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Obituary

Philip Ellis Doak, 1921–2011 ☆

Philip Doak, who died on 30 May 2011 after a brief illness, became a legend in his lifetime as the founding editor of the *Journal of Sound and Vibration*, whose publication from 1964 onwards helped to define a new field of engineering science. His genuine interest in his authors, and promotion of their work through his journal, won him a devoted following in the acoustics and vibration community.

Philip Ellis Doak was born on 30 January 1921 in Grand Forks, North Dakota. His parents Mary Ellice Doak and Henry Andrew Doak were both graduates and teachers of English; Henry was a professor at the University of North Dakota for over 30 years. Phil showed early talent in music and tennis, as well as in academic studies. Formal higher education began in 1939 at the Juilliard School of Music in New York, where he went on a scholarship and spent 3 years, majoring in piano. On graduation, he enlisted as a volunteer in the US Army Signal Corps; this took him initially to technical school to study radar, but by May 1943 he was in uniform in Europe, and saw active service in France after D-day.

As a war veteran, Phil was entitled to 3 years' subsistence and tuition for further education. He was drawn to musicology, but decided to follow up his technical school training with a physics degree and aim for research in musical acoustics. Accordingly he enrolled at the University of Oklahoma in 1946 and completed his BA and MS in 2 years, by working full-time including summer school. His MS thesis was on sound waves in parabolic rooms, supervised by Robert J. Bessey and R.G. Fowler.¹ By September 1948 he was registered for his PhD in MIT's famed Acoustics Laboratory, with Dick Bolt as supervisor, to work on the acoustics of concert halls. Bolt had already begun establishing a consultancy practice, and around this time was joined at MIT by Leo Beranek from Harvard. Together with Bob Newman of the Architecture School, they formed the consultancy firm BBN as an offshoot of MIT. At an early stage in Phil's studies, Bolt assigned him to help with an audience survey at a concert hall in Buffalo, NY—an experience that put him off statistical survey-based research for life, he later recalled.

Phil had already completed most of his thesis work—on reflection of an outgoing acoustic pulse from a plane impedance boundary—when disaster struck: an MIT committee, acting under pressure from US Senator Joseph McCarthy's investigators, withdrew his US Navy funded research assistantship on the basis of Phil's left-wing activities as a music student in 1941. Thus it happened that Phil, who refused to appease the investigation by naming his fellow sympathizers, was forced to leave MIT in 1950 and needed support to continue his graduate studies. Fortunately his case was drawn to the attention of the British atomic physicist PMS Blackett, winner of the 1947 Nobel Prize in Physics and Professor of Physics at Manchester University (1937–1953), who was able to find Phil a position at Manchester. Here he spent 4 years based in the Department of Mathematics, initially as a research student and then as ICI Research Fellow, and would almost certainly have met James Lighthill.² One of Manchester's youngest ever chair professors and a brilliant applied mathematician, Lighthill encouraged the expansion of the University's Fluid Motion Laboratory, founded in 1946 as an adjunct to the Mathematics Department, into the autonomous Department of the Mechanics of Fluids³; it was here that Phil worked for a further 4 years (1954–1958) after his ICI Fellowship ended. The periods at MIT and the University of

☆ The information used to compile this obituary has been assembled from various sources, including recollections of Philip's friends, colleagues, and former students. Stuart Bolton and Harry Plumblee, whose PhD studies he supervised in the 1970s, have provided significant assistance. Other sources include an interview of PED by Karen Fitzgerald of Academic Press (published in June 1993); a tribute by Brian Clarkson of ISVR (published in 2001 by JSV, as a Preface to a Special Issue in honour of Phil's 80th birthday); notes of a conversation between PED and CLM (6 July 2004); and a memoir published by Peter Davies, Professor of Experimental Fluid Dynamics at Southampton and a contemporary of Phil's (2008).

¹ A list of PED's publications is appended at the end of the paper.

² See Ref. [6] attached. PED's paper of 1954 shows strong traces of Lighthill's influence. The latter, at age 26, was promoted to the Beyer Professorship of Applied Mathematics at Manchester in 1950 (succeeding Sydney Goldstein) and may well have sought Blackett's help in finding a post for Phil Doak. Interestingly, Lighthill and PED shared a deep love of music and both were talented pianists.

³ An undergraduate programme in aeronautical engineering was established in 1956, with its first intake in 1957. Two years later Lighthill left Manchester to become Director of the UK's Royal Aircraft Establishment.

Manchester left Phil with a lifelong regard both for the Morse and Feshbach school of mathematical physics, and for the Lighthill approach to problem solving in applied mathematics—as well as providing valuable contacts for his future career.

However, the future must have seemed rather uncertain when he finally took a lecturing post in Applied Mathematics at the University of Liverpool: he had no PhD, and the new position might have appeared “more of the same” given the traditional separation between academic disciplines in English universities at the time (Lighthill’s initiative at Manchester was a welcome break with that tradition). One bright aspect was the presence of an active acoustics group under HD Parbrook in the Physics Department. Nevertheless Phil’s reputation had evidently spread, because in 1962 he was recruited to Southampton by E.J. Richards, who was planning a new graduate institute as an offshoot of the University’s Department of Aeronautics and Astronautics.

On his arrival at the University in April 1962, Philip Doak was asked by Richards to design new acoustic laboratories for the new Institute, and also to act as his aide-de-camp and Editor-in-waiting during negotiations with publishers to establish a new international *Journal of Sound and Vibration*. This was envisaged as a way to promote the new field of engineering acoustics that Richards, himself a mathematician turned aeronautical engineer with experience as Chief Designer at Vickers–Armstrong and a vision for how aircraft noise would drive acoustic technology, had been championing for the previous 10 years.⁴ Phil was appointed Editor by Academic Press on 4 July 1962 and commissioned to set up an Editorial Board with the aim of publishing the first issue in October 1963. The constitution of the Board was established by October 1962, and the first issue of the journal actually appeared in January 1964.

Phil embraced the challenge set by Richards, and the *Journal of Sound and Vibration* became his life’s work. The result was a journal of deliberately wide scope, covering all aspects of sound and vibration, and underpinned by Phil’s passion for clear exposition and fundamental science. Phil Doak remained Editor-in-Chief for 40 years and retired in 2002, having gradually transferred his responsibilities to Maurice Petyt of ISVR who was already acting as European Editor. Authors whose papers were handled by Phil discovered he was a “hands-on” editor. His desire for excellence led him to work with any author he thought deserved publication; he would suggest improvements and even rewrite parts of the text where he felt he could do it better (and he was usually correct). This was in the days of hard-copy submission and hand-written amendments; journal publishers provided copy-editing support, and even redrew authors’ figures. An example of the new Editor’s wide-ranging enthusiasm was his personal involvement in the cover design and in the choice of typography. He commissioned papers to get the *Journal* started, and cultivated reviewers and future authors among his many contacts. Not surprisingly, the *Journal* flourished, and grew from 4 issues per year to 50 at the time of writing.

The *Journal*’s growth, and the increasing pressure on university academics, meant by the late 1980s that it was too much for a single Editor to manage. As a result, an Americas office was established in 1990 under Werner Soedel, and an Australasian office in 1995 under Y.-K. Cheung. Phil’s management style was such that he preferred to let the two new offices operate autonomously within the guidelines he had established, with manuscripts being submitted on a regional basis according to the corresponding author’s affiliation.

Although there is no doubt that Phil’s leadership made an enormous contribution to the development of the *Journal*, his role as researcher and inspirer of graduate students should not be forgotten. His own interests spanned room acoustics, aeroacoustics and the acoustics of flow ducts. Many of his contributions appeared in the *Journal*, of particular note being a series of papers on internally generated sound in continuous media, and another on sound propagation in ducts. In 1968 Harry Plumblee of Lockheed–Georgia became an external PhD student of the University of Southampton (an arrangement suggested by Richards) and was assigned to work with Phil, who visited Lockheed for 3 months later the same year. Plumblee saw the potential for Phil to contribute to Lockheed’s NASA-funded research on jet noise, and arranged for Phil to spend his 1971–1972 sabbatical in Marietta, Georgia, thinking about mean-flow effects on jet noise, and at the same time acting as Plumblee’s PhD supervisor.⁵ The Lockheed–Georgia collaboration produced a number of landmark papers in the 1970s on sound radiation from turbulent jets, with some of Phil’s former students making major contributions.

As a teacher, Phil was responsible for setting up the first undergraduate programme in the Institute of Sound and Vibration Research. He also lectured charismatically on theoretical acoustics to graduate students. These lectures were not for the faint hearted (a typical exam paper ran to 13 pages) but were truly inspirational for those with real appetite. Rarely using any notes of his own, he readily filled from memory a blackboard with the full conservation equations of fluid dynamics, before undertaking, there and then, the derivation of important acoustical results. These were intellectual feats that were astonishing to witness, although some found disconcerting his tendency to write in chalk with his right hand and simultaneously erase preceding parts of the derivation with his left. All this was accomplished whilst taking regular sips of coffee and frequent puffs on his pipe, or a cigarette, and sometimes both. He was also an outstanding supervisor of research and much loved by his doctoral and masters students, who invariably found that he would give freely of his time and be ready to converse on matters acoustical or otherwise.

The Turner Sims concert hall at the University of Southampton is another lasting tribute to Philip Doak’s work. He advised on the design of the hall, ensuring optimal reverberation, and most importantly, adequate diffusion in the sound field. The latter was achieved by judicious design of the brickwork on the side-walls of the hall that provided, as he put it,

⁴ The first jet-powered civil aircraft (DH Comet) entered service in 1949.

⁵ To Phil’s later regret, the textbook on acoustics that he always spoke of writing did not make much progress on the sabbatical.

“bumps on the wall” that would scatter sound over the important range of frequencies. He even overcame his aversion to audience surveys in order to assess the outcome. Although he was typically modest about the result, the hall is widely regarded as providing one of the finest acoustics available and is much admired by audiences and performers alike.

Any attempt to account for Phil's unique achievement has to take account of more than his mathematical flair and attention to detail. These are most likely not the things that would strike one about him on first encounter. Rather, it would be his personal warmth, and perhaps his artistic temperament (we leave aside the enveloping fragrant smoke from his Old Holborn pipe tobacco). Visitors to Phil's office in the early 1960s would see him sitting in front of a framed reproduction of one of Georges Braque's billiard paintings.⁶ The fractured planes of the green billiard table (colour of JSV's cover?) in Braque's cubist depiction seemed to resonate with Phil's complex character. He was indeed a man of many talents, who used them to the great benefit of the acoustics community and at the same time inspired many of his younger colleagues. The community has lost a devoted supporter, who will be long remembered with affection.

A list of PED's publications

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