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Astronomy and Meteorology.

No. 5. MONTREAL, AUGUST, 1887. $1 PER ANNUM—TEN CENTS PER COPY.

Astronomy and Meteorology.

PUBLISHED MONTHLY BY

WALTER H. SMITH,

31 ARCADE STREET, MONTREAL, CANADA.

KIND WORDS.

The Magazine ought to become popular.—*Herald, Montreal.*

The paper is one of the needs of the present time, hope it will go on.—*Democrat, Doylestown, Pa.*

Mr. Walter Smith's new monthly published in Montreal—"ASTRONOMY AND METEOROLOGY"—is to hand, and we are indebted to the publisher for it. It is an excellent paper, deals practically with astronomy and meteorology, and tells many things about heaven and earth which, as Hamlet said, "are not dreamed of in our philosophy." We trust Mr. Smith's venture will become a fixture, permanent, lucrative, and profitable to the proprietor as it certainly must be to the subscriber.—*Standard, Cornwall, Ont.*

Walter H. Smith, the noted weather prophet, of Montreal, Canada, and president of the Astro-Meteorological Society, is now publishing a handsome and exceedingly interesting monthly, entitled "ASTRONOMY AND METEOROLOGY." It gives monthly weather forecasts, astronomical essays with illu trative diagrams, and a fund of general information on the sciences to which it is devoted, of interest to all.—*Gazetteer, Denison, Texas.*

In the month of May, "ASTRONOMY AND METEOROLOGY" published an article on the summer of 1887, from the pen of Mr. Walter H Smith, which merits the attention of the public. The article, written in April, predicted this summer with a fidelity which we have reason to regret. Mr. Walter H. Smith, whose predictions are so generally correct, is rendering a great service to agriculturists and merchants, generally, by his clever indications of coming seasons. We invite our readers to verify this summer's predictions of our prophet, and to follow his indications for the future, if he has been correct in the past.—*La Presse, Montreal.*

Your enterprise in establishing a monthly devoted to Astronomy and Meteorology is highly commendable and should receive the hearty co-operation and patronage of all who pay any attention to such subjects. A good many here who received copies of your Almanac for 1887 are following directions in planting, and watching results. They are also watching the weather predictions with more than usual interest.—*W. S. W., Shawano, Wis.*

Astronomy.

Young declares that were a comet whose mass equalled the earth's, to run full tilt into the Sun, the effect would only be to add to the Sun's store of heat, not to increase its emission.

All that has yet been written about comets and meteors—and the total amounts to many volumes—only serves, as it were, to deepen the mystery surrounding these bodies.

Seeliger finished a count of the stars in the Northern Hemisphere a year or two since. He classed them under seven heads: the first, from 1 to 6 magnitudes inclusive, giving 4,120 stars; class 2, (6 to 7 mag.), 3,887 stars; class 3, 6,054; class 4, 11,168 stars; class 5, 22,898 stars; class 6, 52,852; class 7, 213,973 or 314,952 in all! Argelander had previously made the number 315,089.

Saturn's Belts (not rings) are believed to be subject to far more sudden changes than similar markings on Jupiter.

Of the major planets, Mars has the most eccentric orbit, excepting Mercury. The perihelion distance of Mars being 13,000,000 miles less than its mean distance This amounts to as much as 20,000,000 miles when the orbit of Mars has greatest eccentricity. My readers will readily understand from the above why certain oppositions are so very much more favorable for telescopic observation than others.

Dawes is the only astronomer, so far as is known, who has been fortunate enough to observe a star pass behind the ring of Saturn.

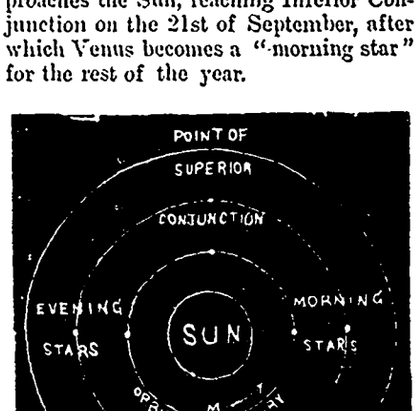
The American Association for the Advancement of Science meets in New York between August 10 and 16. The meeting will, it is said, be one of the most interesting ever held. In addition to the regular sessions, a series of excursions have been arranged to places of interest in the neighborhood of the Empire City.

Vienna's new refracting telescope is 27 inches aperture, 36 feet long, and weighs, with base, 36,000 lbs. It was made by Grubb, of Dublin, Ire., and cost, with dome, masonry, etc., $84,000.

Of the 267 asteroids discovered, 4 were located prior to 1845; from 1845 to 1849, 6; 1850-4, 23; 1855-9, 24; 1860-4, 25; 1865-9, 27; 1870-4, 32; 1875-9, 70; 1880-4, 33; and 1885-7 (to May 28), 23.

PLANETS IN AUGUST.

Venus, lessening in size, but increasing in light, owing to her nearer and nearer approach to the earth, is the most noticeable "evening star" at the opening of the month. Up to the 15th of August the beautiful planet of love grows brighter and brighter each evening. On that day she is at "greatest brilliancy," and will grow less and less in light as she approaches the Sun, reaching Inferior Conjunction on the 21st of September, after which Venus becomes a "morning star" for the rest of the year.



Orbits of the Earth, Venus and Mercury.

The above diagram illustrates the positions and phases of the inferior planets. At the point of "Superior Conjunction" the planet is directly in line with the Sun and invisible. Moving onward, at a faster rate than the Earth, the planet becomes visible as an evening star, showing first a perfectly rounded disc. Later it reaches "greatest elongation east," marked "evening stars," when it shows a shape similar to the Moon at "first quarter." Travelling on, it appears to grow brighter as it nears the Sun, growing more and more crescent shaped, until it is finally lost in the Sun's rays. Passing the point of "Inferior Conjunction," which is sometimes a "transit" over the Sun's disc, the planet becomes a "morning star," reappearing as a thin crescent and growing gradually larger and larger in the telescope until "greatest elongation west" of the Sun is reached, when the planet is similar in shape to the Moon

at "last quarter." Continuing to increase in its illuminated portion, it finally appears full and round again before reaching "Superior Conjunction" once more, and disappearing behind the Sun, passes from a "morning" to an "evening star."

Mercury should be visible about the 16th, just before sunrise, in the eastern sky. On that date he is at his "greatest elongation west" of 18° 38'. The little planet is in perihelion on the 24th and in conjunction with *Alpha Leonis* (*Regulus*) on the last day of the month.

The Moon is eclipsed on the 3rd and the Sun on the 18th. Both eclipses are invisible here.

Saturn and Mars, both "morning stars," are in conjunction on the 28th, the two being then but 49' apart.

Luna is near Neptune on the 12th, Mars on the 16th, Saturn and Mercury on 17th, Venus and Uranus 21st, and Jupiter on the 23rd.

ASTEROIDS AT OPPOSITION.

The four leading Asteroids arrive at opposition this year. Three out of the four have yet to make their opposition passages and become "evening stars," viz.: Pallas, on August 29; Ceres, October 10, and Juno, October 15. Vesta, the largest, who becomes visible to the unaided eye at her oppositions, passed her nearest point to the Earth on April 16, and astronomers will have to wait until the next opposition (Sept. 29, 1888), ere she is again as favorably placed. Those who have moderate sized telescopes and fairly good star maps ought to have no difficulty in locating the other three in their turn. Pallas, at opposition (overhead at midnight) on August 29–30, is then in Right Ascension 22h. 7m. 40s., Declination 5° 30' 24" North. Her motion in declination is then South. Her place in the heavens is in the constellation *Pegasus*, near *Theta Pegasi*. She is the smallest of the four primary Asteroids.

Ceres reaches opposition Oct. 10. At transit that night her R. A. is 1h. 26m. 11s.; Dec. 6° 30' 48" South. Her motion in declination is then Southerly. This particular spot in the heavens is in the Constellation *Cetus*, near *Theta Ceti*.

Juno swings into line with the Sun five days later, passing opposition and becoming an "evening star" at midnight on Oct. 15–16 in R. A. 1h. 42m. 46s., Dec. 3° 43' 9" South. This places her in the Constellation *Cetus* also, a little East of her sister Ceres, and on a level with *Mira*, "the wonderful star," which is then about 30 min. in R. A. to the East of Juno.

Ceres and Juno are in conjunction during the last days of August, when they are about 8° apart, Juno passing North of her sister planetoid.

CONSTELLATIONS IN AUGUST.

On August 15th, at 10.30 p. m., the *Pleiades* in *Taurus* are rising, below *Auriga*, wherein is the bright star *Capella*, now almost North-East. To the right is *Perseus*. Above *Perseus* is the "W" of *Cassiopeia*, and to the left of the latter, *Cepheus*, almost over head. *Aries* has just risen, below it is *Triangulum* and *Andromeda*. The great square of *Pegasus* is a prominent object, lying between the East and South-East, below one part of it is the Constellation *Pisces*, and below the western portion, *Aquarius*. *Capricornus* is nearly due South. Above *Capricornus* is *Aquila*, with its brilliant *Altair*, and to the latter's left *Delphinus*. Above, just southing, is *Cygnus*, with its principal stars forming a cross, the brightest of them being named *Arided*. In the S.S.E. *Sagittarius* is setting, with *Ophiuchus* also near the horizon. *Serpens* is to the right, and above the latter is *Hercules*. *Lyra*, with *Vega*, has passed the meridian. To the right of *Hercules* is *Corona Borealis*, then *Arcturus* in *Bootes*, while N.W. may be noticed *Cor Caroli* alongside *Ursa Major*, now Northing. Above the latter is *Draco* and *Ursa Minor* with *Polaris*.

REVIEW.

Solar Biology: A scientific method of delineating character; diagnosing disease; determining mental, physical and business qualifications, conjugal adaptability, etc., from date of birth. By Hiram E. Butler, 1 vol., octavo, 350 pp., Boston, 1887: Esoteric Publishing Company, 478 Shawmut Avenue.

According to those learned pundits who pose as the leading scientific authorities of the day, a belief in the possibility of outside influences affecting not only the earth generally, but the atoms, active and inert, of which the earth is composed, is as "dead as ditch water," and moreover unfit to be accorded even the very faintest shadow of credence by anyone except the most illiterate and superstitious. Those who are in a position to judge, however, know that some of the most intelligent minds are at work on the question, which has been an important one ever since man began to intuitively know himself surrounded on all sides by a universe of matter, of which the individual is a unit. Were there no intelligent students it were the greatest folly to publish such a volume as this, for it is well bound and well printed on heavy paper, price $5.00, and will doubtless find its way into many libraries, especially into the libraries of persons given to the purchase and study of curious books and occult theories. As many of my readers understand what is meant by "Solar Biology," I need scarcely explain that Mr. Butler's new volume deals largely with the relations of man to the universe, discussing at length the supposed influences of sun, moon and planets, on individuals, rules being laid down by him by which conclusions, said to be superior to those arrived at by phrenologists, are obtained. Similar, in some respects, to nineteenth century Astrology, the author widely departs therefrom in some instances, as, for example, when he draws conclusions from the heliocentric places of the planets, rather than the geocentric. His conclusions are consequently Copernican rather than Ptolemaic. Mr. Butler, one gladly notices, is not argumentative, he having doubtless arrived at the sensible conclusion that parties antagonistic to his theories are hardly likely to purchase much less read. Accordingly, he gives all room to elucidation. A glimpse of the subject matter may be had from the headings of some of the chapters, viz.:—"Bible History of Solar Biology," "Man's Triune Nature," "Selection of Partners in Marriage," "Polarities of the Signs," "Positions of the Planets," "Parental Conditions," "How to overcome Bad Habits," "Cause of Inharmony in Married Life," "Directions for Reading Character," etc. An appendix by John Latham, dealing with "A Lost Planet," is not by any means the least interesting portion of this work, which also contains tables of the Heliocentric positions of the planets from 1820 to 1900.

Seybold Melbin;

OR,

THE WORLD OF MARS.

By Walter H. Smith.

"World of Mars;
Lives there a human brotherhood on thee
Without the sins and errors of mankind."

CHAPTER VIII. *(Continued.)*

I readily assented to this proposition of the fair Martian.

"What then will you say," continued Myrina, "when I tell you that we—the eyes of our spiritual minds being opened by infinite wisdom—have been able to weigh all matter, and by so doing ascertain exactly the influences that have been, are now being, or will in the future be brought to bear on any individual atom or accumulation of atoms?"

"As one of the earth-born, to me it seems incredible. That is all I can say," was my reply.

"But why? Have not even your Astronomers arrived at sufficient precision to calculate the return of accumulations of atoms (which they call comets)? Can they not carefully compute and allow for every perturbation that a comet will go through on its lengthy march through space? They can. But our wise men

can go farther. They have extended our scientific possibilities with microscopical amplification. Just as easily as your astronomers calculate the experience of a comet, ours calculate exactly the experience of the human atom."

"On Earth the few who believe, call this 'Solar Biology,' but those who do not, call it 'Astrology,' and very few outside of lunatic asylums pay any heed to such calculations."

"Because as yet the best on Earth have but a paltry, half-blind idea of the real effects of planetary influences. Your predictors are more often wrong than right because the subject is too vast for them. Your 'Zadkiels' and 'Raphaels'; your 'Orions' and 'Ruthiels' would be immeasurably distanced in prophetic foresight, if pitted for five minutes against our children of five years of age."*

"What you say leads me to look with respect on what I have hitherto sneered at," I remarked. "Be it my task when I return to Earth, to study this science with us at least as ancient as the days of Joseph, the son of Jacob. But you have not yet told me what evil news your friends, the visionaries, had to communicate."

"They uttered words of warning—which I shall not heed—bidding me understand that the end of our affection must be inauspicious and grievous."

"But why?"

"It were needless to enter into scientific details. Suffice it to say, that the positions of the various orbs that go to make up the aggregate of the Universe were ominous at the moment of our meeting. The seers accordingly forecast an evil end to our acquaintance."

"Evil shall never befall Myrina if I can obviate it," was my reply. "Therefore this moment, it becometh me, as one worthy of her affection, to bid Myrina farewell until permitted once more again to visit her—as a spirit, from beyond the grave."

"Stay, thou daring one. Check for a moment thy adventurous spirit, which would, without a thought of the consequences, attempt the accomplishment of that which would bring everlasting grief on us both." Myrina could read my thoughts, which at that moment were those of the life destroyer. "Was it for this, think you," she exclaimed, clutching at both my hands, "that I watched over and loved thee from thy earliest hours? Was it for this that I separated thee from thy kind, and finally allured thee to attempt and accomplish a journey that other earth-men, wooed by Martian maidens, have never dared do more than dream of? Was it not for me to count the cost beforehand, and shall I now fear aught that can come upon me? See, here is the scheme of heaven;" and Myrina drew from her bosom a paper on which the whole heavens were delineated at the moment of our first meeting. We sat for a short time in silent contemplation of it.

"Seest thou not Seybold, that this scheme is more lenient to thee than me? Thy lines will fall in pleasant places when mine are for ever obliterated. Because it is so, and Seybold has little to fear, I am unwavering in my desire for thy continued presence. Whilst we are permitted, let us stay near each other. If ruin or death is to overtake me, I trust, I prefer, I pray that it o'ertake me in thy arms or at thy feet."

To such pleadings earth-love could have but one answer. It was the same on Mars. Self abnegation, that most difficult of virtues, raised my beloved infinitely in my estimation. What but caresses might seal such a bond? In them, we forgot the sword that was lifted over us; so soon to smite. It was most natural, too, for us as lovers to forget. The world may have a theory that love has regained his sight, grown old and obese, had his wings clipped, and changed his bow and arrows for a cheque book. I tell you it is only a theory. What is more, I am ready to assert that the world lies to its face! Because what you designate by the sacred name of love prefers gold to goodness of heart, appetite to affection, lust to love, is that any reason I should? Because love is to you a jest must the rest of the world be debarred from viewing it as a passion worthy of its most serious attention? To love, I take it, is a sacred duty that one owes, not only to another, but to oneself. It gives a zest to, and makes life worth living. Never separate, ye happy lovers!

> "Let each be dear to each, and as nothing count the rest,
> I myself have sometimes been by a lover's ardor blest;
> And then I'd not have changed for any palace here below,
> Or for all that in the heavens in their lustrous splendor glow."

Love is the sun of existence. Without it, human life would be as great a blank as earth-life with the natural sun blotted out.

"Come see where and how we live," said Myrina, the smiles returning to her beauteous face as she rose, taking my hand.

We passed from the conservatory, the portals at the end nearest the house opening at our approach and closing behind us by springs set in the floor. From the conservatory, a hall opened whose length, to my finite ideas, seemed almost infinite. Around this hall ran a second gallery, reached by staircases, in it being ranged the book lore of Martian sages, dealing not only with the affairs and history of their own planet, but with those of all other inhabited worlds. Here of course I saw ranged in many volumes "The History of the Earth." In these, many names that we delight to honor and speak of with enthusiasm, I found written down as tyrants and villains; while many names ignored or unknown to the world, found place among the lines recording virtuous acts and honorable exploits.

To get a book on the subject of Druidical temples, of which Stonehenge forms so important a relic, Myrina had to proceed to a corner of the gallery which lay in shadow. At her approach, there was a sudden "click" and immediately the whole neighborhood became as light as day. What was the cause? The "click" was due to an electric spark, struck by Myrina from her fingers, but the light itself proceeded from a jet of natural gas, with which many of the Martian mansions are lit. Drilling has, of course, to be continued many thousands of feet below the surface ere a pocket of this inflammable material is reached, but when it is reached, it often proves practically inexhaustible, and, under perfect control, is conducted through pipes of various sizes, similar to those used by our gas companies, through the houses and streets, forming an admirable adjunct to electric and solar lighting and heating almost everywhere.

Descending to the ground floor again, I found it covered in the centre with triumphs of the sculptor's art. These were not, as with us, everlasting repetitions of a certain ideal of the human form. The Martian sculptor aims at higher realizations. He presents the observer with exact representations of actual specimens of the Martian race from its first inception; from its creation, through every stage of existence and developmental progress up to the present highest type of intelligence. The race, I saw, had grown, not shorter, but taller and broader, with each æon of existence, during which the atmosphere had become rarer and rarer, and exerted, in consequence, less and less pressure.

Martian sculpture has even yet a wider range. Grouped around each specimen of human progress, were its accessories also, cut in imperishable material. First the open houses, erected as a shade from tropical suns and a protection from tropical showers, with animals similar to those we credit to our latest pre-historic period; then the houses closed all around but furnished with broad verandahs and projecting roofs fitted to effectually screen the then residents from the sub-tropical sun of noon-day, and to shelter them, if needed, from the chill airs of night. Next came houses somewhat similar to those now in use on Earth; then others with thick walls, double doors and windows; next a return to less substantial buildings, when improved appliances in the shape of heating and heating apparatus

* Five Martian years of 1 year and 10½ months—according to earth-reckoning—is here meant.

were discovered, and finally, houses similar to those at present in vogue on Mars.

"I presume this collection is unique, we have nothing to compare with it on Earth," I remarked.

"Oh no! there are thousands of other collections rivalling, if not surpassing ours," replied Myrina. "Had your prehistoric artists worked in stone or iron, or something equally as imperishable, you of the earth might now have possessed almost equally valuable records of the past. How interesting would human monuments, equal in age to Stonehenge—even the Pyramids, prove to you now? It is not too late, however, for you to take a leaf from our book, and, beginning at once, leave something to your posterity. If your private citizens are not sufficiently wealthy, let the State do the work."

"I doubt if we have a State existing that would dare apply its funds to such a purpose; we are too greedy after the anticipated successes of the immediate future to care anything for that which is away in the dim distance. Our first, last and only criterion, the question that comes ever uppermost with our peoples, is: 'Will it pay?' If a thing will not pay, no matter how beneficial it may be, we accord it no chance."

"All you say is but too true," replied Myrina, with a little sigh. Just as the expression escaped her we passed from the representation of Martian life, past and present, to that representing Earth-life. Anon we moved through sculpture depicting the forms obtaining on more distant worlds, even the human oysters of the planet in *Præsepe* were not forgotten. Truly there exists nothing on Earth rivalling this private collection of the house of Am-Ram.

Beyond this gallery, we entered a yet larger one, lighted only from above. It was filled with paintings, delineating with master strokes the various portions of Mars as well as scenes from Martian history. Nor scenes from the past alone, since Myrina pointed out several paintings which she told me had reference to future events and concerned persons not yet born.

Although I was growing used to the possibility on Mars of the impossible on Earth, I here could not repress my astonishment, which amounted in this case to incredulity almost.

"Our seers," explained Myrina, "direct our artists. Extended calculations are continually being made, and each event as soon as fully understood is described. It is next transmitted to canvas. All these pictures have some direct or indirect reference to the family of Am-Ram, and pictures of a similar nature may be found on the walls of all our houses. We have, in fact, nothing that interests us more than these galleries of historic and prophetic family paintings. We are continually studying them, and value them in an educational sense equal to our written and printed records. For instance, what record could teach us more plainly than this picture?"

The canvas to which Myrina pointed showed a submerged forest, amid the tropical branches of whose trees, a house had been erected. Peering from the doorway stood a Martian of much shorter stature than now obtaining. His eyes were directed to the heavens where dense clouds, proclaiming the atmosphere to be at saturation point, hung just above the tall tree tops. In one place the clouds had lifted and a patch of sky appeared. In it was Phobos just past "new" moon, and alongside a brilliant star, the Earth.

"That picture illustrates an incident in the life of my ancestor Jan-Sec, who, with his family, during the pluvial, tropical period of Mars, was forced to live as you see, everything far and near being submerged. The expression on his face is a contented one, nevertheless, because he reads from the reappearance of the Earth and Phobos, a similar promise to the one read by your Noah, when the prismatic bow gladdened his eyes."

Not one picture of famine, pestilence or war was there. There was one, that appeared newly hung, with a drapery over it. "Why, fairest Myrina," I asked, "is yon painting covered, tells it any story that should not be studied by the members of your house?"

"That picture," replied Myrina "is new. It was only fixed in position today. The artists worked upon it nearly the whole of last night."

"Does it concern you?"

"It does."

"Can I not see it?"

"It were best for you not to look upon it. It concerns us both."

Ere Myrina could stay me, I started forward, I lifted the curtain. Verily, the picture did concern us both, and many more beside. It was a scene of carnage, a battle of giants, and we the cause. A revulsion of feeling overcame me as I looked, and I fell to the floor in a swoon.

CHAPTER IX.

A REPAST.—A THIRD SEX.

When I recovered consciousness I found myself in a room of the Am-Ram mansion, with Myrina beside me.

As I opened my eyes Myrina said: "Now I understand why those of Earth are not permitted to foresee the future. They are not able to bear the griefs that are in store for them."

To this I was obliged to assent.

Evidently with the intention of geting rid of an unpleasant recollection, Myrina remarked: "You must partake of our hospitality to-day."

I began to frame an excuse.

"Tut, tut," she said, "no excuses. The master of the house is always ready to welcome those whom his wife or daughters invite to his table. Ladies here have privileges that you would do well to accord your women on Earth. Hospitality, the management of the house, the choice of friends and associates, the ordering of her surroundings and the disposing of herself in marriage are all left to woman here. You should greatly enlarge the sphere of civilized woman. In so doing you would benefit yourselves."

The room we were in looked out upon an enclosed court-yard, in which a fountain was playing. "I notice that you are exceedingly partial to water," I remarked. "Why is it?"

"Because we wish to keep our atmosphere as moist as possible. Our rainfall has diminished to such an extent that it has become absolutely imperative for us to irrigate and spray the whole face of our tropical and semi-tropical nature."

Supper was served in a spacious apartment. Here I was introduced to Am-Ram, father of my beloved. He proved a tall, stately personage, with fire in his eyes and a martial bearing generally. A man that would have become a Wellington or Bismarck on earth. He received me with the barest civility, having, I did not doubt, learned from the seers of his daughter's unhappy choice. The sovereignty of womanhood obtaining on Mars, however, forbade him taking any other action except moral suasion, prior to holding a conference with the ladies of his family, whose decision although averse to the wishes of Am Ram, would have to be abided by, according to Myrina, who took occasion to transmit me a few ideas on the subject (without speaking) as we took our seats.

Myrina's matron mother, Morna, was also present. Considerably shorter in stature than her husband, Morna was more like Myrina than the rest. Mutually attracted, I was received by her with marked courtesy.

Beside Vessa, the sister of whom I have already spoken, there were two sons, both younger than the sisters. These lads I found very intelligent for their age. They were much interested—boy like—with myself, having learned that I was not a disembodied spirit. They put several questions to me concerning my passage, having wishes—which Am-Ram quickly divined—for a jaunt to Earth. Myrina told me later on that the boys afterwards visited a public observatory—of which there are several open to all comers free—in the adjacent town, obtaining there solar observations, hoping to fall into a trance as I had, and be conveyed in spirit by their own will to Earth, then at inferior conjunction.

(To be Continued.)

Weather Forecast.

AUGUST, 1887.

At present writing, August promises to be the worst month of the whole summer generally. It will give the worst storms, have the greatest amount of sudden changes, and be remarkable for both its hot and cool periods. The last fifteen days are the worst in all respects, and my readers may make up their minds for a very trying time. The continued spells of heat point to probable earthquakes and severe drought in sections, intermixed with very heavy electrical storms, with heavy rain and heavy hail. In fact, the whole month, as my extended forecast goes to show, will be a succession of hot waves, heavy storms, and cool spells. The hot, dry waves of the present season have already fully borne out my forecasts, a week especially to be remembered being that at the beginning of July, when shade temperatures in the nineties were the rule all over the North, running up into three figures in Southern sections. At Montreal, we had not recorded as great heat since 1884. Special crop reports at the entry of July showed that dry weather extended throughout a great part of the West and North-West, in Illinois and Wisconsin farmers being said to be in desperate straits, the drought having practically destroyed most of the crops in some sections. In Dakota, the heat by July 1, had cut the expected average down to 66 percent; corn, however, was never better, promising 100 percent yield. Manitoba did not seem to have suffered much, and reported crops generally doing well. The peculiarities of the remarkable August of 1887 will be found in the following extended forecast:—

First Week, August 1 to 6: Warm and windy—A fine interval,—changing to stormy, with heavy rains and high winds.

Second Week, August 7 to 13: A cool to cold term—Auroral displays—Very fine hot weather, another heated term—Some severe thunder and hail storms towards the close of the week.

Third Week, August 14 to 20: Sultry, great heat—Storms general, very heavy rains in the S. and S. W.—A cooler change, especially in Northern sections—Very hot and stormy again at the close.

Fourth Week, August 21 to 27: Storms everywhere, with great heat—Tornadoes probable in tornado sections—Heavy and oppressive "earthquake weather"—High winds and gales—A rapid change of Temperature probable, with local frosts in the N.W., Canada and the Eastern States.

August 28 to 31: Thunder and hail storms in sections, earthquakes again probable—Rapid changes—Cool, showery, with local frosts—End of month warm, with local showers.

Association.

A caucus meeting to discuss the appointment of officers for the session of 1887–8 will likely be held in August or September.

Vice-President Plumadore, of Asheville, N.C., has been appointed Manager of the Transmontane Real Estate and Trust Company of North Carolina; which recently obtained its charter from the Legislature. The development of Western North Carolina is the end the company aims at.

Associate General Robert Lenox Banks, of Albany—who, by the way, was the initial subscriber to ASTRONOMY AND METEOROLOGY—is spending the summer at Lake George, N.Y.

Councillor (Mrs.) M. T. Cole is rusticating with her family this season at Ayer's; said to be one of the healthiest spots in that healthiest of localities, the Adirondack region.

Few, doubtless, of my readers know that Vice-President Test, of Omaha, is a relative of Gen. Lew. Wallace, the author of "Ben-Hur." The latter recently sojourned with our Vice-President, who describes his kinsman in a recent letter to me as "a very agreeable companion, who says he will write a mate to 'Ben Hur'; whose sales exceed those of 'Uncle Tom's Cabin'; until now the most widely circulated American novel. Strange to say, 'Ben Hur' is read with equal pleasure by Jew, Gentile, Protestant, Catholic, Christian and Mohammedan. It has been translated into the Turkish language by order of the Sultan." Mr. Test recently re-delivered his lecture on "Electricity," which appeared two or three years since in the *Advocate*. It was well received.

TELESCOPE FUND.

A meeting of the Telescope Committee was held at Mr. Smith's on June 14th. Present: — Messrs. Beuthner, Creak, Pigeon, Smith (W. H.) and Ussher (B.B.). Mr. Smith having been unanimously elected Chairman, and Mr. Creak Secretary; the Chairman read the resolution appointing the committee, adopted at the June meeting, after which a general discussion of the whole question was entered into.

It was decided to write to various makers on this continent and in Europe for prices of lenses, etc., the same to be submitted, together with the Committee's report and recommendations, at the first Autumn meeting of the Astro-Meteorological Association.

It is considered that the possession of a telescope of high power cannot fail to augment very largely the usefulness and activity of the Association, besides increasing the public interest in its work and affording to members and subscribers the inestimable advantages of practical study and observation; and on ascertaining the full amount required, which will be published later, with full particulars concerning the work of the committee, it is proposed to invite their co-operation in order to secure and mount an instrument which may be a benefit, not only to the Association, but to the Dominion. In the meantime, any communications on the subject may be addressed to the President, Mr. Walter H. Smith, 31 Arcade street, Montreal.

Meteorology.

In the United States, the average temperature for May, 1887, was generally above the normal. The greatest departures were 8° in Michigan and Western New York.

Charleston, S.C., reports a normal mean temperature for May, as do Mobile, Ala.; New Orleans, La.; Galveston, and Rio Grande City, Tex.; Duluth, Minn.; and San Francisco, Cal.

While the Eastern portion of the Continent was generally suffering from heat, portions of the Pacific Coast were cooler than usual. Olympia, Wash. Terr., reporting its average temp. 9° below normal during May.

At Toronto, Ont., the June mean temp. was 63° 85′, or 1° 93′ higher than the mean for the past 47 years, and 2° 95′ higher than June, 1886. Max. temp. 89° 5′ on 16. This is the highest recorded there in June since 1880, when 89° 9′ was registered on 24.

Quebec experienced a very severe thunderstorm on June 29. The lightning struck several places.

Illinois and Arkansas say that the drought is worse than for several years.

There were heavy rains and freshets in British Columbia on June 20th.

May, in New England, according to 149 observers, was an unusually dry and warm month. The deficiency in precipitation was so marked, that it reversed the excess of the previous six months. The dry weather of the first three weeks was, however, followed by enough rain to prevent injury to growing crops.

May 10th was remarkable for its high temperatures in Canada and New England. At Montreal, the maximum was 85° 5′; in the White Mountain Valleys, 89°, and at Berlin Mills, N.H., 94°.

Thousands of dollars damage was done to window glass at St. Paul, Minn., by a hail storm, on the evening of May 1. Some of the stones were three inches in diameter.

Mr. Horne reports from N. H., May, 1887, to have been generally warm for the season. The month entered warm, and went out foggy and rainy. The first five days were hot, as were also the 8-9 and the period between the 14-25. On 28-29 there was a 30 hours rainstorm. June gave an abundance of rain, and a max. temp. of 96°.

Swarms of locusts have appeared in Minnesota. "An insect pest summer."

Mr. Birt's June record (Utica, N.Y.) gives the max. ther. there as 90° on 21 and 29. Min. 34° on 27. Mean., 63° 7′. Max. bar. 29.88, min. 29.22; mean, 29.49. Electrical storm, rain and fresh wind from W. on evening of 21st.

Mr. Redman reports May, in Illinois, as an exceptionally fine month; rains came along so timely, just enough and never too much. The max. ther. at noon was 96° on 21. Min. sunrise temp. 46° on 28. June gave some very high day temperatures, with cold nights and great drought. On 18 days the temp. rose above 90°, on 8 days to 100° and over, the hottest days being the 19-20 when 110° was recorded.

Grayson County, Texas, I learn from Councillor Murray, is likely to have a splendid wheat harvest this year, the average yield to the acre being from thirty to thirty-five bushels. *Corn never looked better*, and cotton is all that can be desired.

Councillor Cole reports from Malone, N.Y., that during several days in May the ther. registered summer like July heat; notably May 3rd (81°), 10th (87°), 15th (81°), 20th (86°), 21st (84°), and 22nd (83°). Frost on 12th as forecast. Very dry about the middle of the month, "bush fires prevalent" on 15th. June's max. temp. was 86 on 30th.

Terrific thunder storms raged over the Hudson River valley on July 6. Trees and houses were struck by lightning, there were washouts on the railways and the mercury dropped 23° in three hours.

The temp. at New York on June 30 was 95° and on July 1st 91°. On the latter date 170 persons died, the greater number from diarrhœal diseases.

Mount Washington's minimum May temperature was 16° on the 12th, and its max. 62° on 17th. During June, the mean. temp. was 2° 9′ in excess of the normal, and the rainfall thirty-nine hundredths of an inch in excess. Snow did not fall there during June.

A town in Hungary was destroyed by a hurricane and waterspout on July 7th.

At Montreal, for June, 1887, the mean temp. was 66° 25′ as against 64° 48′, the mean for the past 13 years. The max. temperature was 86° 7′ on 29; min. 50° 3′ on 18, a range of 36° 4′. Rain fell on 12 days to the extent of 2.44 inches as compared with the mean June rainfall of 3.08 inches. The max. barometer reading was 30.342 on 27, and the min. 29.650 on 16, or a range of 0.692 inches.

July's first hot wave at Montreal proved another sufficient verification of my forecast of "seas, ocean's of heat" and "humanity will suffer severely." Numerous sunstrokes were reported. The max. temperatures were: June 28th, 82°; 29th, 86° 7′; 30th, 86° 3′; July 1st, 87° 5′; 2nd, 89° 1′; 3rd, 82°; 4th, 90° 4′; 5th, 85° 2′; 6th, 86°; 7th, 82° 5′; 8th, 86° 5′, and 9th 87°. July's max. mean for 12 years is 77°.

Mr. Barnard writes from Springfield, Vt. "Cold, harsh, wintry winds held full sway up to May Day, then, presto! a change. The mercury went up into the seventies and eighties, and drying, sultry winds from the S.E. continued uninterrupted until the 25th. Since which date there was continued rain up to June 1. A drought of uncommon severity was fairly inaugurated, but the rain has filled the springs and streams again to overflowing. The forest trees were in half leaf about the 15th and in full leaf on the 22nd, on which date fruit trees were in full bloom. Snow drifts remained in sight as late as the 13th. Clover and June grass in bloom on the 30th."

Mr. Wood reports from Shawano, Wis., that the mean temperature for May compared with previous years at the noon record was as follows:—1887, 76° 21′; 1886, 70° 7′; 1885, 66° 6′; and 1884, 66° 6′. Max. 90° on 20, min. 54° on 3. There were 25 fair and clear days. Total precipitation 1 and $\frac{3}{10}$ inches as against $\frac{1}{2}$ inch in 1886, and 3 inches on 17-18 in 1884. No frosts to affect vegetation. The three last days were cold, raw and windy, threatening rain, with ther. below 50° in early mornings. But on the whole, the month, as predicted in ASTRONOMY AND METEOROLOGY, was "fine, more like June than May." Crops, especially pastures, are suffering for rain.

The average temperature of the three spring months (March, April and May), according to the report of the U. S. Signal Service for May, 1887, was generally above the normal; ranging from normal to 2° above in the Pacific States; from 3° to 5° in Utah, Wyoming and Colorado, from 3° to 4° in the Missouri valley; from 1° to 4° in the upper and central Mississippi valleys, and from normal to 1° above in the upper Lake region.

May was generally a droughty month in the United States, the deficiency ranging from 0.1 inch in the N.W portion of Penn. and N.Y. States to 3.6 inches at Omaha, Neb.

Yet there were streaks of too much rain as forecast. These I said were "most likely in parts of the North-West, and parts of the South and South-West." What says the Signal Service report? "The rainfall (May, 1887) is above the average in western Washington Terr., 3.2 inches; 2.4 inches in North-western Oregon; 1.4 inches at Helena, Mont., and St. Vincent, Minn.; 1.2 inches at Duluth, Minn.; 7.1 inches at Marquette, Mich.; from 0.2 to 0.7 inches in southern and eastern Texas, north-western Louisiana, central Arkansas and Memphis, Tenn; 1.3 inches at St. Louis, Mo.; 0.2 inches at Cleveland, Ohio; 3.0 inches at Pittsburg, Pa.; 0 3 inches at Lynchburg, Va.; 1.2 to 2.6 inches in eastern Tennessee; 1.2 inches at Wilmington, N.C.; and 3.1 inches at Jacksonville, Fla."

During June, July and August this year, a special study of the sea-breeze on the eastern Massachusetts coast has been undertaken by the observers of the New England Meteorological Society, with the assistance of the Signal Service and Harvard College Observatory. The object is to discover the conditions favorable to the development of the sea-breeze, the area and rate of its extension inland and its effect on the temperature.

April in New England gave an average temperature below normal. The precipitation was in excess, its marked feature being the excessive fall of snow. The snowstorms of 2nd and 18th were unusually heavy for April. Readers will notice that my forecast in ASTRONOMY AND METEOROLOGY as well as in the *Planetary Almanac* called for "snow" on both dates. On the 9-10 the temperature was high, rising to 84° in

Connecticut, agreeable to the forecast of "decided heat." Many other features of this month conformed to my forecast.

A Chicago man proposes to attempt to reach the North Pole with an air ship next June.

Charleston recorded another earthquake shock on June 19 at Summerville. Concord, N.H., one on June 30th.

Mr. Brandenburg's *Signal Service Report* for May in Minnesota shows the dominant features of that month to have been abnormally high temperatures, and a deficiency of precipitation in the southern counties. The mean barometric pressure was slightly below the normal, the min. being 29.000 at Rochester, and the max. 30.586 at Grand Forks. The mean temperature was high and the max. very high; viz: Sherburne and St. Vincent 96°, Moorhead 95° 5', Spring Valley 95° and Grand Forks 93° on 10. The minimas on 17th were: St. Vincent 24°8', Moorhead 25°1' and Grand Forks 26°. Mean for the State, 61°7', or 2°8' above May 1886, and 6°9' above May 1885. Killing frosts occurred on the 2-3 and 16-17. The average precipitation for the State was 1.78 inches.

A marked copy of the *Rural Vermonter* reached me recently. In it is an article headed "Weather Predictions," which I have been asked by a subscriber to answer. My reply is, that governments spend millions of dollars annually to support their weather bureaus; that it would never do to let us private weather men get too much credit; that, in consequence, a stock editorial with certain stock arguments has to appear every now and then showing what puny grovellers we private men are, and what high and mighty things have been done—or will some day be done—by the paid prophets attached to the government bureaus. The whole article is a very antiquated meteorological "chestnut," the result of ignorance, spleen and envy. Such have frequently appeared before and been answered.

A Lunar Rainbow was seen at Montreal on the night of July 6th. How many of my readers have seen one? I missed seeing this, and have not yet been fortunate enough to behold more than a fragment of one. This was several years ago, in England. The phenomenon seems either to be far more rare than the Solar Rainbow, or, owing to less people being out at night, is much less frequently observed. Prognostics of immediate weather—according to Simmonite—may be made from this appearance. He says that the Lunar bow indicates a continuance of unsettled weather, the air being nearly saturated, boisterous weather is about to follow. He instances several cases where Lunar Rainbows having been noticed, long spells of tempestuous weather followed.

Auroras in Summer usually follow or accompany a great change, frequently a fall in temperature; coming as they do in the hottest spells, after storms and heavy precipitation. They may, in consequence, generally be held to herald a cool spell.

Gen. Banks is a close observer of weather changes. He wrote, June 23, "I have noticed that heated terms generally appear at the beginning of May and about the end of June. I have known in Albany the hottest weather of the whole year early in May, and almost without exception no hotter weather in the year than late in June. From the 19 to 25 your forecasts have been correct and I shall not be surprised to see the last week in June the same, with the usual hot spell." That Gen. Banks as a forecaster of "hot spells" is a success, is now a matter of history.

In another letter he remarks: "I am glad to see that your Association is flourishing, but disgusted to think that there is any difficulty in your getting subscribers for your paper. I am sure, however, that this difficulty must disappear in time. One gets discouraged waiting sometimes. I hope to hear that the subscription list is full before many days. Everyone that I have sent ASTRONOMY AND METEOROLOGY to is pleased with it."

KEEP COOL.

It is all very well to say "keep cool" but how is it to be done? First keep your mind from thinking about the heat. Do not talk about the height of the mercury more often than you can help, as a great deal depends on the mind. Second, eat little meat, the less the better, as it is heat producing. Third, don't drink too much cold, or iced water, as it only retards digestion and keeps the body in an uncomfortable condition. Instead of drinking when you get hot, bathe as often as you can. A very simple remedy is to let the tap run on one's wrists. Last, but not least, eschew alcoholic liquors in every shape. No one can be cool who "drinks." I see this verified in the plainest manner every day. Sunstroke statistics also prove that it is the drinker of stimulants that first succumbs.

HOLIDAYS.

Summer vacations are a necessity, especially to those who are herded in cities the rest of the year where the rush, hurry, excitement and fever of life and competition wear men and women out faster in ten days than their grandfathers and grandmothers were worn out in five hundred. But the Summer vacation must be judiciously chosen, or it were perhaps as well let alone. There are many people who do not know where or how to spend a vacation when they get the opportunity. Some work harder than ever, and come home "all broken up" instead of having "renewed their strength like the eagle." Some are not happy on mountain, sea beach, lake or hillside unless all the cumbersome appliances of civilization are there too! This is a great mistake. It is a radical change that is wanted. The accountant should not only leave his figures and calculations behind, but should not even question if two and two make four. The author should shun books and newspapers as if they were poison and read from nothing but nature's volume. The public speaker must not talk above a whisper, else the fish will not bite or the game will escape. The man used to toil with his hands should exercise his legs—let him go on a walking or bicycle tour—and he who is continually emptying the chambers of the "golden bowl" of his brain, should stop thinking and take to rowing, mountain climbing, horseback exercise; why two or three weeks' farm labor, if he does not work too hard, may have the effect of adding five years to his life.

SOUTH CAROLINA NOTES.

South Carolina has, it seems, much to be thankful for this year. Not but what it is time things took a turn, because, less than a year ago, repeated and disastrous earthquakes did untold damage there. This summer, all the crops have done better than for the past five years; corn, oats, wheat, rice, sorghum, potatoes, cucumbers and tomatoes being reported far ahead in yield. Farmers and truck growers are, in consequence, jubilant at the prospect, and not disposed to complain even of the extreme heat which has visited them. The promised temperatures of over 100° in the shade for July and August, which I spoke of as likely in my summer forecast, do not, in consequence, trouble the farmers there, especially as they have already touched three figures and survived. In Charleston, on June 10th, the mercury rose to 97°, and a short way out, at Mr. Moore's, it reached 100°. The three previous days had been very hot, with shade temperature from 92° up. In July, 1883, Charleston recorded 104° one day and will likely do as much this year before the Summer is over. The recent heat was followed by cloudy, cool weather—just like Fall—on 11-12. At Columbia, S.C., it was the hottest for three years, the mercury touching 97° in the shade, and that in a draught. The mean temperature of the 10th at Charleston, Augusta, Pensacola and Galveston was 80°. Another hot wave was recorded from the 17 to 20. At Columbia it was 97° on 17; 99½° on 18, and 100½ on 19. In some houses the mercury touched 105° and foliage in places was scorched as by fire. "There will not only be hot waves, but seas, oceans of heat," read my Summer forecast printed last April. Latest reports are to the effect that a streak of heavy rainfall has struck this State.

Correspondence.

All letters should be addressed—"Walter H. Smith, 31 Arcade Street, Montreal, Canada." For a personal reply enclose stamp.

CONDITION OF VENUS — THE DANSVILLE MAN'S THEORIES.

[20.] 1. I have been thinking of the planet Venus a good deal lately, and have about concluded that it is in the same condition that the Earth was before the advent of man, viz. a thick atmosphere causing darkness on the planet—you know we cannot see its surface as we do Mars and the Moon. After a while, when it cools, its atmosphere will change and life—perhaps human—will appear 2. The Dansville man is "decidedly off" on one or two things, still there should be no doubt as to our future world having an atmosphere—without it there would be no sound. Revelations speak of a new "heaven" (atmosphere) and a new "earth." This is not our present firmament and dry land, I take it, but a great globe and its atmosphere.

Omaha. E. F. Test.

Ans.—(1.) My opinion coincides with yours. The planet is, we may fairly presume, as much "younger" than the Earth as Mars is "older" in the stage of planetary existence. It is my ambition—should "Seybold Melvin" meet with sufficient encouragement, and Astronomy and Meteorology pay actual cost—to write an Astronomical Romance on "The World of Venus," to follow the one on "The World of Mars." Unless I get another 100 subscribers, however, there will not likely be any issue of Astronomy and Meteorology after March, 1888. (2.) On such subjects, we can of course only theorize, but what you say, has the recommendation of feasibility.

SIGNAL SERVICE PROBABILITIES—AN ANSWER WANTED.

[21.] I believe that a full and explicit account of the way in which the "Weather Probabilities," prepared at the Meteorological Offices are got up, would be highly acceptable to not a few readers.

(Rev.) G. B.

Ans.—Having only a "general" idea of "how it is done," I should be much obliged if some of my Signal service observers who are subscribers to Astronomy and Meteorology, would kindly send in "particular" answers to this query.

RELIABLE EPHEMERISES—SMITH'S PUBLICATIONS.

[22.] 1. Do you know of any reliable and correct publication giving the aspects and positions of the planets. Common almanacs differ sometimes as much as two or three days. By referring me to something correct, you will much oblige. 2. What publications have you for sale?

Trivoli, Ill. J. J.

Ans.— Most of the gratis almanacs are worthless as regards calculations, and are only useful to burn, or to keep as advertising sheets, for which purpose they are circulated. The so-called "astronomical and meteorological" portions are usually nothing better than a printer's hodge-podge. (1.) If you understand astronomical tables, signs and figures, the best work is *The American Ephemeris and Nautical Almanac*, [Bureau of Navigation, Washington, price $1.00]. Similar information prepared to suit the general reader will be found in *Smith's Planetary Almanac*, [31 Arcade Street, Montreal, current year 12c., back nos. 25c. each]. (2.) Astronomy and Meteorology, monthly, $1.00 per year in advance; *Smith's Planetary Almanac*, price 12c. each; Peck's *Handy Star Map*, showing over 2.000 stars, nebulæ, variable, double, clusters, etc., price $1.00.

TIME TAKEN TO CIRCUMNAVIGATE THE GLOBE.

[23.] Is it possible to make "a journey around the world in eighty days" as described by Jules Verne? If so, when was it accomplished?

Mass. J. B. K.

Ans. — Undoubtedly. The journey has recently been made under 70 days. From London, Eng., to Auckland, N.Z., via Suez Canal, took 39 days and from San Francisco to London 15 days. The S.S. "Alameda," from Sydney to San Francisco, via Auckland, occupied 23 days 6½ hours, the fastest time on record.

WHY METEORS FALL AFTER CANNON FIRING.

[24.] During the war, when much firing of heavy cannon was carried on at night, I have many a time sat and watched the flash of a gun, some five miles away, and just after the report would reach me, I would see a meteor or falling star shoot across the sky. Sometimes the meteor would burst with a loud report. Sometimes without noise. The report or concussion of the cannon appearing to me to have jarred out of the atmosphere these meteors or shooting stars. Could these meteors have been caused by electricity in the atmosphere, being jarred out by the concussion of the cannon? My observation was not confined to one night—but *many a clear night* during that trying time. The theory that rain follows the firing of heavy cannon I also noticed and I am a convert to that theory.

Charleston, S. C. H. M. Simmons.

Ans.—The cause in this case may be similar to that which is supposed to cause the fall of meteorites prior to severe storms. The atmospheric waves in both cases probably became agitated sufficiently to draw down or suck in meteorites from above the atmosphere.

WORKS THAT TEACH ASTRONOMY.

[25.] I wish my son to obtain the rudiments of astronomy. Please state what books, etc., you would recommend and their price.

Montreal. Subscriber.

Ans.—*The Heavens Above*, by Gillet Rolfe (W. Drysdale & Co., Montreal, price $1.50) is a very useful handbook. As a guide to the constellations get Burrit's *Geography of the Heavens* which may be used to advantage in conjunction with my *Handy Star Map* (Walter H. Smith, Montreal, price $1.00). As a general instructor, and for current astronomical literature, you have my Astronomy and Meteorology and *Planetary Almanac*. The cost of the whole would be about $5.00.

BAROMETER AND ATMOSPHERE.

BY THOS. BIRT, UTICA, N. Y.

The ever-varying weight of the atmosphere shows with the constant rise and fall of the barometer. Prof. Espy says: "as soon as one storm is over, nature begins to prepare for another, and so in general, the longer the preparation, the more abundant the result." Here, then, is the ever varying cause of the barometer's rise and fall, but not the main one. The mercurial column gradually rises from one storm to another, and then suddenly falls. Some other cause must modify these sudden changes in the barometrical column. I am acquainted with some meteorologists who have hinted that vapor does not add to the weight of the atmosphere. The barometer often remains stationary for days together, and then makes rapid changes.

The heat from the sun, and not the moon's gravitation, must be the cause of the atmosphere's disturbance, certainly it sets the wind in motion. Its heat often proves less intense in varying localities, and that heat is modified by the clouds above and the surface of the tract below. That grand luminary goes on augmenting centres of disturbance, throwing into commotion vast regions, and causing all the barometerical changes peculiar to our climate. Vapor may modify, but the winds caused by heat break up all its regularity, and leave matters in seeming confusion. This atmospheric commotion may be compared to ocean waves, and the barometer, like a vessel, must rise and fall.