

THE GORDON RESEARCH CONFERENCES AS SCIENTIFIC INFRASTRUCTURE

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Introduction

Conferences serve as a crucial part of scientific infrastructure by offering participants the opportunity to announce novel findings, discuss research methods, and take part in a variety of networking activities. Presenting papers and learning about unpublished new work are vital for scientists to stay current in their discipline. Yet conferences have drawn minimal attention from historians and sociologists of science, whose analysis of scientific infrastructure has instead focused on formal scientific communication through journal articles and on-line forums, the formation of new disciplines and subfields, and shifting funding structures for academic and industrial laboratories (1).

This article focuses on the Gordon Research Conferences (GRC) as a historically unique conference format and management structure. Unlike general professional or society meetings that typically feature short talks, multiple parallel sessions, and efforts to attract media coverage, Gordon Conferences are topically specific, have extensive discussion periods but few formal talks, and are closed to the press. From their modest origins in summer sessions held at Johns Hopkins University in the late 1920s and early 1930s, the Gordon Conferences have grown into meetings that cover over 350 topics and attract more than 20,000 participants annually. We argue that GRC's growth is a product of internal and external factors: conferences stimulate intensive discussion and real-time peer review; new topics are chosen through a

review process oriented to frontier areas of science; and the GRC format fosters intimacy among participants even as the overall size of the scientific enterprise expands. This article explores how the GRC organization managed growth over time and maintained a sense of community within the conferences. More generally, we seek to make visible the inconspicuous roles of fostering the exchange of new ideas, helping form collaborations, advancing institutional changes, and promoting the development of commercial products that conferences play within the scientific community. The article concludes with a description of current challenges faced by GRC and other conference organizers.

GRC's Foundations

The chemistry department at Johns Hopkins University (JHU) began hosting an intermittent set of summer meetings in the late 1920s. Under the leadership of Ira Remsen, JHU had by then already pioneered research-based chemical education in the United States. Its chemistry department was training students for positions in both academia and growing industrial research laboratories (2). Beginning in 1931, summer sessions were held each year to present new findings in chemistry and chemical instrumentation. Graduate students could take the sessions for credit, and prominent academics from across the country appealed to chemistry professor Donald H. Andrews and later to Neil Elbridge Gordon for permission to attend.

Early in his life, Gordon displayed affinities for both chemistry and meeting organization. While in high school in upstate New York he arranged an after-school science club at which “papers provoked animated discussion which continued long past the time for adjournment” (3). Following study at Syracuse University in mathematics and chemistry, Gordon earned a Ph.D. in chemistry from JHU in 1917. By 1928 he was back at JHU as the Garvan Chair of Chemical Education. In the interim he had begun to influence the field, including prompting the American Chemical Society to create the Section (since 1924, “Division”) of Chemical Education in 1921, launching the *Journal of Chemical Education* in 1924, and publishing a textbook, *Introductory Chemistry*, in 1927 (4). As Garvan Chair, Gordon took the lead in organizing the JHU conferences; he narrowed their focus to one topic per session and broadened participation to include scientists from industry and government laboratories. Topics for the week-long conferences in the early years included the Raman effect and molecular structure, colloidal chemistry, catalysis, x-ray crystallography, and organic chemistry (5).

Seeking a more remote location, Gordon relocated the series in 1934 to Gibson Island, Maryland, located some 30 miles from Baltimore on the Chesapeake Bay (6). The research conferences met at the Gibson Island Club during the summers of 1934, 1935, and 1936. Advertised as a way to learn about “frontier problems” in topics ranging from analytical chemistry to nuclear physics, the conferences reflected Gordon’s belief that scientific innovation was fostered by formal presentations in conjunction with informal discussion. He was unhappy with the size of most other scientific conferences of the time. Each of his conferences, he stated, had to have a

chairman of noted authority in his field, leaders to focus discussion on current advances of scientific work, and groups limited in size to encourage dynamic discourse (7). Researchers were drawn by the topics, the location, and by Gordon’s ability to stimulate open communication among scientists from academia, industry, and government research institutions.

GRC in Transition

Through the late 1930s and early 1940s, participation in the conferences continued to grow, and conferees’ topical interests became more clearly focused. A set of core conference series had taken shape by 1945; many of these meetings, or their current incarnations, are still held today. Even as topics evolved through the 1930s and early 1940s, Gordon worked to ensure the conferences’ stability. As secretary of the American Association for the Advancement of Science (AAAS) Section C (Chemistry), Gordon persuaded AAAS to take on a formal role in managing the conferences. AAAS agreed to make the conferences a participating organization, on the condition that they would remain financially independent (8). Gordon served as secretary for the conferences in 1938 and 1939 and was officially appointed their director in fall 1939.

The number of conferences grew quickly from two in 1938 to eight in 1941. Seeking to expand beyond the limited facilities of the Gibson Island Club, Gordon secured funds from AAAS and some thirty-three corporations to purchase a property on the island, known as the Symington House. Conferences were held on the house porch as well as at the Gibson Island Club. For many years, these founding companies and follow-on industrial sponsors were guaranteed registration slots for qualified

Table 1. Name Lineage of Gordon Research Conferences

1931-1932	Summer Session of the Chemistry Department at Johns Hopkins University
1933	Conference on Recent Developments in Chemistry at Johns Hopkins University
1934	Research Conferences on Chemical Physics
1935	Johns Hopkins University Research Conferences on Chemical Problems
1936	Johns Hopkins University Research Conferences in Biology, Chemistry, and Physics
1937	Seventh Annual Research Conference of the Department of Chemistry of the Johns Hopkins University
1938 - 1941	Special Research Conferences on Chemistry
1942 - 1946	AAAS–Gibson Island Research Conferences
1947	Chemical Research Conferences
1948 - present	Gordon Research Conferences

scientists from their research laboratories. In 1942 the conferences came to be called the *AAAS-Gibson Island Research Conferences* (see Table 1 for the GRC name lineage).

The link to AAAS helped ensure continuity for the conferences during changes in leadership and governance structure in the mid-1940s. Gordon accepted an offer to chair Wayne State University's chemistry department in 1942 and in 1945 turned over most of his conference responsibilities to a colleague, polymer chemist Sumner B. Twiss. Both Gordon and Twiss resigned in 1946, and members of the conferences' management committee, chaired by George Calingaert from Ethyl Corporation, began searching for a new director.

The committee also faced tensions with Gibson Island residents regarding conference growth and the participation of African American scientists. In a notorious incident, Percy Julian initially was not permitted to enter the Gibson Island Club to participate in the 1943 hormone conference. He reportedly was only able to join the meeting "after three days of protesting by members of the conference" (9). Among the protestors was Gregory Pincus, who subsequently chaired a meeting on hormone research at Mont Tremblant, Quebec, which grew into the annual Laurentian Hormone Conference series (10). Other complaints in the mid-1940s included inadequate sleeping facilities, poor housekeeping, insufficient meeting rooms, and bad food. Overall, as Sumner Twiss reported to George Calingaert in August 1946, "On the Island there is an Aristocracy of Wealth ... the conferences are an Aristocracy of Brains" (11). Even though Twiss suggested ways for each side to better appreciate the other, the management committee began to look at other locations.

Among possible sites the committee visited Dartmouth College, and on its way back to Boston chanced upon Colby Junior College (renamed Colby-Sawyer College in 1975) in New London, New Hampshire. They found Colby's cool temperatures, classrooms, and dorms a pleasant contrast to Gibson Island. After an impromptu meeting with its president, H. Leslie Sawyer, the college was chosen as the new site in 1947 (12). Shortly thereafter, the management committee elected W. George Parks as the new director. That year, ten *Chemical Research Conferences* were held at Colby. Before the end of the year, Calingaert had obtained Gordon's permission to adopt the name *Gordon Research Conferences*, which was made official at an April, 1948 dedication ceremony (13). Tragically, Gordon was unable to witness the sub-

sequent growth of the conferences. After a long-standing battle with his physical and mental health, he ended his life in 1949 (14).

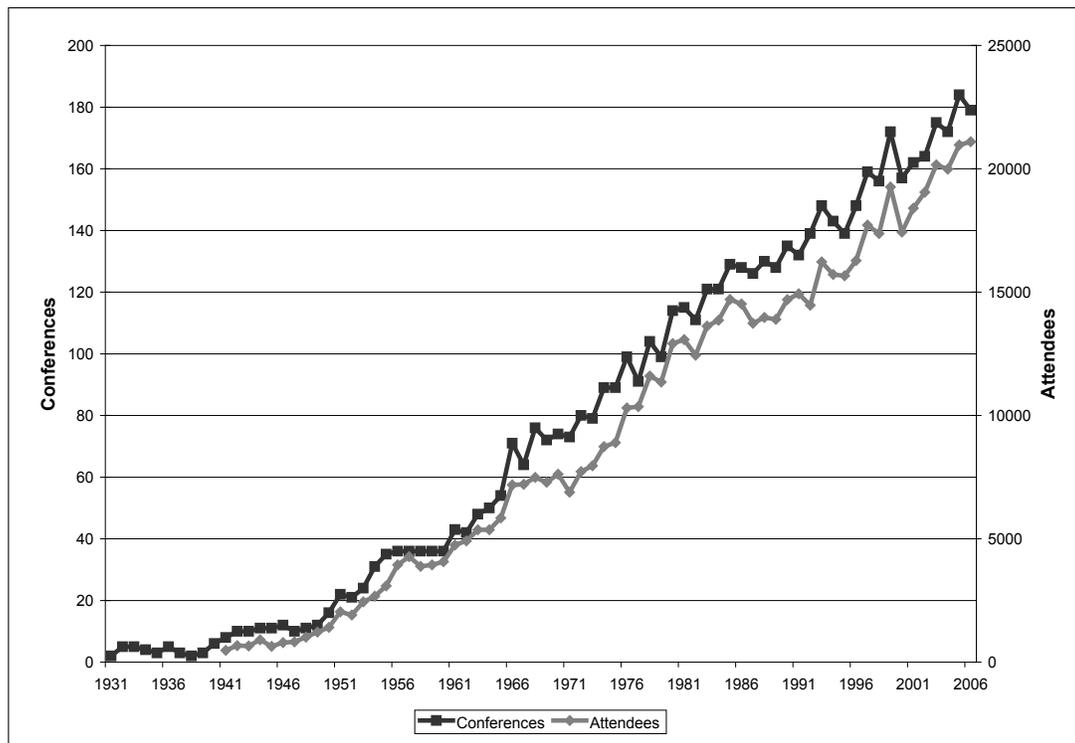
Parks moved conference headquarters to Rhode Island State College (renamed University of Rhode Island in 1951), where he became chairman of the chemistry department in 1950. There he enlisted Alexander M. Cruickshank, a young chemistry instructor and former student, to help manage the conferences, and Alexander's wife Irene Cruickshank to serve as secretary and treasurer. Parks oversaw steady growth in the number of the conferences, attendance, and locations. A survey circulated in 1949 to some five hundred scientists had revealed a strong interest in new topics (15). By its 25th anniversary year in 1956, GRC had grown to thirty-six conferences with nearly four thousand participants from forty-six countries.

Along with expansion came further changes in governance. In 1956 GRC incorporated as a nonprofit organization. A selection and scheduling (S&S) committee was established in 1958 to advise the board on the addition and termination of conferences. Meeting sites continued to grow in number and geography during the 1950s and early 1960s, with conferences held in California starting in 1963. Parks' directorship, however, came to an abrupt end in 1968 in the wake of an IRS investigation into his personal finances. Even though the GRC organization was not implicated in the charges, Parks resigned with encouragement by the GRC board (16).

Continuing Growth and International Expansion

A period of extraordinary growth began in 1968 (see Fig. 1) when Alexander M. Cruickshank was named director, with additional conference sites in New England, meetings in California, and, starting in 1990, Gordon Conferences in Europe. The institution of a less centralized financial structure encouraged conference chairs to apply for federal grants and other support through GRC headquarters. This allowed individual conference series to subsidize the attendance of speakers, graduate students, and other special visitors. Cruickshank worked to maintain accessibility to the conferences by keeping attendance fees low and encouraging an informal and personal atmosphere.

International expansion begun by Cruickshank continued under the leadership of GRC's fourth director, Carlyle B. Storm, with the further addition of sites

Figure 1. Number of Gordon Conferences and Attendees, 1931-2006

in Europe and new conference locations in Asia. Storm retained the unique GRC format, promoted the “GRC brand” conference style focused on discussion, and preserved the place of leading scientists in conference management. Evidence of the organization’s growth and independence came in 2002, when GRC moved from the University of Rhode Island to its own headquarters building. Expansion of GRC meetings and attendees continues under the current director, Nancy Ryan Gray. (See Table 2 for a history of GRC leadership.) In 2006 GRC attracted more than 20,000 participants to conferences at 23 sites in the United States and seven sites overseas.

Conference Operations

GRC’s remarkable growth and success result from a distinctive operating structure that has remained virtually unchanged since the early 1930s, despite transformations in many areas of science and technology. The principles of this format, enumerated in a 1950 publication by the AAAS, still ring true for current GRC attendees: limited numbers of conferees encourage full participation in discussion, the formation of friendships, and impromptu discussions; conferences include a balance of participants from academia, industry, government, and other research institutions; meetings nurture the free exchange of scien-

tific ideas; and documentation or publication of conference discussions or presentations is restricted (17).

The Gordon Conference operating formula puts small groups of scientists into isolated locations for five days with ample discussion time. This structure stimulates advances in fundamental scientific knowledge, generates new experimental techniques, promotes collaborations, shapes science’s institutional structure, and influences the development of products ranging from new polymers to medicines. Table 3 lists a selected set of these outcomes from a survey conducted in 2004 (18).

Remote conference locations provide an environment largely free from other distractions. The 1933 program for conferences at JHU recommended cottages on the Chesapeake Bay from which conference attendees could commute to Baltimore (19). Gordon chose Gibson Island as the new conference site in 1934 for its isolation and vacation-oriented atmosphere. Located near six mountains and several lakes, Colby Junior College provided conferees with cooler temperatures, seclusion, and a variety of recreational opportunities. Conference locations added since that time in New England, California, Europe, and Asia were selected with similar ideals in mind.

Table 2. GRC Directors

Neil E. Gordon	1931 - 1936; 1939 - 1946
W. George Parks	1947 - 1968
Alexander M. Cruickshank	1968 - 1993
Carlyle B. Storm	1993 - 2003
Nancy Ryan Gray	2003 - present

The earliest conferences held at JHU were organized as summer courses taught by chemistry department faculty and visiting specialists over a period of five weeks. One course met each week for five days (Monday to Friday). After the move to Gibson Island, one or two formal lectures were held each day—usually in the morning—followed by discussion periods. The daily schedule and format used today was established in the 1940s: breakfast, formal presentations in the morning, discussions until lunch, afternoons devoted exclusively to free-time, and further talks and discussion in the evening after dinner, with all meals held communally. Especially noteworthy is that afternoons and late evenings are intended for sports, other recreation, and informal discussions. Conferences now run from Sunday night through Friday morning and typically also include time for late-afternoon or evening poster sessions. This atmosphere has established a kind of “real-time” peer review, balanced by afternoon and evening activities that foster collegiality.

As early as 1937, GRC formally announced a policy in its program that restricted the recording or public reference of information presented during a conference (20). GRC does not publish proceedings or permit references to the conferences in published scientific articles; however, it does encourage attendees to publish new findings (often stimulated by discussions at a Gordon Conference) under their own names. This “off-the-record” policy gives conferees the freedom to present and receive critical feedback on novel ideas, fledgling theories, and early experimental results. Poster sessions offer an interesting variation to this policy. Though they might seem to contradict the off-the-record policy, they have been permitted by GRC leadership since being initiated at the 1985 Atomic Physics conference, largely because they stimulate exactly the type of one-to-one and group discussions that GRC aims to achieve (21).

Attendees and Diversity

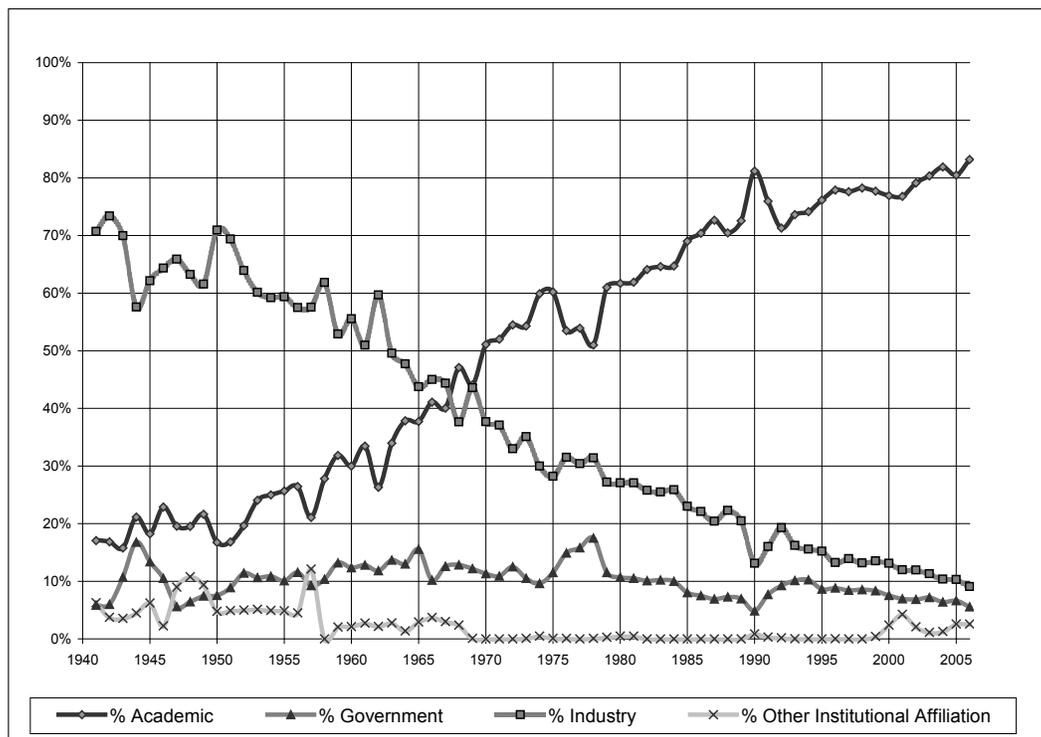
Throughout its history, GRC has sought to keep attendee

numbers small enough to promote full participation and high-quality discussion, but large enough to represent a diversity of perspectives and research approaches. Limited Gibson Island facilities restricted attendance to 60 people per conference in the 1930s and early 1940s. Capacity was increased by the move to New Hampshire in 1947, and board discussions in the 1950s and 1960s set the ideal attendance at 100. Conference registration numbers have increased since then, although meeting room and lodging capacity limit attendance to 135 at many sites. In 2006 conference attendance ranged from 65 to 174, with an overall average of 120 (22).

The balance of academic, industrial, and government scientists at conferences has shifted significantly during GRC’s history. In the 1940s and 1950s, industrial scientists dominated conference attendance. Noting the imbalance, the AAAS committee managing the conferences developed an assistance fund in 1950 to support attendance by scientists from academia and government. Mirroring the post-Sputnik expansion in federal support for academic and government laboratories, academic attendance at GRC began a sharp climb in the late 1950s. By 1969, equal numbers of academic and industrial scientists were in attendance. Since then, the percentage of academic attendance has continued to rise for a number of reasons, including time available to attend a week-long conference and changes in the structure and focus of industrial research. Conference participation today hovers around 81 % academic, just over 10 % from industry, less than 7 % from government, and about 2 % from foundations, nongovernmental organizations, and other institutions.

The percentage of women attending GRC has also increased over time. Already in the 1940s, a handful of female scientists participated in the GRC, particularly in conferences oriented toward the biological sciences. The participation of women remained below 5 % until 1970 but has since increased to nearly 30 % in 2006. GRC’s leadership and governance reflect the organization’s goal of fostering gender equality, with a female director and seven women out of the thirteen-member board of trustees.

A mixture of scientists in various career stages adds new perspectives to conference discussions, facilitates mentoring of younger scientists, and creates a forum for “young Turks” to challenge orthodoxy. GRC has encouraged the participation of graduate students and postdoctoral fellows during the past decade, in part through the Gordon-Kenan Summer School programs.

Figure 2. Institutional Affiliation of Gordon Conference Attendees, 1940-2006

For many young scientists, attending a GRC is the first opportunity to speak in person with world-renowned leaders in their disciplines.

Conclusion

This article has examined GRC in order to draw attention more generally to scientific conferences, an often overlooked element in the institutional structure of science. As the sociologist of science Harry Collins recently argued (23):

...conferences are vital ... little groups talk animatedly about their current work and potential contributions. Face-to-face communication is extraordinarily efficient.

Such animated discussion and high-bandwidth exchange do not happen by coincidence. By analyzing the history and structure of the Gordon Research Conferences as a case study, we have shown how well-designed scientific conferences achieve their educational and community-building goals.

Historians and sociologists of science have long examined the role of communal norms in science and its interface with the public. Yet the important forum that conferences provide to address communal issues ranging from verification of new findings to major disputes has

been largely ignored by social scientists. Scientific meetings like the Gordon Research Conferences, even when intentionally focused on pure research, play a crucial role in the scientific infrastructure and in the process by which new communities are formed. By stimulating frank and critical discussion, they also build consensus on new theories, methods, and results that have impacts well beyond the scientific community.

A significant future challenge for GRC, as well as for other organizations that host scientific conferences, is the overall expansion in meetings. During just the past decade meetings organized by GRC, Keystone Symposia, Cold Spring Harbor Laboratory, the Jackson Laboratory in Maine, and other nonmembership organizations have experienced similar growth curves (24). With the scientific enterprise continuing to increase, especially in Asia, conference organizers operate in an expanding economy. At the same time, the number of meetings that leaders in a specific field can attend is limited, thereby also limiting participation by less established scientists. The competition for top speakers will therefore only intensify in coming years.

Finally, all conferences face the continued challenge of determining what counts as frontier science. Derek Price famously postulated in 1963 that eighty to ninety percent of all scientists who had ever lived were alive

at that moment (25). With scientific growth continuing at an exponential rate, that percentage has increased in the interim. Yet GRC and other organizations run a finite number of conferences for a comparably modest number of attendees. The mechanisms used by GRC for setting conference programs and evaluating content described here have been very successful. A key question for the future is whether GRC's governance tools, including the S&S committee and internal selection of conference chairs, can keep pace with the ever growing number of conferences. Are these mechanisms infinitely scalable, or are they eventually size-dependent? The model thus far has relied on modestly sized conferences in remote locations, which strongly suggests an upper limit to the size of any one conference. The total number of intimate conferences that one organization can effectively manage, however, is likely quite large so long as review mechanisms ensure high quality presentations and discussion.

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REFERENCES AND NOTES

1. E. J. Hackett, O. Amsterdamska, M. Lynch, and J. Wajman, *The Handbook of Science and Technology Studies*, MIT Press, Cambridge, MA, 3rd ed., 2007; J. Ben-David, *Scientific Growth: Essays on the Social Organization and Ethos of Science*, University of California Press, Berkeley, CA, 1991.
2. L. Reich, *The Making of American Industrial Research: Science and Business at GE and Bell, 1876-1926*, Cambridge University Press, New York, 1988; D. Hounshell and J. K. Smith, *Science and Corporate Strategy: DuPont R&D, 1902-1980*, Cambridge University Press, New York, 1988.
3. N. E. Gordon, "The Value of a Science Club in Secondary Schools," *School Science and Mathematics*, 1917, 17, 802-804.
4. N. E. Gordon, *Introductory Chemistry*, World Book Company, New York, 1927.
5. D. H. Andrews, "The Summer Session of the Chemistry Department of the Johns Hopkins University," *Science*, **1932**, 75, 303-304; N. E. Gordon, "Conference on Recent Developments in Chemistry at the Johns Hopkins University," *Science*, **1933**, 77, 320-321.
6. E. Ott, "Significance of the Gordon Research Conferences," *Science*, **1954**, 119, 487-489.
7. N. E. Gordon, "Research Conferences on Chemical Physics," *Science*, **1934**, 79, 176-177; N. E. Gordon, "The Johns Hopkins University Research Conferences on Chemical Problems," *Science*, **1935**, 81, 310-311; N. E. Gordon, "The Johns Hopkins University Research Conferences in Biology, Chemistry, and Physics," *Science*, **1936**, 83, 386.
8. W. G. Parks, "Gordon Research Conferences: A Quarter-Century on the Frontiers of Science," *Science*, **1956**, 124, 1279-1281.
9. D. Ingle, "Gregory Goodwin Pincus," in *Biogr. Mem. Natl. Acad. Sci. USA*, Columbia University Press, New York, Vol. 42, 1971, 233.
10. G. Pincus, "The Hormone Conference in Quebec," *Science*, **1944**, 99, 143.
11. Letter from S. Twiss to G. Calingaert, August 13, 1946. A copy of this letter and references to racial issues on the island involving Percy Julian were generously provided by an anonymous reviewer.
12. A. M. Cruickshank, interviewed by Arthur Daemmrich at New London, NH, August 19, 2002, Chemical Heritage Foundation, Philadelphia, PA, Oral History Collection.
13. Records of the Gordon Research Conferences, Chemical Heritage Foundation, correspondence between Calingaert and Gordon, October 1947, box 2/6; Faculty Bulletin of Wayne University, April 21, 1948, box 1/8.
14. R. B. Hahn, "The Early Days of the Chemistry Department at Wayne State University," published on-line: <http://www.chem.wayne.edu/information/history.html> (accessed May 2007); F. Gordon, *The Price of Decision: Neil Elbridge Gordon, 1886-1949*, University of Louisville, Louisville, KY, 1985, 313-314.
15. Records of the Gordon Research Conferences, Chemical Heritage Foundation, "The Gordon Research Conferences," internal memorandum of the American Association for the Advancement of Science (1950), box 5/3.
16. R.W. Parry, interviewed by Arthur Daemmrich and Arnold Thackray at Salt Lake City, UT, July 19, 2002, Chemical Heritage Foundation, Philadelphia, Oral History Collection.
17. Records of the Gordon Research Conferences, Chemical Heritage Foundation. "The Gordon Research Conferences," AAAS (1950), box 5/3.
18. "Outcomes of the Gordon Research Conferences." Survey mailed to 4,000 past attendees of Gordon Research Conferences in spring 2004; total return of 593 (14.8%). Archived with Records of the Gordon Research Conferences, Chemical Heritage Foundation.

19. N. E. Gordon, "Conference on Recent Developments in Chemistry at the Johns Hopkins University," *Science*, **1933**, 77, 320-321.
20. F. O. Rice, "Scientific News and Notes," *Science*, **1937**, 85, 580.
21. Harold Metcalf, survey response, Outcomes of the Gordon Research Conferences, Spring 2004.
22. Internal operations database, Gordon Research Conferences, West Kingston, RI.
23. H. M. Collins, *Gravity's Shadow: The Search for Gravitational Waves*, University of Chicago Press, Chicago, IL, 2004, 450-451.
24. K. O'Brien, "The Future of Scientific Meetings," *The Scientist*, May, 2006, 50-56.
25. D. Price, *Little Science, Big Science*, Columbia University Press, New York, 1963, 1-2.

Table 3. Selected Outcomes of the Gordon Research Conferences

Outcome Type	Result
Theoretical Knowledge	<ul style="list-style-type: none"> • The mechanism and structure of ATP synthase was reported by both Paul Boyer and John Walker at the 1981 Bioenergetics conference. • Understanding of atomic laser cooling and Bose-Einstein condensation evolved at Atomic Physics conferences in the 1980s and early 1990s. Six physicists who attended these conferences were awarded Nobel laureates for these achievements.
Experimental Techniques	<ul style="list-style-type: none"> • Polarization experiments, electrochemical impedance spectra, and the use of current potential measurements developed at the Corrosion conferences in the 1950s and 1960s fostered understanding of the dynamics of corrosion. • Successful recombinant DNA (rDNA) techniques developed by Herbert Boyer and Stanley Cohen were described at the 1973 Nucleic Acids conference; co-chairs Maxine Singer and Dieter Söll then set aside extra time for attendees to discuss the broader implications of this breakthrough.
Collaborations	<ul style="list-style-type: none"> • The discovery of the 5' terminal cap structure in cellular and viral messenger RNAs was facilitated by the exchange of experimental findings among Robert P. Perry, Bernard Moss, Fritz Rottman, and Aaron Shatkin at the 1974 Animal Cells and Viruses conference. • Jointly published papers on frustrated smectic liquid crystals and liquid crystal phase transitions were the result of a collaboration formed between Carl W. Garland and Ranganathan Shashidhar at the Liquid Crystal conferences.
Institutional Changes	<ul style="list-style-type: none"> • The Society of Toxicology was formed in 1961 as a direct result of the Mechanisms of Toxicity conference. This conference was also key to the development of the Environmental Mutagen Society in 1969. • The International Society for the Study of Xenobiotics (ISSX), an international drug metabolism society, was formed in 1981 by Bruce Migdalof and a small group of participants in the 1980 Drug Metabolism conference.
Commercial Products	<ul style="list-style-type: none"> • A better understanding of the properties and synthesis of polymers and such nonmelting thermally stable fibers as Nomex and Kevlar came out of the Polymer conferences, which have been meeting since the 1930s. • The application of eflornithine as the first new drug treatment for African sleeping sickness in over 40 years was developed by Cyrus J. Bacchi after he obtained a sample from Peter McCann at the 1979 Polyamines conference.

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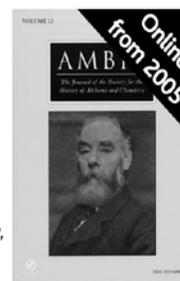
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