for defendant.