



LEARNED SOCIETIES - PAST, PRESENT AND FUTURE?

ADDRESS OF THE BSA PRESIDENT
FROM BOTANY 2013

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(The video of this talk is available at the BSA's Botany conference channel at <http://www.youtube.com/watch?v=f-zJmTX9Zp0>.)

Why do we belong to scientific societies? Why do we come to scientific meetings? As I prepared to take on the role of President of BSA, I realized that the answers to these questions were so important that I wanted to devote my presidential address to the answers. In this digital age, with so many different options for sharing information and interacting with colleagues, why do we hold meetings? Why did 1100 of us travel to New Orleans? We could have all put our talks on YouTube and tweeted about our favorites without ever leaving our offices. What is the role of meetings and of scientific societies generally, and the Botanical Society of America specifically, in modern science?

To explore this question of why we belong to societies and why we come to meetings, I began by asking a more general question: What is a scientific society, or more generally, a learned society? Reading through the literature on learned societies, I found a variety of definitions. Learned societies are...

- Knowledge networks...created to provide a forum for learned individuals to share and discuss knowledge and discoveries (McCarthy and Rands, 2013)
- Primarily concerned with the pursuit of knowledge and its dissemination to a wider audience (Hopkins, 2011)
- Organizations that promote interaction between scholars (*Encyclopedia of Higher Education*)
- Publish the proceedings of their meetings, journals, reports and outstanding investigations by their members. They also award prizes, encourage or subsidize research and maintain libraries (*Columbia Encyclopedia*)
- A means through which interested parties are

able to access the combined expertise of many universities and individuals in one space or for experts to gather to have impact by collectively expressing opinion on a particular topic

- Voluntary organizations of individuals dedicated to scholarship and research, often focused on a particular subject or method.

Common themes of these definitions include the focus on the intake, exchange and dissemination of knowledge, and interaction among individuals and professional recognition. This is a good description of the BSA as a modern Society, but how have learned societies come to embody these properties; how did these networks of knowledge and personal interactions come about? What is the history of learned societies?

Most historiographies trace the origins of modern learned societies back to the *Accademia Secretorum Naturae*, founded in Naples in 1560 by Giambattista della Porta. The society met in della Porta's home and membership was open to all who could "present a new fact in natural science." This was a group who cared about knowledge and came together to discuss and share knowledge widely. The society's activities became the subject of an ecclesiastical investigation and della Porta was ordered by Pope Paul V to close his Academy in 1578 under suspicion of sorcery.



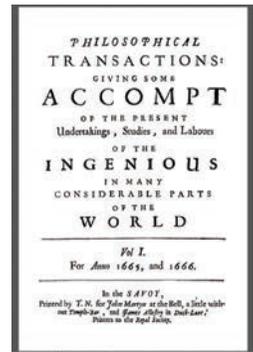
Giambattista della Porta, founder of the Accademia Secretorum Naturae in 1560. Membership was open to all who could present "a new fact in natural science."

Some 50 years later, Federico Cesi, who was passionately interested in natural history, particularly botany, founded another academy, the *Accademia dei Lincei*, in Rome. The academy was named after the lynx, an animal whose sharp vision symbolizes the observational prowess that science requires. The society's purpose was the "acquisition of wisdom and knowledge of things... and the announcement of these to men by both word and voice." They undertook individual projects and investigations, kept members informed about what happened in meetings, and established a library. Perhaps most importantly, they established an ideal to be emulated, that of a community of scholars in constant free and open contact. Galileo Galilei was a prominent member. The society did not long survive the death of its founder Cesi, but was resurrected in modern times, and you can read more about it at www.linacei.it.



The emblem of the Accademia dei Lincei, founded in 1603, by Federico Cesi. The academy was named after the lynx, an animal whose sharp vision symbolizes the observational prowess that science requires.

The *Accademia dei Lincei* inspired the establishment of multiple learned societies across Europe. Groups of people everywhere gathered to discuss science and new knowledge. In England, 1660 saw the establishment of a society that persists to this day: the Royal Society of London for Improving of Natural Knowledge. The society was founded by a small number of men (alas, this history is mostly about men), including physicians and natural philosophers, who began meeting in a variety of localities around London and Oxford. The society was granted a royal charter by King Charles II, but the government did not support the Society. In fact, to this day most learned societies are not supported by any governmental entity; they are volunteer organizations and sustained by members. The members of the nascent Royal Society met weekly to discuss science and they

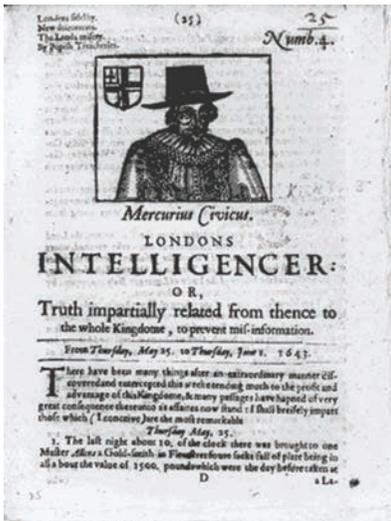


The first issue of the Philosophical Transactions of the Royal Society of London. Journals were created by societies to share information with members and to make their collective findings generally available to other interested groups. Journals became important permanent repositories of information.

even demonstrated new scientific devices and ran experiments at these meetings. They read their own papers, which described new discoveries, to each other and presented papers that they received from scientists on the continent. The Society's motto, *Nullius in verba*, is Latin for "Take nobody's word for it" and signifies the Fellows' determination to establish facts via experiments. This early genesis of the Royal Society occurred within the context of the Enlightenment. The members understood that they could create new knowledge, that they could discover new things about the natural world.

The scientific journal originated with the scientific societies of the seventeenth century. Journals as we know them today were created by these societies as a means of rapid communication among members, to make their collective findings generally available to other interested groups, and to provide a venue to inform members about activities and findings of other societies. Journals also became important repositories of scientific information, providing a dependable and permanent record. The close relationship between societies and journals has been critical to the stability of journals over the long run. Societies are sustained by groups of people that care very deeply about science, and for that reason, they are committed to the journals that communicate their science.

In the middle of the seventeenth century, however, it was not at all obvious that journals would become the appropriate place for scientific



Newspaper from 1643. In the seventeenth century periodical publications were primarily newspapers and broadsides. They were not considered reliable and permanent repositories of information. Image from The British Library, E.104.(3.) Copyright ©1999, The British Library Board

publication. At that time, scholars wrote books and treatises—big fat tomes of information that were published and circulated among the learned. Publishing books was the accepted means to establish a reputation as a scholar and for communication of knowledge. There was no precedent for the publication of credible knowledge in periodical form. In fact, “periodical” and “journal” did not exist as nouns to describe a type of publication! A modern scholar who studied the practice of publication in the seventeenth century (Johns, 2000) raised the question: in this period, why should anyone interested in producing secure knowledge ever think to do so by means of transient publication such as this? Most of what was printed in a journal-type format was intended as ephemera. They included broadsheets that carried gossip and news, and these publications weren’t thought of as a means of communicating dependable information.

Establishment of the scientific journal in its modern form is the result of a synergy between two needs. On the one hand, the members of the Royal Society (and other societies) were very much in need of rapid communication with one another and exchange of information internationally. On the other hand, the printers really needed a dependable income. The printing field was rife with plagiarism

and there was no copyright. Printers would go to all of the trouble and expense of creating scholarly books and the minute they were for sale, another printer would typeset them, print them, and sell them in competition with the original printer. The pace at which journals were published meant that there was always fresh material to print. This mutual need of societies and printers for regular publication created the scientific journal as we know it today.

By the mid 1700s, there were many different learned societies across England and Europe, and there were many journals. Mail was dependable, and distribution of journals to members within societies and exchange of journals among societies kept members informed about new developments in science. The system of exchange of information was so well established that you could sit in your armchair in front of the fire, read your journals, learn about the exploration going on all over the globe about new experiments and discoveries, and you could carry on a correspondence with people of like mind. You did not have to go to meetings. But that’s not what happened.

People continued to form both formal and informal learned societies and to meet to advance science. I’ll give two examples of informal societies that had a significant impact on science. The first is the Lunar Society, a group of men who met in the British midlands around Birmingham in the late eighteenth century. It was an informal society of prominent men, including industrialists, natural philosophers, and intellectuals. They were interested in basic science and natural history, but they were also businessmen and they had a practical focus. Their goals included improving manufacturing machinery and building canals so that they could distribute their products more efficiently. In some histories, the origin of the industrial revolution is traced to these men. They called themselves the Lunar Society (and cheerfully referred to themselves as “lunatics”) because they met during the full moon; the extra light made the journey home safer in the absence of street lighting. These people all had day jobs, yet meeting with one another was so important that they ventured out at night by horseback or carriage and had to travel back home by moonlight. The Lunar Society included Matthew Boulton, who, along with James Watt, invented the steam engine; Joseph Priestley who experimented with electricity and oxygen and was also a clergyman; and Erasmus Darwin, a

natural philosopher and a physician (and Charles Darwin's grandfather). Despite, or perhaps because of, their diverse interests and professions, these men very much valued each other's company and traveled long distances to meet and discuss science.

and free, untrammelled by religious dogmas." In addition to discussion of science, a key aim was to make the practice of science professional. At that time, the word "scientists" had just been coined and there was no such profession as scientist. The X



"A Philosopher giving a Lecture on the Orrery in which a lamp is put in place of the Sun," a painting by Joseph Wright of Derby. This portrays a key idea of the Age of Enlightenment: science grounded in empiricism and reason.

Skipping ahead 100 years to mid-nineteenth century, and going back to central London, my second example of an informal society is the X Club. By this time, the Royal Society and other prestigious societies such as the Linnean Society of London had been well established for over 200 years and their meetings and journals functioned as dependable sources of information about science. Yet, informal clubs and societies continued to form in London to facilitate more intimate discussions and interactions. In 1864, a group of nine men, calling themselves the X Club, began to gather over dinner once a month. All were members of other learned societies, but still felt the need to gather together in an informal setting. The X Club began to meet soon after the publication of Charles Darwin's *On the Origin of Species by Means of Natural Selection*, and in the midst of the debates between the clergy and the scientists over Darwin's ideas. The members of the X Club described themselves as "united by a devotion to science, pure

Club was instrumental in creating paid professional positions for scientists. You'll recognize many of the members: Thomas Huxley, Joseph Hooker, Herbert Spencer, John Lubbock, and John Tyndall.

The word "scientist" was coined in the 1840s (the date is uncertain) by William Whewell at a meeting of the British Association for the Advancement of Science. Before then, people who did science were referred to as "natural philosophers" or "men of science." The very word we use to describe what we are (scientists) was born at scientific meetings, and science as a profession owes much to the activities of scientific societies such as the X Club. Moreover, I would argue, the genesis of science as we know it today occurred in the academies and societies that originated in the middle of the seventeenth century. Modern science did not originate in universities. The universities of the time were fairly moribund. To learn in a university was to study the classics and to master received wisdom. Creation of new knowledge was not a goal of university education.

Modern science originated with the enquiries and activities of scientific societies. The very notion of faculty as members of the “academy” and the words “academic” and “academician” derive from the association of new knowledge with learned academies and societies.



Asa Gray, botanist and early supporter of Darwin's evolutionary theory was elected president of AAAS in 1872. He planned to travel 3,000 from Massachusetts to California on the newly completed transcontinental railroad to attend that year's meeting.

Turning from England to the other side of the pond, we were not dozing. In the colonies, even before the United States became a country, the thirst for knowledge and curiosity about the natural world was satisfied by the formation of learned societies. As early as 1739, the botanist John Bartram made the first proposal to form a general scientific society, but it took Benjamin Franklin to accomplish this goal. Franklin wrote, “The first drudgery of settling new colonies is now pretty well over, and there are many in every province in circumstances that set them at ease, and afford leisure to cultivate the finer arts, and improve the common stock of knowledge.” He volunteered his services as secretary and the American Philosophical Society was established in Philadelphia in 1743. The members were diverse, including doctors, lawyers, clergymen, artisans

and tradesmen and included many founders of the republic: George Washington, John Adams, Thomas Jefferson, Alexander Hamilton, Thomas Paine, Benjamin Rush, James Madison, and John Marshall. Not to be outdone by Philadelphia, John Adams wanted a learned society for Boston and convinced the Boston legislature to establish the American Academy of Arts and Sciences in 1780. The purpose of the society was “to cultivate every art and science which may tend to advance the interest, honor, dignity, and happiness of a free, independent, and virtuous people.” The American Academy, like the American Philosophical Society, had a diverse membership including scientists, writers, and artists, and many founding fathers were members.



In the early history of the United States, learned societies were general societies and members were elected; they were fairly exclusive. Only in the mid-1800s did more focused societies develop with a more egalitarian approach and more inclusive membership. In 1848 the American Association for the Advancement of Science (AAAS) was established to focus more specifically on science and was open to all. The constitution states that “the objects of the Association are, by periodical and migratory meetings, to promote intercourse between those who are cultivating science in different parts of the United States; to give a stronger and more general impulse, and a more systematic direction to scientific research in our country; and to procure for the labours of scientific men, increased facilities and a wider usefulness.” At its very inception, the AAAS focused on the critical role of meetings as a means of advancing science. They also clearly understood the importance of holding meetings in different locations to serve members from across the country. AAAS took the idea of moving the meetings around very seriously. For example, in 1872, Asa Gray of Harvard University was president of the AAAS. Although Gray lived and worked in Cambridge, Massachusetts, the meeting was planned for San Francisco, California. The transcontinental railroad

had only been completed three years earlier, in 1869. Yet, Gray and presumably many other members of the AAAS, planed to travel 3,000 miles on a newly completed rail line to go to a meeting! In the end, the society was unable to negotiate reasonable train fares from the east and they split the difference and met in Dubuque, Iowa. This is a tale of true dedication to scientific meetings.

The Botanical Society of America grew out of AAAS. During the 1883 meeting in Minneapolis, members formed the Botanical Club as a section of the AAAS. It functioned within the AAAS for about 10 years, but at their 1892 meeting, Liberty Hyde Bailey of Cornell University suggested forming a new society of botanists to “unify and subserve the botanical interests of the country.” Bailey chaired a committee to investigate formation of an American Botanical Society and they carefully weighed all of the issues. At the next meeting of the Botanical Club, Bailey presented the committee report: by a vote of 8 to 2 the committee recommended *against* establishment of a separate American Botanical Society. But, one of the two committee members who were in favor of forming a separate society gave his opinion, and he must have been very persuasive because two thirds of the members voted to form a society! The Botanical Society of America was established in 1895, with the aim of promoting botanical research. Interestingly, in the original charter the society moved away from the egalitarian approach of the AAAS, and membership was by election and restricted to active researchers. This troubled some botanists, and in 1897 members of the American Society of Naturalists organized a different botanical society: the Society for Plant Morphology and Physiology. Fractionation was also troubling, and the 1906 meeting in New Orleans, Louisiana saw a union of three societies. The Botanical Society of America, the Society for Plant Morphology and Physiology, and the Mycological Society gathered forces and became the Botanical Society of America. William Trelease and Charles Bessey were the first two presidents of the new BSA. L.H. Bailey was elected president in 1926; they must have eventually forgiven him for recommending against formation of the BSA in the first place.

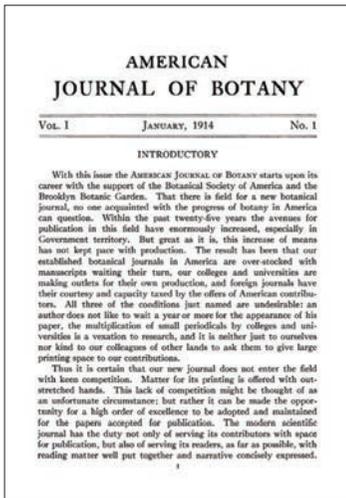
At the very first meeting of the BSA in 1906, members appointed a publications committee and began to discuss the critical need for a journal to publish the results of BSA members and to disseminate them widely. Volume 1 of the *American Journal of Botany* was published in January of 1914.



At an 1892 AAAS/Botanical Club meeting Professor L. H. Bailey suggested that a new society of botanists be established to “unify and subserve the botanical interests of the country.” He ultimately voted against forming the Botanical Society of America.

In 2014 we will celebrate the centennial of the *AJB*; watch the journal for exciting developments as the year unfolds.

Since its birth in the learned societies of the enlightenment, science has changed and grown. Science is an enormous engine of our modern economy and holds a central place in higher education. Importantly, science increasingly bears great responsibility to share its knowledge and values with the public. As science has grown and become more complex, scientific societies have also grown and matured and continue to foster and support science in multiple ways. The BSA is now a thriving and complex organization of 3000 members that support each other in multiple ways. The BSA includes members from around the world, from multiple career stages and multiple professions within the botanical sciences. The BSA is egalitarian; all botanists are welcome as members and anyone can present at the annual meetings. In this age of horizontally organized academic departments, we are a vertically integrated society and our journal and meetings provide an important opportunity to read broadly and to interact with colleagues who work at very different scales, from molecules to ecosystems. In addition to the *American Journal of Botany*, the society publishes the *Plant Science Bulletin* for informal communication, with information on upcoming



Volume 1 of the American Journal of Botany appeared in 1914. We will celebrate our journal's centennial next year!

meetings, courses, field trips, news of colleagues, new books, and professional opportunities, and the brand new, online, open access journal, *Applications in Plant Sciences* (APPS), for communication of innovative tools and protocols. The BSA fosters the careers of our members with multiple awards and recognition, and supports travel and research for our graduate students. The society is active in development of programs that will enhance botanical education at the K-12 level (Planting Science) and undergraduate level (PlantED) and is increasingly involved in providing a collective voice concerning policy issues. The BSA website (www.botany.org) records 250,000 hits per month, and reaches others via e-news and social media. The Society has over 6,300 Facebook and 1,800 Twitter followers. By the second day of the 2013 meeting, over 1000 Tweets carried #Botany2013.

But everything on this list can be done online. So, I come back to the question that I started with: Why do we come to meetings? 1100 people came to the meeting in New Orleans; botanists came from 49 states of the US and from 35 other countries. Why?

From the Royal Society, to the Lunar Society, to the X Club, to the BSA, we come to meetings. Certainly, we all want to share information and research with scientists and educators from around the world. But the heart and soul of a society, what makes us attend meetings, is shared fellowship. We

want to make personal contacts, we come to share ideas and information, we come to experience that completely unexpected and unsought insight that comes from serendipitous interactions, for the intense sustained conversations that occur in the hallways. We come to work through experiments over a beer, to better understand our own data, to figure out how someone else did that, how someone else taught that. Over 450 years after the initial gatherings at the home of della Porta in Naples, gatherings are still part of the essence of science and of being a scientist. The same impulse that drew the lunar men out into the dark night, or Asa Gray to contemplate a 3,000-mile journey at the dawn of the transcontinental railroad, draws us to meetings all over North America.

I sent out a query during the 2013 New Orleans meeting to all of the users of the new mobile meeting app asking “Why are you here?” Almost every response included “make new connections” and “reconnect with friends and colleagues.” Sure, we can interact and collaborate online, and we do. But, we are not avatars. And so we come to meetings. This was true in 1560, it’s true today, and I am confident that it will be true into the future. While innovative technology and the digital world are clearly critical to science, it is societies and meetings that make us complete as scientists.

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