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Notes and Comments

DISCOVERY OF THE FIRST PHILIPPINE COMET

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Editor's note: Comet 1975a, meaning the first comet to be discovered in 1975, is the first comet whose discovery is credited to a Philippine-based observer. The discovery was made in Mudeng, a barrio of La Paz, Abra, a town about 340 km north of Manila. Felicitously, Comet Boethin turns out to be a periodic comet, one that will visit the earth every twelve years. The address below, delivered at the Fifth Annual Convention of the Philippine Astronomical Society, not only describes the cliff-hanging circumstances of the discovery but also reveals the long years of preparation and the man. Father Boethin has also over the years provided prompt and accurate observations of earthquakes in his area. [V.L.B.]

I feel like a lonely bird from the north as I address this Annual Astronomical Convention. Stars, planets and comets have attracted man's attention since earliest times. Ancient tablets and carvings show that the movements of planets were pretty well observed before 3000 B.C. The Emperor Yao, about 2300 B.C., published a collection of documents which showed knowledge of the equinoxes. Today there are still many watching, studying and enjoying celestial objects. Some make practical use of their knowledge as sailors, pilots and surveyors. The others study the skies out of pure interest and curiosity. I myself, from the early days of boyhood, have been watching and observing the skies, following closely the dramatic changes of weather typical in the temperate zone. My diary about atmospheric events, written during my high school and college days, and which I still have, could prove my genuine interest in God's nature.

A rare astronomical event at that time aroused my interest.

It was not a lunar or solar eclipse, but an unusual meteor shower occurring on October 9, 1933. As usual after supper, we students went out for a stroll through the gardens. When I took my first steps outside, I was struck at once by a spectacular celestial show. The whole moonless and starry sky was filled with thousands of shooting stars. At Hamburg Astronomical Observatory, Germany, rates of up to 350 meteors per minute were systematically observed at the height of the shower at 9 p.m. Some radio stations in Europe interrupted their scheduled programs and called the attention of listeners to the great spectacular show. What really did happen? The earth was passing through the Giacobinid meteor stream or orbit of Comet Giacobini-Zinner, as predicted by Crommelin in the May 1933 issue of the *Journal of the British Astronomical Association.* The comet itself had crossed the Earth's orbit three months earlier. The intensity and short duration of the event — no more than two hours — indicated a dense and comparatively compact cloud of meteors. Possibly the cloud of particles was an independent part of the head of the comet, separated from it.

In 1949, I was assigned to the province of Abra in the Philippines. Besides daily weather measurements, meteor observing was my particular interest. Abra skies are brilliantly clear. I have a record of observations of thousands of meteors which form the basis for my monthly calendar of minor and major meteor streams. Even non-members of a stream, called sporadic meteors, must be considered, in order to locate the radiant. But since 1960, I directed my attention to comets. Comet Ikeya 1963a and the sun-grazing comet, Comet Pereira 1963e were the first ones I observed in a 3-inch refractor and of which I made detailed observations. In 1965, I acquired an 8-inch f/7.5 Newtonian reflector which enabled me to observe many periodic and non-periodic comets, down to magnitude 13.

Preceding the discovery in 1975 was another discovery of a short-lived comet in 1973, on January 12, 4 a.m. Manila time, at right ascension (R. A.) = $11^h\ 38^m\ 20^s$, declination (Dec.) = $-20^\circ\ 12'$. The coma was diffuse, $7'$ of arc in diameter and $9^m.5$ bright, i.e., of magnitude 9.5. Within the coma was a

small distinct nucleus. The next day at 4 a.m. the cometary object had moved to R. A. = $11^h\ 38^m\ 29^s$, Dec. = $-20°\ 20'$. On January 14 the comet was hardly visible in the 8-inch reflector: a sudden fading had taken place from $9^m.5$ to almost $13^m.0$. Despite the fading I reported its appearance to the International Bureau for Astronomical Telegrams in Cambridge, Massachusetts. The reply of Dr. Brian G. Marsden, the director, dated 13 February 1973 was:

> Thank you for your Special Delivery letter. I have often wondered about 'short-lived' comets, but I have never had any really definite evidence for such things. Comets certainly fluctuate in brightness quite considerably, and we can certainly imagine that one would flare up to magnitude 9 for three days and then back down to magnitude 12 or fainter. But if this were a frequent phenomenon, I should expect to find more definite cases of widely observed comets that have unexpectedly and suddenly disappeared.

Dr. Marsden even made further inquiries about possible sky-patrol films in Japan near the position of the cometary object I reported on in January, but with no success.

On January 4, 1975, at 8:15 p.m., a very diffuse object of about magnitude 12 came into view of my 8-inch reflector after I had been checking deep-sky objects in the west-southwestern sky for about fifteen minutes. It was almost circular in shape, with a slight central condensation. If there is only a round nebulous mass, the form alone cannot decide the kind of object you are looking at. But in this particular case, since I found blank space at the very location of my object in Dr. Vehrenberg's *Photographic Star Atlas*, which shows stars down to $13^m.5$, I was convinced that it could be a comet. The blank space was indeed a good omen. Incidentally, the discovery was made inside the house looking out the window. The next evening the cometary object lived up to my expectation: it *had moved* further east-northeast compared with the surrounding stars. To my two letters reporting on my discovery, Dr. Marsden replied:

> I realize that cablegrams cost money but I should point out that it also costs money to try and confirm possible comets. When your report arrived, the moon was already getting to be a problem, and now it is impossible to find a suspected twelfth-magnitude comet in the evening sky. I noted that the object was near Jupiter and wondered whether it was perhaps some kind of ghost image. I also checked, but without success,

with observers who might have been photographing the region around Jupiter during the first week of January. I am not particularly optimistic that the comet can be confirmed.

After I was able to re-locate the comet on January 29, two days after full moon, I continued to gather more data of its orbit. On February 3, I sent a telegram to Dr. Marsden stating the observed position of the comet. He replied, providing official confirmation of the discovery:

Thanks to your cabled February 1 observation, I am delighted to say that we have finally been able to obtain confirmatory observations of the comet initially reported in your letters on January 7 and 9. The circumstances of the discovery and confirmation of this comet are quite incredible, and there has not been a comparable delay over announcing a definite visual cometary discovery since the breakdown of international communications during World War II.

I do want to stress that the whole business would have been much more straightforward if you had cabled your early observations to us. As I said in my earlier letter, I realize that cablegrams are expensive for you. As compensation, we shall therefore send you complimentary copies of the *IAU Circulars* when your present subscription expires, and I implore you to use the money thereby saved to send us appropriate cablegrams in the official manner when you discover your next comet.

What makes the situation even more upsetting is the fact that I am all too aware that you have reported cometary discoveries on at least three previous occasions and that none of these could ever be confirmed. In two of these cases there was again this problem of delay in communication: in the third case, that of January 1973, you reported that the comet suddenly faded out after your third observation, and before we could obtain any confirmation — even though your report was cabled to us.

So I congratulate you on your discovery of the comet which we shall almost certainly be calling 1975a. I must also congratulate you on rediscovering the comet on February 1. The comet is certainly a lot fainter than comets one normally associates with visual discoveries. Several people just have not been able to see it, even when using telescopes of up to 32-cm [12.6-inch] aperture. This was also true, I recall, of your earlier reports. I sincerely hope you will indeed be finding further comets, and that in the future we shall be able to get other observers on to them very much more quickly.