JOHN JOLY
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JOHN JOLY[1]

IT is a very appropriate custom that, on Trinity Monday, when we celebrate the birth and continued growth of Trinity College, Dublin, we should also commemorate one of its many famous graduates. Since this year is either the hundredth and first or hundredth anniversary of John Joly's birth, it is peculiarly suitable to do so in his case.

John Joly came of a remarkably cosmopolitan lineage. On his father's side, the Jolys came to Ireland some time about the end of the eighteenth century. They were originally a French noble family, and Professor Joly always claimed that they had been presented by the Pope with a general dispensation until the fourteenth generation. Naturally his friends always claimed that he, being surely the fifteenth, was outside the terms of the contract.

His mother, a German countess, whose family had been ennobled by Frederick the Great, was descended from Greek, Italian and English ancestors. This mixture of blood may partially explain his outstanding versatility and originality in scientific investigations and his power to obtain great aesthetic pleasure in the realms of art, literature and music. I think Wagner was his favourite composer, and perhaps Shelly or Keats his favourite poet. When even mildly annoyed he had the gift of expressing it in suitably picturesque language, and I should like to have the benefit of his views on modern jazz, *vers libre*, and modernistic art. To write down his opinions on such subjects would certainly require asbestos paper.

Joly was born in November 1857 or 1858 at Hollywood, King's County. His father was rector of Clonbulloge, and died very shortly after John Joly's birth. Joly always maintained that he was born in 1857, but the baptismal

[1] This was the Trinity Monday Discourse, delivered on 2 June, 1958.

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register at Clonbulloge, when he and I examined it in 1927, claimed that he had been baptised in November, 1858. Since previous entries for 1858 occurred before this, there seemed to be no reason to question its accuracy, but Joly produced other evidence to show he was right, and there the matter stands. Joly, however, benefited financially, since his life insurance company preferred to accept the 1858 date, and refunded him a certain amount of his past premiums.

John Joly's early education was obtained at Rathmines School, where apparently he was chiefly famous among his classmates for the original tales he contributed to the school magazine. Here he also acquired the honorary title of ' The Professor,' by which he was always known to the end of his life by his closest friends.

He entered Trinity in 1878, his tutor being Mr. Dickson. In Professor Henry Dixon's presence he always referred to the latter as ' Your revered relative, Henry, Donkey Dickson.'

In college Joly was omnivorous in his reading but always refused to be tied down to examination courses, and thus we find that while he studied physics, chemistry, mineralogy and English literature enthusiastically, his only academic distinction was a first Honors in English literature. In the Engineering School, however, he was by far the best candidate in his year, obtaining first place in all subjects at the B.A.I. examination.

Very shortly after graduation he was appointed assistant to Crawford, Professor of Civil Engineering. He held this post till Crawford died in 1887, when he became assistant to FitzGerald. In 1897 he was appointed Professor of Geology, a post which he held to his death in December, 1933.

It will, thus, be seen that his whole working life was spent not only in Trinity, but mainly connected with one building, the Engineering School, for in FitzGerald's time both the Physical Laboratory and the Geological Laboratory were in that building. Joly was very proud of its architectural features. I can well imagine his wrath, however,

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if any 'damned stupid pilldoodle' had referred to it as the Museum Building in his presence. 'D.B.S., my good man, do you suppose me to be a fossil museum specimen?' I may explain that D.B.S. stands for 'don't be stupid,' and was often added as a postcript to Joly's letters to scientific instrument makers.

To give any adequate account in the time at my disposal, of his scientific work would be quite impossible. Joly was certainly one of the most versatile of the scientific men of the nineteenth century even though that was a period of far less specialization than the present epoch. He published papers in Mineralogy, pure Physics, Geology, Astro-physics, Marine Navigation, photography, etc. In all his writings we find the same clarity of thought, and beauty of expression, combined with his outstanding originality. He often advanced the theory to me that he considered that the paucity of first-class modern poets was due to the counter attraction of the pursuit of scientific knowledge, which captured the most original brains. I can well believe that if he had not yielded to this temptation he might well have attained fame in literary fields, as is exemplified by the several volumes of essays on various themes, which he wrote.

He was also a scientific inventor of no mean calibre, as is shown by his production of the steam calorimeter, the meldometer, the apophorimeter, etc., and his colour photography system, which was one of the first of such methods. He was made an F.R.S. early in the nineties, for his work on the measurement of the specific heat of gases at constant volume using his steam calorimeter, a measurement which had not been made directly before. During this period also, he obtained a value of the age of the Ocean based on its salt content.

As an example of how chance may affect the speed of scientific discovery, I may instance some of Joly's unpublished work on X-rays. He was, I think, the first to actually take an X-ray photograph in Ireland, and just before FitzGerald's untimely death at the age of

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forty-nine, the latter and Joly were investigating the effects of the reflection of the rays from crystals at glancing angles. They had obtained some peculiar effects, which they did not understand. I think there is little doubt that if FitzGerald had lived, the discovery of the real nature of X-rays and their diffraction by crystal arrays would have been antedated by about ten years. Joly told me, however, that he was so upset by FitzGerald's death and the loss of his wide knowledge of physics, that he decided to abandon pure physical research entirely, and thus the research was not pursued.

It is, however, in the field of the application of our knowledge of the properties of the natural radioactive elements to geological problems that Joly did some of his best known work. He made some of the earliest measurements of the radioactive content of natural materials, and was the first, in 1909, to invent a method for the measurement of their thorium content. In 1911 he greatly improved on the previous solution method for radium, by his development of the electric furnace method. Radioactive measurements by these methods were carried on in his laboratory up to about 1930, and perhaps I might mention that one of the original electric furnaces is now being used for the C 14 dating system. These radioactive measurements showed that natural radioactivity could easily supply the present measured heat loss of the Earth, in fact, the Earth should be heating up, unless the surface materials, which are available for measurement, are much richer in them than the bulk of the planet. In 1927 Joly and I produced fairly good evidence that this is, in fact, true to a certain extent. In 1923, when Joly was well over sixty, he produced his theory of thermal cycles which gives a clear explanation of the geological history of the Earth in which a series of mountain building epochs are separated by long periods of erosion and marine deposition.

This theory led to a rather heated dispute with Harold Jeffreys, who was a strong supporter of the original cooling Earth theory, in which the formation of mountain ranges

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is attributed to the contraction of the planet. Up to date, no theory of the thermal history of the Earth has been produced which receives general acceptance, but, on the whole, Joly's theory is certainly very plausible, and explains a great deal of the observed phenomena. In 1925 he gave the Donnellan Lectures on this subject, which I am sure anyone who had the good fortune to attend, will remember with pleasure.

His explanation of the formation of pleochroic halos in certain biotites by alpha ray disintegration was also a striking advance. These halos were originally discovered by Dr. Haughton in biotite from Ballyellen, Co. Carlow, where they are specially well developed, and prior to Joly no satisfactory explantion of their production had been given. By their study Joly was enabled to obtain many interesting results. Thus, in conjunction with Rutherford, he measured the age of the halos and also in 1916 discovered an unknown alpha ray active element in Ytterby Mica, which he provisionally named 'Hibernium.' In 1933 this element was finally shown by Hevesy and Pahl to be samarium, or rather one of the samarium isotopes, as we now know. He was also firmly convinced from measurements of uranium halos of different ages, that uranium contained two separate alpha ray emitting isotopes, the rarer isotope having a considerably shorter half life. The measurements on which this theory were based, were very difficult to make and perhaps not entirely conclusive, but alas the discovery of U 235 and the atomic bomb must have now shown even the most unenlightened races that the theory was only too true.

I have only mentioned some of Joly's numerous works but owing to time restrictions, I must ask to be excused from describing his photoelectric theories of photography and colour vision, of the origin of the Canals of Mars and various other scientific investigations. I should perhaps recall that he invented the method of using radon in fine glass capillary tubes for medical purposes and was largely responsible for the foundation of the Irish Radium Institute

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by the Royal Dublin Society in 1914, where his method was employed till quite recently, when the work and the stock of radium was handed over to St. Luke's Hospital.

Joly was very different from the popular picture of the learned scientist, who, once outside his laboratory, is thought to be liable to appear in public in a morning coat, top hat and plus fours. In his younger days he was a keen Alpine climber and photographer. He then took to yachting, and cruised in his yacht, *Woodcock*, all up the West coast of Scotland as far as Oban, and round the South coast of Ireland as far as the Shannon. He was fond of tennis and golf, and from his youth a keen cyclist. He told me that as a boy he purchased one of his first bicycles at Kingstown, and rode it back in pain and grief to Rathmines, being pursued at intervals by small boys throwing stones at the strange apparition. As well as I remember this awesome machine was furnished with two equal wheels shod with iron tyres, the pedals being attached to the front wheel. The fact that he could drive such a brute all the way back from Kingstown speaks well for his physical stamina. In 1919, however, his doctors insisted on his abandoning cycling, whereupon he took to motor cycling with his usual enthusiasm. Previous to this date all motor cycles had been anathema, contemptuously classed as 'smell wheels,' but woe to the man who subsequently referred to one of his machines as a 'smell wheel.' He had in all three motor bikes, the final choice being a four-horse-power Harley Davidson, the previous two smaller models being discarded as too slow. He rode this machine on long trips in Ireland, England and France. Finally, in 1925, he had some difference of opinion with a horse cart and a heap of road metal near Mallow, in which he was rather bruised. His friends then persuaded him to buy a car, on the grounds that it would save their nerves. I think, however, that he always considered motor-car driving to be a rather sissy occupation.

Joly was throughout his life a staunch Trinity man. He was largely responsible for getting the Reading Room

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opened to students in the evening, and for many years organized sets of evening lantern slide lectures for their amusement and perhaps instruction. The College owes the present Physical and Botanical Laboratories with their endowment very largely to his efforts as originator and secretary of the 'Science Fund' early in this century.

The special research endowment of the School of Geology by the late Earl of Iveagh was given in recognition of his personality and distinction as a scientific investigator. He was secretary of the University Council for many years, and also one of the first representative members of the professors on the Board of the College. He represented the University on many occasions at various scientific congresses, and in 1918 was one of the delegates of the Balfour Educational Mission to America. In 1919 he was the first man to be elected to fellowship under the modified method of election, an honour which he greatly prized.

Outside his College, also, Joly had many and various activities. He was successively member of council, honorary secretary, vice-president and finally president of the Royal Dublin Society. He was warden of Alexandra College, and governor of two Dublin Hospitals. He was also for many years one of the most active commissioners on the Board of the Irish Lights Commissioners. Up to his last summer in 1933, he always went on the annual Inspection cruise, and published a very interesting account of one of these cruises in *Blackwood's Magazine*. I have a vivid picture of a rather clumsy keeper attempting to help him ashore at, I think, Roancarrig on one of his last inspections, the result being that 'The Professor' and the keeper performed a rather complicated step-dance on the landing, which fortunately did not terminate in the 'drink'.

It is time now to conclude this very inadequate description of Joly's life and work. Some will perhaps consider that my efforts have included too many personal memories and have not stressed his great scientific achievements sufficiently, but I am afraid I have done so deliberately. His published works now form part of the

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literary heritage of the human race, but who can recapture the charm, originality and humour of his conversation and personality, unless he had the good fortune of knowing him well, and, alas, their knowledge dies with them. I have accordingly, and I fear very unsuccessfully, attempted to recall some ghost of his vivid character.

J. H. J. POOLE

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