

Marx Hardy Machiavelli Joyce Austen
Defoe Abbot Melville Montaigne Cooper Emerson Hugo
Stoker Wilde Christie Maupassant Haggard Chesterton Molière Eliot Grimm
Garnett Engels Schiller Byron Molière
Goethe Hawthorne Smith Kafka
Cotton Dostoyevsky Kipling Doyle
Baum Henry Flaubert Nietzsche Willis
Leslie Dumas Stockton Vatsyayana Crane
Burroughs Verne
Curtis Tocqueville Gogol Busch
Homer Tolstoy Whitman Twain
Darwin Zola Lawrence Dickens Plato
Potter Freud Jowett Stevenson Andersen Burton Harte
Kant London Descartes Cervantes Voltaire Cooke
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**The Storm-Cloud of the
Nineteenth Century Two Lectures
delivered at the London
Institution February 4th and 11th,
1884**

John Ruskin

Imprint

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PREFACE.

The following lectures, drawn up under the pressure of more imperative and quite otherwise directed work, contain many passages which stand in need of support, and some, I do not doubt, more or less of correction, which I always prefer to receive openly from the better knowledge of friends, after setting down my own impressions of the matter in clearness as far as they reach, than to guard myself against by submitting my manuscript, before publication, to annotators whose stricture or suggestion I might often feel pain in refusing, yet hesitation in admitting.

But though thus hastily, and to some extent incautiously, thrown into form, the statements in the text are founded on patient and, in all essential particulars, accurately recorded observations of the sky, during fifty years of a life of solitude and leisure; and in all they contain of what may seem to the reader questionable, or astonishing, are guardedly and absolutely true.

In many of the reports given by the daily press, my assertion of radical change, during recent years, in weather aspect was scouted as imaginary, or insane. I am indeed, every day of my yet spared life, more and more grateful that my mind is capable of imaginative vision, and liable to the noble dangers of delusion which separate the speculative intellect of humanity from the dreamless instinct of brutes: but I have been able, during all active work, to use or refuse my power of contemplative imagination, with as easy command of it as a physicist's of his telescope: the times of morbid are just as easily distinguished by me from those of healthy vision, as by men of ordinary faculty, dream from waking; nor is there a single fact stated in the following pages which [iv] I have not verified with a chemist's analysis, and a geometer's precision.

The first lecture is printed, with only addition here and there of an elucidatory word or phrase, precisely as it was given on the 4th February. In repeating it on the 11th, I amplified several passages, and substituted for the concluding one, which had been printed with accuracy in most of the leading journals, some observations which I thought calculated to be of more general interest. To these, with the additions in the first text, I have now prefixed a few ex-

planatory notes, to which numeral references are given in the pages they explain, and have arranged the fragments in connection clear enough to allow of their being read with ease as a second Lecture.

Herne Hill, *12th March, 1884.*

THE STORM-CLOUD OF THE NINETEENTH CENTURY.

THE STORM-CLOUD OF THE NINETEENTH CENTURY.

Let me first assure my audience that I have no *arrière pensée* in the title chosen for this lecture. I might, indeed, have meant, and it would have been only too like me to mean, any number of things by such a title;—but, to-night, I mean simply what I have said, and propose to bring to your notice a series of cloud phenomena, which, so far as I can weigh existing evidence, are peculiar to our own times; yet which have not hitherto received any special notice or description from meteorologists.

So far as the existing evidence, I say, of former literature can be interpreted, the storm-cloud—or more accurately plague-cloud, for it is not always stormy—which I am about to describe to you, never was seen but by now living, or *lately* living eyes. It is not yet twenty years that this—I may well call it, wonderful, cloud has been, in its essence, recognizable. There is no description of it, so far as I have read, by any ancient observer. Neither Homer nor Virgil, neither Aristophanes nor Horace, acknowledge any such clouds among those compelled by Jove. Chaucer has no word of them, nor Dante; [1] Milton none, nor Thomson. In modern times, Scott, Wordsworth and Byron are alike unconscious of them; and the most observant and descriptive of scientific men, De Saussure, is utterly silent concerning them. Taking up the traditions of air from the year before Scott's death, I am able, by my own constant and close observation, to certify you that in the forty following years (1831 to 1871 approximately—for the phenomena in ques [2] tion came on gradually)—no such clouds as these are, and are now often for months without intermission, were ever seen in the skies of England, France, or Italy.

In those old days, when weather was fine, it was luxuriously fine; when it was bad—it was often abominably bad, but it had its fit of

temper and was done with it—it didn't sulk for three months without letting you see the sun,—nor send you one cyclone inside out, every Saturday afternoon, and another outside in, every Monday morning.

In fine weather the sky was either blue or clear in its light; the clouds, either white or golden, adding to, not abating, the luster of the sky. In wet weather, there were two different species of clouds,—those of beneficent rain, which for distinction's sake I will call the non-electric rain-cloud, and those of storm, usually charged highly with electricity. The beneficent rain-cloud was indeed often extremely dull and gray for days together, but gracious nevertheless, felt to be doing good, and often to be delightful after drought; capable also of the most exquisite coloring, under certain conditions; [2] and continually traversed in clearing by the rainbow:—and, secondly, the storm-cloud, always majestic, often dazzlingly beautiful, and felt also to be beneficent in its own way, affecting the mass of the air with vital agitation, and purging it from the impurity of all morbid elements.

In the entire system of the Firmament, thus seen and understood, there appeared to be, to all the thinkers of those ages, the incontrovertible and unmistakable evidence of a Divine Power in creation, which had fitted, as the air for human breath, so the clouds for human sight and nourishment;—the Father who was in heaven feeding day by day the souls of His children with marvels, and satisfying them with bread, and so filling their hearts with food and gladness.

Their *hearts*, you will observe, it is said, not merely their bellies,—or indeed not at all, in this sense, their bellies—but the heart itself, with its blood for this life, and its faith for the next. The opposition between this idea and the notions of our own time may be more accurately expressed by [3] modification of the Greek than of the English sentence. The old Greek is—

ἐμπιπλῶν τροφῆς καὶ εὐφροσύνης
τὰς καρδίας ἡμῶν.

filling with meat, and cheerfulness, our hearts. The modern Greek should be—

ἐμπιπλῶν ἀνέμου καὶ ἀφροσύνης
τὰς γαστέρας ἡμῶν.

filling with wind, and foolishness, our stomachs.

You will not think I waste your time in giving you two cardinal examples of the sort of evidence which the higher forms of literature furnish respecting the cloud-phenomena of former times.

When, in the close of my lecture on landscape last year at Oxford, I spoke of stationary clouds as distinguished from passing ones, some blockheads wrote to the papers to say that clouds never were stationary. Those foolish letters were so far useful in causing a friend to write me the pretty one I am about to read to you, quoting a passage about clouds in Homer which I had myself never noticed, though perhaps the most beautiful of its kind in the Iliad. In the fifth book, after the truce is broken, and the aggressor Trojans are rushing to the onset in a tumult of clamor and charge, Homer says that the Greeks, abiding them "stood like clouds." My correspondent, giving the passage, writes as follows:—

"Sir,—Last winter when I was at Ajaccio, I was one day reading Homer by the open window, and came upon the lines—

Ἄλλ' ἔμενον, νεφέλησιν ἐοικότες ἄς τε Κρονίων
Νηνεμίας ἔστησεν ἐπ' ἀκροπόλοισιν ὄρεσσιν,
Ἄτρεμας, ὄφρ' εὐδίησι μένος Βορέαςο καὶ ἄλλων
Ζαχρειῶν ἀνέμων, οἳ τε νέφεα σκιάοντα
Πνοιῆσιν λυγυρῆσι διασκιδνῶσιν ἀέντες·

Ως Δαναοὶ Τρῶας μένον ἔμπεδον, οὐδ' ἐφέβοντο.

[4]

'But they stood, like the clouds which the Son of Kronos establishes in calm upon the mountains, motionless, when the rage of the North and of all the fiery winds is asleep.' As I finished these lines, I raised my eyes, and looking across the gulf, saw a long line of clouds resting on the top of its hills. The day was windless, and there they stayed, hour after hour, without any stir or motion. I remember how I was delighted at the time, and have often since that day thought on the beauty and the truthfulness of Homer's simile.

"Perhaps this little fact may interest you, at a time when you are attacked for your description of clouds.

"I am, sir, yours faithfully,
G. B. Hill."

With this bit of noonday from Homer, I will read you a sunset and a sunrise from Byron. That will enough express to you the scope and sweep of all glorious literature, from the orient of Greece herself to the death of the last Englishman who loved her. [3] I will read you from 'Sardanapalus' the address of the Chaldean priest Beleses to the sunset, and of the Greek slave, Myrrha, to the morning.

"The sun goes down: methinks he sets more slowly,
Taking his last look of Assyria's empire.
How red he glares amongst those deepening clouds, [4]
Like the blood he predicts. [5] If not in vain,
Thou sun that sinkest, and ye stars which rise,
I have outwatch'd ye, reading ray by ray
The edicts of your orbs, which make Time tremble
For what he brings the nations, 't is the furthest
Hour of Assyria's years. And yet how calm!
An earthquake should announce so great a fall—
A summer's sun discloses it. Yon disk
To the star-read Chaldean, bears upon
Its everlasting page the end of what
Seem'd everlasting; but oh! thou true sun!
The burning oracle of all that live,
As fountain of all life, and symbol of [5]
Him who bestows it, wherefore dost thou limit
Thy lore unto calamity? [6] Why not
Unfold the rise of days more worthy thine
All-glorious burst from ocean? why not dart
A beam of hope athwart the future years,
As of wrath to its days? Hear me! oh, hear me!
I am thy worshiper, thy priest, thy servant—

I have gazed on thee at thy rise and fall,
 And bow'd my head beneath thy mid-day beams,
 When my eye dared not meet thee. I have watch'd
 For thee, and after thee, and pray'd to thee,
 And sacrificed to thee, and read, and fear'd thee,
 And ask'd of thee, and thou hast answer'd – but
 Only to thus much. While I speak, he sinks –
 Is gone – and leaves his beauty, not his knowledge,
 To the delighted west, which revels in
 Its hues of dying glory. Yet what is
 Death, so it be but glorious? 'T is a sunset;
 And mortals may be happy to resemble
 The gods but in decay."

Thus the Chaldean priest, to the brightness of the setting sun.
 Hear now the Greek girl, Myrrha, of his rising.

"The day at last has broken. What a night
 Hath usher'd it! How beautiful in heaven!
 Though varied with a transitory storm,
 More beautiful in that variety: [7]
 How hideous upon earth! where peace, and hope,
 And love, and revel, in an hour were trampled
 By human passions to a human chaos,
 Not yet resolved to separate elements: –
 'T is warring still! And can the sun so rise,
 So bright, so rolling back the clouds into
Vapors more lovely than the unclouded sky,
 With golden pinnacles, and snowy mountains,
 And billows purpler than the ocean's, making [6]
 In heaven a glorious mockery of the earth,
 So like, – we almost deem it permanent;
 So fleeting, – we can scarcely call it aught
 Beyond a vision, 't is so transiently
 Scatter'd along the eternal vault: and yet
 It dwells upon the soul, and soothes the soul,
 And blends itself into the soul, until
 Sunrise and sunset form the haunted epoch

Of sorrow and of love."

How often *now*—young maids of London,—do you make *sunrise* the 'haunted epoch' of either?

Thus much, then, of the skies that used to be, and clouds "more lovely than the unclouded sky," and of the temper of their observers. I pass to the account of clouds that *are*, and—I say it with sorrow—of the *distemper* of *their* observers.

But the general division which I have instituted between bad-weather and fair-weather clouds must be more carefully carried out in the sub-species, before we can reason of it farther: and before we begin talk either of the sub-genera and sub-species, or super-genera and super-species of cloud, perhaps we had better define what *every* cloud is, and must be, to begin with.

Every cloud that can be, is thus primarily definable: "Visible vapor of water floating at a certain height in the air." The second clause of this definition, you see, at once implies that there is such a thing as visible vapor of water which does *not* float at a certain height in the air. You are all familiar with one extremely cognizable variety of that sort of vapor—London Particular; but that especial blessing of metropolitan society is only a strongly-developed and highly-seasoned condition of a form of watery vapor which exists just as generally and widely at the bottom of the air, as the clouds do—on what, for convenience' sake, we may call the top of it;—only as yet, thanks to the sagacity of [7] scientific men, we have got no general name for the bottom cloud, though the whole question of cloud nature begins in this broad fact, that you have one kind of vapor that lies to a certain depth on the ground, and another that floats at a certain height in the sky. Perfectly definite, in both cases, the surface level of the earthly vapor, and the roof level of the heavenly vapor, are each of them drawn within the depth of a fathom. Under *their* line, drawn for the day and for the hour, the clouds will not stoop, and above *theirs*, the mists will not rise. Each in their own region, high or deep, may expatiate at their pleasure; within that, they climb, or decline,—within that they congeal or melt away; but

below their assigned horizon the surges of the cloud sea may not sink, and the floods of the mist lagoon may not be swollen.

That is the first idea you have to get well into your minds concerning the abodes of this visible vapor; next, you have to consider the manner of its visibility. Is it, you have to ask, with cloud vapor, as with most other things, that they are seen when they are there, and not seen when they are not there? or has cloud vapor so much of the ghost in it, that it can be visible or invisible as it likes, and may perhaps be all unpleasantly and malignantly there, just as much when we don't see it, as when we do? To which I answer, comfortably and generally, that, on the whole, a cloud is where you see it, and isn't where you don't; that, when there's an evident and honest thundercloud in the northeast, you needn't suppose there's a surreptitious and slinking one in the northwest;—when there's a visible fog at Bermondsey, it doesn't follow there's a spiritual one, more than usual, at the West End: and when you get up to the clouds, and can walk into them or out of them, as you like, you find when you're in them they wet your whiskers, or take out your curls, and when you're out of them, they don't; and therefore you may with probability assume—not with certainty, observe, but with probability—that there's more water in the air where it damps your curls than where it doesn't. If it gets much denser than that, it will begin to rain; and then you may assert, certainly with safety, that there is a [8] shower in one place, and not in another; and not allow the scientific people to tell you that the rain is everywhere, but palpable in Tooley Street, and impalpable in Grosvenor Square.

That, I say, is broadly and comfortably so on the whole,—and yet with this kind of qualification and farther condition in the matter. If you watch the steam coming strongly out of an engine-funnel, [8]—at the top of the funnel it is transparent,—you can't see it, though it is more densely and intensely there than anywhere else. Six inches out of the funnel it becomes snow-white,—you see it, and you see it, observe, exactly where it is,—it is then a real and proper cloud. Twenty yards off the funnel it scatters and melts away; a little of it sprinkles you with rain if you are underneath it, but the rest disappears; yet it is still there;—the surrounding air does not absorb it all into space in a moment; there is a gradually diffusing current of invisible moisture at the end of the visible stream—an invisible, yet

quite substantial, vapor; but not, according to our definition, a cloud, for a cloud is vapor *visible*.

Then the next bit of the question, of course, is, What makes the vapor visible, when it is so? Why is the compressed steam transparent, the loose steam white, the dissolved steam transparent again?

The scientific people tell you that the vapor becomes visible, and chilled, as it expands. Many thanks to them; but can they show us any reason why particles of water should be more opaque when they are separated than when they are close together, or give us any idea of the difference of the state of a particle of water, which won't *sink* in the air, from that of one that won't *rise* in it? [9]

And here I must parenthetically give you a little word of, I will venture to say, extremely useful, advice about scientific people in general. Their first business is, of course, to tell you things that are so, and do happen,—as that, if you warm water, it will boil; if you cool it, it will freeze; and if you [9] put a candle to a cask of gunpowder, it will blow you up. Their second, and far more important business, is to tell you what you had best do under the circumstances,—put the kettle on in time for tea; powder your ice and salt, if you have a mind for ices; and obviate the chance of explosion by not making the gunpowder. But if, beyond this safe and beneficial business, they ever try to *explain* anything to you, you may be confident of one of two things,—either that they know nothing (to speak of) about it, or that they have only seen one side of it—and not only haven't seen, but usually have no mind to see, the other. When, for instance, Professor Tyndall explains the twisted beds of the Jungfrau to you by intimating that the Matterhorn is growing flat; [10] or the clouds on the lee side of the Matterhorn by the wind's rubbing against the windward side of it, [11]—you may be pretty sure the scientific people don't know much (to speak of) yet, either about rock-beds, or cloud-beds. And even if the explanation, so to call it, be sound on one side, windward or lee, you may, as I said, be nearly certain it won't do on the other. Take the very top and center of scientific interpretation by the greatest of its masters: Newton explained to you—or at least was once supposed to have explained—why an apple fell; but he never thought of explaining the exactly

correlative, but infinitely more difficult question, how the apple got up there!

You will not, therefore, so please you, expect me to explain anything to you,—I have come solely and simply to put before you a few facts, which you can't see by candlelight, or in railroad tunnels, but which are making themselves now so very distinctly felt as well as seen, that you may perhaps have to roof, if not wall, half London afresh before we are many years older.

I go back to my point—the way in which clouds, as a matter of fact, become visible. I have defined the floating or sky cloud, and defined the falling, or earth cloud. But there's a sort of thing between the two, which needs a third definition: namely, Mist. In the 22d page of his 'Glaciers of [10] the Alps,' Professor Tyndall says that "the marvelous blueness of the sky in the earlier part of the day indicated that the air was charged, almost to saturation, with transparent aqueous vapor." Well, in certain weather that is true. You all know the peculiar clearness which precedes rain,—when the distant hills are looking nigh. I take it on trust from the scientific people that there is then a quantity—almost to saturation—of aqueous vapor in the air, but it is aqueous vapor in a state which makes the air more transparent than it would be without it. What state of aqueous molecule is that, absolutely unreflective [12] of light—perfectly transmissive of light, and showing at once the color of blue water and blue air on the distant hills?

I put the question—and pass round to the other side. Such a clearness, though a certain forerunner of rain, is not always its forerunner. Far the contrary. Thick air is a much more frequent forerunner of rain than clear air. In cool weather, you will often get the transparent prophecy: but in hot weather, or in certain not hitherto defined states of atmosphere, the forerunner of rain is mist. In a general way, after you have had two or three days of rain, the air and sky are healthily clear, and the sun bright. If it is hot also, the next day is a little mistier—the next misty and sultry,—and the next and the next, getting thicker and thicker—end in another storm, or period of rain.

I suppose the thick air, as well as the transparent, is in both cases saturated with aqueous vapor;—but also in both, observe, vapor

that floats everywhere, as if you mixed mud with the sea; and it takes no shape anywhere: you may have it with calm, or with wind, it makes no difference to it. You have a nasty haze with a bitter east wind, or a nasty haze with not a leaf stirring, and you may have the clear blue vapor with a fresh rainy breeze, or the clear blue vapor as still as the sky above. What difference is there between *these* aqueous molecules that are clear, and those that are muddy, *these* that must sink or rise, and those that must stay where they are, *these* that have form and stature, that are bellied [11] like whales and backed like weasels, and those that have neither backs nor fronts, nor feet nor faces, but are a mist—and no more—over two or three thousand square miles?

I again leave the questions with you, and pass on.

Hitherto I have spoken of all aqueous vapor as if it were either transparent or white—visible by becoming opaque like snow, but not by any accession of color. But even those of us who are least observant of skies, know that, irrespective of all supervening colors from the sun, there are white clouds, brown clouds, gray clouds, and black clouds. Are these indeed—what they appear to be—entirely distinct monastic disciplines of cloud: Black Friars, and White Friars, and Friars of Orders Gray? Or is it only their various nearness to us, their denseness, and the failing of the light upon them, that makes some clouds look black [13] and others snowy?

I can only give you qualified and cautious answer. There are, by differences in their own character, Dominican clouds, and there are Franciscan;—there are the Black Hussars of the Bandiera della Morte, and there are the Scots Grays whose horses can run upon the rock. But if you ask me, as I would have you ask me, why argent and why sable, how baptized in white like a bride or a novice, and how hooded with blackness like a Judge of the Vehmgericht Tribunal,—I leave these questions with you, and pass on.

Admitting degrees of darkness, we have next to ask what color, from sunshine can the white cloud receive, and what the black?

You won't expect me to tell you all that, or even the little that is accurately known about that, in a quarter of an hour; yet note these main facts on the matter.

On any pure white, and practically opaque, cloud, or thing like a cloud, as an Alp, or Milan Cathedral, you can have cast by rising or setting sunlight, any tints of amber, orange, or moderately deep rose—you can't have lemon yellows, or any kind of green except in negative hue by opposition; and though by stormlight you may sometimes get the reds cast very deep, beyond a certain limit you cannot go,—the Alps [12] are never vermilion color, nor flamingo color, nor canary color; nor did you ever see a full scarlet cumulus of thundercloud.

On opaque white vapor, then, remember, you can get a glow or a blush of color, never a flame of it.

But when the cloud is transparent as well as pure, and can be filled with light through all the body of it, you then can have by the light reflected [14] from its atoms any force conceivable by human mind of the entire group of the golden and ruby colors, from intensely burnished gold color, through a scarlet for whose brightness there are no words, into any depth and any hue of Tyrian crimson and Byzantine purple. These with full blue breathed between them at the zenith, and green blue nearer the horizon, form the scales and chords of color possible to the morning and evening sky in pure and fine weather; the keynote of the opposition being vermilion against green blue, both of equal tone, and at such a height and acme of brilliancy that you cannot see the line where their edges pass into each other.

No colors that can be fixed in earth can ever represent to you the luster of these cloudy ones. But the actual tints may be shown you in a lower key, and to a certain extent their power and relation to each other.

I have painted the diagram here shown you with colors prepared for me lately by Messrs. Newman, which I find brilliant to the height that pigments can be; and the ready kindness of Mr. Wilson Barrett enables me to show you their effect by a white light as pure as that of the day. The diagram is enlarged from my careful sketch of the sunset of 1st October, 1868, at Abbeville, which was a beautiful example of what, in fine weather about to pass into storm, a sunset could then be, in the districts of Kent and Picardy unaffected by smoke. In reality, the ruby and vermilion clouds were, by myri-

ads, more numerous than I have had time to paint: but the general character of their grouping is well enough expressed. All the illuminated clouds are high in the air, and nearly motionless; beneath them, electric storm-cloud rises in [13] a threatening cumulus on the right, and drifts in dark flakes across the horizon, casting from its broken masses radiating shadows on the upper clouds. These shadows are traced, in the first place by making the misty blue of the open sky more transparent, and therefore darker; and secondly, by entirely intercepting the sunbeams on the bars of cloud, which, within the shadowed spaces, show dark on the blue instead of light.

But, mind, all that is done by reflected light — and in that light you never get a *green* ray from the reflecting cloud; there is no such thing in nature as a green lighted cloud relieved from a red sky, — the cloud is always red, and the sky green, and green, observe, by transmitted, not reflected light.

But now note, there is another kind of cloud, pure white, and exquisitely delicate; which acts not by reflecting, nor by refracting, but, as it is now called, *diffracting*, the sun's rays. The particles of this cloud are said — with what truth I know not [15] — to send the sunbeams round them instead of through them; somehow or other, at any rate, they resolve them into their prismatic elements; and then you have literally a kaleidoscope in the sky, with every color of the prism in absolute purity; but above all in force, now, the ruby red and the *green*, — with purple, and violet-blue, in a virtual equality, more definite than that of the rainbow. The red in the rainbow is mostly brick red, the violet, though beautiful, often lost at the edge; but in the prismatic cloud the violet, the green, and the ruby are all more lovely than in any precious stones, and they are varied as in a bird's breast, changing their places, depths, and extent at every instant.

The main cause of this change being, that the prismatic cloud itself is always in rapid, and generally in fluctuating motion. "A light veil of clouds had drawn itself," says Professor Tyndall, in describing his solitary ascent of Monte Rosa, "between me and the sun, and this was flooded with the most brilliant dyes. Orange, red, green, blue — all the hues produced by diffraction — were exhibited in the utmost splendor.