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Editorial

The Significance of the Ordinary in Physics

The ordinary gets a bad rap. Science communicators praise world-changing geniuses. Funders demand groundbreaking research. Universities tout rankings that make them seem exceptional. This attitude extends to physicists themselves—many an autobiography expresses dissatisfaction at being outshone by colleagues or missing out on a Nobel Prize. In the history and philosophy of physics "normal" can also connote drudgery. Thomas Kuhn wrote about "normal science"—work within a paradigm that seems less significant than addressing anomalies and which is sometimes made irrelevant by the next paradigm shift.

What denigration of the ordinary misses is that the vast majority of physicists, not to mention historians and philosophers of science, are quite ordinary. Not everyone can be an Albert Einstein (who was once an ordinary civil servant and held ordinary lectureships early in his career) or a Thomas Kuhn. By focusing on big names, popular historiography ignores the experience of the vast majority of physicists. It also often ignores the active role that the extraordinary play in sculpting their own images—an apt example of which can be found in Matteo Leone and Nadia Robotti's article in this issue—whether it was Einstein posing on the red carpet with Charlie Chaplin or Stephen Hawking making a cameo appearance in four episodes of *The Simpsons*. Finally, it ignores the extraordinary impact that ordinary people can have on others, especially in their locales or institutions.

Two articles in this issue pay much overdue attention to how ordinary people play a vital role in the history of physics, both for conveying the living fabric of their subject to its students, and by attending to the civic life of the discipline. Mark McCartney's article on Karl George Emeléus (1901–89) explores the work and life of a physicist many would consider ordinary, with Emeléus never elected to the Royal Society despite being a candidate. As McCartney shows, Emeléus nevertheless had an extraordinary impact on Queen's University Belfast, where he worked in some capacity for nearly sixty years. His undergraduate lectures were, as one student put it, a "joy to attend" and Emeléus oversaw the rapid expansion of the department during his tenure as chair. Emeléus had an influence on physics education more widely, writing the undergraduate textbook *The Conduction of Electricity through Gases* (1929), which had new editions in 1936 and 1951. He also had a strong impact on the wider public in Northern Ireland, giving many public talks and advising government on nuclear matters. Although he was in some

senses ordinary, Emeléus had an important legacy of building an institution and inspiring the next generation.

But it is when ordinary people come together that they can have the biggest impact, sometimes drawing the ire of those in power. Barbara Hof, Gerardo Ienna, and Simone Turchetti document grassroot efforts to undertake political activity at CERN, as well as efforts by CERN managers to undermine and suppress them. In 1964, nine-hundred CERN staff members signed a petition in support of a UN resolution advocating for the release of political prisoners in apartheid South Africa. In 1972, a petition signed by 210 CERN workers thwarted an attempt by CERN leadership to stop socialist Daniel Raphaël Mayer from delivering a lecture to the CERN Staff Association. But it was when it was revealed that US physicists had contributed to bombing strategies in Vietnam that tensions came to a head and attempts by CERN staff members to protest such physicists were met with a decisive response. Institutions such as CERN often try to sanitize their image, obscuring the ordinary conscientious human beings that make up their workforce, which is why articles such as that by Hof and colleagues are so important.

When discussing the unexceptional, it is important to remember that what constitutes the ordinary, normal, or standard is always contested, as is excellently demonstrated by Aske Hennelund Nielsen and Maria Rentetzi in this issue. In the interwar period, the standard unit for radiation exposure was disputed between nations. At the first International Congress of Radiology in 1925, the German and French delegations argued for the merits of their respective units, each laying a claim that their unit should be considered universal. Some of the arguments were technical, with the French pioneer in radiology Antoine Béclère arguing that the German unit was overly complex and difficult to use. Other arguments were more nationalistic, with German physicist Herman Behnken claiming that "[…] past experience tends to show that the German way is a practicable one and that it serves its purpose." This sheds a new light on normality, showing how taking ownership of the normal can be a source of pride that is contested between people and nations.

Perhaps physics and physicists could benefit from more celebration of the ordinary. Physics is now usually done in large collaborations—the efforts of any individual are often regarded as a small cog in a large machine. The majority of physicists are not superstars. Dissatisfaction with the ordinary promotes a hyper-competitive, uncollaborative atmosphere that both impoverishes the environment of science and hinders scientific developments. As this issue helps show, when ordinary individuals work together and help one another—for example by

institution building or by protesting—significance can emerge from collective ordinariness.

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