

ONCE IN A BLUE MOON

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"ONCE in a blue moon" used to mean "never," and now it means "hardly ever." Such is the gist of a brief discussion given this mysterious expression by G. W. Stimpson in his book, *Nuggets of Knowledge*. But nothing in this particular nugget even remotely hints at a scientific explanation.

Literature on the subject appears to be practically nonexistent. At the University of Oregon library, I recently made a careful index inspection for the words "blue" and "moon" in all the many books on astronomy and meteorology, and in all copies of the *Monthly Weather Review*, published by the U. S. Weather Bureau, from 1898 to 1942. Not a single reference to "blue moon" was found in any of these. Thompson's *Meteorology*, published 95 years ago, mentioned a blue sun once seen in India, and stated that "it appears to depend upon the presence of vesicular vapor in the atmosphere, the different media of which produce upon light in its passage effects similar to those of mixed plates."

Also searched were Poole's *Index to Periodical Literature* (1802-1906), *International Index to Periodicals* (1920-1944), and the *Readers' Guide to Periodical Literature* (1890-1944). Every one of these big books had numerous references to scientific articles on the moon in a wide variety of magazines. One lone reference to "blue moon" was encountered: *Science*, December 28, 1934, page 617. This proved to be a description of an observation of this disputed phenomenon on September 15, 1934, by Perez Simmons at Santa Barbara, Cal.

Short discussions were published in *The SKY*, November, 1939, pages 17-18, and in *Sky and Telescope*, July, 1943, page 17, and October, 1943, page 9.

In his quiz column in the first *Sky and Telescope* reference above, Dr. L. J. Lafleur quotes an explanation found in the *Maine Farmers' Almanac* for 1937. In effect, this is that at one time the various full moons of the year were given names according to the order in which they occurred — provided there was only one per month. These names were as follows: Moon after Yule, Wolf Moon, Lenten Moon, Egg Moon, Milk Moon, Flower Moon, Hay Moon, Grain Moon, Fruit Moon, Harvest

A rising moon, and a moon near quarter phase, are mentioned often in reporting observations of the blue moon. This photograph, by N. J. Schell, using a 10-inch off-axis reflector, shows our near neighbor several days past first quarter.



Moon, Hunters' Moon, and Moon before Yule. But seven times in 19 years there were — and still are — 13 full moons in a year. This gives 11 months with one full moon each and one with two. This second in a month, so I interpret it, was called Blue Moon, and was considered unlucky and a real nuisance as it occurred at various times of the year and upset scheduling of church festivals.

A hasty glance through the Canadian *Observer's Handbook* from 1936 to 1945 shows us that 1945 had no "blue moon," but that four times during these 10 years our lunar neighbor was at the full phase 13 times per year for observers in the Eastern time zone. Two per month occurred in September, 1936; July, 1939; April, 1942; and October, 1944. The second one in each pair was then a "blue moon." According to this, "once in a blue moon" means about once in two or three years, not an extremely rare occurrence. The next such "blue moon" will be on May 31st, this year.

But if the expression refers to a moon which actually appears blue in color, then for most of us this probably means once in a lifetime — or even longer. That such phenomena are sometimes, although rarely, observed, seems fully established by an abundance of witnesses. I had always been rather skept-

tical until the evening of July 28, 1944, when before my astonished eyes there hung in the southern sky a decidedly blue moon. Three of my neighbors were equally amazed by the very unusual sight.

The moon, at the first-quarter phase that day, was first noticed shortly after sunset, when it was thinly veiled by a small patch of high cirrus clouds, which were tinted a beautiful orange-red by the sun just below the horizon. We thought that the lunar blue might be the effect of contrast with the red of the clouds. But while we looked and wondered, the moon soon floated out into clear sky, and was just as blue as ever!

The blue was *not* uncertain and elusive, requiring close attention to discern the coloration. Not the least imagination was required. Normal eyes were impressed immediately with a very distinct blue so unnatural to the moon.

Now our readers must not picture old Luna grieving behind a dense veil of indigo blue. Nothing of the sort. All the features usually seen on the half disk were clearly visible, but the characteristic white of an early-twilight moon seemed to have been painted over with a very thin, transparent blue lacquer.

This blue was discernible for fully 15 minutes, but as the sky became dark-

er, the weird coloration gradually was lost in the yellow radiance of the night moon. In the *Science* article referred to above, Mr. Simmons states that the blue effect on the first-quarter moon was first noted eight minutes after sunset through a thin bank of cirrocumulus, begonia-rose in color. The sky was spectrum blue and the moon sky-blue. The colors were determined from a technical color chart.

Our observation was discussed shortly afterwards in my weekly astronomical column used by newspapers and radio stations in several far-western states. Accounts of previous observation by others were requested. Within two or three weeks a large number of "testimonials" had been received, some of which are given in part below.

When I read Harold Bell Wright's *Winning of Barbara Worth*, I thought his description of the blue moon was likely fiction. But later I too saw the same phenomenon in approximately the same place and probably under the same circumstances. One August day there was a high wind which filled the air with clouds of dust and sand. We could see the distant hills over the Mexican border with difficulty. About an hour before sunset, the moon quickly took on a bright, clear blue tinge and the air was filled with the same blue light. This lasted for only a few minutes. (Lester Ellis, Spokane, Wash.)

August 4, 1944, the sky became hazy and the moon had a distinct bluish tinge. This was the second time I had seen a blue moon. (F. O. Grams, Madison, Wis.)

I have twice seen a blue moon: in Venezuela in 1919 and in British Columbia in 1939. On both occasions it was midsummer and the blue appearance was as the light-blue side of the blue band of the spectrum. (John Hawthorne, Vancouver, B. C.)

Several months ago in the Aleutian Islands I observed a blue moon. It was a clear night in October or November, not late in the evening and the moon was about full. I wondered if it wasn't from volcanic action, blue dust in the sky. Several active volcanoes are in the vicinity, but I can't recall any disturbance at that time. (Pvt. Tadenoz Chumura, U. S. Army)

Last night I saw a strange sight. The moon was a pure greenish-blue and the sunset sky was green in places." (Pvt. W. G. Smith, in Italy, from a letter to his mother)

In 1928 some friends and I sailed the yacht *Red Riding Hood* from Falmouth, England, to Belize, British Honduras. When we were five days out of Bridgetown, Barbados, we saw a green moon. It was early April. Being interested in painting, I paid considerable attention in an effort to account for what I thought was surely an illusion in the physical sense but definitely a fact from the artist's point of view. The moon was a clear pastel green. The sun had just dipped below the horizon. The sky was cloudless and the atmosphere was extremely clear. The deepening blues of night were showing in the east but

were not yet apparent in the vicinity of the moon.

The only explanation I could think of was that since the moon and sky "appeared" to be of equal values in terms of color (and consequently light), it might be possible to achieve under this condition some form of blending of the two colors resulting in green — which is no doubt physically impossible. (Hugh Clifford, Hollyburn, B. C.)

I have three times since 1936 seen blue moons. My sight is perfect and I am definitely very color-normal, as the Army physical examinations show. (Cpl. Armand Renaud, U. S. Army)

I observed a blue moon about 10 years ago. The moon was rising from behind the Cascade Mountains in front of which is a large mountain lake. It was very definitely blue. I figured it might be caused by the vapor over the lake. (Dr. H. L. Van Brodtslin, Monroe, Wash.)

The occurrence was some 10 or 12 years ago when I was in charge of the U. S. Weather Bureau work in Yellowstone National Park. My impression is that when the blue effect was first noted, the moon was about 45 degrees high. There was at first a thin sheet of cloud over the sky, possibly cirrostratus. Later the clouds cleared away from the face of the moon and I had a clear-cut view. The sky carried a strong suggestion of blue, a pale, weird, steely blue. The time during which I was sure I was seeing a blue moon was probably around 45 minutes.

If I were going to try to dope it out now, I think that before going into any study of diffraction or diffusion, I would run over the possibilities of its having been a polarization phenomenon. I never did figure out any satisfactory explanation at the time, nor since. There was some discussion of this blue moon with friends — but just as little as I could manage. The "why" of the unusual is always asked, you know, entailing a response that in this case I was unprepared to give. I never did like to have to create a fog around something about which I was expected to know. (W. T. Lathrop, Meteorologist, U. S. Weather Bureau, Ret.)

Other correspondents at the time advanced various theories. Jeannette Townsley, of Seattle, wrote that she

The Demon Star

*Ah! Algol! Your evil eye enchants me.
Evil—did I say? O, forgive me I pray
For there's nothing evil I can see.
What a pity that mythology narrate
You the Demon Star because of
Your remarkable coruscation which
Led to speculation that you
Must be evil and—
Then left you to that fate.
Perseus! Do you not resent it
Mythology should so present it?
Algol! From afar. Your very variation
Incites the imagination
To overwhelming admiration
For the so-called Demon Star.*

MALLIE MAE KRAMER

did not believe "once in a blue moon" referred to the moon at all, but to the mating season of certain deer in the Rocky Mountains. Once a year the deer take on a blue sheen called (first by the Indians) the blue moon.

R. C. Stroud, of Seattle, offered this: "Psychology reveals the afterimage to be the complementary color of any color which has strongly exercised the color perception center of the eye. The cones seem to reverse their process, and after staring at an orange sky for awhile the eyes would seem to see a blue cloud if they were turned on a white screen. The silvery moon acts as the white screen. The redder the sky, the more green would the afterimage be in complement. This accounts for the chap whose moon was more green than blue."

No explanation is offered here for a blue moon or a green moon. The evidence that such moons are sometimes seen is too strong to be treated lightly. Definitely, it is not an astronomical phenomenon but purely meteorological. Shouldn't the weather men go to work and give the rest of us a logical explanation to offer our interrogators so that we — and they — shall no longer have to "create a fog" around the subject?

New York Amateurs Aid Dutch Society

The Amateur Astronomers Association, which has its headquarters at the Hayden Planetarium in New York, is helping to replenish the library of the Netherlands Astronomical Society, located at the planetarium in The Hague, Holland. In addition to recent books on astronomy, magazine subscriptions have been taken out so that the members of the Dutch society may bring their sets of astronomical publications up to date.

There are unconfirmed reports that other groups in the United States have undertaken to replenish the depleted stocks of books at certain European observatories and astronomical institutions. Anyone wishing information concerning the needs of astronomers and amateurs in the various countries is invited to communicate with Dr. Bart J. Bok, chairman of the Committee for the Distribution of Astronomical Literature, Harvard Observatory, Cambridge 38, Mass.

National Capital Astronomers

On January 5th, the Washington, D.C., amateurs changed the name of their organization to the National Capital Astronomers. Previously, the society had been known as the National Capital Amateur Astronomers Association. At the same time, the society also adopted a constitution, and amended the by-laws. Junior membership was established with no minimum age; the initiation fee was abolished. Dues for regular members remain \$3.00 a year.