NATURE, EXPERIMENT, AND THE SCIENCES

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NATURE, EXPERIMENT, AND THE SCIENCES

Essays on Galileo and the History of Science
in Honour of Stillman Drake

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FOREWORD

This collection of essays is a tribute to Stillman Drake by some of his friends and colleagues, and by others on whom his work has had a formative influence. It is difficult to know him without succumbing to his combination of discipline and enthusiasm, even in fields remote from Renaissance physics and natural philosophy; and so he should not be surprised in this volume to see emphases and methods congenial to him, even on topics as remote as Darwin or the chemical revolution. Therein lies whatever unity the discerning reader may find in this book, beyond the natural focus and coherence of the largest section, on Galileo, and the final section on Drake's collection of books, a major and now accessible resource for research in the field that he has made his own.

We have chosen, as the occasion for presenting the volume to Stillman Drake, Galileo's birthday; Galileo has had more than one birthday party in Toronto since Drake came to the University of Toronto. As for the title, it reflects a shared conviction that experiment is the key to science; it is what scientists *do*. Drake has already asserted that emphasis in the title of his magisterial *Galileo at Work*, and we echo it here.

Those who have had the privilege and pleasure of working and arguing with Stillman over the years know his tenacity, penetration, and vigour. They also know his generosity and humility. We owe him much.

It would be usual at this point in a volume of tribute to give a brief account of the recipient's career — a career in scholarship which continues to be vigorously productive. But such an account has already been written by William Wallace, whose main contribution to this volume opens the first and major section. It was Wallace who prepared and read the citation when Drake was presented with the Sarton Medal of the History of Science Society in December 1988. We are grateful to the Editor of *Isis* for permission to reproduce it here.

T.H.L. and W.R.S.

STILLMAN DRAKE: CITATION FOR THE SARTON MEDAL

History of Science Society Annual Meeting, Cincinnati, 1988

This evening we have the privilege of bestowing the Sarton Medal, the highest honor the History of Science Society can bestow, on Stillman Drake, Professor Emeritus of the History of Science at the University of Toronto. A comparative late-comer to the academic scene, Professor Drake has become one of the most productive scholars of our generation and simply dominates, without a challenger in sight, the field of Galileo studies. Whereas for some honorees in the past it has been difficult to point out the accomplishments for which they are being honored, no such problem faces me in this citation. The author of sixteen books, a contributor to fifteen other books, with his name fixed to over seventy articles in scholarly journals, Stillman's credentials speak for themselves. And the most remarkable thing about those credentials is that he began to accumulate them over a period of years when his primary work was not in academe but in investment banking. He entered the ranks of "institutional scholars", if I may use that expression, in his late fifties, starting a second career when many are content to retire, and then beginning, not as a lecturer or instructor but as a full professor, prepared to hold his own with the acknowledged masters of the field.

The phenomenon that is Stillman Drake is not easy to explain. Perhaps the route through history, while not providing a causal explanation, can at least "save the appearances". Born in Berkeley, California, on Christmas Eve in 1910, he attended Marin Junior College from 1928 to 1930, then the University of California at Berkeley from 1930 to 1932, where he earned the A.B. in philosophy. Two years later, in 1934, he acquired a Teaching Certificate in mathematics, and that was the end of his formal education. On his *curriculum vitae* the next thirty-three years are covered with a cryptic three-word entry, "Municipal Finance Consultant". Then, in 1967, he moved to Canada to become a professor at the University of Toronto. He has remained there ever since, being named emeritus in 1979 and becoming a Canadian citizen in 1986.

So much for the recorded facts. Stillman has no "early notebooks" to which I can turn for the real story, but he has recorded an incident in his early life that even he sees as significant. Back in 1938 — 50 years

ago — he and some friends began a cooperative and informal seminar, for their own mutual instruction and edification, in which his first contribution was to be a paper on comparative philology. Looking for materials, one Saturday afternoon in 1938, in a San Francisco bookstore, he came across an old book that sparked his interest — so much so that he parted with two hard-earned dollars (a lot in those days) to have it for himself. The book was Alexander Bryan Johnson's *A Treatise on Language*, published over a century earlier, in 1828. Comparatively unknown even to the present day, A. B. Johnson was a linguistic philosopher whose ideas bear comparison to those of Ludwig Wittgenstein. A philosopher Johnson certainly was, but not an academic philosopher, for he pursued instead a very successful career in banking. So impressed was Drake with that rare little book, and it was indeed rare, that he himself, working evenings and weekends, produced a limited hand-set edition of the book, 42 copies in all, that came off the press in August of 1940. That, you might say, was Stillman's first publication. Significantly, it was in philosophy. Many years later, in 1976, he published his *Galileo Against the Philosophers*, and when it appeared I speculated that it might have been misnamed. Should it have been *Drake Against the Philosophers*? No, it could not have been, for Stillman was a philosopher himself. His target, and Galileo's too, was not philosophy pure and simple, but academic philosophy, for which they shared an obvious disdain.

The rare-book incident also provides the only other clue we need to understand Stillman's career. Like Bern Dibner he has been a bibliophile and collector of rare books, creating, over many years, an outstanding collection of sixteenth- and seventeenth-century scientific works that is now housed in the Thomas Fisher Rare Book Library at the University of Toronto. It was only natural that a person with interests such as these should be fascinated with Galileo. The first fruit of that fascination was Drake's classic translation of the *Dialogue Concerning the Two Chief World Systems*, published in 1953, quickly followed by a little gem, *Discoveries and Opinions of Galileo*, in 1957. The year 1960 saw three more translations appear, the *Controversy on the Comets of 1618* with C. D. O'Malley, Galileo's early treatises *On Motion and Mechanics* with I. E. Drabkin, and a new edition of Thomas Salusbury's *Discourse on Bodies in Water*, with an historical introduction and notes. Paralleling those translating activities there began to appear, and to attract the attention of scholars, a steady

stream of essays modestly called *Galileo Gleanings*. The first came into print in 1957, the twenty-third in 1973. A year later, in 1974, Drake published his magnificent translation of Galileo's *Two New Sciences*, a second edition of which is now in press at Toronto.

It is in conjunction with the *Two New Sciences* that Stillman registered, in my view, his greatest achievement — his archival research in the Galileo Font at the Biblioteca Nazionale Centrale in Florence. Working through the mass of manuscript fragments associated with Galileo's masterwork of 1638, particularly those portions relating to *De motu locali*, laboriously arranging and rearranging them, ordering and dating them on the basis of watermarks and other clues, Drake gradually reconstructed the genesis of Galileo's "new science" of motion. Laboring with a zeal not unlike that he showed in hand-printing Johnson's little book many years ago, Stillman unearthed experiments concealed in Galileo's notes that no one had ever seen before. I have worked in that font myself and know how difficult it is to depart from the picture of Galileo painted by the great Antonio Favaro in the Edizione Nazionale at the turn of our century. Indeed, before Drake's researches in Florence, no one would have thought there could be errors or omissions in Favaro's massive scholarly output. But Stillman has done just that. He has succeeded in out-mastering the master, so to speak, and he has enabled us to go beyond Favaro in ways that no one could have expected only slightly over a decade ago. For that we will always be in his debt. His synthetic masterpieces, *Galileo at Work* of 1978, *Galileo* of 1980, and *Galileo: Pioneer Scientist*, now in press, inaugurate a new era that will keep the "Galileo Industry" in business for years to come.

Those of us who have worked with — and fought with — Stillman over the years know him to be a very unusual man, at times infuriatingly like Galileo himself. He is largely self-taught, and that too is a final clue for his understanding. His hobbies range from chess, the viola da gamba, to Sherlock Holmes — yes, he does admit to being an investitured Baker Street Irregular! I have never met anyone with his natural curiosity for knowledge and his tenacity and zeal in pursuing it to the end. He has unearthed more materials for study, and has proposed more ingenious interpretations of them, than any historian I know. Despite occasional disagreements, some hotly expressed in our interchanges, Stillman has never been arbitrary or perverse but has always supported his views with clarity, cogency, and humanity. He has caused

most of us to rethink our positions and reexamine the suppositions on which they are based. Out of such interplay, and I speak now for other co-workers in the field, there will emerge a consensus that can only enrich Galilean scholarship.

We, of course, are not the first to honor Professor Drake. The University of California at Berkeley and the University of Toronto have conferred on him honorary doctorates, he has received numerous grants and awards, including two from the Guggenheim Memorial Foundation, and he is a Fellow of the American Academy of Arts and Sciences, of the Royal Society of Canada, and of the International Academy of the History of Science. In 1984 the University of Pisa awarded him the Premio Internazionale Galileo Galilei dei Rotary Italiani, given to foreigners for outstanding services to Italian culture. To these honors we are happy to add our own. To a man whom George Sarton himself would have deeply appreciated, to one we can hold up, particularly to our younger members, as a model for hard work, for creative insights, for indefatigably making the results of his research available to all, even at times over the protests of the Establishment, to Professor Doctor Stillman Drake, we are most pleased to present the Sarton Medal for 1988.

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WILLIAM A. WALLACE

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T.H.L. and W.R.S.