



CIRRUS OR "MARE'S TAIL" CLOUD.

*G. A. Clarke.*



ALTO-STRATUS—THE "WATERY SKY."

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## THE MAJESTY AND BEAUTY OF THE CLOUDS.

By GEO. AUBOURNE CLARKE, F.R.P.S., F.R.Met.Soc.

YOU who have scaled the summits of the Cairngorms have many a time and oft made close acquaintance with the clouds. On such occasions your chief concern has been the fact either that the clouds hid from your view some very desirable prospect you had toiled hard to enjoy, or else that their presence around you made further movement on the mountain summit a potential danger.

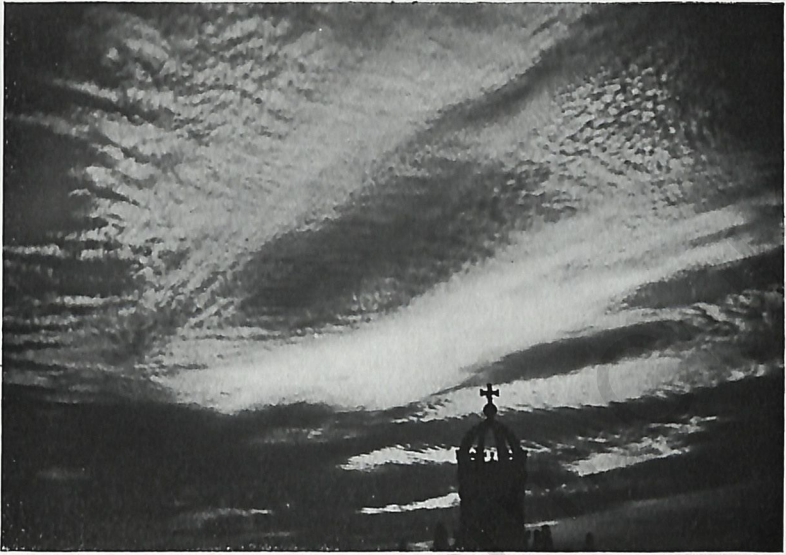
But let us for the moment keep to the plains and valleys and view these clouds from afar. See them wrapping the higher summits in a golden mystery at sunset, or in the height of a springtime noonday sending down shafts of quivering light at whose touch the snow in the corries turns to molten silver. See them blazing like scarlet watch-fires in the cool blue-green of the evening sky, or lying in orderly grey-purple bars athwart the crimson glow in the west long after sundown. Their variety is endless, their beauties ever changing and ever new, and by virtue of their distribution at successively higher levels they waft the mind almost imperceptibly from the tangible solidity of earth through that melting blue vault we call the sky, and so onwards to the outermost regions of star-strewn space.

Certainly those faintly delicate silvery wisps which constitute the highest of all clouds seem to be situated many leagues above us, but that is partly an effect of contrast with the lower cloud, which is always so much more massive in build and more solid in substance. I have already remarked upon the lowest cloud-forms being found enveloping the summits of our local mountains and reaching at times almost to the level of the ground, but had the majestic peak of Everest been set in our midst, its virgin summit would have reached almost to those cloud-wisps I have spoken of. For in our latitudes the limit of height for the clouds is

approximately six miles. At that altitude the air temperature is far below freezing point—about 60 degrees below zero or 90 degrees of frost—and so the delicate thread-like wisps are composed of lines of minute ice-crystals and not of tiny drops of water as is usual with the more solid-looking clouds. Because of their forms and appearance they have been named *cirrus*, from the Latin word signifying a tuft of hair. Sailors have termed them “mares’ tails” because of this tufted appearance. In our regions these clouds generally move from some westerly quarter—it is exceptional, though not altogether rare, to find them moving from eastward.

Beautiful as these high cirrus clouds are—and when seen tinted a delicate rose colour late in the evening, they are, perhaps, the most evanescent beauty to be found in the sky—they are harbingers of bad weather to come. This is because the cirrus clouds are formed in greatest quantity in the forefront of “depressions,” which, as you know, are regions of conflict between currents of warm and cold air moving from different directions and forming a vast eddy, with consequent fall of barometric pressure and the eventual occurrence of more or less continuous rain, together with strong winds and gales at times. When cirrus clouds are so formed it will be noticed by an observer that they rapidly increase in quantity till at last the whole sky becomes covered with a tangled web or even with an almost uniform whitish sheet of cloud, which in turn grows gradually denser and greyer until all that can be seen is a heavy blue-grey or yellowish-grey cloud layer through which the sun appears shining merely as a faintly luminous patch. We then have the “watery sky” as we familiarly term the *alto-stratus* of scientific terminology. When this condition of matters is reached, it is usually a matter of only an hour or two ere the *nimbus*—the real rain-cloud—appears, and we have to don our waterproofs.

Now you will of course know that you have met the rain-cloud trailing along the sides of even the lesser hills of Deeside, and therefore you will gather that, in my description, I have descended very far from the usual heights of the



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ALTO-CUMULUS—"DAPPLED SKY" AT SUNSET.



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STRATO-CUMULUS—THE SKY OF WINTER GLOOM.

cirrus cloud. Such is actually the case; for when a depression advances towards us, cloud is forming at successively lower levels as the central part of it approaches. Thus the "watery-sky" alto-stratus is found at levels between 15,000 and 8,000 feet as a rule, sometimes even lower. The broken, ragged nimbus below it may be anything from 6,000 to 1,000 feet high, and that is why sometimes you can see the higher hilltops even during rain, while at others times even the lower ones are hidden.

But fortunately the intermediate levels are not always occupied by cloud of such sinister import and gloomy appearance as the alto-stratus. Quite otherwise, in fact! For in the intervals between depressions, and likewise along their northern and southern margins, we meet with some lovely skylscapes formed by clouds of the *cirro-cumulus* and *alto-cumulus* types, which are usually grouped together under the popular designations of "mackerel" or "dappled" skies, according to whether the cloudlets lie in wavy bands or in detached flakes.

Though such clouds may not possess the extreme delicacy of the rose-tinted cirrus at eventide, they are nevertheless the clouds to which we owe our most gorgeous sunsets. Aberdeen may well vie with the famed western isles in the magnificence of its sunsets, and it may be of interest to know that the Grampian chain to the south of the Dee Valley, as well as the great Cairngorm group itself, contribute in no small degree to these glorious spectacles. And the reason thereof is as follows. The winds accompanying the mackerel and dappled skies are found to blow chiefly from some point in the south-westerly quadrant, so that before the wind reaches Aberdeen it must cross these mountain ridges. In doing so a series of waves is set up in the air and cloud is formed along the wave-crests. The "stream-line" movement of the air gives to the clouds strangely artificial forms, resembling those of airships, sand-dunes, or, as Shakespeare has it, "very like a whale." The texture of the upper and lower surfaces of these clouds is often singularly smooth, thus giving to the reflected sunset rays a curiously metallic quality. The golds and scarlets and crimsons of the sunsets

may then truthfully be said to blaze. Added to this intensity of colour on the clouds, the air itself is wonderfully clear and pure, so that the background of sky is always of the most wonderfully translucent blues and greens imaginable.

But even in the daytime the regularity and serried arrangement of the little clouds make them worthy of notice, and many a summer landscape is made all the more beautiful by their presence in the sky.

At still lower levels—between 5,000 and 2,000 feet—may often be found a somewhat similar but much heavier cloud called *strato-cumulus*. It is one of our commonest skies, particularly in a spell of cold, dry weather in winter-time, when the sky may have a characteristically gloomy look for days on end.

And now we come to those other clouds which in their forms seem to emulate the hills themselves. I refer of course to the "woolpack" type, known as *cumulus* when small and only slightly developed, and as *cumulo-nimbus* when they tower upwards for miles into the atmosphere.

The ordinary cumulus is found in our skies on almost any average fine summer day, but a little observation will reveal the fact that they begin to appear in the early forenoon, reach a maximum in size and quantity in the early afternoon, then rapidly disperse and disappear in the evening. They are caused by the condensation of moisture carried upwards by local ascending currents of air, which have been heated more rapidly than their surroundings by the power of the sun.

It is when the weather situation is such that these uprising currents are unusually strong, or meet with little restraint in their ascent, that we meet with the other variety, the cumulo-nimbus, which, though they show the same tendencies of growth during the daytime as do the cumulus, are not always so amenable to dispersal in the evening. Actually they are the clouds which give rise to our violent "April showers" of rain and hail, and also to our thunderstorms. When there is a tendency towards thunder, the summits of these clouds often spread out into a flat top resembling a blacksmith's anvil. There is of course no real



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CUMULUS—"WOOL-PACK" CLOUD OF FINE SUMMER WEATHER.



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CUMULO-NIMBUS—AN APPROACHING THUNDER-CLOUD.

hard and fast line of demarcation between cumulus and cumulo-nimbus, the former may, and frequently does, develop into the latter, but there are other times when the thunder-clouds appear in a widely extended bank like a range of distant snow-clad mountains. And to call them mountains is to use no undeserved metaphor, for none but the peaks of the mighty ranges of the Himalayas, Karakoram, Andes, or such like mountain chains, can equal in height or size a really well-developed mass of thunder-cloud. The ordinary cumulus cloud has its base some 3,000 feet or so above us, and its summit perhaps 2,000 feet higher, but the cumulo-nimbus, while having its base no higher, may have a summit towering up to 20,000 or 30,000 feet. Imagine it, if you can! A mass of vapour, microscopic drops of water, despite its very solid and substantial appearance, five miles or thereby in depth—and extending over perhaps a hundred square miles! Even the “steep frowning glories of dark Lochnagar” pale into insignificance beside that mighty structure—unsubstantial though it be. Just try and grasp its significance, and the torrential rain that usually accompanies a thunderstorm will cease to be a wonder any longer.

And finally I might mention the last and lowest of clouds, that known as *stratus*. It is really a fog floating some hundreds of feet above us, and often may indeed be actually a fog which has lifted. Sometimes it is dry, at others it gives us drizzle and “Scotch mist.”

Well, I have tried, all too inadequately I fear, to convey to you some impression of the beauty and wonder that is ever present in the sky. If you care to watch its ever-changing panorama, you will soon discover the source whence Shelley drew his inspiration.