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BIOGRAPHICAL MEMOIR

OF

HEBER DOUST CURTIS

1872–1942

BY

ROBERT G. AITKEN

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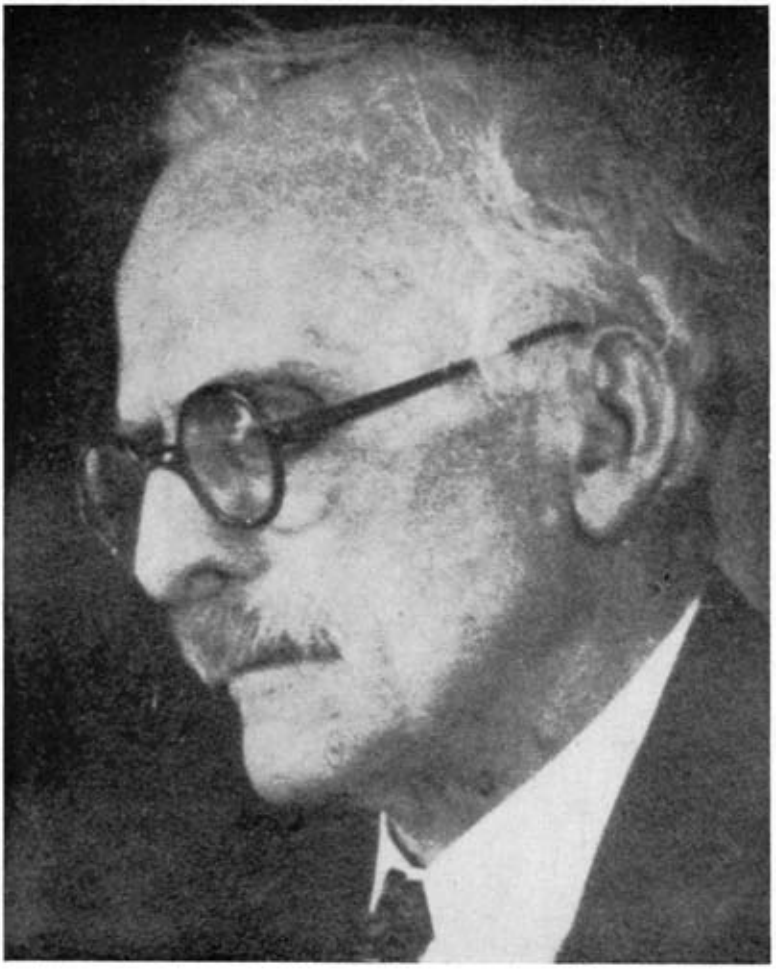

Heber D. Curtis

HEBER DOUST CURTIS

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"Call Dr. Curtis!"—It was gray dawn of a raw December morning on Mount Hamilton, thirty years ago, and our eldest son, home from the university for his Christmas vacation, had roused us, his face drawn and distorted by the agonizing pain in his right abdomen. A word to our physician in San José had brought the curt order, "Bring the boy down at once. There's no time to lose. It's probably acute appendicitis."

By the time the boy and I were ready for the trip, Dr. Curtis had his automobile at the door and we were off on the three and one-half hour trip over the half-frozen, adobe mud road to San José. Surgeon and operating room were ready, and as soon as was humanly possible a highly inflamed appendix, just ready to burst, had been safely removed, and a relieved boy was coming peacefully out from the influence of the anesthetic.

Then Dr. Curtis, having first telephoned to the Lick Observatory to find out if he could do any town errands for anyone "at the top", started cheerfully back on his long, lonesome drive to the mountain, happy in the thought that he had once again been able to be of service.

I tell this story at the beginning of my sketch of the career of Dr. Curtis, to emphasize as strongly as possible the dominant trait of his character—his love for his fellow man, his eagerness to be of service. In our little semi-isolated community of thirty-five or forty adults we all stood ready to help each other in every respect, and I could have called on others who had automobiles and lived nearer to me, but in an emergency of any kind *it was the natural thing to call first on Dr. Curtis.* He was pre-eminently the Good Neighbor.

Born in Muskegon, Michigan, on June 27, 1872, Heber Doust Curtis, the elder son of Blair Curtis and Sarah Eliza (Doust) Curtis, could trace his American ancestry on his father's side through ten generations. A Union soldier, his

father had lost his left arm at Fredericksburg, and then, after taking his A.B. degree at the University of Michigan, had been successively, a school teacher, an editor and a United States Customs official. His mother was born in Maidstone, England, the daughter of a Methodist clergyman, but came to this country as a child and was educated at Albion Female Seminary where she took special interest in English literature and music. She reared her two boys, Heber and Walter, rather strictly. Dancing, card playing, and the theatre were frowned on, and she kept the boys at home of evenings by reading aloud with them the best books she could obtain. Otherwise, they lived the normal life of boys of their social class both at Muskegon and at Detroit where they took up their residence when Heber was seven years old.

He was a good student, finding no difficulty in maintaining a very high rank in his studies both in the grade schools and the Detroit High School. He had plenty of time for outdoor sports and took special pleasure in football, which he continued to play even after he became a teacher. Like many another American boy, he also took a keen interest in machine tools and, in fact, built his own lathe before he could afford to buy a standard one.

At the Detroit High School he took the straight classical course and displayed special aptitude for languages. He was "good", too, in mathematics, but, strangely enough, manifested no interest in the natural sciences, simply taking the courses required of him. Graduating with high standing, he entered the University of Michigan in 1889 and completed the requirements for the A.B. degree, with Phi Beta Kappa rank, in three years and took his A.M. degree in 1893.

When he entered the university, Curtis had decided to become a teacher of the classical languages. He therefore took all the courses in Latin and Greek that were offered, and, in addition, two years of Hebrew, two of Sanskrit, and one of Assyrian. He also enjoyed his work in mathematics, but, as in high school days, showed little interest in the sciences, and, so far as is known, never even entered the observatory which has trained so many American astronomers, including Campbell

and Hussey whom he was to join at the Lick Observatory a few years later.

Leaving the university, Curtis taught Latin at the Detroit High School for six months and then accepted a position as Professor of Latin and Greek at Napa College, a small Methodist institution in California. This proved to be a fateful decision, for here he found a small Clark refracting telescope, standing practically idle and on some impulse was moved to investigate it.

That really marked the beginning of his astronomical career, for while he continued to teach Latin and Greek at Napa for two years, and for another year at San José when Napa College merged with the University (now College) of the Pacific, he was giving more and more time to the study of astronomy. At the University of the Pacific, as at Napa College, he found a small observatory equipped with a good Clark 6-inch refractor and a standard reversible Coast Survey transit instrument. At the end of his first year at San José the professorship of mathematics and astronomy at the little institution became vacant and Curtis applied for it and was appointed!

This "switch", as he himself called it, from the classics to astronomy was one that probably could have happened only in a small college half a century ago. And it is probably the only case on record of a man giving up a career for which he had received full university training, and taking up another in which he had had no training at all except what he had acquired by his own reading and experience, and making the latter a brilliant success. Curtis, it is true, supplemented his own reading by spending the long summer vacation in 1898 at the Lick Observatory, but that was after he had accepted his new position.

In 1900, he was offered a Vanderbilt Fellowship at the University of Virginia and spent the next two years there, taking his Ph.D. degree in 1902, his thesis subject being "The Definitive Orbit of Comet 1898 I." Again, I know of no other astronomer who received his Ph.D. degree after no university training in his special field prior to his two years of fellowship work.

The move to Virginia involved financial problems for the fellowship stipend was only $350 a year, and he had married Mary D. Raper of Ann Arbor in 1895 and now had a family of two small children. In other respects, however, it was a fortunate one and was made at a fortunate time, for it permitted him to join the Lick Observatory Eclipse Expedition to Thomaston, Georgia, in 1900 and the United States Naval Observatory Expedition to Solok, Sumatra in 1901, as volunteer assistant.

His ability and resourcefulness in helping to set up, test and use the eclipse apparatus made so strong an impression upon Dr. Campbell, who headed the Georgia expedition, that he promptly invited Curtis to come to the Lick Observatory as an assistant as soon as he had secured his degree. Curtis himself was so fascinated by the work that in later years he took every opportunity to attend eclipse expeditions and was, in fact, member or leader of eleven in all, before his death. He often lamented, in his last years, that illness by keeping him from observing the eclipse of 1937, had made it impossible to round the number out to an even dozen.

In 1902 he took up residence on Mount Hamilton as assistant in the Lick Observatory and the next eighteen years were the most productive of his very active career. "Research work at Lick Observatory," he wrote in later years, "was, and still is, a very wonderful thing and it looked like a new world to me." His duty as assistant was to take part in the great program of the determination of the radial velocities of the brighter stars which Dr. Campbell had initiated a few years earlier and he set about it with such enthusiasm, mastering all details of spectroscopic observation and measurement, that his work was soon on a level with that of the best observers.

But he did not limit himself to radial velocity work. His eager, active mind led him to examine all the instruments at the observatory, to make suggestions for improvements in some of them and to compute orbits of comets and of spectroscopic binary stars. In 1905, he went to Cartwright, Labrador, with the unsuccessful expedition to observe the eclipse of the sun.

In 1906, he was asked to go to Santiago, Chile, to take charge

of the station established there a few years earlier for the purpose of extending to the south pole of the heavens Dr. Campbell's program of measuring the radial velocities of the brighter stars. This was an assignment that suited Curtis in every respect for it added zest to his astronomical work, and gave him an opportunity to master the Spanish language and to familiarize himself with the manners and customs of the Chilean people. He threw himself into his new work with his accustomed ardor, secured an excellent set of photographs of Morehouse's remarkable Comet of 1908 and made a notable addition to the great radial velocity observing program by the number of plates secured, the discovery of additional spectroscopic binary stars and the computation of orbits, and found time for making improvements in the mounting of the great reflector.

Dr. Campbell recalled him from Chile in 1910, to take full charge of the Crossley reflecting telescope and to carry on the program of nebular observations which had been so brilliantly begun by the late Dr. Keeler in 1898.

During the next ten years Curtis made his greatest contribution to astronomy. Nominally, it is true, he was simply carrying forward Keeler's program. Practically, it was his own program. The general subject was the same but the observing methods were Curtis's own, and there had been so many changes and improvements in the mounting, many of the most important by Curtis himself, that the Crossley reflector had become almost a new telescope.

The results of his work are embodied in "the Nebular Volume," Volume XI of the Publications of the Lick Observatory as well as in many short papers in various journals, and were afterwards included in his general memoir on the *Nebulae,* written for *Das Handbuch der Astrophysik.* The memoir on the *Planetary Nebulae,* with its beautiful photographs and drawings and detailed descriptions is a classic and the chapter on the spirals was even more important.

At that time (1910-20), astronomers in general had abandoned the conception of a plurality of worlds which had prevailed a century earlier, in favor of the idea that all the objects

revealed to us by our most powerful telescopes were members of a single great system. Curtis was led to take the older view on the basis of his own observations and of his study of the work of others. The dark areas and the great rift in the Milky Way would, he thought, if viewed from a sufficiently great distance, give much the appearance of a "banded spiral" of which he photographed many with the Crossley, and both phenomena could well be explained by the presence of a light-absorbing medium. This medium, too, would quite fully account for the fact that few spirals are visible to us near the plane of the Milky Way. They are there, but hidden by the light-absorbing cloud. Then, if the novae which Ritchie at Mount Wilson, he himself at the Lick, and other astronomers were beginning to find in increasing numbers in spiral nebulae were similar objects to the Milky Way novae, their relative faintness would give an approximate value for the distance of the spiral in which they appeared.

For a time only his colleagues at Mount Hamilton, and a few other astronomers agreed with him in his views. This did not greatly disturb Curtis. He was rather slow in formulating his opinions, but when once he had reached his conclusion he held to his views tenaciously and was always ready to defend them. It must have been a great satisfaction, however, to have Hubble's* researches in 1925, made with the 100-inch telescope and the far more accurate method of measuring distances to the nebulae provided by the Cepheid variable stars not only confirm his views as to the abundance of external galaxies and their great distances, but prove that his own figures had been extremely conservative.

In 1920, just as his observing program on the nebulae had reached a certain terminal point, he was invited to become director of the Allegheny Observatory and after some hesitation accepted the offer. This meant a radical change in the nature of his activities. He had first of all to settle some difficult administrative problems and then to devote some time to teaching at the University of Pittsburgh. Moreover, the 30-inch

*And those of other astronomers, later.

photographic refractor at Allegheny was specially planned for stellar parallax work in which he had had no experience. The program had been initiated by Professor Schlesinger, who had resigned the directorship to take up similar work as director of the Yale University Observatory.

Curtis, wisely, continued this program, and took a personal part in the actual observing work, but he contributed nothing new to it. His personal energies were devoted rather to building up the machine shop and to the design and construction of new instruments for his own observatory and for other institutions.

Characteristically, his first task was the grinding out of the periodic error in the driving worm of the 30-inch refractor. He designed and built a new type of stellar comparator, and a number of instruments for use on the four eclipse expeditions conducted jointly with his friend Dr. John A. Miller, director of the Sproul Observatory. A long-screw measuring machine which he built for Dr. Miller gave him special satisfaction for, as Dr. McMath has said, he regarded a successful ruling engine as the most perfect man-made machine.

Under his wise administration the great parallax program and the lesser programs of observing work made steady progress; his teaching work at the university was in a high degree successful; he was in constant demand as a lecturer and the eclipse expeditions and the design of improved instruments at the machine shop absorbed his surplus energies. He was advancing the interests of astronomy in many ways, even though he was not developing an observing program of his own, and he was happy in his relations with his colleagues at the university and observatory.

Then came the invitation to go to Michigan as the director of the observatory, coupled with the assurance that funds would be provided for building a large reflecting telescope. This was in 1930. It was the opportunity offered to build a great telescope that led him to accept the invitation. In other respects the directorship there offered little that he did not already have at Allegheny. But Curtis, like all astronomers who have worked with large telescopes, had problems in mind that could

be attacked successfully only with a very powerful instrument, and, in addition, had given much attention to the mounting of such a telescope and had quite definite ideas on the subject which he was eager to try out.

Unfortunately, the great depression followed. The disk of pyrex glass, large enough for the construction of a mirror of 97½-inch aperture, was successfully cast by the Corning Glass Company, and delivered to the observatory at Ann Arbor. But then the generous donor, Mr. Thomas W. Lamont, had to notify the university authorities that he could not go on with the enterprise!

This was a severe disappointment to Curtis, who was already absorbed in working out the details for the mounting of the telescope, but there was nothing he could do about it. He took up the general duties of his office, forwarded the various observing programs he found in progress and took a personal part in the actual observing work, gave regular lectures at the university, and put in his spare time in completing his working drawings, in the hope that funds for the great telescope might later become available.

Fortunately, when Curtis came to Ann Arbor, the development of the McMath-Hulbert Observatory as a private institution was well under way. As this gradually grew into the present powerful equipment for solar research, and became an integral part of the "Observatories of the University of Michigan," Curtis's interest in the project grew. He was in almost daily conference with Dr. Robert McMath, the active head of the observatory, throughout the last ten years of his life and Dr. McMath has testified that "his contributions to the McMath-Hulbert Observatory cannot be measured."

With all these varied duties, Dr. Curtis still found time to attend meetings of scientific societies, and to organize and head the successful eclipse expedition to Fryeburg, Maine, in 1932. His work in later years was interrupted by several periods of illness but despite these he was able to continue in active service to the very end of his life. After driving home from Cleveland, Ohio, where he had attended and taken an active part in the meeting of the American Astronomical Society during convo-

cation week (less than two weeks before his death) he complained of fatigue, but even on the day before his death he spent a few hours at his office. He died quietly in his sleep in the early morning of January 9, 1942.

Dr. Curtis was, of course, a member and officer of the professional astronomical societies of the country, serving as a member of the publication committee of the Astronomical Society of the Pacific for a number of years and as its president in 1912; a member of the council of the American Astronomical Society for several terms and vice-president of the Society in 1926; and vice-president and chairman, Section D (Astronomy) of the American Association for the Advancement of Science (1924). In recognition of his contributions to astronomy, he was elected a foreign associate of the Royal Astronomical Society of London and to membership in the National Academy of Sciences and in the American Philosophical Society. He also joined the Astronomische Gesellschaft in the earlier part of his career, and was a member of the International Astronomical Union, Commission 13 of solar eclipses.

He attended the meetings of the societies in our own country as regularly as possible and took an active part in their council meetings as well as in the discussions at the open sessions.

He had a remarkably wide range of intellectual interests combined with a passion for thoroughness in all work he undertook. This unusual combination made it possible for him to be at one and the same time a great linguist, a most successful teacher, a distinguished research observer, and a builder of instruments of precision. But his colleagues, students and friends will recall most of all his ever-cheerful comradeship, his wise counsel, his helpfulness in times of need. He was first of all a man who loved his fellow men and joyed in serving them.

University of Michigan
College of Literature, Science and the Arts
Faculty Record
Name: *Heber Doust Curtis*
Department: Astronomy
1. Date and Place of Birth: June 27, 1872, Muskegon, Michigan
2. Educational Record (Institution, Date, Degree):

Undergraduate Work: University of Michigan, A.B., 1892

Graduate Work: University of Michigan, A.M., 1893; University of Virginia, Ph.D., 1902

3. Academic and Professional Record at Institutions Other than University of Michigan:

Teacher, Detroit High School, 1893-94
Professor, Greek and Latin, Napa College (Calif.), 1894-96
Professor, Mathematics and Astronomy, College of the Pacific, 1896-1900
Vanderbilt Fellow in Astronomy, University of Virginia, 1900-02
Asst. and Asst. Astronomer, Lick Observatory, 1902-05
Acting Astronomer, in charge D. O. Mills Expedition to Southern Hemisphere (Santiago, Chile), 1906-10.
Astronomer, Lick Observatory, 1911-20
Director, Allegheny Observatory, 1920-30
Director and Professor of Astronomy, Univ. of Mich., 1930-42
Director Emeritus, Univ. of Mich., 1942-

4. Membership in Professional and Learned Societies:

Astronomical Society of the Pacific (President, 1912)
American Association for the Advancement of Science (vice-president, Section D, Astronomy, 1924)
American Astronomical Society (vice-president, 1926)
Astronomische Gesellschaft
National Academy of Sciences
American Philosophical Society
Research Club (Univ. of Mich.)
Foreign Associate, Royal Astronomical Society
International Astronomical Union; member of Commission 13 of solar eclipses
Phi Beta Kappa; Sigma Xi; Phi Kappa Phi

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Note: Following the procedure of numerous scientific yearbooks, the media in which many papers have been published have been abbreviated as follows in the list below:

AJ—The Astronomical Journal
AN—Astronomische Nachrichten
AphJ—Astrophysical Journal
ASP—Publications of the Astronomical Society of the Pacific
LOB—Lick Observatory Bulletins
PopAstr—Popular Astronomy
PublAO—Publications of the Allegheny Observatory
PublMO—Publications of the Observatory of the University of Michigan
PublLick—Publications of Lick Observatory
Other media have been given in full, or slightly abbreviated.

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1926-27, " *35*, 561-62, 1927.
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1936

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1913

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1915

Astronomical exhibits at the Exposition. ASP *27,* 105-9.

1917

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1919

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1920

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1925

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1928

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1929

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1934

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1938

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D. Abstracts and Reviews

(Abstracts of Curtis's own papers are entered above under A; the following are on works by other authors)

1903

Publicationen des Astrophysikalischen Observatoriums Königstuhl-Heidelberg; Bd. I. ASP *15*, 233-35.

1904

On some results obtained by the D. O. Mills Expedition to the Southern Hemisphere (W. H. Wright). ASP *16*, 222.

1909

Two new calculating tables, J. Peters Neue Rechenafeln, and O. Lohse Tafeln für numerisches Rechnen mit Maschinen. ASP *21*, 226-7.

1910

Two new microscopes for the measurement of spectra (Zeitschrift für Instrumentenkunde, June, and Deutsche Mechaniker-Zeit, Nov. 15. ASP *23*, 67-8, 1911.

1911

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Photographic determinations of stellar parallax, by F. Schlesinger, AphJ *32*, *33*, *34*, 1910 and 1911. ASP *23*, 205-6.

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1912

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The spectroscopic binary β Scorpionis, J. C. Duncan, Low. Obs. Bull. *2*, 21-5. ASP *24*, 283-4.

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Ueber . . . scheinbarer Durchmesser der Sterne . . ., von S. Pokrowsky, AN *192*, 21-36. ASP *24*, 284-85.

1913

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Comet *a* 1910, by C. O. Lampland, Low. Obs. Bull. *2*, 34-55. ASP *25*, 304.

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Zur Frage . . . der Masse der Kometenkern . . . von S. Orloff. Bull. Acad. Imp. St. Petersb. No. 5,257. ASP *25*, 175-77.

Lehrbuch der spärischen Astronomie, von L. de Ball. ASP *25*, 224-25.

Das Bodeseche Gesetz und die sogenannten intramerkuriellen Planeten. von C. V. L. Charlier, AN *193*, 260-72. ASP *25*, 97-99.

Transactions of the astronomical observatory of Yale University, *2*, parts 3 and 4, 1912. ASP *25*, 44-46.

1914

Some results of observations with the photographic zenith tube, by F. E. Ross, AN *197,* 137-40. ASP *26,* 112-13.

Ein schwacher Begleiter zu Capella, von R. Furuhjelm, AN *197,* 181-82. ASP *26,* 113.

1917

Space, time and gravitation. Abstract of articles by de Sitter, Mon. Not. RAS *76,* 699-728, 1916; Observ. *39,* 412-19, 1916; and by T. J. J. See, Observ. *39,* 511-12, 1916. ASP *29,* 63-64; PopAstr *25,* 216-17.

Systematic variation . . . of stellar parallax, by A. S. Flint, AJ *29,* 189-204, 1916. ASP *29,* 61-2.

1924

Eclipses of the sun, by S. A. Mitchell, 1923. AphJ, *60,* 262-63.

E. Eclipse Expeditions

Year	*Location*	*Sponsoring Institution*
1900	Thomaston, Georgia	Lick Observatory
1901	Solok, Sumatra	U. S. Naval Observatory
1905	Cartwright, Labrador	Lick Observatory
1914	Brovary, Russia	Lick Observatory
1918	Goldendale, Washington	Lick Observatory
1923	Yerbaniz, Mexico	Sproul Observatory
1925	New Haven, Conn.	Sproul Observatory
1926	Benkoelen, Sumatra	Sproul Observatory
1929	Takengon, Sumatra	Sproul Observatory
1930	Gerlach, Nevada	Allegheny Observatory
1932	Fryeburg, Maine	Univ. of Mich. Observatory