

## The Morehouse Comet

Some men achieve greatness by excelling in one particular field of endeavor, while others, it would seem, may be noted for the broadness of their living experience which produces a well balanced personality. Dr. Daniel W. Morehouse was one of those rare characters who achieved renown in both respects. While his ability and character would have brought him high honor and distinction in time, there can be little doubt that his discovery of the Morehouse Comet, while yet a young man, was an event which actually "sparked" his life and set him safely upon the highway toward a successful career. It proved, as it were, that tide which "leads on to fortune", not in a pecuniary sense, but rather in the fulfillment of purpose which all men crave. It gave him favorable publicity at the period of his life when it meant much to him. And so, perhaps, if one were asked to point at any single event which marked the beginning of his notable career, it would be the happy accident of discovering the remarkable comet which ever afterward was to bear his name.

While astronomy was the principal field of his

interest, Dr. Morehouse was not primarily a research astronomer. He began his teaching career as a physicist, and much of his energy was later devoted to administrative work as dean and college president. Nevertheless, his enthusiasm for astronomy never abated, and he established an enviable reputation as a popular lecturer on that subject. Even as a student he lived figuratively among the mountain tops where his view of both heaven and earth was unobstructed. His vision and perspective qualified him as a scientist and humanitarian, while his keen intellect, fine appearance, and friendly outlook upon life endeared him to all those with whom he came in contact. Wide as Dr. Morehouse's reputation was among men who studied the stars, he was almost equally well known in educational and religious circles.

During the summer of 1908, D. W. Morehouse was studying as a graduate student in Yerkes Observatory at Lake Geneva, Wisconsin. There he was working in the well-equipped laboratory under such eminent astronomers as E. E. Barnard and Philip Fox. Professor Barnard had charge of the Bruce photographic telescope, and occasionally Morehouse was privileged to use it. This instrument, in reality two photographic telescopes on a single mounting, could be used only under the direction of Professor Barnard. Since he was

doing some special work on the Milky Way, other astronomers at the Observatory refrained from encroaching upon the professor's "happy milking ground" and concentrated their attention elsewhere. By thus avoiding duplication of effort, their studies were likely to be of greater scientific value.

It happened that on the evening of September 1, 1908, Morehouse was asked to photograph a region along the fringe of the Milky Way. "In mid-morning of September 2, 1908", said Dr. Fox, "as I came down from the 40-inch dome where I had been working with the spectroheliograph, I met Morehouse as he came up from his darkroom. There was excitement in his manner and voice, so much so that he scarcely whispered as he spoke: 'Fox, I think I've discovered a comet.' When I asked him if it appeared on both plates he rushed down in the dark room and in a moment returned to report the confirmation."

This discovery, albeit accidental, since astronomers do not spend their time searching for unexpected comets about whose existence there can be no previous knowledge, was a triumph for the young Drake professor due to the highly unusual nature of the comet which was to bear his name. Because "the Morehouse comet proved the most bizarre, most whimsical, most unpredictable of

any heavenly vagrant ever discovered", its changes were recorded with the greatest eagerness by a large body of photographic astronomers in America and Europe. It was especially notable for the fact that during the period of its visibility it traveled from pole to pole, having been circumpolar during many weeks in the fall of 1908. Its course made continuous observation practical for many consecutive hours throughout the night, thus greatly facilitating the exploitation of its photographic possibilities.

At the time of its recognition, Comet C, as the Morehouse Comet was then called, had a long tail, and appeared to be moving rapidly toward the constellation of Cepheus. It soon began to display its whimsical character, demonstrating that no one could confidently predict the shape its tail might take. The first marked transformation occurred between September 30th and October 2nd. On September 29th the tail appeared perfectly normal, but on the next night it displayed unprecedented activities, changing continuously until by October 1st a complete disruption had occurred. Although the nucleus remained as it had been, the tail was gone, and the great masses which had formed it were attached to the coma only by "slender streamers". "Photographs of October 2nd show 3 distinct tails; one broad and

fan-shaped, and two smaller ones. They were all faint and changing slowly."

On October 15th, a second and much larger tail was thrown off, this time in a more violent and explosive manner. Two great condensations appeared in the tail, evidently caused by "the localization of the particles in the tail due to some encountered force". These condensations were on opposite sides of the tail, and moved away from the head of the comet at different speeds. They were gone by October 17th. During the period October 15th to 17th the old curved tail disappeared and in its place "a bright, short, spike-like projection, with one end between the masses and the broad end attached to the coma, formed the new tail." The average speed of the comet while these changes were taking place was about 135,000 miles per hour.

The comet was less active during November, although "by no means quiescent". Other distinctive features began to appear about the middle of the month. Morehouse's photographs taken on the 11th, 15th, and 16th showed an undulating or pulsating form of tail which was explained by two French observers as being caused by a tail composed of two parts, wound around one another in spiral form. The photograph of November 15th revealed slender streamers shooting out from the

main body of the tail with great velocity. These actions impressed one observer with the effect of a slowly revolving pinwheel, and another thought it had the "appearance of a thin white veil draped over a star." By November 18th the comet had attained its greatest beauty. The slender rays that marked the tail appeared to predominate, and the tail itself was broken into waves, with a noticeable dark streak extending back from the head along the north side.

The comet was nearest to the earth in October, and it passed its perihelion on Christmas Day. Had the perihelion occurred in June, the comet would have been a spectacular sight as viewed with the naked eye. As it was, the comet was barely visible to the naked eye about the middle of October and again toward the end of the month, and then only to those who knew where to look for it. Its brightness was irregular, but the comet was genial, for, being blue, it was highly photogenic. In the later months of 1908 it was favorably situated for observation in the northern hemisphere, and during February, March, and April, the southern hemisphere enjoyed the same favor. Actually the comet was visible somewhere from the time of its discovery until July, 1909.

The Morehouse Comet was more exceptional in its actions than in its constituent material. It

was composed of the "poisonous cyanogen element", but this was not very unusual. Other unrecognized ingredients were also present. The spectacular behavior of the celestial visitor, however, attracted the most attention for, instead of assuming a customary tail, the tail appeared in various shapes. During its observed course, the comet maintained an almost parabolic motion. This meant that its period of recurrence was extremely long. Astronomers did not calculate when it would reappear because the course it followed during the period when it was visible gave no clue to the size of its ellipse. The consensus of opinion was that the comet would not be visible again for several centuries.

Astronomers learned much about comets from the strange behavior of this Morehouse maverick, but one of the most important lessons it reemphasized was that astronomers have yet much to learn about comets. It upset some of the rather "smug theories formulated to account for the more conventional changes of form". The activities of its tail showed, for example, how very complicated and how little understood were the causes of the existence of tails in comets. "Condensations, waves, straight rays, twisted funnels, and numerous unrecognized forms" composed the constantly changing phenomenon. The Morehouse Comet,

said Dr. Barnard, "has shown features that would have singled it out as a very remarkable object, and on more than one occasion it has presented a most extraordinary and unique appearance." The comet gave astronomers sufficient data to keep them busy digesting and interpreting for a long time.

To young astronomer Morehouse went the full credit for discovery. Professor Barnard had discovered sixteen comets before 1892, and he could well afford to support the claim of his pupil to this one, even if it were not the custom to credit the discovery of an unexpected comet to the person actually finding it. In all fairness it must be added that Borrelly observed the comet independently two days later. This comet of the "unstable tail" was given the catalogue number 1908-III because it was the third to pass perihelion in that year. But, as Dr. Fox has so strikingly stated, "with this comet the name 'Morehouse' will go flaming through space for ages". In recognition of his work of discovery, he was awarded the Donahue Comet Medal by the Astronomical Society of the Pacific.

BEN HUR WILSON