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1. INTRODUCTION

Benjamin Franklin is well known to all meteorologists for his experimentation in lightning as well as many other aspects. He is of great interest for many reasons that are lesser known, including his views on the importance of a scientifically literate society, development of a systematic experimental approach to scientific thought (of his day), profiting from his ideas, basic vs. applied research, and dissemination of scientific findings. Much research on Franklin has been done recently in honor of the tercentenary of his birth in 2006, and this has created new interest in other aspects of one of our "Founding Fathers" who also happened to be quite astute in his applications of others' scientific principles to practical societal matters. This paper will survey some of Franklin's interesting observations and experiments (not related to lightning), culled from more recent writings by historical scholars.

2. DEVELOPMENT OF PUBLIC SCIENCE LITERACY

There are no shortage of recent biographies of Franklin, scientific and otherwise, particularly recently. Here I would like to concentrate on Franklin's efforts towards the organization of America's first learned society, the American Philosophical Society. It is in this work that Franklin intersected with other learned British (they were all still British citizens!) men, including the famous botanist John Bartram, Cadwallader Colden, James Logan, and the Swedish botanist Linneaus.

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3. PRECURSORS TO LIGHTNING RESEARCH

The sequence of events that led up to Franklin's lightning research has been reviewed previously in an historical context, but reveals some interesting aspects of Dr. Franklin's approach to discovery. They will be reviewed in the talk, along with several aspects of systematic observation enumerated in the next section.

4. SYSTEMATIC OBSERVATIONS AND EXPERIMENTATION

4.1 Heat

We will discuss the lifelong interest in smoke, chimneys, stoves, and public health.

4.2 Motion

Franklin was rather interested in air in motion, also as it relates to public health, and we will cover these topics, as well.

4.3 Astronomical observations

Eclipses and transects of planets both piqued Franklin's interest, and problems associated with various observations helped him to try to understand weather systematically.

4.4 Storms

His discovery that nor'easters do not come from the northeast is but one aspect of the story here – he was also interested in hurricanes and tornadoes, too (whirlwinds), and he was in effect the first tornado chaser!

4.5 Climate and oceans

Franklin's conjectures on the role of the Gulf Stream and volcanic eruptions on climate are important contributions to the "grey literature" that helped others to realize his importance as a brilliant thinker in his own right. We will review this material, too. In particular, the story behind Franklin's systematic observations of the Gulf Stream and development of the map of the Gulf Stream that is rather famous now is rather fascinating (Cohn 2000).

5. ON PUBLICATIONS AND PATENTS

Access to Franklin's work requires a different mindset than that with which the scientific researcher is probably most comfortable. For one thing, none of his writings appear in scholarly journals as his own work. Most of what we know about Franklin, his observations, experiments and ideas, come from his copious letters to his correspondents. We are fortunate that many of these letters have been preserved so that the scholars who have worked so hard to piece together Franklin's complex life have not an easy job to do, but at least one that has a trail worth following.

It could be argued that Franklin would not have been comfortable writing up his own scientific work in any case, had the modern scientific journal been more established by this time. Franklin was not at his best as an orator in scientific audiences, to be sure; he reserved that privilege for his political speeches no doubt. But as a printer, he developed a keen eye to writing persuasively, recognizing good writing when he set type and learning how to do it as a printer's apprentice and surreptitiously as Silence Dogood. Many of his original publications have more of a flavor of a *Dear Abby* column, or an advertisement for some commercial venture, than that of a scientific nature. But is this writing style not valuable?

His writing often took a satirical if not sardonic turn, and in his scientific, diplomatic, and other writings this work turned up often. Examples are well described by others (e.g., Morgan 2005; 2006) but the titles of one of his own edited works perhaps speaks best (Japikse 2003).

It has been often related that Thomas A. Edison has more patents than anyone else (from the U. S. Patent Office, he has 1,093; Maney 2005). While this is not quite true (S. Yamazaki, a researcher in a Japanese semiconductor firm has many, many more, with 1,432 and D. Weder, a floral designer, has 1,322, according to Maney), B. Franklin has none. His drive and desire was not to make money once he turned his life to invention. He made his money in franchising his printing operations, among other things, including providing for a supply and distribution network in the colonies, according to his many biographers. Rather, his motivation for scientific discovery seemed not to have a profit motive in terms of economics, but to provide a benefit to society. His own writing on this work informs this perspective the best (Morgan 2005):

There are many who strive to let science stroke their ego; others seek a profit motive, and still others seek a greater societal benefit, a benevolent approach. I suggest that was Franklin's desire all along, from his turkey-cooking to his work on designing ships hulls to aid the Atlantic crossings and everything in between (of more interest to the geoscientist). He truly was the epitome of an 18th Century Renaissance man with philosophical roots dating back to Bacon and Rousseau, in spite of his own inadequate education, which often led others to underestimate his abilities (e.g., Morgan, 2006; van Doren 1938).

6. CONCLUDING REMARKS

There has not been enough time in the past six months for me to read all of the excellent new material out on Franklin in the past five years or so – and so this review serves as only a cursory examination of material with which I've become familiar myself. Curiously, I find myself continuously drawn back to Franklin's own papers, however (now available online thanks to the Packard Humanities Institute, American Philosophical Society, and Yale University, and I commend those scholars that have taken the time to digest his works, as I am only beginning this process. I look forward to spending lots more time in those archives, too!

ACKNOWLEDGEMENTS

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