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## Detection of elusive Radio and Optical emission from Cosmic-ray showers in the 1960's

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In the 1960's, a small but vibrant community of cosmic ray physicists, trained in the methods and techniques of elementary particle physics and nuclear physics, pioneered new methods of detecting extensive air showers with the prime objective of searching for point sources of energetic cosmic rays. It was my personal good fortune to have been in the right place (University College Dublin) at the right time (latter half of the sixties) and to have simultaneously researched on both optical and radio detection techniques for my doctorate. It was a very exciting and challenging experience, occasionally frustrating, sometimes bordering on the heroic but, most emphatically, always chronically underfunded.

In this talk, I share my personal recollections of that early work, of people and places, reconstructed from memory, old black-and-white photographs and long-neglected research publications, all dusted off for this occasion. Of course the ultimate irony is that by the early part of the 1970's it was the collective view that little further progress was possible with radio systems utilised as stand alone shower detectors, since the emission was quite highly beamed and the effective collection area for high energy showers was possibly quite limited. Similarly, experience with attempts to exploit the optical Cherenkov emission from showers as a basis for high energy gamma-ray astronomy also proved to be pessimistic, certainly given the small light-collecting systems in use up to about 1972. By then it was time to leave the field and do other things.

However, as time moved on, new and creative people entered the field and technologies advanced rapidly, out of all proportion to what was on hand almost 50 years ago. It would have been beyond my wildest dreams in 1970, to imagine that the radio detection technique would prosper as it has, becoming such a key component in the field of experimental neutrino astrophysics. By the same token, when I returned to the optical work in 1979 as a member of the Whipple collaboration developing the Cherenkov imaging technique, I could never have imagined that TeV gamma-ray astrophysics would prosper as it has. Perhaps the moral of the talk is that one should never give up on a good idea, however great the technical issues might be.

**Auteur principal:** M. FEGAN, David (University College Dublin)

**Orateur:** M. FEGAN, David (University College Dublin)

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