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Astronomy and Meteorology.

No. 7.

MONTREAL, OCTOBER, 1887.

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Astronomy and Meteorology.

PUBLISHED MONTHLY BY
WALTER H. SMITH,
 31 ARCADE STREET, MONTREAL, CANADA.

One hundred subscriptions are still needed to pay cost of printing. Is it the intention of my friends that I should publish this paper at a loss?

Astronomy.

The average duration of a sun spot is from two to three months, but a spot is recorded that lasted eighteen months. Some spots only last a few hours.

Mercury's apparent diameter varies from five seconds to twelve seconds; that of Venus from ten to sixty-six seconds; Mars from four to thirty seconds; Jupiter from thirty to fifty seconds; and Saturn from fourteen to twenty seconds. The order, according to greatest apparent brightness, is therefore: 1, Venus; 2, Jupiter; 3, Mars; 4, Saturn; and 5, Mercury.

From the above it will also be seen that Jupiter, when least bright, is still more brilliant than Saturn and quite equal to Mars when brightest, that Mars is the dimmest of all at apogee, that Mercury at his best is a little brighter than Venus at her worst, and nearly equal to Saturn when the latter is nearing conjunction, and that Venus at her best is more than twice as bright as Jupiter at his worst or Mars at his best.

The stars visible to the naked eye between the North Pole and the thirty-fifth circle South of the Equator number about 3,400.

Mars is the only superior planet that has appreciable phases. At quadrature he appears slightly gibbous.

Viewed in its relation to the other stars, our sun belongs to the smaller or inferior order. As a sun, *Sirius* is thought to exceed our heat giver in volume about one thousand times.

If 100 be taken to represent the amount of light that reaches the earth from a star of the first magnitude, then the light from a star of the second magnitude is equal to 25, third 12, fourth 6, fifth 2 and sixth 1. Stars of lesser magnitude are invisible to the unaided eye and are denominated "telescopic stars."

The lunar day is twenty-nine times and a half as long as the terrestrial day. Near the moon's equator the sun shines without any intermission for nearly fifteen days, and is absent a similar length of time.

The evening skies are now bare of visible planets. Jupiter is too near the sun, and Venus, Mars and Saturn are "morning stars."

The distance of a star with a parallax of one second would be 206,265 times the distance of the earth from the sun, or some nineteen million million miles. No star is nearer than this.

Saturn's ring system, at present so well defined and nicely opened that a glass of very moderate power suffices to show it, is gradually closing up as viewed from the earth and will be turned edgewise to us in 1892-3, when the best telescopes will lose all trace of it for a time.

OCTOBER CONSTELLATIONS.

At 10.30 p.m. on October 15th *Ursa Major* is due north at its lowest elevation. Beneath *Polaris* is *Ursa Minor* and between the two Bears *Draco*. *Cepheus* is above *Polaris*, and *Cassiopeia* almost directly overhead. *Gemini* is rising in the North-East, and above it is *Auriga*. Due East, *Orion* is just rising, with *Taurus* and *Perseus* between it and *Cassiopeia*. South-East are *Cetus* and *Eridanus* and above these, on the ecliptic, *Pisces* and *Aries*. Almost due South, and near the horizon, is *Fomalhaut*, the leading brilliant in *Pisces Australis*, and above it is first *Aquarius* and next *Pegasus*, whose "square" is on the meridian, with *Andromeda* to the East of it. South-West, on the point of setting, is

Capricornus, and due West, approaching the horizon, *Aquila*. Above *Aquila* is *Cygnus* and *Delphinus*, and between *Aquila* and *Pegasus*, the small asterism *Equuleus*. North-West is *Lyra*, with *Ophiuchus* below it, and skirting the horizon in that direction *Hercules*, *Corone Borealis* and *Bootes*.

THE OLBERS-BROOKS' COMET.

In reply to a letter asking for the position of his discovery on August 25th, Mr. W. R. Brooks forwards the following:

T=1887, October 6.480, Greenwich Mean Time.

| Greenwich Midnight. | R.A. | | | Decl. |
|---------------------|------|----|----|--------|
| | h. | m. | s. | |
| September 2 | 9 | 8 | 44 | +30 2 |
| 6 | 9 | 27 | 4 | 30 11 |
| 10 | 9 | 45 | 48 | 30 13 |
| 14 | 10 | 5 | 0 | 30 5 |
| 18 | 10 | 24 | 32 | 29 49 |
| 22 | 10 | 44 | 16 | +29 23 |

Accordingly, the comet first appeared in *Cancer*, entered *Lynx*, and crossing the foot of that constellation was in *Leo Minor* by Sept. 6th, and, at time of writing (Sept. 15), is almost directly North of *Regulus* in *Leo Major*. Dimness, growing daylight and strong moonlight, thus far, have made it a hard object to find with an ordinary telescope.

STAR SWEEPING.

Although all the planets are away, good work may now be done on moonless evenings by the amateur possessed of an ordinary telescope. It is best to wait until all the twilight has faded out of the sky, say until about 8 o'clock. True, we have not yet the winter constellations, but many of the grandest revelations of the telescope are within reach. For what astronomer is there that ever grows tired of viewing double and triple stars, gorgeous star clusters and hazy nebulae? How beautiful is *Mizar* in *Ursa Major*, with its companion star, and *Alcor* and the other visible in the same field! Then there is *Polaris*, with that faint little twinkler just above it; and for clusters, all one has to do is to sweep the regions adjacent to the Milky Way, in the neighborhood of the constellations nearly overhead, where such sights as the magnificent cluster in the sword hand of *Perseus*,—where the stars are literally powdered over the whole field,—and the nebulae in *Andromeda* will swim into ken. Low power eye-pieces are best for star sweeping.

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 XII.

A DECREE OF EXTERMINATION.

Happy indeed are those not so bound! Not that I would wish them to undergo my experiences, which have had much more of the bitter than the sweet in them; but because, whenever man succeeds in shaking off the trammels of custom and revelling in the natural, he approaches nearer the Infinite. It is only then that he hears and sees:

"Sermons in stones, books in running brooks,
And good in everything."

At least I found it so. The farther I got from the world of fashion, conventionality and folly, the nearer I drew to nature and truth and my life became happier and more worth the living. For you must not suppose that utter loneliness possessed me when on earth. True it is that I, like the sound sleeper and adventurous dreamer spoken of by Lytton, lived a real life in my sleeping, and an artificial life in my waking moments—being now a part of Mars rather than a portion of the earth—yet, for all this, I was not out of tune with nature. Her great heart-beats were still of essential interest to me, indeed I was fonder than ever of natural objects, being now better able to understand them.

That every starlit evening saw me in my observatory, focussing the ruddy planet, can readily be understood. Who, indeed, could have foregone my opportunities,—opportunities such as were never before enjoyed by mortal,—of roaming over another planet in company with so learned and accomplished an instructress as Myrina. I remember on one of my visits that I again alighted a considerable distance from the Am-ram mansion, and in proceeding thereto the thought struck me that I had, thus far, discovered no traces whatever of factories. There were granaries and store-houses in plenty, boats, cars and balloons to any number arriving and departing filled with crude products or manufactured articles, but no place where the latter were produced. My curiosity was aroused, and on arriving at the Am-Ram mansion almost the first question I put to Myrina that day was a request for an explanation.

"My best explanation would be to accompany you either to our Arctic or Antarctic regions, where the matter could be explained entirely to your satisfaction," was the strange answer made me.

"If so, I should like to visit your arctic regions, if possible," I replied.

"But that is impossible when your usual brief stay is taken into account," remarked Myrina. "Even supposing you descended on the country in question, the time at your disposal would, under the circumstances there obtaining, be too contracted."

"I not only wish to witness your manufactories, but to ascertain of what materials your thickest garments are made. This puzzles me somewhat, as, thus far, no living creature, except of the Martian human race, have I yet been able to discover. But perhaps you have herds of tame animals, similar to our sheep and alpaca goats, in other parts of your globe."

"No, we have not. There is scarcely a vestige of animal life left at present. As you know, we are not flesh-eating, and were not obliged to permit animal life to exist to secure food. As for our dress; supplied with plants whose fibres are warmer, when carefully woven, than any animal fur extant, we had no need to propagate animals in order to obtain clothing. But, nevertheless, ages ago, this planet teemed with varied forms of life, even as yours now does; for in those days Mars had a much warmer, much moister atmosphere, and room, as well as food, existed for all. But slowly, steadily, surely, the cold zone grew broader and broader, forcing habitation within less and less space, the possibilities of existence grew ever less and less, until our animals became burdensome, their daily consumption of food could not be spared and just what was best to be done became a serious question, debateable by the general council.

"In any crisis of grave import it is here customary to call a council or general representative assembly, not so much to decide on what shall be done, as almost everyone—as you know—is gifted with foresight, but to take the actual vote and discuss the various opinions on the subject in hand. Ruling, as we do, without kings, princes or high-priests, for each individual here is personally in direct relation with the Ruler of the Universe and needs no intermediary, it is, of course, impossible that all should join in a discussion of this kind. It is, therefore customary, Mars being divided into districts of almost equal population, to choose and send a delegate, even as you choose and return delegates to your councils, synods and assemblies on earth. Your parliaments and your congresses meet in your capitals. We discountenance the crowding of people into cities, and therefore have no capital city. But, as the Jews had their temple of Zion, the Egyptians their temple of Isis, the Greeks and Romans temples to Jove; even as your Mahomedans look to Mecca, and your Catholics to Rome, so we have one place consecrated above the rest, a holy temple, a meeting place for all, set

apart by nature as well as man from the rest of the world,—your astronomers know it, you must yourself have seen it in the telescope, standing out plain and distinct in the midst of De-la-Rue ocean."

"White Island?"

"The same. But more of that anon. The council of which I speak decided that a law of utter extermination against animals was the one thing needful. The law was enacted, the council dispersed, and a thorough destruction of animal life systematically began. Not only were the wild animals, from the least to the greatest, from the smallest insect to the greatest aquatic mammal destroyed, but those termed 'domestic' also. Of course, many a subterfuge was resorted to by people to preserve the lives of their pets, but in the end, the clearance proved successful and thorough."

"But it must have taken a long time," I remarked.

"Why so?"

"That is, if you killed everything, insects, reptiles, fish, etc."

"Everything living but mankind was destroyed, and it did not take very long. A month or so probably."*

I was astonished and showed it.

"Why," I said, "we could not so much as commence a general war of extermination on the earth in so short a time. It would take a couple of years to gather a general council together from all civilized countries, much less to decide and act as well."

"I dare say, but we are one people and act as such, not as five hundred nationalities, all jealous of the rest. Besides you have not the approved appliances for destruction that we have. Why a dozen neuters here, under the direction of a competent captain, and all armed with electrical staves, could destroy more things in a week, animate or inanimate, than a fleet of your heaviest armed warships in a month. Suppose, for instance, a drove of antelopes was seen, say twenty miles off, and our company of twelve neuters and a captain wished to destroy it. The animals would first be mesmerized, that is, forced to approach their destroyers, even against their will. When sufficiently close, they would be made to halt, and one touch with an electric staff would tumble the beasts over. Small fry, such as ants, spiders, winged and other insects, were magnetized in a similar way, we took no pains to find them, but willed that they come to us. There was no need to hunt anything to death. As for the denizens of the ocean, we arranged numberless batteries beneath the surface, and by continuous electrical discharges from vessels sent into all parts, pretty nearly everything mortal was destroyed."

* A Martian Month, it should be remembered, is nearly twice as long as a month on earth.

(To be Continued.)



Weather Forecast.

OCTOBER, 1887.

My general impressions of this month do not differ greatly from my *Almanac* "general forecast," printed over a year ago. In fact, one of the beauties of forecasting by Astro-Meteorological rules is, that revision is seldom necessary. But that one can dwell at more length on the probabilities of an approaching month two weeks beforehand, than one can two or three seasons ahead, goes without saying. October, 1887, I take it, will be somewhat more of a "winter" than a "fall" month. It will be pretty full of cold, wet, "wretched" weather, with snow and sleet falls. There will be generally wintry weather about the middle. Snow-falls in Northern and North-Western sections will begin even earlier than this, say by the 6th or 7th. Intermixed, will occur hot weather for the time of year, glorious brief spells of "Indian summer." Killing frosts are probable as early as the first week. Heavy rains in the West and South seem very likely. The storm periods of October are likely to be of marked severity. People who think they know all about the weather will say that the winter has set in before October is out, and will predict in consequence a severe, cold winter, with heavy snows. They will be mistaken, however, just as they were when the cool days at the close of August led them to talk of an early fall and a cold September. Fact is, September has been a generally fine warm month, with—up to date (19th)—an absence of marked disturbances, exactly as anticipated. My forecast by weeks is as follows:

October opens cold and frosty N., cool in the S.

First week, Oct. 2 to 8: Killing frosts in Northern and Middle sections—Dark, cold weather about 6th and 7th, with high winds and heavy precipitation in places; rains general (snow probable).

Second week, Oct. 9 to 15: Misty, mild—Brief period of "Indian summer" weather—Cloudy and stormy again, rainy and cold—Unsettled at the close, with general wind, rain, hail and snow.

Third week, Oct. 16 to 22: Hot weather for October, quite a summer-like

spell—Cloudy and dull—A cold change—Killing frosts about 20th, 21st and 22nd, according to locality.

Fourth week, Oct. 23 to 29: Milder, with thick atmosphere and a storm period—Cool, fine and frosty—Close of week rainy, sleety and windy, with low temperatures for the season.

Close of month: Very cold and stormy, winter-like, sleet and snow N., rains S.

NOTES.

I have prepared more lengthy forecasts for my 1888 *Almanac* than for any previous issue. The "general forecast" embraces an amount of information alone worth many times the price of the book.

Very cold weather; an abrupt entry of winter, at the close of November and entry of December, 1887.

Heavy precipitation during October this year. Similar in quantity to that of 1885.

Amongst those contributing special articles to *Smith's Planetary Almanac* for 1888 are: Messrs. A. J. Pigeon, Thos. Birt, E. F. Test and Rev. P. C. Lawrence.

In Canada, the Eastern and North-Western States, late fall ploughing, well on in November, will likely be in order this year.

The effects of that ecliptic conjunction in August, 1886, cost Charleston in repairs to properties alone \$3,550,000.

"I have kept a daily record of the weather. Your forecasts are very accurate, and to farmers should be priceless," is how one correspondent in Minnesota puts it.

"We appreciate your valuable work, and frequent reference has proved your forecasts of the weather generally correct," is the unsolicited testimony of Mr. D. S. Barriger, Vice-President of the Omaha Elevator and Grain Co., in a recent letter to the editor.

The first wild geese flying southward passed over Montreal on the morning of Sept. 21st. There is a good deal of nonsense accepted as gospel with regard to the flight of birds and the changes of the weather. Birds and other animals are simply gifted with instinct, and can have no knowledge whatever of a season in advance. They take their cue from their immediate surroundings. These birds indicated something, however. They showed us that away North, beyond the reach of the telegraph, cold weather had occurred, doubtless with snow, driving them South. Had this occurred earlier they would have come South earlier. Again, the remaining of arctic birds in Southern latitudes shows the winter North to be a severe one, else they would not stay, and the absence of arctic birds during winter, even though our winter may be severe, should be taken as an indication that the winter further North is a comparatively mild one.



Association.

Ere another number is issued the Astro-Meteorological Association will have got to active work again for another season. As already intimated, the season will likely be a very prosperous one. I am pleased to state that several well-known Montreal names have been handed me for proposal as members.

Although impossible, with such a limited membership, to arrange what papers shall be read a season ahead, I am able to announce what is already promised. At the opening meeting, which is really the closing session of our financial year—the Association dating from Oct. 29, 1884,—Mr. A. J. Pigeon will read a paper of great interest on "The Great Pyramid," dealing specially, of course, with its relation to the Astronomy, not only of the earliest, but more modern times. On October 25th, I have been requested to lecture on "The Worlds Around Us," in Association Hall here, the lecture to be one of the winter course for young men. It will be ably illustrated with slides by Mr. Pigeon. At the fourth annual meeting on November 4th, the reading of reports, election of officers, president's address, and other usual business will be in order. Promises of papers on different subjects have been received for meetings later on from several members, and it is hoped that large audiences will be the rule. The rent of the room has to be paid whether associates attend or no, and a full house is always preferable to an empty or half empty one. The meetings this season will be held at the same place, viz: the Fraser Institute, Dorchester Street, Montreal.

The regular meetings for the season of 1887-8 are: Oct. 7th, Nov. 4th, Dec. 2nd, Jan. 6th, Feb. 3rd, Mar. 2nd, April 6th and May 4th. That is, provided it is not decided to alter the meeting night from Friday to Tuesday evening, of which there is some talk at present.

Vice-President Mansill writes that he has finished the book on which he has been laboring for some time, entitled "A New System of Natural Science." He

further states that he reads *ASTRONOMY AND METEOROLOGY* with much interest, and hopes that it will prove a financial success.

Since last issue I have purchased the Bowles Newtonian reflecting telescope. This instrument was constructed by Mr. Bowles in 1884. The mirror is of silvered glass, $8\frac{1}{4}$ inches clear aperture, and the focal length of the tube is six feet. The mirror and diagonal are from the well-known optician, J. A. Brashear, of Alleghany, Pa., maker of the great Lick spectroscope, the Warner Observatory spectroscope, the concave grating spectroscopes of Vienna and Paris Universities, the 20-inch mirror of the Alleghany Observatory, and many other fine optical instruments. The eye-pieces are from Dolland, of London, with powers of 175, 250 and 360. My purchase is mounted on a revolving stand, with open lattice work tube and brass finder, has screw focussing adjustment, and is altogether a very serviceable instrument. Knowing its capabilities—for I tested it with its former owner several times, and found it do better work than the college six-inch refractor here—I have no hesitation in anticipating that it will do some good work. Tests on the moon, *Polaris*, some few other double stars, the great cluster in *Perseus*, etc., have already delighted me, albeit that the mirror and diagonal badly need re-silvering. But Mr. Brashear says that his mirrors may often look worthless, and still be capable of doing good work. This is certainly true in the present case.

It is my intention during the winter and spring to have certain evenings for observation with associates and their friends. As for instance, "a night with the Moon"; "a night with Saturn"; "double Stars and Nebulæ"; and, towards the close of the season, "a night with Jupiter"; when actual observation may be supplemented by conversation, each member telling what he knows of what is observed, alongside the eye-piece. These evenings would not, of course, interfere with the regular monthly meetings of the Association.

Associate Logan writes me a long, interesting letter from Hawaii. Taking an active part in the recent bloodless revolution there, his account of the shameful doings of court and court-officials go a long way to prove that a revolution was absolutely necessary. What is of perhaps more interest to us he states that the editor of *O Luso Hawaiiano*, a Portuguese paper there, has been predicting weather from the forecasts in *Smith's Planetary Almanac*, and the forecasts there prove remarkably correct. Now, is not this a grand proof that the science of planetary meteorology has its foundations laid in truth? If not, why should the anticipated conditions follow at such widely separated spots as Canada and Hawaii?

Meteorology.

August, 1887, at Montreal, gave a mean temp. of $65^{\circ} 94'$, as compared with $67^{\circ} 49'$ the mean for 13 years. Max. temp. $87^{\circ} 9'$ on 4th; min. $49^{\circ} 6'$ on 25, a range of $38^{\circ} 3'$. Rain fell on 9 days to the extent of 1.72 inches, as compared with a mean of 2.44 inches. Highest bar. reading 30.342 on 31, lowest 29.653 on 18.

Mr. Birt reports August at Utica, N.Y., as giving a mean temp of $61^{\circ} 99'$; max. 93° , min. 28° . Rain seems to have fallen on only 4 days.

Mr. Horne reports from Melvin, N.H., that August entered hot, falling to 46° by the 14th. Rain storms along the middle of the month, which ended showery.

Mr. Brandenburg reports July in Minnesota to have given an excess of temp. Tornadoes on 25, 26 and 29 did some damage near Moorhead. Average temp. for the State $72^{\circ} 4'$ or $0^{\circ} 2'$ and $1^{\circ} 5'$ above that of the corresponding month of 1886 and 1885. Highest temp. 101° on 15, lowest 37° on 23.

His report for August shows the month to have been characterized by a temp. below the normal, and a deficiency of precipitation. The first general frosts occurred on the mornings of the 24-25. Tender vegetables were nipped. The mean temp. was $65^{\circ} 3'$, or $2^{\circ} 2'$ above the corresponding month of 1885, and $4^{\circ} 7'$ below that of 1886. The average precipitation was 3.04 inches, or about half an inch above the corresponding months of 1885 and 1886.

July in Canada was remarkable for unusually dry, warm weather from the lakes eastward. The average temp. was above the normal in Ontario, Quebec, New Brunswick, Nova Scotia and Manitoba. In British Columbia and the Gulf of St. Lawrence it was slightly below. In many parts the drought ruined the crops, wells ran dry and the trees resembled October instead of Mid-summer. Max. temp. 102° at Chatham, Ont., on 17; min. 31° at Kilnap, Assin., on 12.

August in New Jersey gave a deficiency of heat of $1^{\circ} 26'$. The max. was 94° at Salem on 6; min. 42° at Hanover on 27. Rainfall below the average.

Mr. Barnard reports August in Vermont a disagreeable month. Haying did not begin there till August, and many farmers did not finish before September.

Mr. Wood, from Wisconsin, reports August with a max. temp. of 94° at Shawano on 1, and a min. of 56° on 22. Comparative mean temp. and rainfall for four years as follows, except for 1884, when the rainfall was probably over 5 inches:—1887, $76^{\circ} 10'$, rainfall $3\frac{1}{2}$ in.;

1886, $79^{\circ} 17'$, rainfall $4\frac{1}{2}$ in.; 1885, $74^{\circ} 22'$, rainfall $5\frac{1}{2}$ in., and 1884, $77^{\circ} 14'$.

Mr. Downing reports from Concord, N.H., for August: Mean temp. $66^{\circ} 2'$; max. $85^{\circ} 5'$ on 1; min. 46° on 28. Light frost on latter date.

Mr. Parker reports from New Brunswick my July and August forecasts fully verified. Uncommonly dry and extremely wet weather in sections of that province.

St. Johns, Nfld., and St. Pierre Miquelon and adjacent coasts experienced a furious gale on August 26th. The hurricane came from the West Indies, where it did great damage on the 24th.

Manitoba now estimates her surplus crop of wheat for export as about 6,000-000 bushels.

Parts of West Virginia suffered severely from drought during August.

Immense bush fires have been ravaging extensive districts in Ontario during September. The forecast, it will be remembered, called for such.

The old idea that rains follow railway lines has been heard from again, this time it is in Mexico. Serious washouts have occurred along the Mexican Central Railway in a section where the country was very dry, in advance of the building of the road. The idea is, of course, that the rails attract electricity, which brings the rain with it.

The water in the St. Lawrence, Ottawa and tributaries has been very low this September.

Wisconsin is said to have got the worst of the drought this year. About 75,000 acres, it is stated, were left about as barren as the Desert of Sahara.

Shocks of earthquake were felt at Savona, Italy, on Sept. 4. But little damage was done.

Newfoundland was the scene of another great gale on Sept. 17. Bonavista Bay after the storm presented a dreadful scene, wreckage, timber, masts and other debris being strewn indiscriminately about the place. Twenty fishing vessels were driven ashore, and several others sunk at their moorings.

A very large meteor was seen at Halifax and adjacent parts of Nova Scotia on the night of Sept. 15. It is described as bursting into fragments ere it reached the ground, and to have left a long luminous train behind.

The "equinoctial" this year started from Western Cuba on Sept. 16 and moved forward, reaching the Central and Western gulf coast on the 19th. The low pressure out seaward caused a strong wind to blow from the North-West and West over the St. Lawrence and Lake region on the 20-21, which was followed by heavy showers over the St. Lawrence valley.