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Science and Censorship:
Hélène Duhem and the Publication of the "Système du monde"

THERE WAS A time when voluminous books and indeed multivolume works were not a rarity. Only about a hundred years ago did some, especially scientific, journals begin to insist on parsimony with words. Scholarly criticism too has become more keen on facts and documentation as distinct from mere interpretation, let alone surreptitious rhetoric. The recent skyrocketing of the cost of printing has also forced editors and publishers to be more and more demanding about conciseness. Even well-endowed university presses have become unreceptive to typescripts running to two volumes; those running to three, let alone four volumes, are usually dismissed out of hand. Works of five, to say nothing of seven or ten volumes, belong more and more to a perhaps not too distant but increasingly legendary past.

More than three decades have gone by since 1954 when the printing presses produced the last or tenth volume of Toynbee's *A Study of History*, whose first volume was published in 1934. Such a vast enterprise may be interrupted by the author's health or death or conceivably by other causes. Among these there can be an ideological opposition ready to seize on various pretexts, such as changes of socio-political circumstances, to stifle a great intellectual venture. Such opposition does not wish to be written about and certainly not frequently or at length.

Still, in all likelihood, enormously much would have been written during the last four decades if the manuscript of the last five volumes of Toynbee's magnum opus were still looking for a typesetter. There would have been endless probings into possible sinistrous forces at play behind the scenes. And what if the printing of Churchill's *History of World War II* had come to an end with the third volume, and what if large batches of manuscripts written in the hands of a Freud, a Jung, a Sartre, or a Bertrand Russell, all ready for printing, were still not feeding the intellectually hungry but rather the slimy mould in a cellar, an attic, or a warehouse? Investigative scholars would have a field day with no diminishing returns in sight.

The Unknown Scandal

To the remark that since nothing of that sort has happened, at least not in the recent history of Western democracies, and therefore the subject should be dropped so that parsimony with words may be observed, the answer is simple. Such a thing did happen and to a ten-volume work which is easily the most original, creative, and potentially epoch-making achievement for the interpretation of Western cultural history. The

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work in question is *Le système du monde: les doctrines cosmologiques de Platon à Copernic*. Its author is Pierre Duhem (1861-1916), one of the most brilliant students ever to attend that topmost of French schools, the Ecole Normale Supérieure (1882-85), who spent the last twenty-two years of his life as professor of theoretical physics at the University of Bordeaux.[1] The first five volumes—each more than 500 pages—of that work were published in five successive years, 1913-1917. Although another five volumes were ready in manuscript when Duhem suddenly died, they were not published until four decades later (1954-59).

The very fact that the second half of a most meticulously documented scholarly history of science, especially of astronomy, physics, and their philosophical background, was published after such a lapse of time is a proof of its value. Indeed its value should seem extraordinary to anyone mindful of the speed with which research becomes dated nowadays. A five-year delay is already ominous; to be behind the latest by ten years is well-nigh catastrophic. A delay of forty years should seem equivalent to plain mummifying. Yet, when in 1954 the sixth volume was published, A. Koyré, a leading historian of science, and not at all sympathetic to Duhem's perspectives, wrote that the *Système du monde* is incredibly rich in data and texts which cannot be found anywhere else in print. Implied in this was not only the acknowledgement that Duhem's research was pioneering in the strictest sense, but also that scholarship had failed to a large extent to catch up with Duhem in the forty years subsequent to his death.

The delay, in itself grave, should, in view of Duhem's scholarship, seem shocking if not simply scandalous. No probing whatever into that delay took place, in France or elsewhere, prior to the recent publication of my book, a half-a-million-word monograph on Duhem's life and on his work[2] as a theoretical physicist, philosopher of science, and historian of medieval science, indeed the pioneering discoverer of science in the so-called Dark Ages. My probing was largely conjectural and brief, although, as it turned out, on the right track: once Duhem was no longer alive, powerful ideological opposition—academic and political—to his findings about the Middle Ages was successful in discouraging the publisher to go on with the project.

The present paper is a renewed probing into that opposition, but on the basis of a vast correspondence kept by Hélène Duhem (1891-1974), Duhem's only child.[3] The correspondence is proof—often month by month, at times week by week—of a struggle which she carried on for thirty years in the face of an opposition whose insuperability was proportional to its resolve and ability to remain invisible.

What opened some doors for me was, so it seems, the courage with which, through a portrayal of Duhem's struggles, the Christian contribution to the intellectual formation of the Western world is defended in my book. But this is precisely what makes the question about the absence of probings into that delay even more perplexing. After all, there have been in France some Catholic scholars—philosophers, physicists, and historians—for whom Catholicism was their intellectual lifeblood and not merely a label, something to be downplayed in order to gain the esteem of "purely scholarly" circles. They could not plead ignorance about the enormous potential support which Duhem's work presented to their interest in the Christian foundations of Western civilization. They could have certainly gained the confidence of Hélène, a conservative, politically as well as religiously, and drawn on her storehouse of documents and vivid memories. Once the publication of the *Système* had been completed in 1959, the story of the delay could have been pieced together, with her guidance, into a monumental tapestry, to be unveiled at an opportune moment. That tapestry, a metaphor for a thorough documentation and unsparing narrative, would have conjured up with its somber hues some behind-the-scenes figures doing their best to repress superior scholarship. Such a tactic is a cen-

sorship more destructive than the banning of books. The latter, which is often decried as a crime against mankind second only to apartheid and camps of extermination, assures global publicity, while the former may secure complete oblivion.

The purpose of this probing is not a postmortem aimed at certain Catholic scholars in France (and elsewhere), though some of them are still alive and vigorous. Nor is the purpose a calling to the carpet of those whose creed is essentially a program of fair play, pure scholarship, respect for intellectual merit, a universal promotion of progress—in short, a cultural creed professedly free of ideology. Some of them, in the field of the history of science, could not, of course, be unaware of what went on in regard to Duhem's manuscript. Perhaps on seeing the evidence laid out here they will be less vocal in their rather selective indignation. The purpose is to awaken through a story, full of cloaks and daggers, the readers—broadly conservative—of this journal to the importance of science for the conservation of all that is noble, beautiful, dignified, and transcendental in human life and civilization.

Conservatives are apt to aim, at best, at benevolent neutrality about science, a neutrality all too often excusing one of ignorance, if not of plain selfishness. The latter at least can be dynamic. But conservatism can be a static defense of a mere status quo for which there is no place in a world of science. Science has been since its rise in the West an increasingly potent source of novelty. For the past fifty years novelties that in a few years can transform hallowed lifestyles, eliminate jobs by the millions and coldly impose new ones, are bursting through science on mankind at a maddeningly accelerated rate. Partly because the rate is so maddening, the urge to conserve the old style is also rising with an elemental force. To try to conserve the old style is often sheer futility. Values alone can be conserved; but are they not the ones most threatened by a runaway science and technology? Is not science, if not a Frankenstein, a soulless game of man's insatiable and irresponsible curiosity? Was not science born in that great rift of modern Western culture, the decades around the French Revolution? From there it is but an instinctive association for conservatives to Edmund Burke's impassioned indictment of the Jacobins and the rest: "The age of chivalry is gone. That of sophisters, economists, and calculators, has succeeded; and the glory of Europe is extinguished forever."[4]

Is not science therefore the result of Western man's brave turning his back to the Creed in order to be his own master especially through science? Was there not a tacit admission of this even on the part of a Bergson, so much at odds with the tyranny of mechanism in biology, in psychology, and in philosophy? It is tempting to think that he endorsed the cliché, produced by the leaders of the Enlightenment in terms of that turnabout, when he wrote in 1907 in his *Evolution créatrice* that science descended upon the earth on the inclined plane of Galileo.[5]

Bergson, alert and sensitive as he was to anything new in biology and psychology, should have known better. He worked in Paris, where, as befitting the City of Light, rumors about intellectual novelties are transmitted almost with the speed of light. For three years prior to the publication of his *Evolution créatrice*, two French scholarly journals had been carrying lengthy reports which should have at least created some misgivings about Galileo's inclined plane as the secular equivalent of Jacob's ladder. In fact, no one was more surprised than the author of those articles, Pierre Duhem, by then recognized as a leading theoretician of thermodynamics. As a Catholic, he certainly did not view the Middle Ages as the epitome of darkness, but he did not expect to find there science of any significance. He shared the general belief that in tracing scientific history one was to jump well over a thousand years from Archimedes or Ptolemy to Galileo. Thus in a series of articles, which Duhem began in 1903 on the origin of the science of statics, Archimedes was at first followed by Stevin and Cardanus, im-

mediate predecessors of Galileo. But in reading Cardanus, Duhem found a cryptic reference to a certain Jordanus, a name noticed during the previous ten or so years by several historians of science who, unlike Duhem, had not cared to track down that elusive figure whom Cardanus seemed to credit with an important scientific insight.

Duhem's Discovery

The task, involving a search for half-a-millennium-old medieval manuscripts and the deciphering of their quasi-cryptic scripts, would have been shunned by all theoretical physicists and by most historians of science who at that time were still few and far between. Duhem's heroic effort paid a most unexpected dividend. He found that in speaking of the laws of balance Jordanus, who turned out to have flourished around 1320, enunciated the law of virtual velocities which is the cornerstone of general dynamics.

The rest is an epic of Duhem's pioneering and heroic exploration of the science of the Middle Ages as an age of primary importance for the understanding of the rise of science. A pioneering epic it was, as Duhem could not rely on printed sources: even the better works on science history, such as a three-volume work by Whewell published in the 1840s, offered but a few trivial pages on what happened between Archimedes and Galileo. Duhem certainly could not count on "peer support," that is, on academic consensus and expectation. Soon he had the not necessarily enviable distinction of towering above all his peers, a circumstance all too often sparking jealousy and in his case deep resentment. But he was undaunted. In the twelve years between 1904 and his sudden death in 1916 at the age of 56 he not only continued his prodigious series of publications on theoretical physics, but filled 120 large-size notebooks, each 200 pages long, with excerpts from medieval manuscripts which he had to beg from other French libraries. He had no microfilm, no xerox machines, no dictaphones, not even ball point pens at his disposal. Above all, he had no research assistants of any sort. Worse, he often had to hold firm his trembling right hand with his left.

His were, however, the priceless assets of steely resolve, a brilliant mind, and a facility for writing. Most of his first drafts could directly be sent to the printer. And he sent them in gigantic volumes on medieval science which until then was believed to be non-existent by the scholarly consensus. By 1906 there appeared the 600 pages of *Les origines de la statique* and the first volume of his famed studies on Leonardo whom he soon perceived as a main channel of medieval science for Galileo. By 1909, when he published the second volume of his Leonardo studies, he was already writing the *Système du monde*. By 1913, when he published the third volume of his studies on Leonardo, he had already discovered Buridan and Oresme as the original formulators of the equivalent of Newton's first law of motion.

Meanwhile, the manuscripts of the *Système du monde* had grown so vast that he was able to offer the famed scientific publisher in Paris, A. Hermann, a contract which was eagerly accepted. Hermann, then in his seventies, had great admiration for Duhem ever since he published in 1887 Duhem's *Le potentiel thermodynamique*, now in the Microprint Landmarks of Science series. Two years earlier, the manuscript of that work had been presented by Duhem, a second-year university student, as a doctoral dissertation to the Sorbonne, which rejected it. The reason for this was the inability of Marcelin Berthelot, an excellent experimental chemist and a chief pundit of the secularist ideology of the Third Republic, to see his own favorite scientific theory, the principle of maximum work, demolished by one who was not even a "beginner." Owing to Berthelot's influence the Ministry of Public Instruction gave teaching posts to Duhem only in provincial universities, although his excellence should have secured for him a prominent chair in Paris.

The contract between Duhem and A. Her-

mann was certainly unique on the part of an already world famous scholar.[6] He obligated himself to deliver to the publisher in mid-1913, and in each of the next nine years, a manuscript equivalent to about 500 large octavo printed pages. Compared with this the obligation assumed by the publisher to bring out one volume each year seems far easier. The publisher was to put on sale 700 copies of each volume. Duhem was to receive no royalties for the first 400 copies of any volume sold. Beyond that number he was to receive a royalty of 40 percent of the sales. The first volume appeared in late 1913, shortly before he was elected as one of the first six non-resident members of the Académie des Sciences. The second volume was published in 1914, the third in 1915, the fourth in 1916 shortly before Duhem's death on September 14. By then he was reading the proofs of the fifth volume which appeared in late 1917. The publisher was in fact so interested in the work that even in the most difficult wartime circumstances he secured the best paper for printing, of which he repeatedly and with obvious satisfaction informed the author.

Duhem left behind a batch of manuscripts which was quickly identified as the continuation of the *Systéme du monde*. His daughter Hélène, then 25 and his sole survivor, deposited the manuscript with the Académie des Sciences, where her father had several trusted friends, among them Darboux, its perpetual secretary, who, however, died soon afterwards. The Académie in turn set up a committee to evaluate the publishability of the manuscripts.[7] The verdict, tendered by mid-1917, was unqualifiedly positive. As a result, the manuscript of what later became the sixth volume, was handed over to Hermann and Cie. That volume was not published until 1954.

There could have been a justifiable delay of at most five years, the immediate post-World War I years, which particularly echoed the perennial complaint of publishers about "hard times." But those publishers even then kept producing books, including large scholarly ones, by the score. This was true of Hermann and Cie., which admitted in 1926 to Hélène the fact that the first volume had completely sold out. (By the mid-1930s the same was true of the other four volumes as well.) Clearly, Hermann and Cie. was not losing on the venture, even if it had regularly and promptly paid Hélène the royalties due for copies above the first four hundred. Meanwhile the company's directorship was abandoned by Adolphe Hermann, already in his eighties. By 1930, M. Freymann, the husband of one of Adolphe's three granddaughters, was in charge and played over the next thirty years the role of Hélène's direct antagonist. He never tired of referring to bad economic conditions as the cause of postponing publication.

Ideology and Censorship

The indirect and more important antagonist of Hélène, and the real cause of the almost four-decade delay, should be looked for in a symptom of which a telling part is the traditional slighting of Duhem by those in the profession known as historians of science.[8] Young members of that profession are largely unaware that the slighting in question is almost a hallowed pattern. One such young scholar admitted his utter surprise when faced with a point made in my paper, "Damned with Faint Praise, or the Fate of Pierre Duhem," which I presented at the Boston Colloquia for the Philosophy of Science on March 13, 1979.[9] The point related to an article which George Sarton, founding editor of *Isis*, the leading history of science quarterly, published in *Scribner's Magazine* in 1919 on Leonardo the scientist. In that article Sarton presented himself as a pioneering student of Leonardo the scientist, and completely ignored Duhem's three truly pioneering volumes on the same subject. About the same time Sarton stopped reviewing in *Isis* the *Système du monde* whose first volume dealing with Plato and Aristotle he had greeted there with great applause. But as an unabashedly prominent Freemason and

the son of a virulently anti-clerical Freemason in Belgium, Sarton clearly perceived that volumes 3, 4, and 5 had anticipated enough of the thrust of the rest of the *Système du monde*. Such a work, a supreme threat to the strictly secularist interpretation of Western intellectual history (so dear to Freemasonic circles where science owes its origin to the de-Christianization of the West), had to be made ineffective by silence, the most innocent looking among the means of censorship.

In 1938, Sarton printed in *Isis* a notoriously virulent attack on the intellectual honesty of Duhem's scholarship. To be sure, he provided space in *Isis* about the same time for a call on behalf of an international subscription to promote the publication of the remainder of the *Système du monde*. In that call he seconded the elderly Mme. Paul Tannery, a good friend of Duhem and the widow of a famed historian of ancient Greek mathematics and astronomy. Sarton knew of course that because of his Catholicism Tannery was deprived by the circles led by Berthelot of the chair especially established for the history of science in the Collège de France.[10] The injustice precipitated Tannery's death in 1905; his widow found much consolation and support in the letters written to her by Duhem, who also wrote the leading obituary on Tannery.

That Sarton could not be sincere in his support of that call became evident in his five-volume bibliographical history of science prior to 1400[11] in which none of Duhem's major publications are mentioned. (Imagine a bibliographical history of World War II with no reference to Churchill's six-volume work!) Then came in 1948 Sarton's series of lectures at the Collège de France on the role of tradition in science, a theme most powerfully articulated by Duhem. Sarton invited[12] to his lectures the noted French church historian, Albert Dufourcq, a colleague and friend of Duhem between 1901 and 1913 at the University of Bordeaux and a most valuable protector and advisor of Hélène until his death in 1952. To Dufourcq's astonishment, Sarton failed to refer to Duhem in his lectures. In their subsequent private conversation Sarton spoke of the manuscript (which he in all likelihood never saw) of the *Système du monde* as "undoubtedly" a series of disconnected jottings, a fact fully reported by Dufourcq in his letter of May 27, to Hélène.

By then Hélène and Dufourcq knew about the explicit resistance on the part of prominent French academics—either radical leftists or radical secularists—against the publication of the *Système du monde*. Their chief source of information was Abel Rey, director of the Institut pour science et technologie at the Sorbonne, whose doctoral dissertation (1905) included a chapter, not altogether sympathetic, on Duhem's philosophy of science. Yet Rey was one of those rare scholars who in spite of ideological differences was willing to recognize intellectual and scholarly excellence. Hélène's correspondence shows that Rey did much between 1935 and 1939 to rally support in French academic and administrative circles to secure the publication of the *Système du monde*. Not being suspected in those circles, at that time heavily dominated by members of the Front Populaire, of Catholic sympathies, he could move about freely and gain firsthand information. An earful is conveyed in his letter of November 19, 1936, to Hélène. He spoke of his "stormy" meeting with Freymann who proposed the publication of the sixth volume in fascicles,[13] each with independent pagination, which would have made publication of a single volume all the more difficult. More importantly, continued Rey,

> to my great astonishment I have found him [Freymann] rather reticent concerning the subvention from the Ministry. He told me that M. Cavalier (who is director of the bureau for at least this year for some strange reason) was not favorable, nor was Perrin [a Nobel-laureate physicist] for political as well as for scientific hostility. I believe that he [Freymann] is afraid that subvention from the Ministry would obligate him to publish and in my belief he

> in fact finds useful that difficulty. But he does not admit it . . . . I am therefore pessimistic for the moment because I sense that he does not want to begin the publication of the manuscript.

Shortly afterwards Dufourcq informed Hélène that Cavalier was openly contemptuous of Duhem's scholarship.[14]

Half a year earlier, on May 30th, Rey wrote to Hélène of his "more than 50 telephone calls" to Freymann who over many years kept telling Hélène that the typesetting and printing would proceed with all possible speed. To facilitate quick publication, Hélène in 1937 consented to the modification of the original contract and settled with a ten percent royalty for all copies sold. In view of the first-rate printing facilities available to Hermann and Cie., volume 6, either in facsicles or as a unit, should have been available for sale by the end of 1938 at the latest. But as late as June 7, 1939, Freymann promised publication of volume 6 (with Hélène's preface) only by the end of the summer. Six months later volume 6 was still "being produced with all speed" as Hélène learned from Freymann's letter of Dec. 15, 1939. Such was Freymann's intolerable sop for Hélène's expression of her utmost grievance which he quoted verbatim and which puts in a nutshell that side of his true performance which he could no longer hide from Hélène: "You [Mlle. Duhem] tell me you [M. Freymann] will certainly invoke the actual circumstances. The fact is that, when the thing was possible, you did not act in spite of your formal promise given to me and in spite of the written committment binding you."

Underlying Hélène's despair was, of course, the anxiety caused by the eruption of World War II. As one whose several relatives died in World War I or lost their possessions, she could be but deeply concerned about the fate in store for her father's priceless manuscripts. They could have easily become one of the irreparable cultural losses suffered by occupied France. The years of convenient copy-making were still decades away.

Once the war was over, the resolve behind Freymann's delaying tactics grew in proportion to the vastly increased opposition to it. The chief new figures he had to contend with included Dupouy, head after World War II of the Centre National de Recherches Scientifiques; De Broglie, perpetual secretary of the Académie des Sciences; and two elderly distinguished mathematicians, Hadamard and Cartan. The former was a close friend of Duhem since their student days at the Ecole Normale in the 1880s. Cartan, also a Jew like Hadamard, was most influential in obtaining in 1917 for Hélène a yearly pension from the "Société des Amis de la Science" following her father's death.[15]

In 1947 Dupouy made a large subvention available for Freymann who in face of the sum in question could no longer resort to a tactic which was a mainstay of his during the 1930s. Already Adolphe Hermann preferred a subvention from the Ministry which did not imply a strict obligation to publish each and every year for the next ten years.[16] Freymann certainly wanted no obligation vis-à-vis the Ministry which did not adjust in postwar years to actual purchasing power either the subvention accorded to Duhem's work in 1913 or similar grants. Hence Freymann could find excuse in the reduced value of ministerial subvention, and for that reason to press Hélène for a rewriting of the original contract. At any rate, the vastly enlarged subvention was made available to Freymann in 1947 on the condition that within a year he would publish volume 6. A year later Dupouy in vain reminded Freymann of his promise.[17] By 1952 Freymann's footdragging made Dupouy skeptical about the entire matter to the extent of trying to secure publication through another publisher. The ensuing legal litigation would have, of course, well served Freymann's delaying tactics of which Fabius Cunctator of ancient Roman times might have been proud. On March 31, 1954, De Broglie squarely threatened Freymann with court action.

That almost immediately after Freymann's

death, which came on April 2, Hermann and Cie. proceeded with all possible speed under its new director P. Bernes is itself a strong indication that Freymann's standard excuses—rewriting the original contract, shortage of paper, rising typesetting costs, drastic decrease of library orders, especially from American universities—were so many cover-up attempts. The true cause of his incredible procrastination may lie in his apparent readiness to serve as a tool of powerful intellectual and academic circles who did not wish the second and culturally more decisive part of the *Système du monde* to appear in print.

Pluralism, True and False

No wonder. In volumes 6 and 7 Duhem presents a vastly documented study of the work of Buridan and Oresme. These two luminaries of fourteenth-century Sorbonne arrived at such scientific breakthroughs as the formulation of what later became known as Newton's first law of motion without which his second and third laws and the entire system of classical physics are inconceivable.[18] In volumes 8-10 Duhem provided ample evidence that such and similar breakthroughs (among them the definition of constantly accelerating motion), so important for the purposes of Galileo, had been handed down in ever wider circles of scholars. Most important, in those posthumous volumes Duhem stated most emphatically that Buridan and Oresme broke with the debilitating Aristotelian physics of motion by reflecting on what was demanded by the Christian dogma of creation in time and out of nothing. Whereas for Aristotle, a pantheist, the universe and its motions could have no beginning, for the Christian the world, if it came out of nothing, and in time, had to have a beginning even with respect to the quantity of motion contained within it. But since the Creator was absolutely transcendental to the universe, the latter's motion could no longer be conceived, as was done by Aristotle, as a continuous participation in the divine, but as a power given to it once and for all.

What Duhem unearthed among other things from long-buried manuscripts was that supernatural revelation played a crucial liberating role in putting scientific speculation on the right track. But then the claim, so pivotal for the secularist anti-Christian interpretation of Western cultural history—that science and religion are in irreconcilable conflict—could only be deprived of its prima facie credibility. It is in this terrifying prospect for secular humanism, for which science is the redeemer of mankind, that lies the explanation of that grim and secretive censorship which has worked against Duhem (and his few allies) by two principal means: One is the prevention of major scholarly evidence in favor of Duhem's perspective to appear in print or at least to be printed by "prominent" publishing houses. The other is selective indignation in scholarly societies and their journals—allegedly devoted to universal truth regardless of race, religion, and politics.

No definition of truth can be hoped to be accepted universally in a professedly pluralistic society. But any definition of truth which permits the cavalier handling of monumental facts would certainly contradict scholarship insofar as it ought to be based on as full knowledge of facts as possible. Such a monumental fact of twentieth-century intellectual history is the kind of persecution which kept first-rate scholarship from appearing in print for almost forty years. When some British intellectuals pleaded insufficient knowledge about another persecution that went into high gear in the late 1930s in Nazi Germany, the late Arthur Koestler reminded them of their duty as intellectuals to track down and expose any trampling down of the intellectual dignity of man whenever word is received, however muted, about its taking place. The word about Duhem's posthumous persecution could be ignored only by those in the field who did not wish to know it was happening, or perhaps deep in their hearts were happy about its happening. A number of them

paraded as chief luminaries in the field just in those years when the complete *Système du monde* emerged in print and when a big conference of historians of science heard the brave but unechoed declaration of a leader among them: "Pierre Duhem is the acknowledged teacher of us all."[19]

That they could have found out the truth from a fragile woman, Hélène Duhem, who in 1936 published at her own cost a moving biography of her father with ample reference to his intellectual martyrdom,[20] only magnifies the case in an age so eager to find women heroes. Such a heroine was Hélène Duhem, without whose perseverance and faith the intellectual world might have been poorer by a monumental revision of a systematically distorted Western intellectual history. Like her father, she too was particularly fond of Pascal. She could have hardly failed to think of the gist of her long struggle, never discussed in public by scholars, on behalf of her father's monumental work, as she came across in the *Pensées* the phrase, more expressive than any accusing finger: "Silence is the greatest persecution."[21]

1. For details on Duhem's life and work and other items not documented in this article, see my work quoted in the next note.
2. *Uneasy Genius: The Life and Work of Pierre Duhem* (Boston: Martinus Nijhoff, 1984).
3. The correspondence is in the possession of Mlle. M.-M. Gallet and M. N. Dufourcq, to whom I would like to express my appreciation for having made it available to me for this and further studies.
4. *Reflections on the Revolution in France* (Pelican Books, 1968), 170.
5. *Creative Evolution*, tr. A. Mitchell (New York: Modern Library, 1944), 364. Bergson's statement should seem all the more surprising because, as shown by a note (264), he was not unaware of Duhem's work on the history of modern mechanics.
6. The contract was signed by Duhem on June 21, 1913.
7. Concerning publishability, any doubting Thomas may convince himself by a mere look at the manuscripts of volumes 7-10 in the Archives of the Académie des Sciences in Paris. The manuscript of volume 6 was given to the Library of the University of Bordeaux.
8. The slighting is indirect as for instance in the article "Oresme" by E. Grant in *The Encyclopedia of Philosophy* (New York: Macmillan, 1967), 5: 547-49, who fails to note that it was Duhem who put Oresme on the map of modern intellectual awareness.
9. Although I was invited to present a paper on any topic relating to the philosophy of science, my paper was not considered for publication in any of the volumes of the Colloquia on the ground that it was not scholarly enough.
10. The chair, occupied by Lafitte, "the positivist pope," from 1893-1903, went to Wyrouboff, a crystallographer and a worthy successor to Lafitte from at least the ideological viewpoint.
11. *Introduction to the History of Science* (1927-1947).
12. The invitation, which was not solicited by Dufourcq indicated Sarton's awareness (and possible apprehension) of Dufourcq's decade-long efforts on behalf of Hélène and the publication of the *Système du monde*.
13. The fascicles would have been part of the ones (by then more than seven hundred) constituting the series, "Actualités scientifiques et industrielles."
14. Jacques Cavalier, who was killed by a motorcyclist on March 21, 1937, was professor of physics, before he became in 1926 director of French higher education.
15. Duhem's close and lifelong friendship with some prominent and staunchly liberal Jews is mentioned here because of the customary character-assassination in which he is written off as an ultraconservative, royalist, anti-Semite of extremist religiosity.
16. Letters of April 11 and 17 of 1913 of A. Hermann to Pierre Duhem.
17. As put in writing by Dupouy in his letter of July 11, 1951, to the Académie des Sciences, of which he sent a copy to Hélène. The material kept by Hélène is all the more valuable, because the more than 20-year-old documents of CNRSc are usually "mis au pilon," that is, thrown in the incinerator.
18. The enormous scholarly value of volume 7 is also attested to by the imminent publication of much of its contents in English translation by R. Aryew under the title, *Duhem on Medieval Cosmology* (University of Chicago Press).
19. A statement of H. Guerlac in Oxford in July 1961.
20. *Un savant français: Pierre Duhem* (Paris: Plon, 1936). She did not succeed in publishing a documentary history of the publication of the first volume of the *Système*. Her manuscript, of about 40 pages, entitled "Comment fut publié le *Système du monde* de Pierre Duhem: fragments d'une correspondence," is one of a number of manuscript documents relating to Duhem's life and work which are being prepared for publication by Mlle. Gallet and myself.
21. See *Pascal's Pensées*, with an introduction by T.S. Eliot (New York: E.P. Dutton, 1958), 270, (no. 919).