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Essay Review

On a missed opportunity for collaboration between historians and mathematicians: A biographical avalanche triggered by Professor Ioan James, FRS

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1. Introduction: concern and criticism summarized

I have become increasingly concerned in recent years about an avalanche of books featuring biographies of mathematicians, scientists, and engineers, four of them published by the prestigious Cambridge University Press since 2002. All have been written—or compiled rather—by the prominent topologist Ioan James, FRS, now in his early eighties, and until 1995 Savilian Professor of Geometry at the University of Oxford. To date I have counted seven biographical books by James, one of them co-authored, of which the most recent, *Remarkable Engineers*, is due to appear in early 2010. The biographical essays contain almost no discussion of the scientific achievements of the people described, and the publishers use this fact rather as a recommendation in their advertisements. I have only seen the first five of these books and will leave it to my colleagues from biology and engineering to judge whether James the mathematician uses the main notions of their various scientific disciplines correctly in his biographies of biologists and engineers [James, 2009a, 2010]. In this respect, of course, his biographies of mathematicians and physicists which I have seen cannot be criticized. They are, however, marred—as will be outlined below—by many lacunae, misreading of the existing literature and mistakes, and they are not based on original research by the author.[1]

In 2009, James decided to add another dimension to his biographical campaign, namely the Jewishness of some of the scientists described. It was then that I found my pain

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[1] As a German I also strongly object to James's usual omission of the Umlaut-signs from German words, although there are occasional exceptions, for example, in words like 'Göttingen'; one should expect more respect for a language in decline than this, particularly in a work on historical periods when German mathematics was still dominant.

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threshold passed, because the topic is close to my research area (see, for example, [Siegmund-Schultze, 2009]). Therefore James's book *Driven to Innovate: A century of Jewish mathematicians and physicists* [James, 2009] will be central to what follows. If some of my commentary is necessarily critical of what is, in my opinion, a sadly misguided effort, then this criticism should in no way detract from its prominent author's admirable life's work in topology. It merely seems to me that his recent efforts do not add much of value to his work. On a final personal note, I sympathize with and appreciate many of James's human and political attitudes as revealed in his biographical collections (but not with all, as I will detail in the case of Einstein), his fascination with the lives of the scientists, his compassion for their sufferings, his criticism of hagiographic approaches in the literature, and his lack of self-adulation, otherwise so frequent in biographical works by scientists. But I would argue that attitudes alone do not exonerate an author from the need to respect facts as well as the hard work of historians before him and from the need to protect the public from misinformation.

In order to put the following discussion into perspective, I begin with some more general reflections about what in my opinion could be expected from a fruitful collaboration between professional historians of mathematics and mathematicians. In this connection I am mainly interested in questions like: What should the public expect from a biographical collection authored by a scientist/mathematician as opposed to one written by a historian or a journalist?

At the end of my essay I will reflect on some questions which might be less easily answerable: What could possibly have driven this successful mathematician to a subject so clearly outside his area of expertise? Which mechanisms induce reputable publishers to accept manuscripts without effective scrutiny? What does the appearance of such collections say about some mathematicians' view of the tasks and merits of genuinely historical research?[2]

2. Historiography of mathematics as a collaborative enterprise

I have to begin with a confession: I consider the historiography of mathematics to be a huge collaborative enterprise where individuals work with a broad spectrum of approaches and each with her/his special competence in history and/or mathematics for the common goal of reaching understanding on the borderline of the two subjects. Due to the hybrid nature of the field of "historiography of mathematics" all participants in the enterprise are subject to occasional dilettantism and to mistakes. It is precisely for this reason that collaboration is needed which should also include amateurs who often contribute valuable material from quite unexpected sources and perspectives. Among professional historians of mathematics the "occasional dilettantism" is probably more frequent in the middle of the spectrum of approaches and less so at the extremes. These extremes are pure social history of mathematics on the one hand and pure inner-logical historiography on the other, the latter occasionally performed by research mathematicians themselves. Mathematicians are usually more interested in and aware of the history of their subject than general historians (as opposed to professional historians of mathematics) are in the impact of mathematics on culture and society. Therefore and because of the increasing marginalization of the humanities in today's academia, it is also clear where most of the material resources for

[2] In a similar vein, in Dauben [2002], the ill-advised efforts of an amateur (of a different kind to James) to write the "universal history of numbers and computing" and the responsibilities of authors and publishers have also been discussed.

such research have to come from and with whom the power lies in the collaborative enterprise. (The situation in this respect might be somewhat different in the historiography of science and medicine.) The power of the mathematicians in the common enterprise is often exerted in a benign way, for instance through the Mathematical Research Institute in Oberwolfach (Germany) and in the recent *Princeton Companion to Mathematics* [Gowers et al., 2008] where—in different ways—historical topics are well represented.

The common enterprise "historiography of mathematics" properly carried out is, I believe, of benefit to both mathematicians and professional historians of mathematics. Not least, it is a service to the public visibility of mathematics and to its cultural embedment in a global world which is technologically ever more based on mathematics. In the enterprise thus described, communication and collaboration between mathematicians and historians are crucial, and—in addition to finding knowledge on the borderline of the two subjects—the popularization of mathematics by scholars or by informed laymen is very valuable. I personally admire work which has been done in recent years by journalists and popular writers, for instance on Ramanujan, Nash, and Wiener. One feels that these writers take their subjects seriously and provide new material, even if the mathematical and historical insights to be gained are restricted. A necessary condition for a fruitful collaboration between individuals of the three groups (historians, mathematicians, and laymen) is that they fully recognize their functions and competences, do not ignore work of the others, and give credit where credit is due.

Both working and retired mathematicians can help professional historians of mathematics to gain new and mathematically deeper perspectives on the historical material while historians can caution mathematicians against overly presentist views of the past. Retired research mathematicians quite often have to take it on themselves to write histories of entire mathematical disciplines or bigger fields, such as algebra (B.L. van der Waerden), functional analysis (J. Dieudonné), number theory (A. Weil), and mathematical statistics (A. Hald), because it is they who have the expertise to connect history to modern research. These histories of mathematical disciplines are then subject to enrichment by historical contexts which only professional historians are able to provide. Quite often the merits of a retrospective look by research mathematicians at the history of mathematics, such as the interpretation of Greek geometry in terms of "geometric algebra," have to be balanced against the distortions inherent in such an approach. Discussions in this respect between mathematicians and historians have been generally fruitful. Sometimes exaggerated claims by mathematicians had to be criticized in a more principled manner; van der Waerden's speculations about Neolithic mathematics, for instance, have been refuted by archeologists.

Occasionally, however, there occurs speculative historical work by mathematicians which leaves the realm of mathematics altogether. The "New Chronology," proposed by the Russian mathematician Anatoly Fomenko (born 1945), who claims that several centuries of the middle ages have been fabricated by contemporary writers and historians, has not found much serious support.

There are other activities based on exceeding competence which are less spectacular but equally damaging to historiography. One such case is the recent biographical work of Ioan James.

3. A mathematician's unfinished movement toward the historiography of mathematics

James was a student of Henry Whitehead and was himself very successful in homotopy theory. As an editor of Whitehead's four-volume *Mathematical Works* (Oxford: Pergamon,

1963) James showed an early interest in and responsibility for the historiography of mathematics, given that the publication of collected works of pioneers is an important part of historiographical activity. Writing in a delightful tone, James, in his article of 1990 "Reminiscences of a Topologist" [James, 1990], gives valuable hints at crucial events in the internal history of homotopy theory from personal experience, and at the same time contributes interesting facts to the social history of modern mathematics. He makes it clear that there were bigger names in the field than himself, such as Whitehead, R. Thom, J.-P. Serre, and even his slightly younger colleague F. Adams. James is clearly not concerned about unduly bolstering up his own reputation.

After he retired from the Savilian chair, James organized the massive volume *History of Topology* [James, 1999]. Although his three contributions to the volume cannot easily be called original historical work, the project as a whole had undeniable merits in supporting the collaboration of historians and mathematicians. The third of his own articles in the volume, entitled "Some Topologists" [James, 1999b], seems to have stimulated James's interest in biographies. Although these short biographical remarks are mainly based on secondary literature, James is able to add interesting material from his personal encounters with some leading topologists, and he makes apt remarks about their contributions too.

All pre-conditions for further fruitful collaborative work with historians seemed to be in place when in the new millennium James, then in his early seventies and having largely stopped publishing research mathematics, discovered his passion for biographies of mathematicians from fields other than topology, of scientists, and other remarkable individuals. He freed himself from any restrictions of his own area of expertise and his publications grew gradually into a highly imitative enterprise.

4. Seeking structure in the biographies: a fascination with the pathological in science

In the epilogues to his first two biographical collections on mathematicians (2002) and physicists (2004) James tries to find some structure and comparative perspective for the seemingly different lives he wants to describe. Since he does not discuss scientific accomplishments, which interconnect scientists naturally, and because he has not done biographical research by himself, he is forced to find some other general point of view in order to justify the enterprise. He first refers to factors such as occupation of the fathers, geographical distribution, and precocity of the scientists. In the volume on the mathematicians one finds the following additional remark:

> Abel, Cantor, Sylvester, and Wiener showed signs of manic depression, as is not uncommon in highly creative individuals [James, 2002, 421].

But it is only in the volume on physicists of 2004 that James seems to have progressed in psychiatric research:

> Boltzmann, and probably Ehrenfest, suffered from the mood-swings characteristic of manic-depression, but retrospective diagnosis of mental disorders is notoriously difficult. People with Asperger's syndrome, a mild form of autism, seem to be attracted to physics. Newton, Cavendish, Einstein and Dirac are thought to have had the syndrome [James, 2004, 377].

James follows up this trace in another book two years later, entitled *Asperger's Syndrome and High Achievement: Some Remarkable People* [James, 2006], where he identifies Newton, Russell, Einstein, Ramanujan, Wittgenstein, and Turing as Asperger cases. And he adds to this list celebrities through the centuries such as Michelangelo. Thus James exceeds his

original field for a second time, even more strikingly than when leaving topology. He writes in the preface:

> Hans Asperger, a Viennese paediatrician, thought that for highly intelligent people a trace of autism could be essential to success in the arts and sciences. He believed that the typical Asperger traits of perseverance, drive for perfection, good concrete intelligence, ability to disregard social conventions and unconcern about the opinions of others could all be seen as advantageous, possibly a prerequisite for certain kinds of new thinking and creativity [James, 2006, 7].

However, James cautions his readers in the "introduction" which follows:

> There must have been plenty of other cases, but the right kind of biographical information is not easy to find. ... Unfortunately, information about the childhood of the subject, which could be highly significant, is often lacking [James, 2006, 9–11].

James even warns against considering Einstein and Wittgenstein—whom he nevertheless portrays as Asperger cases later in the book—by quoting the well-known neurologist Oliver Sacks [2001]:

> Many psychiatrists are skeptical. The profiles are not to be regarded as case studies. In the words of the well-known neurologist Oliver Sacks ..., 'pathologizing genius and diagnosing historical figures has become an obsession with us'. 'It seems to me extremely unlikely', he continues, 'that Wittgenstein or Einstein were significantly autistic, as compared with Cavendish, who showed a near total incomprehension of common human behaviour, social relationships and states of mind.' [James, 2006, 11]

Indeed, reference to Asperger's syndrome in the biographical entries of James's book is sparse for lack of reliable data. As a matter of fact, the biographies of the mathematicians and physicists in the book largely reproduce what James had compiled in his previous collections. However, from this point these prior collections are quoted in James's books as authoritative sources.

Instead of collaborating with professional historians of mathematics, James preferred to seek the advice of the psychiatrist Michael Fitzgerald, who apparently had been looking for case studies of Asperger's syndrome in history and now welcomed the authority of a scholar of James's stature. They published a joint book the following year. On the dust jacket of [Fitzgerald and James, 2007] the authors are characterized as the "internationally famous mathematician Ioan James and accomplished psychiatrist Michael Fitzgerald," while their work on the *Mind of the Mathematician* is somewhat defensively described as an "eclectic and fascinating blend of story and scientific inquiry". One reviewer remarked that the slim (181pp.) book does not in any way systematically discuss the "interaction between psychology and mathematics" [Otte, 2008], and again, two-thirds of the book are filled with James's biographies without any clear focus on psychology, not least because the creation of mathematics itself is not discussed at all.

My remarks should not be misunderstood as denying that among mathematicians and other persons of excellent individual achievement psychological problems and difficulties with social conformity are probably more prevalent than among average researchers, let alone in the average population. The single-mindedness of a strong research effort certainly contributes to such possible correlations. In particular there can be no doubt that several outstanding mathematicians (S. Lie, G. Cantor, N. Wiener, C.L. Siegel, J. Nash) have exhibited some malfunctioning social behavior which warrant the question as to what extent their mathematical talents and productivity can be related in one way or other to

psychological or neurological factors. In some cases (for instance, Lie, Cantor, and Nash) historians have found endogenous clinical evidence which can partly explain certain "eccentric" behaviors. In other cases political factors and extreme practices in education during childhood have been analyzed as possible reasons. In addition there is a rather long list of literature written by mathematicians themselves on the psychological conditions of creativity. A recurring question also asks for possible correlation between mathematical and musical talents in individuals. What most of these attempts at explanation have in common is that they are based on meticulous historical or psychological work and that they do not pretend to give complete explanations. Ioan James proceeds differently. He does not quote any scientific sources of the kind mentioned but jumps from scanty anecdotes and gossip to conjectures or even to explanations.

The historian should not forget about the general historical problem of "Madness and Civilisation" (M. Foucault) either, namely the standards by which each society judges the behavior of its citizens as "normal" and "aberrant". It is unconvincing and even sad to find Einstein listed—against Oliver Sacks's advice—in James's and Fitzgerald's collections as a possible candidate for Asperger's syndrome. Einstein, one of the few scientists in the Weimar Republic of the 1920s who stood up against the aggressive and often irrational nationalism of his "normal" colleagues (including, although more moderately, Max Planck), a man who made an effort for international collaboration with France—hardly autistic behavior—is thus clearly misjudged or at least treated one-sidedly. It goes without saying that James never really discusses Einstein's political actions, despite having [Rowe and Schulmann, 2007] in the bibliography of the book we will shortly discuss.

One might ask for the motivation behind James's relating his scientists to Asperger's syndrome. There is of course, as mentioned before, the need to find a unifying, somehow "scientific" topic to justify his publication. While journalists and filmmakers, for obvious reasons, often like to emphasize eccentricities of scientists and, in a way, have to use eccentric personal traits to give a kind of surrogate description of the exceptionality of a person whose scientific merits are largely inaccessible to the public, a scientist should be able to stress other components of a personality. But James seems to be fascinated, just as laymen often are, by the sparkling personalities of his famous colleagues. He considers the historiography of science from a pure consumer position, the historian serving as a kind of entertainer by providing the necessary anecdotes.

5. The "Jewishness" of scientists as a label and as a serious historiographical theme

The next step in James's career as a biographer—the one to which I object the most—is the 2009 book on Jewish mathematicians and physicists that is the focus of this essay. I am tempted to say that its apt title *Driven to Innovate* is the best part of the book, because it says something about the sociological background for the undeniably high proportion of Jewish scientists in the 150 or so years described.

Entering the discussion of Jewishness of scientists, James makes an unsubstantiated claim about Jewish Nobel prize-winners in his preface:

> In the first half of the twentieth century 14 per cent of the prize-winners in physics were Jewish, in the second half it was 32 per cent, and since then it has continued to rise [James, 2009, 7].

This is no minor point, because it concerns among other things the long-term effects of the emigrations from Nazi Germany. An Israeli website (http://www.science.co.il/Nobel-

Physics.asp) counts 44 Jewish laureates among the 177 Nobel prize-winners in physics until 2005, which corresponds to an overall percentage of 25%. While six of the 18 winners between 2000 and 2005 are also listed as Jewish, none of the 10 winners between 2006 and 2009 are included in the website mentioned. So it seems at least premature to assume a growing proportion of Jewish Nobel prize-winners in physics in the new millennium, not least due to the small sample. In view of the general tendencies of internationalization in science it would also be surprising to see that the declining academic anti-Semitism in Western countries like the United States and the growing international awareness of Russian physicists with many Jewish researchers among them since the middle of the 20th century would have had such long-term effects.

Explaining that

> this book was written by one who has neither the advantages nor the disadvantages of being Jewish [James, 2009, 7],

James declares that

> the question of whether or not a particular person should be classified as Jewish is not one in which I would wish to become too involved [James, 2009, 11].

James shows by this very quote and in the remarks which follow this passage a certain awareness of the convoluted problems of self-definition (by the 'Jews') and imposed definition (by the 'non-Jews') of what was considered to be 'Jewish' in a particular historical environment. But it is in the end the author himself who united the 35 mathematicians and physicists, all born during the 19th century or a few years after, under that common notion. That means James has to make his case for each of the different scientists described in the book; he has to demonstrate what historical circumstances make it reasonable to characterize them as 'Jewish'. Unfortunately, as we will see, the chapters quite often leave out exactly what was characteristic for the situation of Jewish scientists in their period.

To his credit, James finds it necessary to write a 51-page general introduction on "Historical background" and "Jews in Academia". He draws on a wealth of general historical literature, which is in the bibliography. However, as we will see, he uses the literature very selectively and perfunctorily, and he quite often misrepresents the historical results. In addition, he refers to the literature only summarily and without giving page numbers in the chapter entitled "Credits," which comprises just three pages at the end of the book, and he often forgets to mention the literature which he actually used. James shows his awareness of traditional and more recent, mostly sociological interpretations of the situation of Jews in science, which have been given by Thorstein Veblen (1919) and Hollinger (1996ff). Nevertheless, the impression of his introductory remarks is one of eclecticism. Important periods, pertinent for the following biographical entries, such as the situation of Jews in the Weimar Republic or in Italy at the same time, are not discussed at all. What is strikingly absent from the entire book is a more general discussion of the effects of internationalization of science on the situation of Jewish scientists. In particular the older tradition of Göttingen mathematics and physics and its competition with Berlin during the German monarchy is almost lacking, in spite of mentioning publications by David Rowe (such as Rowe [1986]) in the bibliography. The chapter on the number theorist Edmund Landau therefore creates the false impression that there was no problem in hiring Jewish mathematicians in Göttingen around 1900; the reference to Hilbert's academic teacher A. Hurwitz on page 223, according to which "Göttingen had once tried to recruit Hurwitz,"

perpetuates an old myth in the historical literature, currently still being repeated in the online MacTutor history of mathematics archive [http://www-history.mcs.st-and.ac.uk/].

As early as the introductory chapters of the book inaccuracies abound, for example, when James speaks about "harmonious" conditions for the mathematicians of Berlin and Frankfurt even after 1933, pointing misleadingly to Frankfurt's then 15-year-old "constitution of the university [which] forbade discrimination of any kind" [James, 2009, 46]. Although the author largely abstains from attempts at a psychological or genetic characterization of what is "Jewish" in the work or in the personal behavior of a scientist, and although he certainly rejects racist theories issued by Nazi mathematicians such as Ludwig Bieberbach, he refers briefly and in a rather undecided manner to historical and contemporary theories about the "Jewish mind" [James, 2009, 21–23]. It is here that James points back to his earlier speculations about Asperger's syndrome, mentioning—admittedly without vouching for their correctness—certain hypotheses about "the prevalence of genetic disorders ... among the Jewish people" [James, 2009, 21].

The bulk of the book, the biographical entries on "Jewish mathematicians and physicists," is largely devoid of any effort to systematically deal with the implications of "Jewishness" for the persons described. "Jewishness" therefore often appears as a rather superficial label. What is worse, the author adds some occasional and casual remarks about the alleged "Jewishness" of scientists which have no basis in the facts whatsoever. On page 126 the French mathematician with a long Catholic family tradition, Paul Appell (1855–1930), spelled by the author with one "l", is classified as "Jewish". Maybe James is here confused by the fact that Appell, as several other more left-leaning French mathematicians, was a "Dreyfusard". Typically, James refers in his book only passingly to "the notorious Dreyfus affair" [James, 2009, 132], which is so central to the history of French culture and science, when he discusses the live of another Dreyfusard, the Jewish mathematician Jacques Hadamard (1865–1963). The author does not make clear that around 1900 religious denomination still played the main role in defining "Jewishness", in spite of growing undercurrents of racist anti-Semitism. This is even partly true of the situation in Italy under Mussolini. In his chapter on Zariski, who lived in Italy from 1921, James writes about the year 1925:

> Already Mussolini's anti-Semitic policies were being put into effect, and Zariski began to doubt whether it would be wise to remain in Italy much longer [James, 2009, 270].

Apparently James is here wrongly equating Italian Fascism—a very dictatorial and demagogical regime indeed—and anti-Semitism; one knows that the Italian anti-Semitic laws were promulgated only in 1938, partly under German pressure. The book by Parikh [1991] which is James's source here, does not say anything which could corroborate the quote given above, and indeed James would be hard pressed to explain why in 1933 quite a few Jewish mathematicians emigrated from Germany to Italy.

It is well-known that after the Nazi movement took power in Germany in 1933, the situation for those who were defined as Jewish by the Nazis, even if they had lost all connection with the Jewish communities of their ancestors, became unbearable. This also applied, of course, to individuals in countries under German occupation during the war. It is therefore shocking to read another casual, totally unsubstantiated remark by the author on page 236: "The Polish mathematician Waclaw Sierpinski (1882–1969) was another Karaite." Why is that shocking? Because James has just classified Abram Besicovitch (1891–1970) as "Jewish" on the basis that his forbears belonged to the Turkish "Khazars" who were known as "Karaim," after having been converted by the Karaite, "a breakaway sect of Judaism" [James, 2009, 236]. In other words, James talks in very few and vague terms about

extremely complicated ethnic-religious situations, without a hint of evidence with respect to Sierpinski, without referring to or even knowing ongoing historical discussions about the identity of the "Karaites" and "Karaims" [Gordon, 2009], and, above all, without asking himself the simple historical question: how could Sierpinski, who was working as a clerk in German-occupied Warsaw in 1944, possibly have survived if he was considered to be Jewish?

In any case, in a biographical collection which attaches the label "Jewish" to the persons described, one should expect the utmost care in delimitating the relevant "population" of Jews. In addition, one should focus on those events in the lives of the scientists which were clearly connected to their being "Jewish" in the concrete sense used in each context. But these demands are frequently violated in James's book. The author often does not realize what is important to stress in a given context. Referring to Dirichlet's wife Rebecca [James, 2009, 72], James does not say—although he doubtless knows—that she was the granddaughter of the Jewish philosopher Moses Mendelssohn and sister of the famous composer. Mentioning Richard Courant's first wife, Nelly Neumann [James, 2009, 228], James neither mentions that she was Jewish by Nazi definition nor that she would finally perish in an extermination camp. When the author discusses the Danish mathematician Harald Bohr [James, 2009, 219], brother of the more famous physicist and both being "half-Jewish" according to the Nazis, he forgets about Bohr's conflict in 1933–1934 with the German Nazi and leading mathematician Ludwig Bieberbach, after criticizing the latter's racist theories of mathematical "styles". This conflict was crucial for the future history of the German Mathematicians' Association. The incident has been thoroughly analyzed by Herbert Mehrtens [1989]—a name which is missing in the bibliography—but the information could have been gathered from other sources, such as Sanford Segal's book [2003], as well. When referring marginally to the physicist Gustav Hertz, the author says:

> Being of Jewish descent, he was forced to leave the Technical University in Berlin-Charlottenburg ... but he remained in Germany and became director of an industrial laboratory [James, 2009, 267].

Does James not realize that he confuses his readers by not mentioning the fact that Hertz could only survive in Germany because he was not "fully" Jewish according to the Nazis?

Discussing the American topologist Solomon Lefschetz, a person presumably close to James's interests and receiving a full entry in the book, the author finds it unnecessary to mention [James, 2009, 208], how unusual Lefschetz's appointment as a full professor at Princeton University was in 1925, when discrimination against Jewish students and staff was still very common at American universities. In the full article on topologist Max Dehn [James, 2009, 158], the author seems unaware of the fact that Dehn was dismissed in 1935 from Frankfurt University earlier than stipulated by the Nazi law, probably due to revenge by an early anti-Semite among German mathematicians, then influential in the Nazi ministry, Theodor Vahlen.

Lack of caution also blemishes James's biography of the American Norbert Wiener. He tells his readers the following "fact" about Wiener's German wife:

> Margaret was a fervent admirer of Adolf Hitler and kept copies of his book *Mein Kampf* prominently displayed in her [their?–R.S.] bedroom, to the intense annoyance of her Jewish husband [James, 2009, 259].

None of the biographical sources which James quotes in the "Credits" [James, 2009, 303], not even [James, 2002], makes this claim. One has to assume that James has taken this from the highly controversial, though apparently well-researched book of the journalists Conway

and Siegelman [2005], which appeared after the "source" [James, 2002] and is not in the bibliography of *Driven to Innovate*. Writing in 2006, the reviewer of this book says that he was glad Wiener never had to read it [Marcus, 2006, 577]. But in any case James should at least have quoted his source and alerted the reader to the devastating effect this incident, if it was true at all, would have had on Wiener's vulnerable psyche. He should also have added the remark, apparently going back to Wiener's children, that "Wiener never learned the full extent to which his wife embraced the Nazi ideology" [Conway and Siegelman, 2005, 101].

James's general political statements are often sweeping and unfounded. He says that Germans had dominating roles in the Russian pre-revolutionary bureaucracy and continues:

> After the October Revolution they were mainly replaced by Jews, who rose high in the administrative ranks of the Soviet Republic. They also played a leading role in Soviet science, particularly mathematics and physics [James, 2009, 180].

I am afraid such generalizing statements, which are bound to nourish the old myth of a "Jewish–Bolshevist world conspiracy," will not go down well with Kojevnikov, on whose book [Kojevnikov, 2004] this chapter on the physicist Abram Ioffe is mainly based. Nor do they fit with other passages in James's book in which he reports—again without source—that "in 1922 Lenin had expelled a large number of prominent Russian intellectuals, many of them Jewish, who he suspected were opposed to Bolshevism" [James, 2009, 265]. A similar remark is due when the author categorizes Hadamard and Emmy Noether lightly and without evidence as "communists" [James, 2009, 63].

The description of Richard Courant's flight from Germany [James, 2009, 234] is misleading in several respects, although the available biographical sources—mentioned by James in the bibliography—are good. James does not realize that Courant, as an applied mathematician, was less desirable to American universities immediately after 1933 than other refugees and that he had to carve his niche in the U.S. by his own efforts. Nor is James's claim that "the German government (had) a particular animus against Courant" justified—after all, by skillfully citing his earlier achievements for German mathematics, Courant managed to be freed from the usual heavy emigration tax.

6. Lack of method and damage to the discipline

All the criticisms which have been made so far of James's 2009 book concern the central question of the "Jewishness" of the persons featured, a question put by the author himself into the foreground, and the historical consequences. But there are other flaws, one of which is the repetitiveness of the whole enterprise. Several of the biographies in the work under review (on the mathematicians Jacobi, Sylvester, Kronecker, Hausdorff, E. Noether, Lefschetz, Pólya, Courant and Zariski, and on the physicists Meitner, Ehrenfest, Born, and Niels Bohr) are very similar and partly identical with their descriptions in James's books of 2002, 2004, and 2006, while biographies of Cantor, Hadamard, Emmy Noether, Wiener, and Einstein are featured for the third time. In those biographies where cuts have been made, the author usually refers to his own previous articles, not mentioning that these were completely based on other people's work. As has been mentioned already, his manner of referring to the results of historians leaves much to be desired and he often distorts information derived from the literature which he lists in the bibliography.

But there are many more inaccuracies in the book and a general lack of awareness of historiographical method. Of these mistakes, I give the following few examples, although

James is definitely not alone in this respect, compared to other mathematicians writing on history (on which see below).

A typical example of James jumping to conclusions caused by a narrow historical knowledge and insufficient use of the sources listed in the bibliography is the flawed insertion of the geometer Heinrich Maschke (1853–1908) into his story. Reading in a biography of the physicist Max Born about a certain Dr. Maschke—who was Born's mathematics and physics teacher at a Breslau (today Polish Wrocław) high school around 1900—he concludes [James, 2009, 200] that it must have been Heinrich Maschke, the doctoral student of Felix Klein, who was also from Breslau. But Maschke had already emigrated to the United States in 1891, while the Dr. Maschke in Breslau is correctly identified in Reid [1976, 9], a source cited in James's book, as Erich Maschke, unrelated to Heinrich, and later Courant's teacher as well.

One should perhaps in fairness not expect the author to know everything of the more recent biographical work on the persons about whom he is writing, although one would at least have hoped so in the case of the set theorists and topologists, who should be closest to James's interests. There is for instance discussion in Purkert and Ilgauds [1987] which sheds light on Cantor's descent, while James [2009, 95] calls Joseph Dauben, whose Cantor biography of 1979 is, by the way, still valuable, Cantor's "most recent biographer". Telling the reader that Felix Hausdorff was "comfortably ensconced as Extra-Ordinarius" [James, 2009, 134] in Leipzig in 1902 ignores not only the general plight of a special group of professors at German universities without regular pay ("außerplanmäßiger Extraordinarius"), but the description also shows James's unawareness of the anti-Semitic atmosphere around Hausdorff and his unhappiness with it [Purkert, 2008, 42].

Knowledge of more recent literature would perhaps have made the author more cautious about calling Hausdorff's 213-page long *Das Chaos in kosmischer Auslese* (Leipzig, 1898) "an obscure philosophical essay" [James, 2009, 134]. In a way this book was important for the development of set theory and therefore James's own discipline of topology. In fact, it was Hausdorff's discussion of the German philosopher Nietzsche's notions of infinity in this publication which induced him to go deeper into Cantor's Mengenlehre, soon to become his favorite research subject. This has been convincingly shown by W. Purkert in a commentary to the republication of the *Chaos* within the recent carefully produced Hausdorff-edition in Bonn [Hausdorff, 2004, 580].

Although James "greatly regrets" [James, 2009, 10] that only three of the 35 scientists featured in his book are women (apparently intimating that there were no more of the same caliber as the men, although he could have easily added, for instance, the able applied mathematician Hilda Geiringer) he does not always reveal a full awareness of women's difficult situation in their scientific careers. When mentioning Einstein's first wife Mileva the author does not, unlike in his previous book [James, 2006], give any hint that she was an equal partner in physical discussions. In the full entry on Lise Meitner, the author—despite listing the fine book of Sime [1996] in the bibliography—manages not to mention the central and ongoing historical discussion on whether Meitner deserved to win the Nobel prize for her contribution to the discovery and interpretation of nuclear fission. It is not even mentioned that Meitner's collaborator Otto Hahn received the Nobel prize in chemistry for 1944 for that achievement. Instead, James makes the following dubious remark about Hahn and the Jewish refugee Meitner, who had to leave Berlin in 1938:

> It was widely felt that by encouraging her to leave Berlin when she did, he might have saved her life but he had effectively blighted her scientific career [James, 2009, 154].

As already mentioned, remarks on actual mathematics and physics are sparse in *Driven to Innovate*. When briefly discussing Courant's contribution to developing the finite difference method for the solution of partial differential equations, James says:

> Courant set out to ... refine it until it produced precise solutions, not just approximate solutions, or at least established the existence of precise solutions [James, 2009, 233].

Here it is possible that the lay reader could miss the point that approximation in the sense of convergence does not imply imprecision. This remark is meant less as a criticism of James than as a reminder of how notoriously difficult and at the same time how potentially meritorious it is to explain mathematics and its history to the public. Here James could have found abundant opportunities. Instead he largely abstains from this job. It seems very rare that a topologist does not even make an effort to say something about the work of his forbears in his field. For example, in the case of Emmy Noether, it is striking that James merely calls her the "Queen of Modern Algebra," without referring to her important work at the intersection of group theory and topology. Of course, James is well aware of this work, as [James, 1999a] shows, but in the current volume it remains totally inexplicable why the Russian topologist P.S. Alexandrov would take such an intense interest in Noether's fate. This again shows James's total indifference to a complete and convincing historical argument, maybe even his contempt for the efforts of historians.

7. Again the question of motivation, and conclusion

As I have endeavored to show, *Driven to Innovate*, which repeats much from previous biographical publications by the same author, contains many inaccuracies and above all systematic faults, for instance in quoting other work. This makes it useless, if not outright damaging, and not just for historians.

For a comparison, one should look at other works by mathematicians dealing with the history of mathematics, in particular with biographies. In historical accounts written by mathematicians it is a well-known but hardly surprising phenomenon that the ideals of precision to which a mathematician is accustomed from his/her own discipline do not easily translate into precision in historical work. But we historians have to live with that, just as mathematicians might sometimes find some of our discussions of mathematical notions similarly vague.

E.T. Bell's book on *Men of Mathematics* is known to be notoriously unreliable and sketchy, but it is a good read and can instill enthusiasm for mathematics in the beginner, not least because it aims to show that "mathematicians can be as human as anybody else" [Bell, 1937, 23] and because Bell wants to "lead up to some of the dominating ideas governing vast tracts of mathematics as it exists to-day" [Bell, 1937, 17]. I personally love O'Shea's book [2007] on the Poincaré conjecture, although it contains many minor factual mistakes. It is certainly careless of O'Shea to lightly declare that Hilbert was Klein's student in Leipzig [O'Shea, 2007, 145] or that Hadamard was "just five years younger than Poincaré" [O'Shea, 2007, 150], which he could easily have checked in any biographical account. But in a sense it is important to make the "right mistakes" and not the ones which distort the essence of what you want to talk about, such as James does with his mistakes on Appell and Sierpinski, which go to the very core of the discussion of "Jewishness". O'Shea, unlike James, is a mathematician who uses the work of historians with profit, gives credit where credit is due, immerses himself in the spirit of the times, and, crucially, imparts his mathematical knowledge in a form which the public can understand. James does nothing of that.

His books are not even a particularly good read, as Bell's biographies are. They come across as quasi-objective collections of biographical "facts", which makes them even more dangerous for the general consumer.

Why then does James compile these books? This is still puzzling to me. There are many motivations which a mathematician can have to study the history of his discipline and the lives of his ancestors, such as propaganda for his specialty, awareness of crisis, social concerns, and didactic aims. I once tried to classify them [Siegmund-Schultze, 1992], but James does not seem to fit into any of the categories because he is apparently not interested in a real study or in cooperation with historians.

It is clear that James is fascinated with the lives of the mathematicians and physicists featured in the biographies. It cannot be denied either that readers without previous knowledge and who are unfamiliar with some general historical facts will probably find much of what they can read here of interest. To James, history should apparently convey some feeling for the moment, a feeling which the historian is supposed to occasionally provide in a nice celebratory speech for a big scientific personality, commissioned by scientists, and soon to be forgotten afterward. But in the end this stimulates hagiography, an attribute that James allegedly despises.

James has read a lot of biographical literature but he is, particularly when forced to shorten existing biographies, unable to distinguish between important and marginal historical facts. He shows a lack of respect for the work of historians who often required decades of immersion into the subtleties of the historical contexts. As much satisfaction and confirmation of the merits of their own work historians might draw from this fact, they would certainly have preferred to be spared James's efforts. It seems all the more unfortunate that the one attribute which James could most profitably have contributed to the "collaboration between historians and mathematicians", namely his detailed mathematical knowledge in such an important part of mathematics as topology, is not used in his biographical books.

There remains the question of the responsibility for truth. Once again, to be absolutely clear: I am not talking about mistakes as such, which we all, historians and mathematicians alike, make all the time. I am concerned primarily about attitudes on the side of both amateur authors, such as James with respect to history, and publishers.

As far as the publishers are concerned it is greatly annoying that they apparently do not sufficiently vet manuscripts written by influential scientists, or simply send them out for review to other scientists or non-historians, who do not know the facts either. This is illustrated by the back cover of the present book, which contains glowing testimonies from a rabbi and a prominent mathematician. One should also ask the more principled question of what useful purpose a collection of short biographies in book form—one which is definitely not a dictionary and which lacks references, particularly to the scientific works of the persons portrayed—can fulfill today in the age of the internet.

In the preface to his first biographical collection [James, 2002], the author says (and he repeats it almost verbatim in his second book [James, 2004]):

> This book is intended for those who would like to read something, but not too much, about the life stories of some of the most remarkable mathematicians (physicists) [James, 2002, xi].

What is "something" and what is "too much"? After reading these books and the book under particular review here, one might be tempted to say that "something" can already be "too much". In today's internet age one should rather go to the MacTutor website if one wants to read "something." I myself find this website useful as a first orientation for

further research. Unlike in James's biographies, there is also some mathematical literature for further reading added, although the manner of quoting within the biographical entries and the reliability of information provided are often similarly dubious. Indeed, be aware that while visiting the MacTutor website, one risks hitting the entry for Ioan James himself, where one is then confronted with the "fact" that: "Over the last ten years, James has produced a number of outstanding historical studies."

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