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Ouvrage recensé :

*The Cold Light of Dawn: A History of Canadian Astronomy* by Richard A. Jarrell, Toronto, University of Toronto Press, 1988. Pp xi + 251, ill., \$40.00, ISBN 0-8020-2653-2.

par Arthur E. Covington

*Scientia Canadensis: Canadian Journal of the History of Science, Technology and Medicine / Scientia*

*Canadensis : revue canadienne d'histoire des sciences, des techniques et de la médecine* , vol. 13, n° 1, (36) 1989, p. 67-69.

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DOI: 10.7202/800284ar

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*The Cold Light of Dawn: A History of Canadian Astronomy* by Richard A. Jarrell, Toronto, University of Toronto Press, 1988. Pp xi + 251, ill., \$40.00, ISBN 0-8020-2653-2.

The accomplishments, failures and practices of astronomy during the past 500 years in Canada are described in a single volume by R. A. Jarrell, Associate Professor of Science Studies at Atkinson College, York University. The preface and introduction provide an overview for selecting dominant features of the growing science of astronomy in the New World. The emphasis is not on technical matters, although they are present, but on social relations between individuals and on institutions. The study is organized in four distinct eras: from 1534 to 1840, dealing with European astronomy in the service of the colonies in the New World; from 1840 to 1905, with the support of governments to found observatories and by universities to offer studies in natural sciences and mathematics; from 1905 to 1945, with the establishment of three major observatories and the participation in international astronomy; and finally from 1945 to the present, with completely new avenues of research. The style is concise, and the account may be followed in the notes or through references given in the

bibliography. There are three appendices and an index. The account is sometimes overwhelming, but is fortunately enlivened by the author's general reflections and comments and by the inclusion of thirty-one photographs. The photograph on the dust jacket is of the well-known David Dunlap Observatory, at dawn with snow on the ground. The dedication of the Canadian astronomer to his or her science is suggested, as is the poetic title of the book.

The names of fifteen of the early observatories established before 1900 are given in Appendix A, sometimes with comment. Unfortunately, the short-lived observatory at Louisbourg (1750-51?), although mentioned in the appendix, is not in the index. The natural appeal of celestial objects for everyone also led to the founding of the Astronomical and Physical Society of Toronto in 1890. The society is open to both professional astronomers and to lay persons, supports public lectures and publishes a Journal.

A federal charter enabled it to extend its activities outside Toronto as the Royal Astronomical Society of Canada; there are now twenty-one centres across Canada.

Soon after the development of the telegraph in the mid-1800s, land surveyors sent time signals from established observatories for the determination of longitude. When the cable connecting western Canada to Australia was completed in 1902, Otto J. Klotz, a Canadian astronomer who had participated in the surveys, found the time difference between signals sent east and west from Greenwich to Australia was only 1/15 second. The year before, Marconi had made his famous trans-Atlantic communication, and W. F. King, the senior Canadian astronomer, entertained the idea of obtaining longitude with wireless signal. This was not possible until 1920.

*The Cold Light of Dawn* also chronicles the establishment of a federally-funded observatory in Ottawa by King, Klotz and Deville. The first project, assigned to J. S. Plaskett, was to organize an expedition for observing a total eclipse of the sun in Labrador on 29 August 1905. It was clouded out and the equipment was returned to Ottawa and installed in a new building which had been officially opened in April 1905. The observatory undertook diverse activities: in astronomy, time service, solar observations, gravity and magnetic surveys and in seismology. The solar program, which had been initially started by Plaskett, was assumed by Ralph DeLry; Plaskett could then devote himself to the application of physics to astronomy and to promote the construction of a large telescope for the Dominion Astrophysical Observatory in Victoria. After its installation in 1918, the diameter of 72 inches (1.83 m), made the telescope a foremost instrument for a few years. Plaskett and his staff soon made observations which revealed the rotation of our galaxy. The account of this period

shows clearly the nature of the animosities which were unfortunately present in the Dominion Observatory at the end of World War I. The teaching of astronomy at the University of Toronto was developed by C. A. Chant at the beginning of the century. It was only much later, in 1935, that the university was presented with a 74-inch (1.88 m) telescope as a memorial for David Dunlap.

Studies in the final period, from 1945 to the present, show that Canada participated in certain aspects of the global post-war growth of astronomy. Shortly after the war, forty -three years ago, studies in solar radio astronomy were initiated by this reviewer, and were followed by radar studies of meteors entering the earth's atmosphere by D. W. R. MacKinley and P. M. Millman. In 1947, C. S. Beals was transferred from the Victoria observatory to become Dominion Astronomer in Ottawa, and he directed studies of meteoritic craters in Canada. When Beals retired in 1964 (incorrectly given as 1962, p 164) major changes in administration followed, and in April 1970, the Dominion Observatory was closed. Most of the staff came to the National Research Council and became part of the Herzberg Institute of Astrophysics when it was formed in 1975. The specialist histories and memoirs needed for recording the most recent times have yet to be written and studies. The possible closing of the Algonquin Radio Observatory announced in 1986 has been recorded without any analysis.

*The Cold Light of Dawn*, a comprehensive study of Canadian astronomy by Richard Jarrell, is much needed and is likely to remain the definitive reference for several years. It should find a place in the libraries of professional and amateur astronomers as well as of interested lay people.

Arthur E. Covington

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Arthur E. Covington was Canada's pioneer radio astronomer. Since his retirement from the National Research Council, he has lived in Kingston, Ontario.

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