

**THE LINDSAY CENTENNIAL SYMPOSIUM.
ERIC MERVYN LINDSAY AND ASTRONOMY IN IRELAND.
Report and Selected Contributions from a Conference held
in Armagh on 26 January 2007 to Celebrate the
100th Anniversary of the Birth of E.M. Lindsay,
Seventh Director of Armagh Observatory**

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Abstract: The Lindsay Centennial Symposium celebrates the wider importance of astronomy in Ireland and its unique role in advancing our understanding of the world in which we all live. Astronomy is an international endeavour that transcends political boundaries and helps to draw people together. Virtually every country in the world—and Ireland is no exception—looks to astronomy as part of its national heritage and as an activity, in common with other nations, that goes back almost to the dawn of civilization. In Ireland, astronomy can be traced back more than five thousand years to the time of the construction of megalithic monuments, such as the famous passage-tomb at Newgrange. More recently, Ireland was home to the largest optical telescope in the world, the so-called ‘Leviathan of Parsonstown’. Lindsay played a major role in advancing Irish astronomy. He recognized, very early on, that astronomy is not merely a national activity, but an international one as well, and one that on the island of Ireland must include close collaboration between the two jurisdictions: Northern Ireland and the Republic of Ireland. Astronomy attracts people, young and old, into science and to a more scientific way of thinking; it addresses issues of major significance for culture and for our understanding of mankind’s place in the Universe; and provides young people with challenges in science and mathematics that are of the utmost technical difficulty and which bring important practical benefits to society. The occasion of the 100th anniversary of Lindsay’s birth is a time of great optimism for political and economic developments on the island of Ireland, and especially for the growth of astronomy on both sides of the Border and as part of Ireland’s involvement in wider European science.

Keywords: Irish astronomy, biography, Eric Mervyn Lindsay, Armagh Observatory, Dunsink Observatory, South African astronomy, amateur astronomy, astronomy and society, education and public outreach

1 MESSAGE FROM PATRICK MOORE

“I am particularly sorry that I cannot be with you today on this great occasion. Eric Lindsay was a close friend of mine, and I was very glad to work with him at the founding of the Planetarium. He was a great astronomer, and also a great friend. He carried out work of great importance, and he was also one of the best at bringing astronomy to the people.

I am proud to have known him. He is greatly missed by us all, but he and his work will not be forgotten.”

Patrick Moore
Selsey
23 January 2007

**2 INTRODUCTORY REMARKS BY MARK BAILEY:
“THE IMPORTANCE OF IRISH ASTRONOMY”**

It is a pleasure to welcome you to today’s celebration of the 100th anniversary of the birth of Dr Eric Mervyn Lindsay (see Figure 1), and to thank so many of you for being here today and for your enthusiastic support for this meeting.

As you know, Ireland has a long history of interest in astronomy—stretching back more than five thousand years to the famous megalithic monument of Newgrange and other early astronomical sites. More recently, Ireland and Northern Ireland have laid claim to a proud tradition of scientific and technological innovation. In astronomy this includes the largest telescope in the world for 72 years from 1845, the great 72-inch reflector or ‘Leviathan of Parsonstown’, in Birr, Co. Offaly, and the record of its two astro-

nomical observatories—Dunsink and Armagh—which date respectively from 1783 and 1789. The work of these ‘sister’ observatories in the intervening two hundred years illustrates the strength and vitality of Irish astronomy throughout this period, a project that has now been augmented by burgeoning university groups on both sides of the Border. The past two hundred years have seen a revolution in mankind’s understanding of the Solar System and the wider Universe, an activity in which Irish astronomy has played a very significant role.



Figure 1: Dr Lindsay, Patrick Moore and Cardinal Conway (left to right) in conversation in the grounds of the Armagh Observatory in February 1967.

Of course, Ireland—like Britain—does not have the best weather to pursue astronomy, and the growing light pollution associated with increasing urbanization means that many of us no longer enjoy the very dark skies that we remember as children. The modern astronomer has to visit remote high-altitude sites to get the best observing conditions, and increasingly—to avoid the vagaries of the opacity of the Earth's protective atmosphere—uses instruments on board satellites or spacecraft, rather than the ground.

Nowadays, we take these advances for granted, and sometimes forget the heritage on which they are based. Today's meeting provides us with an opportunity to look back at the foundations of modern Irish astronomy—how we got where we are today—and at the same time to look forward with anticipation to the results of more recent research.



Figure 2: E.M. Lindsay in his study at Armagh Observatory. "I divide mankind into two classes: those who are interested in astronomy, and those who are not. And this division cuts across all races, nations and social groups ..."

A second theme running through today's meeting is the importance of government support for 'pure' science. The fortunes of Ireland's two observatories during the twentieth century amply illustrate this so far as astronomy is concerned. Astronomy is not expensive in the big scheme of things, but it is probably not exaggerating to say that many university groups and national observatories, even now when astronomy is so successful, are struggling for funds. One reason for this is that, at first sight, most astronomical research produces few immediately applicable, 'useful' results!

Nevertheless, astronomy plays a unique cultural role. First, it is the same dark sky that is visible from here, or Hawaii, or wherever, that has been experienced by all cultures at all times, influencing all peoples and civilizations in their respective religious and philosophical thinking from the dawn of time. "It is indeed a feeble light that reaches us from the starry sky", said the Nobel physicist Jean Perrin, "but what

would human thought have achieved if we could not see the stars?"

Secondly it seems important to highlight the fact that astronomy does in fact bring occasional very important benefits: 'spin-offs', if you like. While it is difficult to quantify the economic rate of return from investment in a 'pure' science such as astronomy, there is no question that discoveries in the subject occasionally have the potential for massive social and economic impact. For example, the effects of the variable Sun and most other 'extraterrestrial' effects on climate are still so poorly known that they are routinely ignored in calculations of predicted global warming; yet, what caused the Ice Age? Similarly, we now know that comets and asteroids can run into the Earth with occasionally catastrophic consequences, influencing not just the economy—that would be the least of our worries—but the evolution of life itself.

Another example—and one about which Eric Lindsay (Figure 2) would have had a very clear view—is the interest and fascination that many people have in astronomy at some point in their lives, and the capacity of astronomy to inspire people, both young and old, steering them towards science and towards a more scientific way of thinking. Both Ireland and Northern Ireland face the same problem of decreasing numbers of students choosing to study the so-called 'hard' sciences, such as physics, mathematics and engineering. These are areas of key importance if we are to compete internationally in the twenty-first century global market. It is no accident that many former pure Physics university departments are now offering either Astronomy degrees or combined Physics and Astronomy degrees. Astronomy has mass appeal!

Finally, astronomy is an international venture. I have mentioned how access to dark skies is the one part of our natural environment that has been experienced, equally, by all cultures at all times. Similarly, international collaboration in astronomy, involving cross-border exchanges of personnel, ideas, funds and equipment, is—and always has been—the norm. There are many examples where astronomical projects, as in the Lindsay era with construction of the Armagh-Dunsink-Harvard Telescope in Bloemfontein, South Africa, have played an important role in providing tangible political benefits in terms of greater co-operation and mutual understanding.

On this note, and especially considering Lindsay's international astronomical interests and his equal devotion to Irish and Northern Irish astronomy, it seems entirely appropriate that the Lindsay Centennial Symposium should be formally opened by the Joint Secretaries of the North/South Ministerial Council, first Mary Bunting (Northern Secretary) and then Tom Hanney (Southern Secretary).

3 OPENING ADDRESS BY NORTHERN SECRETARY, MARY BUNTING

Good Morning everyone and thank you, Mark, for your very inspirational opening comments. Indeed, many of the themes that Mark has drawn on provide a very fitting beginning for the Symposium. Tom Hanney and I are delighted to be here this morning to open this very important event and it's absolutely wonderful to see so many people from different parts of Ireland and internationally.

When Mark was speaking he mentioned the role that astronomy can play in inspiring people, in bringing people together, and as a mechanism for mutual co-operation and benefit. I think that this is very true, and certainly the work that Dr Lindsay did in his time was an inspiration to everyone. It is a pity that people in Northern Ireland don't know more about the wonderful people who have done so much to put Northern Ireland on the map both in the UK and Europe, and indeed in the world. I think that his pioneering North/South work, which Mark mentioned in terms of the work between Armagh and Dunsink Observatories, and his work in South Africa, amply demonstrate how important it is that people don't allow borders to artificially cloud the good work that can be done when they work cooperatively.

We are very proud of Dr Lindsay in Northern Ireland. He is one of a number of leading scientific minds that this small place has produced, and we should celebrate the work that he did and the heritage that he has developed. Indeed, we are very pleased to be here in Armagh. When I came here last January I was struck by the fact that we have the two churches—it is the ecclesiastical capital of Ireland—and in many ways it is also the leading centre for astronomy in Ireland. I suppose you could say that it is a truly heavenly place! And we have grown to really enjoy our time here and recognise the potential in Armagh to develop this cooperative North/South work.

We are also very hopeful that over the coming days we will begin to see the light behind the shadow. This reflects another of Dr Lindsay's statements that struck me, "... that where there is a shadow, there must be light." In the Northern Ireland context we have had a lot of shadows, and so let us hope that we are now coming out from that period and into the light of a more fruitful, happy and peaceful place for all the people.

The work that you do in promoting science with young people is also very important, and I think that at this time in the history of Ireland we are beginning to recognise that if we are to develop our economy—both North and South—we really do need more young people pursuing careers in science and technology. And there is no better way than astronomy to bring people into science.

I was struck by what you said there, Mark, as a maths and physics student myself way back in the 1970s. There were very few of us around at that time and I know just how hard it can be for many young people. Astronomy does play a very important role in bringing people in; we need to bring more people in; and we need to build on the inspiring work of people like Dr Lindsay and yourselves if we are to compete effectively in the global economy—where other countries are churning out science and technology graduates by the thousands. So it is a very important contribution that you are making to that. It is interesting also to realise that there have been so many people I didn't know about until I was preparing for this event today, and that Patrick Moore had such a close association with Armagh: another very inspirational person and inspirational leader.

So, I wish you well with your symposium. It is going to be hard going. I have seen the programme

and you will be hard at it right through until later on tonight, but I am sure you will enjoy it; indeed, as would anyone who is interested in astronomy. So good luck with your work and have a really good day. Thank you very much Mark!

4 OPENING ADDRESS BY SOUTHERN SECRETARY, TOM HANNEY

Thank you very much for the invitation to address this Lindsay Centennial Symposium. It is an honour for Mary and me to have been asked to do this, especially when I think that before this invitation both Mary and I would have admitted to ignorance about the existence of Dr Lindsay. But now, having read so much about him, I think we both tend to see him as an inspiration for the work that we are undertaking here in Armagh. We are certainly inspired by his drive, by his determination and vision. And, as you have pointed out in the background literature, he was also somebody committed to North/South cooperation in astronomy at a time when North/South cooperation hardly existed on the island of Ireland.

The North/South Ministerial Council for those here who are not familiar with it, is an all-Ireland institution established under the Good Friday Agreement, and we are located here in Armagh, a close neighbour of the Observatory. Our objective at the North/South Ministerial Council is to foster mutually beneficial relations between Northern Ireland and Ireland on a wide range of issues. Even though the institutions of the Good Friday Agreement are currently suspended, it doesn't mean that Mary and I have nothing to do here in Armagh. In fact there is a wide range of ongoing cooperation to take care of. Currently, it is true to say that relations between North and South on a wide range of issues including energy, communications, trade, investment, the environment and so on have probably never been closer.

In many ways this cooperation is advancing without the direct involvement of Governments. For example, in the business sector North/South cooperation is at an all-time high, including trade and investment flows. However, much more can and will be done. At the North/South Ministerial Council we are looking forward to the future and we hope to see an Assembly and Executive in place in Belfast by the end of March.

Last year, the two Governments published a very important document. It was a comprehensive study of the all-island economy, and identified a very wide range of areas where we can cooperate together in the future. We are looking forward to restoration to try to take this document forward. Also, just last week the Irish Government published its National Development Plan which envisages the expenditure of 184 billion Euro in Ireland over the next seven years, and for the first time the National Development Plan includes a chapter on North/South cooperation. Under this the Irish Government has committed to spending substantial sums of money on projects within Northern Ireland that are mutually beneficial to both sides of the island, and again at the North/South Ministerial Council we look forward to taking this work forward.

Much of the success of our work in Armagh will depend on the success of the outcome of the current political process. While I know that astronomers would very much frown on the sister pseudo-science

of astrology, I think that we at the North/South Ministerial Council would be very interested to know if you astronomers charting the movements of the stars could tell us whether we will see Dr Paisley and Martin McGuinness in office in Belfast at the end of March. Perhaps conjunctions of Mars and Venus might facilitate the outcome!

On a more serious note, it is an honour to speak at this conference. When Dr Lindsay came to Armagh relations between North and South were in a very poor state. I was therefore very interested to read that the North/South agreement relating to the establishment of the Armagh-Dunsink-Harvard Telescope in South Africa was potentially the first North/South Agreement ever. It is a very important document. I think we should probably have a framed copy of it in the entrance to the North/South Ministerial Council here in Armagh.

Just as North and South have come closer together in order to cooperate in the face of the earthly challenge of globalisation, I think it is very important that we should come closer together as efforts are made to chart the heavens and unlock its secrets. Certainly at the North/South Ministerial Council we are very willing to work closely with Mark and his team here and to try and develop the current system of Lindsay Scholarships. For our part, we are taking this issue up with Dublin now and I think we would very much hope to see development of the Lindsay Scholarship scheme in the future, perhaps awarding more scholarships. This is something that we would like to take up with Mark and his team after the Lindsay Centennial Conference. So I wish you all the best in your work in the coming day and an enjoyable Symposium, and it has been a pleasure to be here. Thank you.

5 ACKNOWLEDGEMENTS

On behalf of everyone at Armagh Observatory, I want first of all to thank everyone who attended and contributed to today's events, making it a most remarkable and memorable meeting. I also want to thank Bebe Ishak and John McFarland, whose idea it was last October/November to organize a conference to celebrate the 100th anniversary of Lindsay's birth, and for helping to drive forward so effectively the

arrangements for the meeting. Virtually every Observatory Ph.D. student and a large number of members of staff have been involved in one way or another, whether in designing the original poster for the meeting or providing research talks and posters of their own, or in some other matter. Aileen McKee has ably managed all the local arrangements and not only produced the final copy of the programme but also provided an extremely helpful transcript of the oral contributions, some of which are included as part of these Proceedings. Thanks too are due to Martin Murphy and Geoff Coxhead, for ensuring the smooth operation of all the technical aspects of the meeting; and particularly to Máire Brück, Pat Corvan and John McConnell for permission to use historic images from their personal collections. Full details of the original programme for the meeting, including the Book of Abstracts of contributed talks, and images, slides and a video record of the meeting, are also available from the Armagh Observatory web-site, at: <http://star.arm.ac.uk/lindsay/>. Finally, I thank John Butler, Pat Corvan and John McFarland for their care in reading this manuscript, which has helped to remove any minor errors and inconsistencies.

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 June 2007

Professor Mark E. Bailey is Director of the Armagh Observatory in Northern Ireland, and a Vice-President of the Royal Astronomical Society. He obtained his Ph.D. at the University of Edinburgh in 1978 with a thesis on the evolution of active galactic nuclei, but his current research focuses on issues closer to home: solar system astronomy, the origin and dynamical evolution of comets, asteroids and meteoroids, and solar system–Earth interrelationships, including aspects of the comet and asteroid impact hazard. In addition to nearly a hundred refereed scientific papers, he has co-edited several books and conference proceedings and is co-author of *The Origin of Comets* (Pergamon, 1990). In 1990, he was honoured by the IAU when minor planet (4050) was named 'Mebailey', and in 2007 he received an MBE.