Editorial

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The back cover of this issue of *Resonance* carries a sketch of one of the pioneers of radio astronomy – Martin Ryle – who developed the techniques of radio interferometry at Cambridge. This has been the basis of modern interferometric radio telescopes, including the Giant Metrewave Radio Telescope (GMRT). Martin Ryle's life and work has been beautifully summarized by Rajaram Nityananda, while the basics of radio astronomy, the GMRT and some results have been lucidly presented by Jayaram Chengalur. This issue also carries other general articles and a classroom tutorial on the Marangoni effect by Chirag Kalelkar.

Since the establishment of Cavendish Laboratory in 1874, it has been a story of doing cutting-edge science and making profound discoveries with apparently simple experiments, usually on a shoestring budget. Ernest Rutherford who led the Laboratory from 1919 till his death is known to have said, "We have no money, so we shall have to think." Ryle and his colleague Vonberg spent their early years stocking the Laboratory with war-surplus equipment, from simple voltmeters to antennas for their experiments, as these could be obtained cheaply. Story has it that he managed to get some 3 m and 7.5 m German Würzburg dishes from a metal scrap merchant who obtained these from the Royal Aircraft Establishment.

Govind Swarup, the father of Indian radio astronomy mentioned to me: "I met Sir Martin Ryle at Cambridge in early September 1963, soon after my return to India in April 1963, ... I described to him my proposal to construct a ~ 500 m long 30 m wide parabolic cylindrical radio telescope equatorially mounted on a suitable hill in South India for lunar occultation observations of a large number of weak radio sources in order to distinguish between the Big Bang and Steady State theories. I told him that Dr. Homi Bhabha has supported the proposal and has asked me

to first build a group." He mentioned that Martin Ryle liked the idea and suggested that he investigate the harmful effects of ionospheric scintillation, and "Not to hire a Consultant who makes radio telescopes like bridges!" Martin Ryle had joined Ratcliffe to work on the ionosphere but soon lost interest. He and Vonberg started observing the Sun, and sometime in 1945–46 developed the idea of an interferometer.

Ryle, a completely hands-on person, was to recollect later on interferometry: "I don't think the idea arose by analogy with an optical Michelson interferometer because one had forgotten all one's physics by the end of the war. I think it arose from the idea that if you have a null by interference between two aerials, then this could fairly easily tell you something about a compact source. And then you could make that null narrower by separating the aerials. I suppose we were reinventing the Michelson interferometer, but I think it came from a rather simple-minded thinking about aerials rather than from saying, 'Ah, I remember in my physics book – optics'." (Quoted in Woodruff Sullivan III's *Cosmic Noise*, *A History of Early Radio Astronomy*). He later went on to study 'radio stars', and the rest, as they say, is history.

As Rajaram Nityananda's article highlights, although Martin Ryle was involved in the war effort, it left him disillusioned and working for peace towards the latter years of his life. He was to write soon after the war "..... Anyway, damn it all, it was all concerned with killing people, and one got fed up with that." He was deeply concerned about the moral dilemmas that scientists face and wrote "... We should strive to see how the vast resources now diverted towards the destruction of life are turned instead to the solution of the problems which both rich – but especially the poor – countries of the world now face." The Martin Ryle Trust Scientists for Global Responsibility, a registered charity, continues to work on reducing conflicts between states and promoting the ethical and responsible use of science, design, and technology.