

NOYES.(I.P.)

— RED-SKIES —

1884.



METEOROLOGY.

RED SKIES.

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It is doubtful if anything ever created a greater commotion in the scientific world than the red sky so conspicuous the past year. The scientists almost to a man seem to have found, for them, a reasonable solution therefor in the *dust theory*—dust either from meteors or from the volcano at Java, which occurred the latter part of August, 1883.

I, as a student of the Weather-Map, take exception to this *dust theory* and maintain that this delicate redness in the sky is the result of the presence of a minimum quantity of moisture in the air—and that water and not dust is the cause, and that it is not peculiar to times of meteoric showers or volcanic eruptions, but to those conditions which we term high-barometer, when there is the least possible moisture present in the atmosphere.

The objections to *volcanic dust* and *meteoric dust* are not altogether the same, yet they are similar and in some respects identical. First, as to *meteoric dust*: in the absence of any remarkable display of meteoric showers it could not be from near meteors; and had this phenomenon produced any such effect the dust producing it would have been so plenty all over the surface of the earth as to have left a such mark, or evidence, that it would have been useless to deny that it had occurred, and there being some possibility of this red-sky effect being produced by it. But then showers of meteors as a rule are not so universal in their distribution; they are more apt to be local; and when they do occur they are plainly seen. So this would seem to shut out near or local meteors.

It may be claimed that it came from his distant meteors within the orbit of the earth; that as the earth came around to their point the whole atmosphere would then be affected. In this case the dust would have been so far away that it would have made no difference as to time of day when, with a clear sky, it might have been seen and its effect noticed. It would not have been necessary first to have the Sun go below the horizon. At so great a distance the Sun would shine through it, equivalent to us, perpendicularly to the plane of the earth. This being the case it ought to have given, if *dust would give such an effect*, a rosy tint to the sky at all hours of the day. Again, this effect would only have been for a short time when the earth was passing the locality of these supposed meteors; and then from this distance we would either have had an abundant supply of dust to gather as evidence, or there would have been none at all to have been examined by a microscope; *i. e.* there would be no “half way doings” about it.

For these reasons, and other reasons to be mentioned, I do not believe that it could have come from meteors distant or near.

The volcano at Java, August 27, 1883, being the only *volcanic* dust claimed as having produced this effect, to that we will direct our attention. It is said that it was an immense volcano and that the world never saw such a phenomenon in this department before—it excelled all others—that the air for miles around was thick with dust and ashes; that the dust was thrown 3,000 feet! in the air. From the height at which the dust was thrown it would seem, to one not posted in modern meteorology as revealed by the Weather-Map, and as to the height that the clouds move, that 3,000 feet was a great distance. A monument 600 feet high would be extraordinary and of immense height, but what would such a height be beside a mountain six miles high? The highest clouds, it is said from good authority, move at an elevation of 23,000 feet, or over four miles, showing that the currents of winds are at least that high, and the chances are that they are even much higher. What is 3,000 feet to this? But, it may be asked what has this to do with it? If one will study the Weather-Map and note the storm-centres thereon—how they move, how they create the currents that gather the clouds, that produce the rain, he will see that these storm-centres are located over the world, from 1,000 to 2,000 miles apart, that they travel in belts and on all sorts of lines. That between the centre of the United States and Java there must be at least six of these centres on one line. We cannot, at present, for want of stations, prove how many belts there are between these points, but as near as we can ascertain there must be about three between there and here. At each one of these storm-centres the wind is blowing from all points of the compass, north, east, south and west, at the same time; and, as above stated, these storm-centres affect the movement of the clouds at least to the height of 23,000 feet, and the lighter atmosphere undoubtedly above this point. This being the case, it would be impossible for any material like dust or even a balloon, that could only attain the height of 3,000 feet, to pass over one of these centres or the atmosphere centering to them, and pass on to some remote part of the world. Before we had the Weather-Map we could not be blamed for thinking that our atmosphere followed the surface of the earth around as the water poured on a grind-stone follows the stone around, but it does not. The water on the grind-stone is no parallel.

This dust would be gathered by the first storm-centre within its locality, whether, east, west, north or south; and after it had reached the centre there would not be much dust remaining in the air to be passed on to some other point. It would be precipitated then and there. It might travel 1,000 or 2,000 miles, but would not get beyond that limit. But it is said that dust has been seen in the air and gathered, and is now held as testimony in the case. I have not the least doubt but what a *little* dust can be found in the atmosphere at any time, for the wind is always raising more or less, but this does not reach a very high elevation, at least independent of high elevations. It may be found on a high mountain, but that would be only relatively high.

The great Michigan fire in September, 1881, might be brought forward as evidence of extensive discoloration of the sky by smoke, then the query may be raised: if smoke may thus discolor the sky, why not dust?

If one will refer to the Weather-Map for that date he will see that on that day we had an area of low-barometer on a high line of latitude. The smoke effect took place in the track and within the influence of this "Low," and nowhere else; and it only lasted a few hours, in all about half a day. It did not continue on around the world, west as well as east, and continue for months.

We occasionally have a tornado. The dust raised from this source is local, but at times it spreads over a great extent of territory and fills the air with fine dust, and dust that ought to remain in the air as long as any volcanic dust from Java, and yet who ever heard of this dust for even one day producing a red sky? As to the properties of dust, it will not, even under the most favorable circumstances, compare with water in the power of refraction; as for its power of reflection it must be of very bright surface to produce much effect in this line. Water will produce such effects; the evidence thereof is daily before us; we have but to look at the clouds, at the ocean, and at the rainbow.

In meteorology we have high and low-barometer; the one may be termed the atmospheric-hill, the other the atmospheric valley. "Low" or low-barometer is the agent of the storm; the centre to which the winds are gathered. The clouds are being formed wherever there is heat and moisture; as the clouds are formed the winds carry them along towards "Low." On the surface of the earth this movement is from the "High" to the "Low," the result is that there is little moisture at "High," but then it is impossible to remove all the moisture from "High" and it is just the little, the minimum, which remains that produces the delicate pink or red sky. In the area of "High" there are few or no clouds present—the sky is clear. The moisture present is so thin that we do not see it when the sun-light is at right angles to the cloud stratum or moisture. It is not until the Sun is below the horizon, when, as it were, we see through this thin atmosphere edgewise, that the effect is produced; also in addition to this the Sun shines up underneath this delicate cloud formation and illumines the under side of it. This is well illustrated by a piece of glass; hold it so the plate or pane is perpendicular to the light and we see no color, turn it edgewise to the light and we have quite a strong green color. We also see this same general effect in the Moon, when it rises of a clear night, while at the horizon, when we see it through the lower stratum of atmosphere, through the atmosphere edgewise, it appears to be of a deep red color; when it has ascended to mid-heaven, if it is a clear night it is of a bright silver-white, yet it is the same Moon that at the horizon was a deep red. The Moon has not changed, it is only the different atmosphere through which it is seen that produces the effect. So there is no doubt as to the power or property of water to produce this phenomenon.

Those who have earnestly supported the dust theory have considered it conclusive that this red-sky phenomenon was seen in "foggy England," and yet a little further on they say that the atmosphere was the while "remarkably free

from moisture." A fact is of no value in an argument unless it effects the evidence. How nicely these two facts support the water rather than the dust theory. Seen in "foggy England," *but only seen when there was no fog in the air!* When it was clear atmosphere. Now they cannot have a clear atmosphere even in foggy England without the presence of high-barometer.

This redness may also be produced partly from artificial source. Let the air of an evening be quite thick with moisture; like what it is when the "Low" centre is off to a great distance; not thick enough for a fog but a slight presence of suspended moisture. Let this be over a city or where there is considerable light. The light shining on and through this moisture will produce the same general effect of redness.

The evening of June 12, 1884, in Washington we had a peculiar effect of red sky, only a part of the sky, a space of about 30° was of this delicate pink color, while the rest of the heavens was a delicate green. In the first place it is very queer if this pink or redness is caused by dust that the dust should be so peculiarly suspended in the air, and again that this dust should remain so many months thus suspended.

This peculiar line was evidently caused by the formation of the clouds below the horizon. We cannot prove this but it is the only reasonable cause, and is most reasonable.

Again on the evening of June 28, 1884, ten months from the time of the volcano at Java, we had in Washington, D. C., a most brilliant and magnificent display; the sky was clear, without a cloud; no grander display have we had than this. On all of these occasions the area of high-barometer has been over us. In addition to all this another important fact must not be overlooked. Even when it is quite cloudy, when "High" is upon or near us, this delicate pinkness will occur whenever there is a piece of clear sky, between the heavy cloud patches. This coloration is from the same cause as produces the extended coloring with a general clear sky, wherever there is clear sky, whether in patches or in mass, between clouds, or freedom of clouds, the effect is the same. When in small patches the effect is local, when in mass it is general. When this effect occurs, as to time, its strongest and best exhibition is when the Sun is some distance below the horizon; it shines up and illuminates underneath the vault of the grand dome of the heavens above us. The further the Sun is down, until it has passed beyond the limit, the higher up on this vault, or underside of dome, does throw its light. This is conclusive proof in itself that it cannot be the dust from afar; from distant meteoric-dust. If it was from near dust, and if dust could produce such an effect, the amount of dust that it would take to produce it would be of such a quantity as to leave its mark upon the earth, a mark that would not be overlooked or slighted.

In opposition to all these facts and impossibilities those who advocate the dust theory have only one point of importance, and that is they say that they have gathered some of the dust and that on examination the particles agree in formation with the particles from Java.

Now in any case of evidence where there were so many strong facts on one side and only one on the other would any jury in the land give a verdict against the side of many facts in favor of the one fact no stronger than any one of the facts on the other side? Would they not be apt to say, if this phenomenon is produced by dust, why not gather more of it—quantites of it—right here when the phenomenon occurs? When the phenomenon continues for month after month, and is so conspicuous and general would they not be apt to hold that this dust ought to be so thick in the air as to cause a universal discomforture therefrom; would they not be apt to require a sample of dust possessing such luminous qualities, not a mere grain or two but a *quantity*? I think they would at least demand this much if not more.

On the other hand there would be no difficulty in proving to them that this phenomenon occurs, every time, under certain conditions of the atmosphere; and only at these times. That moisture is thus suspended in the air, and that it has all the qualities to produce such an effect.

People not familiar with the Weather-Map cannot well appreciate the full force of this presence of delicate moisture. They may think it peculiar not to have it regularly, at stated times, and as much or little one year as another. But herein is one of the special beauties of this wonderful map. It shows us that nature is never twice alike. Here in the United States the year of 1883, as a whole was conspicuous for a prevailance of "High." What were the conditions over the rest of the world we cannot prove, as here, by actual observation, but if a certain condition is the cause of a certain natural phenomenon here it is safe to say that a like effect in other countries will be produced by a like cause, and more particularly so when we have all the indirect proof, sky and color, which is the natural result of this condition.

The areas of high and low-barometer travel around the world in belts. These belts vary in line and form and are never twice alike. The peculiar juxtaposition and course of "Low" and "High" is what makes the variation in our weather. A high "Low" giving us hot, dry weather with occasional local showers; "High" over us giving us cool, pleasant weather that does not require much moisture, for not much is used. In this case the moisture is not taken away, out of the ground, etc., and transported somewhere else, as with high—"Low" and southerly winds over a great extent of country. With "High" the sky is clear and quite free of clouds; there not being much moisture and heat to generate them, nor wind to bring them from afar. What moisture then is present is disseminated to such a degree that the direct rays of the Sun, at right-angles to the earth, does not reveal its presence; it is only when the Sun is below the horizon that its presence is realized.

If this phenomenon is caused by dust it would seem that we ought to have the supply of dust replenished quite often, but we have had no new supply and yet the phenomenon continues.

Unfortunately the Weather-Map is a new thing and the scientific world therefore knew little or nothing about it. Hence it is not surprising that they should

have been thus misled by this great eruption at Java, but now that the phenomenon continues it seems most absurd to hold on to so unsatisfactory an explanation, when we see the many facts that can, mostly through the Weather-Map, be brought to disprove it. This dust theory may have answered very well, like the absurd theories of the weather prophets, for years gone by but for the present, with the light of the Weather-Map it seems too absurd for intelligent persons to believe.

WASHINGTON, D. C., July, 1884.

REPORT FROM OBSERVATIONS TAKEN AT CENTRAL STATION,
WASHBURN COLLEGE, TOPEKA, KANSAS.

BY PROF. J. T. LOVEWELL, DIRECTOR.

The usual summary by decades is given below.

	Sept. 20th to 30th.	Oct. 1st to 10th.	Oct. 10th to 20th.	Mean.
TEMPERATURE OF THE AIR.				
MIN. AND MAX. AVERAGES.				
Min.	52.	34.	49.	45.
Max.	99.	89.	89.	92.
Min. and Max.	75.	61.	69.	68.
Range.	47.	55.	40.	47.
TRI-DAILY OBSERVATIONS.				
7 a. m.	64.1	62.6	56.9	61.2
2 p. m.	83.2	79.2	81.9	81.4
9 p. m.	67.6	63.4	62.2	64.4
Mean.	71.4	68.4	67.0	69.0
RELATIVE HUMIDITY.				
7 a. m.	79.5	83.1	84.0	82.2
2 p. m.	58.8	48.9	52.8	53.8
9 p. m.	83.8	81.0	80.0	81.6
Mean.	78.0	71.0	72.3	73.8
PRESSURE AS OBSERVED.				
7 a. m.	28.880	29.007	29.128	29.005
2 p. m.	28.960	28.985	29.115	29.020
9 p. m.	28.872	29.002	29.124	28.999
Mean.	28.873	28.998	29.122	29.008
MILES PER HOUR OF WIND.				
7 a. m.	12.5	14.1	19.2	15.3
2 p. m.	21.2	17.9	14.6	17.9
9 p. m.	11.0	12.4	14.0	12.5
Total miles	3086	3650	2484	10220
CLOUDING BY TENTHS.				
7 a. m.	6.1	5.0	3.2	4.8
2 p. m.	5.3	3.6	2.9	3.9
9 p. m.	4.2	4.0	3.0	3.7
RAIN.				
Inches.	4.36	1.58	.47	6.41

The first frost of the season occurred October 9th, a slight white frost which hardly injured vegetation at this place, and there was no recurrence of frost up to the 20th.



