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Science Service and the origins of science journalism, 1919-1950

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Science Service and the origins of science journalism, 1919-1950

by

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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: History of Technology and Science

Program of Study Committee:
Amy Sue Bix, Major Professor
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Iowa State University
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2013

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DEDICATION

For my husband Greg—this wouldn't mean anything without you,

and for Cosette, Willie, and the rest
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ABSTRACT

In 1919, just after the end of World War I, Edward W. Scripps and William E. Ritter joined to form a science news organization dedicated to pioneering the dissemination of accurate, accessible, and engaging news of science to the public primarily through the mainstream media. Scripps, a longtime journalist and successful entrepreneur, and Ritter, a respected biologist and teacher, were convinced of the importance of science knowledge to the American public. They also were concerned about limits and abuses under other political systems where science research was abridged or threatened. They sought to create a "scientific habit of mind" among the general public to increase the average person's awareness of the role of science in his or her daily life, to gain support for science research, and to help protect American democracy through an intelligent—meaning science-educated—citizenry. The result of this collaboration was the organization Science Service, established in 1921 for the popularization of science, with the support and participation of the leading science organizations, including the American Association for the Advancement of Science, National Academy of Science, and the National Research Council, as well as leaders of the journalism community. Reaching the public also meant navigating the contentious relationship between scientists and the press to create new ways of translating science information, and overcoming scientists' reticence about sharing their research interests with the lay public. Additionally, Science Service weighed capturing the public's attention through enticing but only fact-tinged stories, versus adhering to higher scientific and journalistic standards of fact-based but less sensational articles. Through the post-war twenties, the Depression thirties, and the war-plagued forties, Science Service forged relationships with
scientists, the press, political figures, government agencies and offices, and the general public that continue in the 21st century. Science Service made the first sustained effort at gathering and disseminating consistently credible, engaging, and understandable news of science and emerging technologies to a nationwide audience through the easily accessible mainstream media. This emerging field of "science journalism" sought to create a science-minded public able to appreciate, and willing to support, science and science research. The organization expanded the science news climate by creating a forum for science dialogue among scientists, journalists, and the public—a dialogue that continues today.
CHAPTER 1

INTRODUCTION

If the great mass of the people, through accurate and interesting accounts of the successes and failures of science, can glimpse and understand that essence of science, its trying, testing, and trying again, if they build their own convictions that this is a good, sensible, successful, and useful method, then there is hope that they will apply it more widely to everyday life, to our human relations, to running our businesses, to our governments, to everything we do. So many of the ideals that we cherish, such as liberty, opportunity, the pursuit of happiness, freedom, democracy, are achieved by the utilization of scientific methods.¹

In 1919, American newspaper publisher Edward W. Scripps and prestigious biologist William E. Ritter began making plans to improve science communication and popularization in the United States. The two men aimed to create a permanent mechanism that would disseminate accurate, accessible, and engaging news of science to the public through the mainstream media and other means. Scripps, as a longtime journalist, had started newspapers in rural areas and small cities that focused on providing understandable news coverage for the average person. Ritter was a popular biology professor who conducted seaside summer workshops to introduce students to the science behind marine life. Both men were interested in improving the relationship between scientists and ordinary Americans as a crucial factor in maintaining a healthy democratic society and promoting modern scientific progress. They worried that during World War I, other political systems had demonstrated a dangerous tendency to limit or abuse science research. In order to head off any such threat in the United States, Scripps and Ritter believed, it was essential for informed and responsible citizens to

possess a basic knowledge of scientific principles and a curiosity about the role of science in
everyday life. By establishing Science Service, Scripps and Ritter wanted to ensure that
Americans could get reliable, positive information about scientific discoveries and
phenomena in their hometown newspapers, over the radio, and through other trustworthy
channels. They sought to create a scientific habit of mind among the general public to
increase the average person's awareness of the role of science in his or her daily life, to gain
support for science research, and to help protect American democracy through an
intelligent—meaning science-educated—citizenry.

Many American scientists shared this concern for improved communication between
scientists and the public coming out of World War I. Indeed, some of the country’s leading
scientific societies had proposed or planned starting their own journals, but were slow in
actually initiating any such efforts. Hence, when Scripps and Ritter proposed their plan to
create their own organization to promote science news, a large part of the scientific
community eagerly supported the plan. In 1921, Scripps and Ritter formally established the
organization Science Service, dedicated to promoting the popularization of science and the
spread of sound scientific news coverage. Their effort had key support and participation from
the nation’s leading scientific societies, including the American Association for the
Advancement of Science, National Academy of Science, and the National Research Council,
as well as leaders of the journalism community. During the 1920s and beyond, Science
Service developed and expanded the first sustained effort in the United States to gather
consistently credible news of science and emerging technologies, then distribute it in
engaging, and understandable form to a nationwide audience through the easily accessible
mainstream media. In doing this, Science Service helped establish and promote an entire new
discipline, the emerging field of science journalism. By the time World War II began, Science Service had established a new forum for science dialogue among scientists, journalists, and the public—a dialogue that continues today. In the early twenty-first-century, newspapers, magazines, radio, and new media devote more attention than ever to covering science, technology, and medicine, confident that such stories are important and interesting to a modern audience. Universities have entire programs devoted to teaching science journalism. Science Service did not institute all that singlehandedly, but its history played a central role in setting the stage for today’s popular science news coverage.

Before the creation of Science Service, major newspapers had run occasional stories about science, but their quality was uneven. Careless and sensationalistic reporting fostered a long-standing tension between scientists and journalists, who often had difficulties understanding and respecting each other's disciplines. Scientists of the late 1800s and early 1900s often hesitated to share their research, since they distrusted journalists' ability to portray their work accurately and doubted whether the public could comprehend complex information. For their part, journalists often found scientists to be uncooperative, unwilling to pay attention to press deadlines and editorial policies, and reluctant to work on explaining their work in accessible terms that would allow for accurate and timely reporting.

Given that history, the founders of Science Service had to create more than just a mechanism for distribution of science news; they had to change the entire practice of how scientists and journalists related to each other. Science Service worked to facilitate greater communication and cooperation between the two groups, a process they believed would mutually benefit the scientific community, the journalism community, and ultimately, the American public.
As Science Service writers and officers produced and distributed more and better science news stories during the 1920s and afterwards, they had to resolve an entirely new set of questions about what modern science journalism should look like. In particular, the organization had to determine a new set of ethics that would keep science news coverage accurate, while also making it as interesting as possible for a modern audience. The group’s coverage had to set the tone: must science news follow the highest possible standards of factual reporting, or would it compromise, capturing the public’s attention through enticing but only fact-tinged stories? The founders and trustees of Science Service tried to walk a fine line in the 1920s; they acknowledged early on that they might occasionally have to resort to some level of sensationalizing to gain an audience, but cautioned that doing so would mean they had strayed from their best intentions and were not serving science or science reporting well. As a matter of philosophical principle, they believed that good journalism could make science news exciting and engaging, without straying into sideshow oddities and false claims.

From its inception, Science Service leaders were interested in exploring a wide variety of methods to further the cause of science popularization. From 1921 onwards, the organization pursued ways to spread information via the newspapers and other print media, radio, lectures, professional meetings and conferences, phonograph records, academic and popular books, and school programs. Given that Scripps was a newspaperman, Science Service logically started its work in bringing news of science to the public through the print media. Week by week, month by month, Science Service writers and editors produced stories about new discoveries and directions in biology, chemistry, physics, invention, medicine, and related areas. Through national syndication, the organization placed these stories with large and small newspapers around the country, and also brought this material directly to readers
through its own publication, the *Science News Letter*. In doing this, Science Service directors aimed to make scientists, journalists, and readers comfortable with science news and, indeed, to lead those groups to expect to see good science stories appear regularly in print. They knew that if they were successful, individual newspapers would eventually eclipse Science Service's newspaper syndicate by hiring science writers of their own, and developing their own science columns and sections. These developments would effectively eliminate the need for Science Service's syndicated service, and that was, in fact, what occurred by the mid-1960s.

This dissertation considers Science Service's efforts to popularize science news and improve public awareness of science during the period from approximately 1919 to 1950. Other individuals and groups before this had expressed interest in science popularization, and Science Service was never the only organization or entity interested in furthering the public's appreciation for science research and its role in daily life. But the crucial fact to note is that Science Service was unique in making the first *organized, sustained, multi-faceted* effort at bridging the gap between scientists and the public, and that its growth before World War II led scientists, journalists, and ordinary Americans alike to expect credible and responsible science news reporting. In the narrowest sense, Science Service sold science to newspapers through its syndicate service, and to people through its news letter and book service, and through radio programming, under its charter as a self-supporting non-profit organization. In the broader sense, Science Service *offered* science to the public itself. The group cooperated with government offices during World War II to promote faith that science would help win the war. It promoted what we call today “science literacy,” working with schools to create a variety of education programs for children and encouraging adults to observe the stars, learn
about the weather, and follow the latest science. Reporters and editors directly answered letters from the public, promoting ongoing exchange of ideas and correcting misinformation.

And finally, Science Service promoted scientific research itself, helping investigators share and analyze information about earthquakes and other phenomena.

Chapter 2 provides an overview of earlier efforts at science popularization, beginning in Europe in the seventeenth century, and later in America. The chapter includes a description of publications of the times, activities of scientific societies, and also describes the extent of scientists' interaction with the public. Figures such as Robert Chambers and T.H. Huxley in Great Britain, and Thomas Jefferson and Benjamin Franklin in America, took different approaches to a problem they all agreed was important, disseminating science information. The chapter also considers the many different forms of science display and popularization—the credible and the less so—as well as different science periodicals published in the nineteenth century. The establishment of the Smithsonian Institution also played a significant role in achieving credibility for science. As technology and science became more common, both in the workplace and in the home, some community and professional leaders questioned whether developments were outpacing society's ability to effectively, fairly, and beneficially incorporate the changes. As this chapter notes, other scholars have offered a variety of perspectives from which to interpret the history of the popularization of science and science information. This chapter links this secondary literature on the history of science popularization to the immediate focus, the efforts of Science Service after 1921 to educate and inspire average people about science and the associated technologies.
Chapter 3 provides an institutional history of Science Service. It is not possible in a work of this length to track and articulate the organization's development at every step and every point. Instead, this history focuses on the intersection between the social, political, scientific, and journalistic conditions at the time, and the founders'—E.W. Scripps and W.E. Ritter—concerns and intentions. Brief biographical sketches reveal the influences and goals of the two men, so different and yet with common goals and convictions regarding the need for science popularization. The chapter traces the ways that Scripps and Ritter worked to measure and gain support for an organization to facilitate communication between the science and journalism communities and the public. This chapter also details the emergence of two early leaders of Science Service programs, Edwin E. Slosson and Watson Davis, whose influence and philosophies regarding science popularization dominated the organization not only through World War II, but for decades beyond. Finally, the chapter shows how these men addressed the practical and philosophical challenges in starting a new organization built on an essentially new idea, reshaping the general journalistic climate for science news both in the United States and abroad.

Chapter 4 considers the challenges in trying to evaluate the work of Science Service, especially given the limits of surviving archived material evidence, and the difficulty of assessing the reach and influence of news coverage. It is vital to distinguish from the start between people’s “exposure” to news and a measurable “impact” on their ideas; one does not automatically connote the other. Examples show that Science Service leaders themselves generally were aware of the difficulties in determining impact and so were very careful about claiming impact. Instead, the group relied on newspapers' circulation figures to suggest how many Americans around the country might potentially read the articles placed in those papers.
by Science Service. But that picture was inherently incomplete; some newspapers reprinted Science Service stories without payment or byline credit, or changed the title to suit their own tastes, and so organization leaders knew all along that they could not perfectly track the full effect of their work. That situation makes it impossible for a historian to count the total times that Science Service stories appeared in all papers around the United States, much less to ever know the exact number of men and women who read them. Instead, this chapter will offer a snapshot of Science Service activity by providing lists of many newspapers that subscribed to the Science Service syndicated material, as well as examples of the articles and regular features that those papers used. We can also find samples of the many specialized articles that Science Service staff writers produced for newspapers and magazines outside the regular syndication mechanism, on an individual basis. We have some evidence to suggest the impact of Science Service work —statements of use, endorsements, or other comments—from institutions, publications, and readers. More than that, as this chapter will show, we do have more reliable measurements of readership, through the subscriber statistics for Science Service’s own weekly *Science News Letter*, which consolidated much of the same material sent to subscribing papers. It was through the news letter, which arose in response to reader demand, that Science Service selected and presented those articles from the newspaper material that addressed the most engaging and salient aspects of science news. This chapter provides brief overviews of other Science Service endeavors, including aids to earthquake and astronomy research, radio, book service, phonograph records, Science Clubs and Science Talent Search, but like the rest of this work, focuses primarily on the print-related work of Science Service.
Chapter 5 considers the ways in which Science Service sought to reshape the broader human and institutional context of the emerging field of science journalism, creating better relationships between researchers, the press, and the public. The chapter notes the support in the post-World War I scientific community for popularizing science news, with well-known and highly respected scientists who devoted substantial time to serving on the Science Service board of trustees, writing articles, or agreeing to participate in radio programming. That support proved crucial, especially during the Depression era, when the national economic crisis led to new questions about the concept of progress. While many optimistic observers saw infinite opportunities for society in science and emerging technologies, others found science to be a convenient and plausible scapegoat, responsible for many of society's ills. This chapter discusses the role of Science Service in this ongoing dialogue about the costs vs. the benefits of science. Finally, this chapter discusses the National Association of Science Writers, a new organization created in the 1930s to facilitate accurate science writing and support the science writing community. Many early leaders and members of this group were connected with Science Service, illustrating the organization’s rising influence in the journalism profession.

Chapters 6, 7, and 8 include case studies that illuminate the way that Science Service addressed various aspects and challenges related to gathering, interpreting, and presenting science information to the public over the first three decades of its existence. Chapter 6 examines several major developments for Science Service in the 1920s. An evaluation of the Scopes trial in 1925 highlights how Science Service representatives struggled with questions regarding the extent of appropriate levels for their participation in an episode crucial to American science education and law. The organization’s writers, editors, and leaders
confronted complex ethical and philosophical issues about which news was reliable, how they should handle potential sources, and the balance between accuracy and sensationalism. In order for science news coverage to succeed, Science Service had to decide how to approach such important professional questions. That lesson hit home with another episode covered in this chapter, the case of a Tennessee infant born with an appendage resembling a "tail." Coming just a few years after the Scopes trial, that story had the potential to draw more publicity for discussions of evolution, with an attention-grabbing angle that could garner countless readers for Science Service. At the same time, directors wrestled with the question of how involved they should become in gathering evidence of the physical anomaly, and the ethical dilemma of whether the story was sound enough to share with readers. In covering science, Science Service had to learn to handle controversy, as illustrated in a final episode from the 1920s. When a cigarette company interpreted Science Service's published comments about nicotine content as detrimental to its enterprise, Science Service was forced to defend its process of gathering information as well as its right to publish what it deemed credible material.

Chapter 7 evaluates developments in the 1930s and Science Service's credibility after a decade in existence. As people became aware of the organization and its outreach efforts, some turned to Science Service for answers to their private concerns and questions, writing to the staff much as people wrote to President and Mrs. Roosevelt for reassurance and solace. The chapter discusses examples of that correspondence, where ordinary Americans sought information from Science Service. As detailed here, Washington leaders also turned to Science Service as a valuable resource. In 1933, Eleanor Roosevelt's office requested that Science Service compile a report of the number of women working in government science-
related jobs, information that it appears the First Lady may have used in her writings about women’s career options. During this decade, the high profile Washington personality, Federal Bureau of Investigation director J. Edgar Hoover, also interacted in many ways with Science Service director Watson Davis. Hoover shared the contents of many official FBI reports with Science Service, as well as details of the FBI's use of scientific methods to improve its crime-solving operations. In exchange, Hoover sought information from Science Service about scientific or technological innovations that might prove useful to his agency. Davis knew that stories about gangsters, the Bureau, fingerprinting, and related topics were natural attention-getters, so he eagerly reached out to gather information about the FBI’s uses of scientific methods that he could share with readers. But though Science Service had clearly gained credibility, it was not free of controversy in the Depression era. New debate erupted over what constituted appropriate advertising in the *Science News Letter*; critics argued that the group should refuse to accept Consumers Union advertisements, which they believed posed ideological and commercial risks.

Chapter 8 describes Science Service as it related to World War II efforts. The organization participated in providing information to various war committees and departments. Staff writers also wrote booklets and pamphlets for use by the government and the military. But again, ethical questions complicated the process of science news coverage. In 1945, when government agents accused a Science Service writer of divulging classified material regarding radar after a visit to a military installation, the organization had to negotiate the hazards of wartime journalism, where the need for secrecy promoted censorship, even as defense agencies circulated win-the-war propaganda. The case illustrates the ongoing challenges inherent in attempting to provide engaging and relevant material to
readers, while also respecting the procedural and ethical limits of the special access afforded the organization as it grew in credibility and influence. Even before the war ended, as this chapter concludes, Science Service writers and leaders joined scientists themselves and other observers in thinking about the role that science and technology would play in a postwar world and peacetime democracy. Science Service attempted to present a wide range of science information to help the public contend with the disruptions in their daily lives, allay their larger global fears, and make them aware of new and important developments in science and related technologies.

As these chapters illustrate, between the two world wars, American science reporting increased dramatically, both about headline stories such as the Scopes trial and with more commonplace stories about earthquakes, medical discoveries, and weekly astronomical sightings. Science Service did not contribute all of those news stories alone, but did supply a large share of them. More than that, the organization facilitated the growth of science journalism in general. Through the post-war twenties, the Depression thirties, and the war-plagued forties, Science Service forged relationships with scientists and their professional societies, the press, political figures, government agencies and offices, and the general public. Many of these connections continue in the 21st century. The goal, then as now, was to expand the public's access to, and appreciation for, science information. Today, interested Americans feel entitled to learn about science research and developments, responsibly and accurately reported. Science Service participated in creating that science-minded public, by fostering the emerging field of science journalism between the wars, and opening new relationships between scientists, the press, and the public.
CHAPTER 2

Popularization

When Science Service initiated its efforts at facilitating the popularization of science news, it was not treading into completely unexplored territory. During earlier centuries, both in Europe and the United States, some scientists (both as individuals and in groups) had sporadically attempted to share information about their work with a general audience, but the public's enthusiasm for that knowledge had ebbed and flowed. It is useful to examine the prevailing assumptions and context of earlier efforts at popularization—presenting information or material in a form widely understandable or interesting to ordinary people—both in the United States and abroad. This history makes it clear that the constricted relationship that existed between the American science community and the public right before World War I was not inevitable, that a certain level of exchange had existed in earlier periods and other places. This perspective then helps underline the importance of the situation in the early twentieth century, when the relationship between American scientists and the public was often one of mutual unease, the problem that Science Service aimed to change by opening new and better avenues of communication. These interlocking concepts of professionalization, communication, and science popularization play an essential role in the emergence and importance of Science Service. For that reason, it is valuable to examine recent scholarship that suggests new approaches to the traditional means of describing and determining the extent of science popularization.

There was never any set rule or precedent requiring scientists (or natural philosophers, as they were known earlier) to interact on a grand scale with all levels of society, nor forbidding that interaction. Indeed, the environment of scientific investigation
has often prized secrecy, and complicated or discouraged communication with outsiders. But in many cases, across centuries and in different countries, these scholars did share news of at least some of their discoveries and demonstrations of natural phenomena with the public. During the Scientific Revolution of the sixteenth and seventeenth centuries, European science began to move out of the universities and into a more "civic, courtly context," as historians Peter J. Bowler and Iwan Rhys Morus have explained. Scientific societies, such as the Royal Society of London, the Académie des Sciences in France, and the Accademia dei Lincei in Italy provided venues for popular lectures, re-creations of experiments, and displays of natural phenomena. Such audience events were intended to thrill and amaze a public not that far removed from a belief in sorcery and superstition. By the beginning of the eighteenth century, the main venue for disseminating information about science was coffeehouses, which served as gathering places for bankers, merchants, entrepreneurs, and some workingmen. In these forums, men of science competed with each other in attempts at the most elaborate displays of scientific principles and chemical reactions.  

Another development significant to popularization efforts was the expansion of printing that helped fuel the Scientific Revolution. Though not in a form we would necessarily recognize today, magazines and journals appeared as early as the 1600s. In Europe, by the seventeenth and eighteenth centuries, books and journals about "natural

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philosophy”—again, the term for what came to be called science—were available to a broad and popular audience, depending on their level of literacy and ability to purchase books at a time when few people owned their own. In 1665, the Royal Society began publishing *Philosophical Transactions*, a journal meant for both science specialists and leisured gentlemen.³ Eighteenth century men's and women's magazines contained news and gossip about science, and were aimed at the literate and leisure urban middle-class. By the nineteenth century, the works were aimed at a wider variety of audiences, as befitted the changing nature of literacy, education, and prosperity.⁴

By the 1800s, those with the inclination and leisure time could experience news of science and scientific accomplishments in several ways. At the Royal Institution in London, founded in 1799, chemistry professor Humphrey Davy astounded crowds with demonstrations of his Voltaic battery. Davy’s assistant, Michael Faraday, expounded on

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⁴ Peter J. Bowler and Iwan Rhys Morus, *Making Modern Science: a Historical Survey* (Chicago: The University of Chicago Press, 2005), 379–80. Also see, Patricia Phillips, *The Scientific Lady: A Social History of Woman’s Scientific Interests, 1520–1928* (London: Weidenfeld and Nicolson, 1990). According to Phillips, certain areas of amateur science interest became distinctly feminized; relatively well-off, well-educated British women in the 17th and 18th centuries became a sizable customer base for sellers of science books, lectures, and equipment. Denied the classical education males enjoyed, women who were interested could engage in scientific study and practice, largely because men rejected it as a harmless hobby, too similar to women's activities to warrant their attention. Women benefited from books and lectures specifically for them, as well as specially designed instruments, and even science poetry. When women began to make notable strides in science areas, they gained access to the classical education they had earlier been denied, and opted to leave behind the science fields that had elevated their status. In so doing, they gave rise to the belief that women were unsuited for science (x–xi). A large amount of material was created for, and directed toward, women interested in science. Books and other literature, lectures, personal tutoring, as well as fieldwork and membership in scientific societies were intended to encourage women's interests (77). *The Ladies Diary, or the Woman's Almanack... Containing many Delightful and Entertaining Particulars peculiarly adapted for the Use and Diversion of the Fair-Sex* was established in 1704 and continued for over a century. This was the first almanac designed for women that was composed predominately of mathematical and science material (98). Other periodicals aimed at women's science interests included the *Female Spectator* (1744–6), *The Ladies Magazine; or Entertaining Companion for the Fair Sex, appropriated solely to their use and Amusement* (1770s), and the *Lady's Monthly Museum* (late 18th century). Many textbooks and poetry books also incorporated science with women in mind (118–119). A small subset of privileged American women during the 1700s and 1800s echoed this British feminine scientific interest, buying scientific reading material and even producing their own science books aimed at educating and amusing girls.
magnetism and electricity in his Friday evening discourses, and in the 1820s he began a series of Christmas lectures for children that continue to this day. In the 1850s, Thomas Henry Huxley took his lectures on biology and other scientific subjects to British workingmen in mechanics' institutes and workingmen's halls.5

These nineteenth-century men of science encouraged and welcomed the public's attention, as seen in the popularization efforts made by Robert Chambers and Thomas Henry Huxley. As Joel S. Schwartz has suggested, those two men had different motives, levels of education, and experience with the world of science, but both believed it was essential to present science information to the public. Robert Chambers, a self-educated bookseller, publisher, writer, and amateur naturalist, had no formal science training but was interested in science phenomena. Chambers' interest in science was influenced both by his father's curiosity about the natural environment and astronomy, and by his own biological challenges that made him curious about heredity and evolution. Both Robert Chambers and his brother William were hexadactyls—born with six fingers on each hand and six toes on each foot. The surgeries that helped William left Robert lame. Unable to participate in many of the physical games common to young children, Robert pursued intellectual hobbies, and developed a strong interest in scientific phenomena. Later, when Robert's own daughter was born with the same extra digits, he sought scientific explanations for the mutation and kept highly detailed diaries, similar to scientific notebooks, regarding her operations and progress. Charles Darwin later communicated with the Chambers family when Darwin became aware of the

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extensive record that Robert had kept of his daughter's surgeries, particularly the claim that one of the removed fingers had partially grown back.⁶

Building on his personal interest in science, Robert Chambers used his family-owned *Chambers' Edinburgh Journal*, first published in 1832, to disseminate science information to the general public, giving readers access to material otherwise only available to science specialists in published transactions from scientific meetings.⁷ Articles in Chambers’ *Journal* focused on a wide variety of topics such as steam navigation, fish behavior, spontaneous human combustion, plant life, bird migration, weather, the transmutation of species, and a regular feature, "Popular Information on Science." Chambers also anonymously published a popular work, *Vestiges of the Natural History of Creation*, in 1844, which attracted widespread interest by proposing controversial pre-Darwinian ideas about the transmutation of nature and life.

In these publications, Chambers made a significant contribution to the popularization of science in Britain because of his ability to communicate simply and directly with a general audience. By "removing the air of mystery" surrounding science, Schwartz has observed, Chambers helped educated working people and members of the middle class gain a rudimentary understanding of scientific principles. His magazine, the "first high-class cheap periodical published in Britain," helped generate a curiosity about science that later made the theories of Darwin and others more acceptable to the public, according to Schwartz.⁸

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⁷ Ibid., 343.
⁸ Ibid., 359-60.
Despite his success in writing and publishing popular science material, Chambers remained an amateur enthusiast, unable to command full respect from many of the era’s professional scientists. T. H. Huxley believed that credible knowledge of science was reserved for those who had studied it formally, and that amateurs’ efforts did not further the cause of science and, in some cases, did more damage than good. Huxley himself had studied medicine and science, despite his impoverished background. During his apprenticeship to two doctors, Huxley witnessed the suffering of the poor in the urban districts of Victorian London, and grew determined to help struggling people overcome their disadvantages. He dedicated most of his life to the dissemination of science information to the British public, considering education the most effective way to raise people's opportunities and quality of life. Through writing, teaching, public addresses, lectures to workingmen's societies, as well as presentations at the Royal Institution, Huxley sought to educate the masses about the importance of science. He also became a science correspondent to the Metaphysical Society journal, *Nineteenth Century*, and contributed feature articles under the heading, "Recent Science," which appeared occasionally for many years.  

Although Chambers and Huxley held very different positions in the scientific community, the two men shared a conviction that it was valuable, even essential, to share as much information about science as clearly and simply as possible, to as wide a British audience as possible.  

Likewise in America, science education, lectures, and demonstrations captured the attention of a portion of society in the 1700s. The American Philosophical Society of Philadelphia developed out of Benjamin Franklin's cohort of science enthusiasts in 1749. For

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9 Ibid., 370-2.  
10 Ibid., 381-2.
Franklin and his cultured colleagues such as Thomas Jefferson, "promoting science as an idea or vision has never been very far from selling it as a necessary object of study," suggests historian Scott L. Montgomery. Franklin and Jefferson both pursued ideas for inventions and dedicated substantial time to studying natural philosophy. Both advocated strongly for increased instruction in science at the college level, believing that learning science would improve educated men’s dedication to truth and exactitude. By extension, they suggested, science education would advance the nation economically and help secure political freedom, by creating an educated and ethical citizenry, and thus providing a solid foundation for building the great American democracy experiment. Both Franklin and Jefferson linked science to republican virtues and values, viewing science popularization and education as "a means to make and remake society itself."11

Over the years following the Revolution, Americans gained new access to science learning in non-academic contexts. A growing middle class of merchants, businessmen, prosperous farmers, and others grew eager to incorporate science knowledge into their homes and lives. They formed clubs, associations, and formal and semi-formal groups to discuss and read about science. Both mothers and fathers made efforts to teach their children about astronomy and natural history, the most easily observed aspects of science. Though fathers tended to teach astronomy to their sons, mothers often emphasized natural history. Such training fit within the realm of what historians have called “republican motherhood,” the era’s belief that women had a responsibility for guiding and forming children to become

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12 Ibid., 525-6.
virtuous, intelligent citizens of the new United States. Promoting science in the home served
to create a larger presence for science in society, where popularizers often presented
scientific progress, industrial growth, and natural abundance as part of a divine plan for
God's chosen nation.13

By 1824 the Franklin Institute in Philadelphia had instituted lectures that specifically
sought to bring news of science to workingmen, as opposed to only men of status, thereby
expanding the place of science in ordinary people's lives.14 Public debates, discussions,
lectures, demonstrations, and meetings kept science topics relevant to average people. These
examples indicate the extent to which science crossed into other areas of culture and life, and
how men of science incorporated the public display of their work into their personal and
professional philosophy about what was appropriate for their profession and status. It was not
inconsistent with their values and standards, and not just for the purpose of gaining financial
support. As Bowler and Morus have commented, such outreach "was what men of science
did."15

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13 Ibid., 536-8.
14 Peter J. Bowler and Iwan Rhys Morus, *Making Modern Science: a Historical Survey* (Chicago: The
University of Chicago Press, 2005), 371. Also see Nina Lerman, "The Uses of Useful Knowledge: Science,
"Preparing for the Duties and Practical Business of Life": Technological Knowledge and Social Structure in
Mid-19th-Century Philadelphia," *Technology and Culture* 38 (1997): 31-59, for studies of how science was
differentiated from technology, particularly for women, in nineteenth-century Philadelphia. According to
Lerman, science became "a label to appropriate, as well as a knowledge to possess," as opposed to artisanal
knowledge, which did not have the same prestige. Lerman described the activities of the Franklin Institute for
the Promotion of Science and the Useful Arts, and beginning in 1826 its publication the *Franklin Journal*. $2
ladies' tickets were issued for the Institute's lecture series in the spirit of the republican motherhood ideal, the
idea that the science women learned would help improve society by helping them raise better, more prepared
sons. Lerman also examined the various types of technical and apprenticeship training available to young boys
and girls in Philadelphia at the time. Also see Hyman Kuritz, "The Popularization of Science in Nineteenth-
Century America," *History of Education Quarterly* 21, No. 3 (Autumn 1981): 259-74,
15 Peter J. Bowler and Iwan Rhys Morus, *Making Modern Science: a Historical Survey* (Chicago: The
University of Chicago Press, 2005), 373.
Other forms of display and popularization captured people's imaginations both in Europe and the United States. Cabinet displays of scientific instruments, science museums, exhibitions, even sideshow attractions such as P.T. Barnum's exotic displays, helped engage the public with science. The Crystal Palace at the Great Exhibition of the Works and Industry of All Nations, in London in 1851, brought science and technology to the public in an even grander fashion. Its impressive displays of the latest knowledge and inventions became the inspiration for national and international exhibits for the next one hundred years and more.16 In America, the first high-profile display of international science and technology was the Philadelphia Centennial Exhibition of 1876, which included the first public demonstration of Alexander Graham Bell's telephone.17 Later exhibits at World’s Fairs across different countries included fantastic displays of electricity and other natural phenomena harnessed and developed in the name of progress.

The professional science community did not accept all presentations of "science" as valid and reputable, but that did not prevent the public from enthusiastically embracing the ideas and clamoring for more. Mesmerism, or animal magnetism, as promoted by Viennese physician Franz Anton Mesmer in the late 1700s, was the manipulating of the magnetic fluid in humans and animals to bring about effects and sensations, often without the participant's awareness. Paris salons overflowed with enthusiastic patrons seeking to be "mesmerized"—


or hypnotized—to cure illnesses, explain behaviors, or just be entertained. Those who considered themselves science professionals, as well as the wary clergy, often objected to what they considered to be an inappropriate and suspect use of "science."\(^{18}\)

Phrenology, another wildly popular attempt at appropriating the clout and credibility of science, was the brainchild, so to speak, of the Viennese physician, Franz Joseph Gall, in the early nineteenth century. His theory was that the brain, as the seat of the mind, had various organs within it, and the size and shape of these organs, and the strength or weakness of the associated faculties, were revealed by the contours of the skull. By "reading" the skull, practitioners could reveal the underlying attributes and limitations of the mind. Lectures, books, and parties encouraged the average person to believe that he or she could master the techniques of reading and mapping the brain. Not surprisingly, these readings were sometimes used to justify a "scientific basis" for who was the best candidate for a job, the servant most likely to steal, or the child most likely to succeed.\(^{19}\)

Charles Darwin's theories regarding evolution, first published in *The Origin of Species* on natural selection in 1859, and in *Descent of Man* in 1871, made him a controversial figure, and his assertions the topics of numerous debates. Darwin wrote for his fellow scientists rather than the public, but even if the public did not fully understand the finer points of his arguments, many were undoubtedly aware that there was controversy.

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stirring in the scientific community. Evolution was not a new theory, but it was Darwin who made it most famous, and though he did not specifically refer to humans in *The Origin of Species*, except for one sentence near the end, it was apparent to many that he was suggesting mankind was subject to the same natural processes that he posited for lesser beings. The idea that humans were anything other than special creations of God, each an individual work of intent, undermined Victorian ideals of progress, which Darwin said was not necessarily automatic, and perfectibility, which was unattainable. That there was considerable agitation and dissent among scientists themselves kept the topic in the news, but undoubtedly confused and bewildered the lay public as much as it stimulated their curiosity. In time, the controversy that surrounded Darwin's theories died down as scientists began to reach some consensus on various aspects of his work, and evolutionary biologists began to focus on understanding its multiple, complex implications. Meanwhile, “Darwin,” “evolution,” “survival of the fittest,” and many more terms entered popular vocabulary.

During the early nineteenth century, American readers with a curiosity about science gained some new access to information, but this was not yet dependable. As was common with many other aspects of culture, the United States tended to follow what happened in Europe, and publishing was no exception. Following on the heels of European science journals, Americans began producing an increasing number of scientific journals and other science-oriented materials. Straining to find and keep an audience, most of the publications experienced financial difficulties and changed hands in an effort to survive. *Scientific American*, the oldest continuously published science magazine in the United States, first

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published in 1845 as a four-page newspaper, was an eager early promoter of popular science. The paper originally reported on the activities of the Patent Office, as well as inventions and innovations in science and technology. *Scientific American* ran into financial and practical difficulties after World War II; the publication declined, until re-emerging with a new focus, reoriented as more of a project magazine and source of technical information.²¹ *Popular Science Monthly* was founded in 1872 as a source of science information for the educated layman, and began by reprinting articles found in European periodicals. By 1915, declining readership forced editor and publisher James McKeen Cattell to announce that some of the assets had been sold to another group who intended to continue to produce a science magazine for general audiences. The result was *Popular Science*, a workbench style publication filled with short articles and illustrations.²² The remaining publication continued as *Scientific Monthly*, which was then absorbed in 1958 into *Science*, the academic journal of the American Association for the Advancement of Science. *Science*, first published in 1880, had long been regarded as one of the top scientific journals in the world. However, since articles were written in such scholarly fashion, increasingly full of jargon, the lack of easy access for the average person meant that *Science* rarely helped popularize new ideas and discoveries.²³


²² Archives of Popular Science Monthly can be found at http://onlinebooks.library.upenn.edu/webbin/serial?id=popularscience.

²³ Information about the history of the journal *Science* can be found at http://www.aaas.org/aboutaaas/.
Finally, from the late nineteenth century onward, science speculation and science fiction, as a literary genre, drew in the reading public.24 Part entertainment, and part social/political statement, tales of hitherto unknown lands and creatures, astonishing travels, and magnificent or terrifying possibilities, captured and expanded the imaginations of readers. Jules Verne's *20,000 Leagues Under the Sea* (1870), *A Journey to the Interior of the Earth* (1864), and *From the Earth to the Moon* (1865), along with H. G. Wells’ *Time Machine* and *War of the Worlds* (both 1895), created exciting journeys supported by enough scientific references to make them seem authentic and credible. In *A Journey to the Interior of the Earth*, Verne referred to scientific societies and the dissemination of knowledge, the lack of standardization of measures, and described various actual instruments being used by the characters.

Until the end of the nineteenth century, the average person in the United States could gain some exposure to the world of science, real or imagined, and men of science found it consistent with their professional aspirations and reputations to share at least some of their information. The founding of the Smithsonian Institution in 1846, thanks to a bequest in 1829 from British chemist James Smithson, gave tangible support for American science, plus new visibility. Smithson's will specified the creation in America of the institution in his name, "for the increase and diffusion of knowledge among men," but beyond that gave no other specific details. Congressional debate swirled around whether the United States should actually accept this bequest from a British private citizen. There was also substantial argument over what type of institution would be best for advancing knowledge: a national

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university, a center for agricultural research, a site for physical science experiments for the Navy, a resource for meteorological studies, or something else. But in 1836, the United States did accept Smithson’s money and his charge to create a new institution in his name. Under the direction of its first secretary, Joseph Henry, the institution became many of these things under one umbrella—the repository for collections from scientific exhibitions, a library, a natural history museum, a meteorological center, and perhaps most importantly, a symbol of the importance of original research.25

The first awarding of the Nobel prizes in 1901 helped give science prestige, and the Louisiana Purchase Exposition of 1904 in St. Louis honored science while entertaining the public.26 Scientific societies, publications, and universities had also helped establish the public image of scientists as experts in their fields, and the public was captivated by the mysteries and near magic of the scientists' lectures and demonstrations. Scientists retained substantial prestige with the onset of the Progressive period, but given the proliferation of "experts" in emerging fields, scientists were no longer the only authorities willing to share their theories. Ronald Tobey has suggested that as new fields emerged and adopted new standards of education and licensure, scientists became a more cloistered enclave as they sought to protect and elevate their standards and practices. This distanced them from the


public with whom they had previously had more genial and frequent contact. The Progressive-era public was enthralled by new lecturers in areas apart from science, new and unrelated fields of study, social reform movements, new causes, and new discoveries. Scientific research no longer captured the public's attention as it once had.\footnote{Ibid., 3.} With scientists' increased isolation, the discipline began to regard efforts at popularization as "unacceptable," a distinct shift away from before.\footnote{Ibid., 8.}

Technological innovations that were changing home life, travel, communication, health, shopping, and the work world, crowded out interest in scientific theories and natural phenomena. People were enticed by the more practical expressions of science and technology that they could see affecting their daily lives, from electrification and early automobiles, to movies and much more. Frederick Winslow Taylor’s ideas about scientific management, the principles of applying efficiency standards to supposedly increased productivity, claimed substantial attention among businessmen, politicians, and the public.\footnote{Frederick Winslow Taylor, \textit{The Principles of Scientific Management}, (New York: Harper & Bros., 1911).} Basic science research no longer inspired the same awe and respect that it had in the past.

Additionally, by the early twentieth century, more and more of the work of scientific research had moved into universities, research facilities, and private business laboratories that had little interaction with non-professionals. The number of industrial research laboratories in the United States increased from three hundred in 1920 to one thousand in 1927.\footnote{Ronald C. Tobey, \textit{The American Ideology of National Science, 1919-1930} (Pittsburgh: University of Pittsburgh Press, 1971).6. Also see Leonard S. Reich, \textit{The Making of American Industrial Research: Science and Business at GE and Bell, 1876-1926} (Cambridge: Cambridge University Press, 1985); Peter Galison and...} Within these institutions and facilities, scientists and their colleagues were more
likely to value and understand research on its own terms, without the need to appeal, or pander, to a less-informed public.\textsuperscript{31} American scientists increasingly divided into specialized areas with corresponding societies, as had their European counterparts previously, and became more removed from each other and the public.\textsuperscript{32} For example, the American Association for the Advancement of Science was created in 1848, the American Chemical Society in 1876, and the American Physical Society and American Astronomical Society in 1899. Honorary societies, such as the National Academy of Sciences established in 1863, added another dimension to establishing science as an elite pursuit.\textsuperscript{33} Government work during World War I, shrouded with the mantle of "classified," put science off-limits to the average person. By the time the war ended, people had understandably mixed feelings about what science made possible.

Albert Einstein's theories of relativity further complicated attempts to garner public interest in science, largely because scientists themselves were divided about the "truth" and relevance of Einstein's ideas. As scientists debated and argued about the aspects of the theories, it kept science near the front page, but in confusion and disarray. Most specifically, it emphasized that this was an area of science with no obvious practical application to the

\textsuperscript{32} Ibid., xii.
average person’s life, and made it difficult for people to take or maintain interest in the subject matter.\textsuperscript{34}

As the twentieth century began, germ theory and better understanding of hygiene made diseases more manageable, improved infant mortality and life expectancy, and technological innovations changed work, transportation, and communication. Life was more urban, more demanding, and more challenging. Social, economic, and political factors all conspired, if unintentionally, to create barriers between the world of science/science research and a curious, excited, but easily distracted, public. New, more practical, applications of what science made possible, and what the newly emerging engineering profession was developing, grabbed what attention average people had to give while pursuing the realities of their daily lives. Scientists were caught between their belief that research for its own sake was of great importance, and convincing the public that they had something valuable to offer society. According to Andrew Ede and Lesley B. Cormack, there was always a fine line between the roles of intellectual and technician: "Too far to the technical side and a person will appear to be an artisan and lose their status as an intellectual. Too far to the intellectual side, and a person will have trouble finding support because they have little to offer potential patrons."\textsuperscript{35}

As a world war loomed, then exploded, drawing the United States into the conflict, most people were too worried and too scared to give much thought to issues beyond daily demands and the life and death realities of being at war. If science was on their minds at all, it was most likely because of the new weapons being used—submarines, airplanes, machine


guns, and chemical weapons. Scientists were "both mad and the only sane and rational people on the planet," and "loved by the public as saviors and hated as designers of weapons of mass destruction." Discussions of basic research and peaceful applications did not make it to the front page or the dinner table. Scientists' efforts at popularization waned, and a troubled society hardly noticed.

A key element for the historian who wants to consider this story of popularization of science is to examine more closely the inherent assumption and acceptance of the power imbalance between the scientist and whoever is not a scientist. In Europe and the United States during the late nineteenth century and early twentieth century, education and professionalization solidified the lines defining qualifications. Expertise became increasingly specialized, underlining the gulf between the "experts" and those without the requisite extensive education. According to historian Celia Applegate, the "phenomenon of the expert professional created in its wake that somewhat hapless person of public discourse, the layperson." The resulting dichotomy between scientists and the public potentially inhibited public debate over scientific ideas, especially given the elite body's employment of exclusionary and specialized language that they shared, which remained foreign and often impenetrable to outsiders. According to historian of science Jessica Wang, this divide made philosopher John Dewey increasingly concerned in the 1920s that given the rapid pace of scientific and technological change at the turn of the twentieth century, there was "society, but it is no community." Dewey remained hopeful that the gulf between specialists and a

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general audience could still be bridged, that ordinary Americans could participate
meaningfully in public discourse about ideas if "experts" would actively engage and
communicate with them.38

Historians of science have understood that beyond the question of who has access to
specialized knowledge, it is equally vital to assess how knowledge is or is not transmitted.
James Secord recommended pursuing a reconceptualized history of science where science is
"a form of communicative action."39 He maintained it is the "social nature of knowledge" that
causes it to circulate in society. Beyond just printed materials and written work, scientific
communication includes diverse activities such as talking and note taking in the laboratory or
field, writing research papers, defending research findings within learned societies, advising
on government policy as an expert witness, and teaching students in classrooms and
laboratories. By outlining patterns of dialogue, historians can develop better integrated
pictures of how and where knowledge is achieved and shared.40 Secord advised moving away
from the tendency to focus on individual countries and national styles—a common approach
particularly when positioning the earliest American science as a product and imitator of
much British science.41 Efforts at comparative studies risk reinforcing national boundaries
even as they seek to illuminate the creation or diffusion of knowledge in different locations, a
difficulty reduced by a more global focus.42

40 Ibid., 655, 665.
41 Ibid., 668.
42 Ibid., 669.
In thinking about Secord's conceptions of "knowledge in transit," Jonathan R. Topham further developed questions about how historians can perceive the creation and transmission of specialized knowledge. His answer drew on Secord's observation that over time the concept of "popular science" has developed a lexicon, ideas, ambiguities, complexities, and cast of actors worthy of significant research.43 Topham pointed out that "while there were specific identifiable moments in history at which such notions as 'popular science' began to be used to organize the production and status of knowledge, they were contested from the outset, acquiring multiple meanings and being endlessly reinvented over time." Topham continued, "just as the discourses and practices of 'popular science' came into currency at a historically specific moment, there is no reason why they may not pass out of currency again and become obsolete."44 Topham further developed Secord's idea of transnational studies, not only for comparison but also to gain appreciation for the interconnected nature of "popular science." Such theories have recently attracted particular attention from the research group "Science and Technology in the European Periphery" (STEP), whose perspective describes popularization as "one of the practices of appropriation" that facilitated the dissemination of scientific and technological knowledge in Europe. Scholars working with the STEP focus contend that "popular science" played a significant role in the "discourse of modernity," leading to the "construction of the perception

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44 Ibid., 313.
of a national scientific culture" in "peripheral" countries that was different from the main scientific culture in France, Germany, and Britain.\textsuperscript{45}

James T. Andrews told of a different approach to popularization in \textit{Science for the Masses: The Bolshevik State, Public Science, and the Popular Imagination in Soviet Russia, 1917-1934}. According to Andrews, popularizers in early twentieth century Russia supported broad popular involvement with science, and encouraged public interest and participation. The popularizers themselves reflected a diverse group of scientists, editors, educators, and teachers who "attempted to transgress professional, discursive, social, and class boundaries."\textsuperscript{46} Scientists in Russia eagerly created the environment by which the public could join in the discussion of science's role in society.\textsuperscript{47} Back in the eighteenth century, some Russian scientists had attempted early popularization, largely through popular works on geography; during the nineteenth century, natural history museum exhibits and scientific society lectures largely filled the role of popularizer. By the twentieth century, popular-scientific journals attempted to satisfy the market for information on a variety of scientific topics, including human evolution and astronomy.\textsuperscript{48} During the Soviet era, members of scientific societies realized that cooperating with state institutions allowed them to maintain their independent public identity and keep the state from interfering with their public educational activities.\textsuperscript{49} Popularizers, including scientists themselves, willingly and

\begin{footnotesize}
\textsuperscript{45} Ibid., 314. For further discussion of the extent to which popularization studies have tended to focus on Britain, and the need for greater emphasis on a global approach, see Andreas W. Daum, "Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections," \textit{Isis} 100, No. 2 (Jun. 2009): 319-332, http://www.jstor.org/stable/10.1086/599550.


\textsuperscript{47} Ibid., 7.

\textsuperscript{48} Ibid., 7-8.

\textsuperscript{49} Ibid., 9.
\end{footnotesize}
enthusiastically engaged the public, through lectures, journals, exhibits, and other means, and found support for the efforts in the government. Communist Party journals provided a variety of readers, including professionals, students, and workers, with useful scientific and technological information similar to that published in Western journals. Though popularization activities slowed down in later years, Andrews documented that Soviet culture had a vibrant and active science-popularization environment, during the very same decades that Science Service was trying to reach and engage public readership in the United States.\(^{50}\)

While Andrews and other historians of science have looked at efforts at popularization across a variety of periods and nations, Roger Cooter and Stephen Pumfrey suggest a different perspective, that scholars must consider the equally important and often overlooked failures of communication and forms of resistance to popularization.\(^{51}\) Scientists often policed and emphasized their specialized knowledge to maintain their social status. Historians' acceptance of that knowledge as insulated from non-scientists and the larger public created what Cooter and Pumfrey described as "the notion of its separate sphere."\(^{52}\) Cooter and Pumfrey assert that historians have not paid enough attention to the factors of gender, race, and social class in popular science communication.\(^{53}\) Too often, the two suggest, historians still position science knowledge as attained by elites, then "watered down for popular consumption." Historians then measure "the column inches in the press, the number of mechanics' institutes, or the membership of amateur scientific societies" to document "progress" in popularization, "uncritically assuming that any increase represented

\(^{50}\) Ibid., 170-2.


\(^{52}\) Ibid., 240.

\(^{53}\) Ibid., 244.
greater diffusion, if not greater progress." Ultimately, Cooter and Pumfrey strove to emphasize that science popularization has usually been complicated by the existence of an unequal power relationship between the holders of science knowledge and others.

Within this context of the historiography of science popularization, it is important to remember that Science Service sought to equalize the communication, if not the actual relationships, between scientists and the public. In 1927, Edwin Slosson, the executive editor and director of the recently formed Science Service, described popularization of science information as translation. He noted the speed with which science had developed in several new areas, resulting in specializing scientists moving further away from each other as well as from the general public. The more complicated areas of research had necessitated their own "trade language," which was impossible for the average person to understand and difficult to translate into understandable terms for the layperson. Slosson believed translating science was as essential as translating the language of one country into the language of another—so that one might understand the other—but found it fraught with the same challenges. No two languages fit word for word, and the language of science was no exception. Slosson described the attempt to put scientific terms into ordinary language as "science in round numbers," less exacting than actual scientific references, but conveying the essential meaning and value. As evidence that it was not always possible or desirable to attempt a literal translation, Slosson offered the example of a missionary who attempted to translate the New Testament into the Eskimo language, and who rendered the phrase "The Lamb of God" as "God's Baby Seal." Though technically a true translation, the meaning had been obscured.

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54 Ibid., 248.
55 Ibid., 251, 254.
Slosson contended that scientists "cannot talk unless they hold a piece of chalk in their hand," and challenged them to become willing to help in converting their language into accessible terms. As Slosson observed, "Archimedes could teach a lesson in geometry and Jesus could teach a lesson in ethics by drawing on the sand."56

This was the challenge popularizers faced as they attempted to translate the facts and language of science into understandable and meaningful information for the average person. In this history about the evolution of Science Service during the early twentieth century, it is important to emphasize that the importance of its existence does not lie in simply documenting the number of "column inches in the press" generated by its reporters and editors, or even the number of inches devoted to science news that it inspired in other publications. Instead, the significance of Science Service lies in the way that the organization and its supporters tried to build a broader, firmer foundation for communication and understanding between scientists and the public, by way of the media and other popular forms of outreach.

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CHAPTER 3

Institutional History

The men who founded Science Service in 1921 intended for that organization to add a unique contribution to the nation’s existing scientific societies and research organizations, to complement that professional expertise with a new focus on public outreach. In order to appreciate how the early leaders of Science Service visualized its purpose, it is vital to understand how much American scientists had professionalized and organized over the preceding decades, how much had changed in the growth of scientific work itself, and its increasingly visible role in the economy, government, academia, and modern life. The roots of that change lay in the mid-nineteenth century, which saw the opening of the Smithsonian Institution, an increase in science instruction and activities at small colleges, and public participation in science through lectures and the purchase of science periodicals and texts. National development precipitated more government involvement with science with the opening of new lands for settlement, farming, and resource use. States and other agencies often commissioned special geological surveys. As Sally Gregory Kohlstedt has noted, geological formations are not contained by political and other artificial boundaries, making inter-state cooperation for topographical mapping essential. Not coincidentally, geologists became one of the first sets of science professionals to organize, forming the American Society of Geologists in 1840 (renamed the American Society of Geologists and Naturalists in 1842). With an eye toward the benefits of additional research, more extensive intellectual and material resources, and the potential for advancing their work, the geologists and naturalists broadened their organization into the American Association for the Advancement
of Science (AAAS) in 1848.\textsuperscript{57} The AAAS actively campaigned to extend government support of science, petitioning Congress to ensure that scientists would be part of federal sponsored exploring and surveying expeditions.\textsuperscript{58}

The AAAS grew rapidly; by 1860 it had gained more than 2,000 members and started holding what Kohlstedt termed "gala annual meetings." Those meetings often attracted some press coverage, and AAAS leaders were eager to accommodate journalists.\textsuperscript{59} Late nineteenth-century publications regularly featured articles on science. According to Kohlstedt, the \textit{North American Review} (founded in 1821), \textit{Harper's Monthly Magazine} (1850), and \textit{Popular Monthly} (1876) included science material, as did specialized magazines such as \textit{Scientific American} (1845), and \textit{Popular Science Monthly} (1872). By the late 1800s, expanding AAAS annual meetings offered ever-increasing amounts of material, but reporters complained that it seemed to be becoming even more unintelligible.\textsuperscript{60} As Kohlstedt has noted, this was a time before scientific news services, and there was little successful effort at translating the scientific sessions into material accessible to the public; the quality of science reporting remained a mixed bag of errors and sensationalism.

In 1900, the AAAS began producing its own journal \textit{Science}, intended to offer intellectually dependable coverage of the latest research, targeted more for a professional

\begin{itemize}
\item \textsuperscript{58} Sally Gregory Kohlstedt, et al., \textit{The Establishment of Science in America: 150 Years of the American Association for the Advancement of Science} (New Brunswick: Rutgers University Press, 1999), 29, 31.
\item \textsuperscript{59} Ibid., 15-6.
\item \textsuperscript{60} Ibid., 18, 21. Membership was extended to women beginning with astronomer Maria Mitchell's selection in 1850, and the disabled (a number of deaf scientists), though the organization had no African-American scientists in the nineteenth century.
\end{itemize}
than a general readership. Although the publication experienced early financial difficulties and chaotic management, it survived and solidified its role as the official publication of AAAS. Under the iron-fisted editorship of James McKeen Cattell beginning in the 1890s, *Science* gained the respect of scientists because of its dedication to publishing research results, and helped to create a sense of community among American scientists.

The AAAS itself continued to expand; from its inception, the organization had accepted everyone who had an interest in science, regardless of education or occupation. It welcomed amateur participation, but also gained enough stature to hold sway on matters of concern to established professionals. Chief among the aims of the AAAS was the establishment of standards—for individual credentials, research results, methods, and presentations—which was consistent with efforts to standardize other professions at the time. But during the early twentieth century, as Michael Sokal has documented, the AAAS suffered from bad executive leaders who made poor monetary decisions. With those budget problems, the AAAS often delayed publication of the *Proceedings* from the annual meetings by months, and then included much duplication of material already published in *Science*. Edwin E. Slosson, then a reporter for the *Independent*, with interest and experience in science, was among those who criticized the disjointed nature of the *Proceedings*.

Meanwhile, other organizations had joined AAAS as part of the American scientific community. Chartered by Congress in 1863, the National Academy of Sciences (NAS) was created as an American analogue to the national academies of Great Britain and the European

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62 Ibid., 29, 31.
63 Ibid., 18, 21.
64 Ibid., 63.
Continent, a prestigious and permanent body to provide expert advice to the federal government. Its mandate stipulated that “whenever called upon by any department of the Government,” the Academy would “investigate, examine, experiment, and report upon any subject of science or art.” The NAS was both an honorific and working organization, and in contrast to the AAAS, membership was limited and elite. One of the first government requests was for the Academy to study the feasibility of achieving standardized units of weights, measures, and coins for both domestic and international use. After three years of investigation, an NAS committee recommended that the U.S. adopt the French metric system. Congress enacted legislation that authorized the committee's recommendations, but never mandated a full switch to metric weights and measures. The inch and ounce were established in the public mind, and fast-growing American industries were resistant to change.

Like the AAAS, the NAS was experiencing some difficulties by the turn of the twentieth century. The government had not called on the NAS for assistance as frequently as the organization had hoped. Furthermore, NAS’s 1901 president Alexander Agassiz, son of Louis Agassiz, joined other observers in criticizing the tendency of some members to promote government science rather than counsel it.

Questions about the proper mission for the Academy grew crucial by 1915, as it appeared increasingly likely the United States would enter the Great War and hence needed

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66 Ibid., 172. Despite the ongoing research and recommendations of the NAS, the United States remains the only industrialized country in the world not using the "hard metric system"—or metric only—and instead uses the "soft metric system" where both the traditional and metric measurements are listed. For information on the metric system see the National Institute of Standards and Technology at http://www.nist.gov/index.html, and the NIST's "The United States and the Metric System: A Capsule History" at http://www.nist.gov/pml/wmd/metric/upload/1136a.pdf.
to bring its military up to speed on the latest military-related scientific developments. Given that possibility, the young, energetic NAS member and astrophysicist George Ellery Hale pressed for the Academy to offer its services to the President by formally setting up a research foundation designated for that particular purpose. After President Wilson met with a delegation from the NAS in April 1916, he formally approved creation of a new body, the National Research Council (NRC), with the broad mandate to create a cooperative effort among the "governmental, educational, industrial and other research organizations…[and] the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare."

As a more focused body than the broader NAS and with more authority, the NRC was able to mobilize the country's scientists, foundations, institutions, governmental bureaus, laboratories, and universities for the war effort. Under Hale as its first chairman, the NRC organized special physics conferences to search for solutions to the German U-boat problem and helped develop weather balloons for the Signal Corps' Meteorology Division. NRC efforts helped produce innovations related to the major technological tools of the war—the airplane, the tank, the machine gun, the weapons carrier, and poison gas. The group also arranged to bring a joint scientific mission of French, English, and Italian scientists to the United States to work on war-related research. Through this organized effort, university

68 Ibid., 209, 212.
69 Ibid., 229-30.
laboratories went to work on some of the many scientific challenges of the war: gun defense, high explosives, smoke screens, dyes, wireless telegraphy and telephony, fuel substitutes, submarine detection, materials testing, and pathological and medical problems.\textsuperscript{70}

The wartime multiplication of science-related organizations created some tensions. Many American scientists belonged to both the NAS and the AAAS, whose goals of promoting and securing the position of science were similar. At one point, Hale proposed combining the efforts of the three organizations—the AAAS, NAS, and NRC, but AAAS leaders feared they would be marginalized and ultimately eliminated.\textsuperscript{71} Since plans for such a merger seemed doomed, Hale decided to concentrate on efforts to transform the NRC into a permanent body, which would continue working even after the war ended. He envisioned an organization staffed by members of scientific and technical societies, working to promote international cooperation in science and industrial research. After some wrangling over the authority of the organization, President Wilson signed an executive order in 1918 to continue the NRC as a peacetime organization.\textsuperscript{72}

The NRC quickly thrived, winning a $5 million gift from the Carnegie Corporation for the construction of a building, and $500,000 from the Rockefeller Foundation, the first of many contributions it made, to support research in physics and chemistry.\textsuperscript{73} As the head of the postwar NRC, Hale suggested that the group should maintain scientific research on a continuous basis, so valuable time would not be wasted attempting to marshal resources.

\textsuperscript{72}Ibid., 233-5.
\textsuperscript{73}Ibid., 237, 256-7.
during the "feverish moments of war." He pointed to the hard lessons learned during the recent conflict, when England had been unable to manufacture the special kinds of optical glass for periscopes, gun sights, and field glasses previously imported from Germany, until British scientists rediscovered German methods for themselves.74

This, then, was the foundation of the American scientific community after World War I, with organizations that occasionally conflicted over institutional jurisdiction, but more commonly shared a deep commitment to promoting science for national well-being. This tight and overlapping community of leaders recognized that while the NRC, NAS, and AAAS each had their strengths, postwar American science also faced larger challenges—in particular, cultivating greater national appreciation of science and better communication between scientists and the public. Hale wrote in 1919 that while the American public displayed an “unquestioned” interest in science, people too often preferred sensational discoveries, even if little supporting evidence existed. Hale complained about the appearance of "pseudo-scientific journals" dispensing "nonsense in the guise of science," and worried that "charlatans" making unfounded claims on behalf of science had even been able to attain funding from Congress.75 Entomologist Vernon Kellogg, Permanent Secretary of the NRC from 1920 to 1931, declared that what the country needed was "a wider recognition, an increased social evaluation of the place of scientific research in our national life."76

This desire for greater recognition of the role of science in war, peace, and daily life was at the heart of Science Service's goals. Consequently, in 1920, the AAAS, the NAS, and

75 Ibid., 5.
the NRC joined together to support and sponsor the creation of Science Service, a new institution to promote public understanding and appreciation of research. It was no coincidence that the first members of the Science Service board of trustees included representatives from all three other groups—Hale from the NAS, physicist Robert Millikan from the NRC, and botanist Daniel MacDougal from the AAAS; Kellogg became vice-president. The NRC also provided office space for Science Service until the organization could acquire its own quarters.77 The support of these institutions was critical in establishing and sustaining Science Service.

After the end of World War I, members of the general public were understandably occupied with getting their lives back to normal, in a never-quite-the-same-again way, given what the world had experienced. For the average American, regardless of whatever grand discoveries or inventions, or the improvements science had brought to daily life, such knowledge had not had the power to prevent the devastating loss of life associated with either the war or the influenza pandemic of 1918-19. Millions of people worldwide, both civilians and military personnel, many of them young and healthy, succumbed to the terrifyingly rapid effects of the infection.

Likewise, though the Allies won the war, in the conflict both sides developed and used devastating new weapons. Machine guns, flamethrowers, poison gas, military airplanes, tanks, and submarines were just some of the innovations that racked up casualties on the battlefield and produced terrifying reports in the newspapers. The shocking new efficiency of killing people had not been one of the benefits of scientific research that pre-war advocates

had generally praised. As historian Daniel J. Kevles has pointed out, the devastation of World War I led many people to condemn the destructiveness of modern technology, the "dehumanizing effects of the machine" that made the slaughter of other human beings more impersonal; transformed assembly-line workers into part of a larger industrial machine; and left cities polluted with the "blight of urban technological civilization."  

Still, postwar scientists believed there were far more positive aspects to research and innovation that the public should hear about and appreciate. Advances in the biological understanding of disease and knowledge of hygiene had brought early twentieth-century Americans tangible benefits in health and in reduced infant mortality. As Andrew Ede and Lesley Cormack have written, the war introduced incredible, though fearsome, new uses for science, and "brought the utility of science to the forefront."  

The American war effort had mobilized academic institutions, scientific societies, and scientists; in fact, the newly formed National Research Council had more scientific volunteers available than tasks to assign. Wartime assigned new urgency to research, but also special constraints. According to Kevles, American civilian scientists had been willing to accept secrecy as a condition of their work during the war, but were less willing to be so secretive after. American scientists were also troubled by observing the way that oppressive and intimidating political conditions overseas had devastated European scientists' ability to pursue and share their research. Scientists in wartime Europe also feared the loss of

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81 Ibid., 148.
information through physical destruction of materials, notes, and records. For American scientists, wartime represented a powerful threat to national and international exchange and professional freedom. As they entered the post-war period, many American scientists were more convinced than ever that the only environment in which science research could truly flourish was a democracy.82

The Background for Science Service

Those concerns, about creating a postwar American democracy that welcomed and supported scientific and technological progress, were what ultimately inspired creation of Science Service. The aim was to disseminate accurate, positive news of research and innovation to a large audience, taking advantage of scientists’ willingness to share their work and the reach of the mass-circulation press of the early 1920s. Following that aim, Edward Willis Scripps and William Emerson Ritter became partners in an endeavor to bring news of science to the general public on a consistent and credible basis, in order to create a constituency who would value, demand, and protect science research and information as their due in a democratic society.

Edward W. Scripps was born on a farm in Illinois in 1854, and was the youngest of thirteen children. His family became involved in the newspaper business, and by the time he was twenty-four in 1878, Scripps had started his own paper, the Cleveland Penny Press, with $10,000 he borrowed from his brother and sister. Within ten years he owned papers in St. Louis and Cincinnati as well, and along with his brother and another investor, formed the Scripps-McRae League of Newspapers in 1894. This gave him controlling interest in thirty-

82 Ibid., 141, 152, 287.
four newspapers in fifteen states. In the early 1890s, with his newspaper properties under the management of his partner Milton McRae, Scripps withdrew from the daily management of the papers to concentrate on developing his ranch, Miramar, near San Diego, California. By the end of the decade, with the ranch completed, Scripps became re-involved in the management of his papers.83

Scripps had definite ideas about the role of a popular press in a democracy, and about a publisher’s ethical obligations to readers. He had long contended that big business was corrupting the American press, and Scripps did not trust big advertisers, such as department stores. In 1903, the manager of Seattle’s Bon Marché department store demanded the right to censor potentially embarrassing articles about lawsuits against the store in Scripps’s Seattle Star. The editor of the Star refused and the store withdrew its advertising. Scripps reportedly was pleased with the outcome, citing the example as evidence of the position he had long maintained—"I recognize the advertiser as the enemy of the newspaper."84 Refusing to become dependent on big advertisers, or subject to their influence, Scripps tried to restrict the amounts and types of advertising that appeared in his newspapers. For instance, he instituted a policy forbidding his editors from accepting patent medicine advertising, which at the time represented a significant potential source of income for a newspaper. This position limited his papers' competitive position and kept them limited to a role as small players in most media markets.85 But Scripps's philosophy reflected his concern about the larger role of the

84 Ibid., 89.
85 Ibid., 89-90. Though Scripps wielded great influence over his papers, editors maintained some level of autonomy when it came to accepting advertising. Scripps paid notoriously low wages, and editors could augment their salaries with dividends from increased revenue. That revenue was more easily gained through advertising than increased circulation. While some editors tried to convince Scripps that readers liked
press in a democracy; he worried that most newspapers were either owned or influenced by millionaires, thereby reflecting the views of the elite rather than the common citizen. According to Scripps, "there is no room in any democracy for what might be called an endowed or subsidized press."  

But Scripps also understood the practical side of his publishing business. In 1902, Scripps founded the Newspaper Enterprise Association (NEA), which was the first newspaper syndicate to supply a full range of materials to subscribing newspapers, including feature stories, illustrations, and cartoons. His goal was to generate inexpensive newspaper content that all of his papers could use, and to facilitate expansion of his syndicate. He then joined with other investors to create United Press International (UPI) in 1907 with the expressed intent of providing competition for the Associated Press (AP).  

Scripps positioned himself as a voice for the average working-class reader, and believed his newspapers should be accessible to, and understandable by, the majority of society, whom he referred to as "the 95%, namely the working man and the poor and unfortunate." He considered his newspapers as a schoolroom for working people who otherwise lacked the wealth and "native intelligence" that would make them equals with other, more fortunate people. His papers supported organized labor, reform efforts for safer food and streetcars, and improved working conditions. Scripps identified with the average advertising, and that by rejecting department stores the newspapers were losing readers, Scripps remained convinced that editorial integrity and advertising could not co-exist, 99-100. Also see Michael Schudson, Discovering the News: A Social History of American Newspapers (New York: Basic Books, 1978) for a discussion of advertising in late nineteenth and early twentieth century newspapers.  


working-class person. He had humble roots, he distrusted the wealthy and powerful, and he believed the common person deserved a voice in society. These also were the same people who bought his papers and helped him amass his publishing empire.\textsuperscript{89} Scripps claimed his goal was to make the world a better place to live in, by using the best tool, the "almost invincible power and force of the daily press."\textsuperscript{90}

Scripps eventually gained a very wide audience for his many newspaper endeavors. He trained young editors through a franchise model he developed for the newspaper business, keeping a partial interest in the most successful ones. According to some estimates, almost seventy percent of the voting population had access to Scripps media by the election of 1912.\textsuperscript{91}

As residents of the San Diego area, Scripps and his sister, Ellen Browning Scripps, became aware of efforts around the turn of the century to establish a marine biological station in the area. In backing that effort, Scripps met William Emerson Ritter, a fellow farm boy from Wisconsin. Ritter always had a keen interest in nature and animal life, and he developed that interest into a long, important, and rewarding career as a scientist. He taught school for a few years as a young man in Wisconsin, became a member of the biology department at the University of California in 1891, and received his Ph. D in zoology at Harvard in 1893. By 1903, he had been promoted to full professor and then chair of the zoology department at the University of California. As the first teacher of laboratory zoology on the American Pacific coast, Ritter also founded and edited the university's publications on zoology. He was elected

president of the California Academy of Sciences, which he helped reorganize, and took part in various scientific expeditions, including the 1899 Harriman Expedition to Alaska where he shared a tent with the naturalist John Muir.

Ritter’s research interests centered around fish and tunicates, or sac-like filter feeders that live in the ocean. Beginning in 1892, he conducted seaside laboratories almost every summer along the Pacific Coast, teaching students to study these and other animals in their natural environments. Ritter worked out of a portable wood and canvas structure, using equipment borrowed from the school. An early attempt to raise $20,000 from the area’s leading businessmen to build a permanent facility fell miserably short of the goal. Dr. Fred Baker, a local physician with an interest in conchology (seashells), believed that the San Diego area was the best location for a permanent marine station. He introduced Ritter to E.W. Scripps and his sister, Ellen, and together they and others formed the Marine Biological Association of San Diego in 1903. E.W. and Ellen Scripps were early financial contributors and members of the board of the organization, and soon became the sole monetary patrons of the effort.

The city of San Diego owned large parcels of land left over from its earlier days as part of the Mexican regime before becoming the state of California. E.W. Scripps convinced

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the city to turn one of the tracts over to the Marine Biological Association for just $1000, and the city agreed. Ellen Scripps donated $10,000 to build a roadway through the property in 1905, plus $50,000 for permanent buildings, plus funds to hire Ritter as the new research institute’s permanent director starting in 1909. In 1925, the Marine Biological Association was renamed the Scripps Institution for Oceanography.

Scripps and Ritter became good friends and the two men, though different in temperament and lifestyle, shared a common interest in understanding human beings, from the basic scientific level of how humans function, to their choices and actions as reflected in public affairs. Frank Thone, whom Scripps hired to be Ritter's scientific secretary in 1914, later described both Scripps and Ritter as "idealists" and "inquirers." Thone remembered that the two men were "earnestly seeking the truth, and both were believers that the truth, science, would set men free, if men could only come to know the truth." Ritter opened the world of scientific inquiry to Scripps. Scripps supported Ritter’s interest in marine science, but he ultimately wanted to analyze human society, rather than sea life. According to historian Oliver Knight, Scripps wanted Ritter’s science to explain, "what kind of thing this damned human animal is," a quest that changed the nature of Ritter's work over the years.

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95 Wm. E. Ritter, *The Marine Biological Station of San Diego: Its History, Present Conditions, Achievements, and Aims*, (Berkeley: University of California Publications, 1912): 160-3, http://babel.hathitrust.org/cgi/pt?id=uc1.31822029732385;seq=1;view=1up. For additional information contained in reports to the University of California at the time of the establishment of what became the Scripps Institution for Oceanography, see *Biennial Report of the President of the University on Behalf of the Regents to His Excellency the Governor of the State, 1904-1906* (Berkeley: The University Press, 1906), http://scilib.ucsd.edu/sio/annual/sio_1904-1906.pdf; and *Biennial Report of the President of the University on Behalf of the Regents to His Excellency the Governor of the State, 1908-1910* (Berkeley: The University Press, 1910) http://scilib.ucsd.edu/sio/annual/sio_1908-1910.pdf. Through an agreement with the University of California, Ritter returned to the school to teach one or more brief, concentrated courses each year, and the university paid one-third of his salary while the marine station paid the other two-thirds.


97 Oliver Knight, *I Protest: Selected Disquisitions of E.W. Scripps* (Madison: The University of
interest in investigating and improving twentieth-century Americans and their democracy
was the vision that ultimately led to the creation of Science Service.98

Science Service Founded

In November of 1919, Scripps established an organization called the American
Society for the Dissemination of Science, which was the seed from which Science Service
grew. The organization's by-laws laid out guidelines and restrictions, many of which were
later copied by Science Service, while some were not. The American Society for the
Dissemination of Science was to be made up exclusively of men of science, at least ten
chosen by Scripps himself, with an elected layman journalist on staff only to supervise the
suitability of science articles for publication. Scripps did not even envision a rented office for
the organization. This was a different structure from what evolved for Science Service. But in
setting out the purpose of this new American Society for the Dissemination of Science,
Scripps articulated the same philosophy that would later define Science Service —an
emphasis on creating a more scientific attitude in the public. His new group aimed to appeal
to people's curiosity, to present the facts of science with "astonishment and wonder and awe,"
to "exert a ruralizing influence" on the public by stressing natural laws and the "secrets of
nature," and to address the needs of civilization caused by increasing population, limited
resources, and the responsibility of industry and science to produce and distribute supplies to
meet those needs.99
In creating the American Society for the Dissemination of Science, Scripps wanted to set up an "institution for popular education in science through the daily press." As he envisioned it, this organization would promote the writing and distribution of news stories about the latest scientific discoveries. Scripps, who had long advocated that the daily news should be written so the average person could understand it, believed the same should be possible regarding news of science. In a 1926 public address, after Scripps had died, Ritter reflected on what had made his friend so determined to make science news available to the public. Ritter explained:

> It is useless, Mr. Scripps often said, to think of making the world safe for democracy without thinking also of making democracy safe for itself; and the only possible way of making democracy thus safe is to make it more intelligent. But since to be intelligent is utterly impossible without having much of the knowledge, the method, and the spirit of science, the only way to make democracy safe is to make it more scientific.

According to Ritter, Scripps, who was largely educated by his sister, came to the study of science and philosophy later but believed the basic principles of these disciplines were important enough that they guided his business practices as well. He saw all endeavors as having human welfare at the core, and was convinced that science and business journalism could work in cooperation. Scripps saw that many newspapers spread incorrect information, and some of it was about science. This, Scripps thought, created a common interest for the

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two fields of endeavor. Both sought the truth about human concerns and could share the goal of expressing that truth in language that those affected could understand.  

Ritter went on to say that Scripps thought of daily newspapers as "educational agencies" as much as schools were. For that reason, he envisioned his new agency as a tool that, "because of its complete organic independence of his own and all other newspapers, would make it possible for scientific men the more effectually to utilize the newspapers for making actual their great latent powers of good for the public at large."  

Scripps, as the major backer of the American Society for the Dissemination of Science, made clear his belief that an organization for promoting popular knowledge of science should be not-for-profit, but should be self-supporting. Writers should be compensated for their work to generate articles and stories from science information, and newspapers that wanted to print those articles should pay a reasonable price, but no individual should be compensated for any other reason than services performed in pursuit of the organization's goals.  

Scripps also declared that scientists should be the ones to create and operate the organization since it was science that was at the heart of the idea. Others could have input, but any chances for success depended on professional scientists being actively involved in working with and for the organization's goals. Particularly after World War I had given scientists valuable experience in cooperating with outsiders (government and military officials, for example) Scripps and Ritter believed that many in the scientific community had

103 Ibid., 202.
now grown better at communicating with non-scientists and more willing to support efforts to share new research with the public. For that reason, the two men hoped, many scientists would support his call for dissemination of science through better coverage in the news media, as long as scientists were assured they could maintain control over their discipline and their intellectual products. In Scripps’s ideal vision, the cooperative efforts between scientists and journalists would foster mutual trust; the venture should counter journalists’ impression of scientists as self-serving, and counter scientists’ view of journalists as irresponsibly interested only in the sensational.105

In order to make sure that members of the American scientific community would be willing to listen to and cooperate with a new organization to promote popularization of science information, Ritter set out across the country to talk to as many of the nation's scientists as he could during the winter of 1919-1920. He had reason to be hopeful, because leading members of the National Research Council, the American Association for the Advancement of Science, and the National Academy of Sciences had been discussing the possibility and viability of producing a popular science journal of their own. In the end, key members of these professional societies resisted the idea, and plans for a journal were never finalized.106 Scripps was unaware of these earlier efforts at a journal when he formed the American Society for the Dissemination of Science, but this history does suggest that at least some prominent scientists of the era were aware of the value of outreach and potentially willing to participate in popularization efforts. Ritter held individual and group interviews

with almost 300 scientists at the chief centers of scientific research in the United States, exploring their receptivity to Scripps’s planned organization. He concluded that fully 50 percent of the men interviewed were "unqualifiedly favorable" to the idea and were willing to help in the ways that they could. Another 45 percent seemed "hesitant," Ritter concluded; those scientists agreed with the premise of dissemination, but thought it possibly too difficult an undertaking. The remaining five percent were "positively hostile" to the idea, because they either did not think it could be successful, or they thought any success in attempting to popularize science would ultimately be either useless or possibly harmful.\textsuperscript{107}

Even while a substantial number of scientists expressed a favorable attitude toward the plan Scripps and Ritter were proposing, the majority stated that no new organization should be founded for the purpose. Though the country had no centralized science entity, there were federal scientific bureaus, state scientific commissions, a few industrial laboratories, museums, and educational and philanthropic research institutions. Scientists were not particularly motivated to create yet another agency.\textsuperscript{108} They generally felt that there was already excessive organization in the science field, and that the purpose of science dissemination could best be served through the work of a smaller group of men representing the already established organizations. Scripps and Ritter rejected that alternative proposal; they feared that even with only one representative chosen from all the science organizations in the country, the group would still be too large and unwieldy for success. Scripps and Ritter decided to move ahead by determining which groups were the largest and most inclusive of

\textsuperscript{107} William E. Ritter, "Science for the Millions," 1921, SIA RU7091, Box 1, Folder 6, n.p.
the many different research interests in the country, and were also most predisposed to the goal of public service, and work within their structure somehow.  

Work began on resolving the organizational issues, and Scripps and Ritter convened several conferences in the spring, summer, and fall of 1920. Groups of scientists and journalists came to two meetings at Scripps's house in California and two in Washington, DC. Ultimately, they determined that the AAAS and the NRC were best suited to provide a framework within which the new organization could work, but journalists should also have significant involvement since the goal was to communicate scientific ideas through the newspapers. After reaching that conclusion, Scripps and Ritter agreed to dissolve the American Society for the Dissemination of Science on March 18, 1920. In its place, they formally created Science Service, as the vehicle for pursuing the scientists' and journalists' goals.

From these preliminary meetings the men arrived at two conclusions. One was that while the primary and major goal would be to get science news in the daily papers, the organization did not have to limit itself to that medium only. Other opportunities might emerge—recordings, radio, lectures, and other venues they could not yet imagine or project. An organization with philosophical and organizational flexibility and foresight could ideally take advantage of such developing possibilities. The other conclusion was that they wanted to limit the science subjects under consideration to the natural and physical sciences. In other words, they intended to exclude the humanistic sciences of sociology, psychology, and

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110 Ibid.
anthropology because as Ritter explained, these fields involved "passionate controversy," and because the concept of "demonstrable evidence" was difficult to apply to them.\footnote{William E. Ritter, "Science for the Millions," 1921, SIA RU7091, Box 1, Folder 6, n.p.}

Science Service began by forming a provisional organization of six. That core included William Ritter, Edward Scripps, and his son Robert Scripps. The other three members were some of the most influential men of science in the country: George Ellery Hale from the National Academy of Sciences, Daniel T. MacDougal of the American Association for the Advancement of Science, and Robert A. Millikan from The National Research Council. In turn, those three scientists asked each of the foundation organizations with whom they were affiliated to nominate an additional two men, to bring the total of scientists connected initially with Science Service to nine. The Scripps estate added three representatives, and the field of journalism also had three.\footnote{Ibid.} That initial board was set to begin the first steps for Science Service to define its structure and purpose, which meant finding the proper personnel. Scripps endowed the organization with $500,000 plus $30,000 a year until the organization became self-supporting. With the board of trustees set, Science Service opened for business on January 1, 1921. Vernon Kellogg, Permanent Secretary of the National Research Council, was a key supporter of Science Service from the start, and he arranged for it to begin by working out of a small office in the NRC headquarters in Washington, DC.\footnote{Oliver Knight, I Protest: Selected Disquisitions of E.W. Scripps (Madison: The University of Wisconsin Press, 1966), 728.}
Establishing Science Service Operations

Science Service, with its plans for a cooperative effort between scientists and journalists, was set to begin the most elementary of operations at the beginning of 1921. The new organization already had some claim to status, thanks to its endorsements from established science organizations and the impressive office address at the National Research Council. But through its early operations, Science Service would need to earn credibility in the newly developed and evolving genre of science journalism, then be vigilant about guarding it. The practical, philosophical, and ethical challenge of their effort was to learn to inspire readers’ excitement about science without sacrificing accurate reporting; science news stories had to emphasize saliency without resorting to sensationalism. The two men who helped Science Service navigate this challenge in the 1920s were Edwin E. Slosson and Watson Davis. Under their guidance, the organization began to find its moorings, and set the tone for the new field of science news.

Scripps and Ritter chose Slosson as the man who had exactly what they wanted to set Science Service on its new path, a personal combination of journalistic experience and scientific ideals. Slosson was born in Albany, Kansas in 1865, and went on to earn his Bachelor of Science Degree in 1890 and his Master of Science in 1892 from the University of Kansas. He then took a position as an assistant professor of chemistry at the University of Wyoming, where he stayed for the next thirteen years. In addition to his teaching responsibilities, Slosson served as the State Chemist at the Wyoming Agricultural Experiment Station. He continued his studies in organic chemistry and received his doctorate from the University of Chicago in 1902. Shortly after finishing that degree, he spent the summer writing articles for the Congregationalist journal the Independent in New York City.
Slosson then accepted a full-time position as the Literary Editor at the *Independent*, and moved to New York City.115

During his seventeen years at the *Independent*, Slosson wrote articles of his own on a wide range of scientific and other topics, as well as editing others' work. He published articles on the "Great American Universities" in 1910, which were not always flattering pieces.116 He published his two-part series of interviews with leading intellectuals of the day, *Major Prophets of Today* in 1914, and *Six Major Prophets* in 1917.117 Drawing on his background in chemistry, Slosson in 1919 completed his most successful book, the bestseller *Creative Chemistry: Descriptive of Recent Achievements in the Chemical Industries*. As his introduction explained, the book had originated in a series of articles prepared for the *Independent*, intended to familiarize general readers with industrial chemistry, as well as to provide supplemental material for high school and college chemistry students. In this book, Slosson described human evolution as "three periods of progress": the Appropriative Period, when man is a savage and discovers things around him; the Adaptive Period, when man is a barbarian but improves what he finds; and the Creative Period, marked by the civilized man who invents what he needs. Simplified, "The first finds. The second fashions. The third fabricates."118 Chemistry was a product of the creative stages of man, according to Slosson, and different from the natural and historical sciences in that chemical sciences control their

subject. This ability to "manifest in actuality" what chemists dreamed of was "comparable to that of art itself."\footnote{119}

In *Creative Chemistry*, Slosson addressed a number of subjects in simple and direct language, the same style that would later become one of Science Service's greatest strengths in its publications. In discussing soil conditions, he described the Great War as one that "not only starved people: it starved the land." In speaking of the dawn of synthetic substances, whereby man could now create many of the products he desired, Slosson said, "the man of science has signed a declaration of independence of the lower world and we are now in the midst of the revolution." In discussing the "race for rubber" production, Slosson drew on analogies from theology, business, children playing with their toys, Herbert Spencer's "dissolution of definite coherent heterogeneity into indefinite incoherent homogeneity," and Mother Goose's fable of Humpty Dumpty, to arrive at the dictum: "It is easier to smash up than to build up."\footnote{120} The accessible nature of Slosson's writings earned *Creative Chemistry* a place on the Washington Academy of Science's 1929 list of the top 100 science books considered "attractive to the general reader and at the same time authoritative and modern in their treatment of the subject."\footnote{121}

Slosson also taught a course in physical science for journalism majors at the Pulitzer School of Journalism at Columbia University from 1912 to 1920. Here again he was able to combine his knowledge and experience of chemistry with his other passion, writing about science and other topics. In the years before World War I, this journalism school curriculum

\footnote{119} Ibid., 3.  
\footnote{120} Ibid., 22, 57, 87.  
required students to take a first-year course in the principles and results of modern science. Slosson taught the first part of the course, chemistry and physics, while another instructor taught biology. The course "offered a difficult problem of instruction," according to school director John W. Cunliffe, presumably because many, if not most, of the students were non-science majors, but Cunliffe maintained it was so successful that other colleges had replicated the idea. When the curriculum was reorganized, Slosson created a new course, "The Modern World," which dealt with the commercial resources and industrial organization associated with modern scientific discoveries.\footnote{Columbia University, \textit{Annual Report of the President to the Trustees, With Accompanying Documents} (New York: Columbia College, 1921).} It was Slosson's experience and interest in teaching others how to combine science and journalism that convinced Scripps and Ritter that Slosson was the man to take the job of editor at Science Service. More than that, the fact that Columbia University's journalism program required future writers to take courses in science suggests that at least some in the journalism community before and after World War I agreed with the philosophy of Scripps, Ritter, and Slosson, that writers should be able to understand and explain important discoveries to their readers, cultivating that latent interest in science as an essential part of the modern world.

In establishing Science Service, Scripps and Ritter had to decide how to structure its daily operations. The board of directors disagreed over whether to give one person full control as managing editor, complete with the authority and responsibilities of that position, or whether to divide the functions of the principal staff writer and the business manager.
between two different people.123 Before accepting the new job, for his part, Slosson wanted clarification about this division of responsibilities. In fall, 1920, Slosson traveled to California, where he apparently met with at least Ritter to discuss the possible Science Service job. Writing to Ritter after returning home, Slosson emphasized that he was "more interested in the popularization of science than in anything else in the world and that I expected, if possible, to devote the rest of my writing life to that work through whatever channels were open to me." It was because of that desire, Slosson said, that he "dreaded to become absorbed in the details of business management" if he took the editor’s job with Science Service. Slosson felt confident that he could handle the editorial aspects—writing, procuring, and preparing articles. But he favored a division of work that would leave responsibility for the marketing details to another staff member.124

In early December 1920, Ritter responded to Slosson, who was still associate editor at the Independent, telling him that with most of the initial framework in place for the organization, board members unanimously agreed that they must have Slosson as part of Science Service in some capacity. Ritter queried Slosson more explicitly as to the division of labor and responsibilities that he envisioned.125 Slosson responded that what he had in mind was the same division of responsibilities common in most areas of publishing, and sketched the details of it for Ritter. Slosson also expressed his hope that he had not given the impression that he was lazy and wanted to "sit in an easy chair watching the wheels go around." Instead, Slosson said, he simply wanted to concentrate on the work for which he felt

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123 Vernon Kellogg, National Research Council, letter to Edwin E. Slosson, December 10, 1920, SIA RU7091, Box 1, Folder 2.
125 Edwin E. Slosson, letter to Vernon Kellogg, December 8, 1920, SIA RU7091, Box 1, Folder 2.
himself best suited. While Scripps was providing the initial financial support for Science Service, Scripps also believed that the organization could soon become financially stable and self-supporting. Slosson worried that he did not have enough experience in the business side of journalism to make it happen. He was "much disposed to accept" the editorial job, providing that Science Service hired a separate business and publicity manager. Slosson stated, "I do not care whether I boss him or he bosses me—if he's a good boss."\footnote{Edwin E. Slosson, letter to William E. Ritter, December 6, 1920, SIA RU7091, Box 1, Folder 2.}

On December 10, 1920, James McKeen Cattell, Science Service trustee, editor of Science and Scientific Monthly, and the first professor of psychology in the United States, well known for his "mental tests," administered an intelligence test to Slosson. It was an interesting step, given that Slosson held a doctorate in chemistry and had been editor at the Independent for more than a decade and a half. Perhaps it was the board's acknowledgment of Cattell's professional passion, or perhaps indicative of the emerging climate of the expert and standardization in various fields. Whatever the impulse, Slosson mentioned it in a letter to Vernon Kellogg, saying it took about an hour and he did not know if he had passed.\footnote{Edwin E. Slosson, letter to Vernon Kellogg, December 13, 1920, SIA RU7091, Box 1, Folder 2.}

One element of the examination was a request for Slosson to draw up a budget for Science Service on the spur of the moment. He was able to produce what he considered a reasonable estimate, based on his knowledge of the expenses for both the Foreign Press Service and the Independent, though he acknowledged that not knowing how many articles they could actually place with the press made estimates difficult. Slosson indicated his preference was that they put out "two widely syndicated articles of five hundred or a thousand words a week, each well worked out and of real literary quality rather than to
handle twenty-five thousand words of re-write material." For seventeen years he had written three to five thousand words a week, as well as reading and editing approximately ten to fifteen thousand more, and he felt that he could do even better work if he did not have to do so much writing.128

Finally, on January 4, 1921, the Executive Committee met in the office of the National Research Council and officially voted to appoint Dr. Slosson as Secretary of the Committee as well as the Editor of Science Service at a salary of $7500 a year, beginning January 1, 1921. Soon after that, the Executive Committee appointed Howard Wheeler, former editor of the San Francisco Daily News, as the business manager to handle the finances and manage the day-to-day office matters.129

The first public announcement of the new organization appeared in Science, the official journal of AAAS, on April 8, 1921, and also was distributed to one hundred twenty-five representatives of newspapers and press associations. Written by Slosson, the article began by asserting that citizens in a democracy need to understand the "aims and achievements of modern science" not just because of the knowledge to be gained, but also because "research directly or indirectly depends upon popular appreciation of its methods." It was not enough to learn something about science in elementary school—learning needed to also be part of adult life as well. Slosson presented Science Service as a sort of "liaison officer between scientific circles and the outside world." Slosson vowed that the organization would not be under the influence of any clique, class, or commercial interest, and would not

128 Edwin E. Slosson, letter to Vernon Kellogg, December 13, 1920, SIA RU7091, Box 1, Folder 2. Slosson projected a possible budget in "Tentative Estimate of Outfit and One Year's Expenses," n.d. SIA RU7091, Box 1, Folder 2.
129 Science Service, "Minutes of the Executive Committee of Science Service," n. d., SIA RU7091, Box 1, Folder 3.
favor any one science organization over others but would instead act to serve all the sciences. He also made an appeal for correspondents, particularly young men and women in the various sciences who wanted to learn to write popular science articles.\(^{130}\)

In its initial press releases, Science Service sought to define and publicize its purpose and also its broader philosophy that improved science journalism would bring value to many Americans. That message, that Science Service aimed to serve multiple communities at once, came through in the heading of another bulletin, an "Informal Prospectus Which It Is Hoped Will Be of More Than Ordinary Interest to Scientists, Institutions of Research, Educational Institutions, Writers, Editors, Reporters, Publishers." That article stressed that the Great War had exacerbated the nation’s longstanding serious need for an agency to spearhead the "intelligent application of American journalistic methods to the mounting fund of scientific knowledge." The piece bemoaned the problem that while the scientist was an explorer who relished the "romance" of his work, "tales of his adventures into the unknown, dramatic as they are, seldom find their way into print." Because scientists themselves did not have the time or the training to explain their discoveries in a form the average reader could understand, Americans were just beginning to perceive how innovations brought "new comforts, new security, better health, and increased happiness" into the home, office, and factory. Science Service proclaimed its goal of bringing the every-day man and the scientist together, to lead average Americans to gratefully acknowledge the ways that both pure and applied research had made modern lives better.\(^{131}\)


In order to actually bring science stories to newspapers, Science Service needed writers and more editorial help. A key early staff member was Watson Davis, who later claimed to have been on the front steps waiting to be hired the day Science Service opened for business in 1921. Davis had a science background, including a civil engineering degree from George Washington University, with work experience testing concrete used in American ships for the National Bureau of Standards. He also had experience as a science writer for the *Washington Herald*, where he originated a science column, "What's New in Science." In early January 1921 Slosson met with Davis and suggested that Davis make a list of subjects he felt qualified to pursue, as well as story suggestions. His list included a wide variety of topics, including "civil engineering, building materials, geology, mineralogy, paleontology, ceramics, architecture, and chemistry," the last being assisted by his wife, Helen Miles Davis, who had a Bachelor of Science degree in chemistry.\(^{132}\) Davis clearly had experience both in science and in science writing, but historian Marcel LaFollette has suggested that Slosson had reservations about hiring Davis because Slosson believed that only currently-active scientists could adequately interpret science information for the public. While Davis had an engineering degree, he was not considered a scientist in the same sense as the scientists on the board of trustees who were making the decision. Because of these reservations, Slosson originally hired Davis part-time; for the next year and a half, Davis juggled his continuing full-time job at the National Bureau of Standards with editing and writing articles for Science Service.\(^{133}\)


Through its first months of work in 1921, Science Service had the advantage of ongoing support from national science organizations such as the AAAS, the NRC, and the NAS. Prestigious researchers such as George Ellery Hale and Robert Millikan dedicated time to serving on the Science Service board of trustees. Those men specialized in the physical and biological sciences, a fact that drew some criticism from engineers—and Ritter expected to get the same from medical men—who objected that their field was not represented on the board. Nevertheless, Ritter still felt the group had been wise in limiting its leadership roles to men from science, rather than technology or medicine, since the challenges and needs there were sizable. Looking over the nation’s scientific community in 1921, Ritter recognized that the multiplication of science-related organizations had created some tensions. He hoped that Science Service could help promote stronger relationships and better communication between different official and professional groups of scientists, such as the AAAS and the NAS. Science Service could then improve how those different groups interacted with the public, especially on disseminating information about science research.

Looking over the state of American science in 1921, Ritter saw a seeming consensus among leaders of the scientific community that the nation needed new efforts to cultivate public understanding and appreciation of research. It was this shared philosophy that made Ritter more convinced than ever that what they were trying to achieve with Science Service was of great importance. He described it as a "seedling institution of popular education quite without a counterpart in its conception." Ritter believed that most open and alert-minded men

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134 William E. Ritter, Notice of first trustees meeting, May 10, 1921, SIA RU7091, Box 1, Folder 3.
135 The trust was formally established on July 22, 1921, and Science Service was incorporated as a not-for-profit organization in Delaware on November 1, 1921. Smithsonian Institution Archives website for the Science Service collection RU7091, http://www.societyforscience.org/history.
136 William E. Ritter, letter to E.W. Scripps, May 13, 1921, SIA RU7091, Box 1, Folder 3.
of science would agree that the progress, and possibly the very existence, of American
democracy was hanging in the balance, that increased dissemination of science information
was essential to avert a dangerous decline in the stability of the United States. Ritter believed
"that unless far reaching modifications in our national life are brought about, the peak of our
growth and prosperity is reached, and from now on we shall be sliding down, perhaps very
gradually, the other side of the curve." He said, "We know for a certainty that a considerable
number of men of science believe that something similar to Science Service is absolutely
necessary as one means for accomplishing the results desired." Ritter did not specify any
precise signs that concerned him enough to question the country's equilibrium; however,
1921 was a recession year and many of the new businesses started just after the war were
failing. Unemployment was high, with 4,750,000 people out of work, and national income
had declined 28 percent from the previous year. Ritter may also have been thinking about
lingering unease over the war, with its threats to scientific research and exchange, and the
difficulties in gathering and harnessing the country's scientific resources.

Although Ritter's passionate conviction that Science Service could save America
remained high, he also was aware of impediments to the organization's progress. With the
1921 recession, general business conditions were unfavorable for all kinds of endeavors,
including both Science Service and the wider publishing industry it aimed to serve. But aside
from the immediate economic depression, Ritter worried about what he saw as a much bigger
long-term obstacle, the problem of attempting to educate a huge population about the future

137 William E. Ritter, letter to E.W. Scripps, May 13, 1921, SIA RU7091, Box 1, Folder 3.
138 Jonathan P. Hughes and Louis P. Cain, American Economic History, Fourth Edition (New York:
139 David A. Shannon, Between the Wars: America, 1919-1941 (Boston: Houghton Mifflin, 1979), 95.
benefits of science when most people did not find dry research reports interesting or relevant to their present lives. Pure research particularly was difficult to present as worthwhile when any benefits seemed so distant and amorphous. Overcoming this public apathy was, in Ritter's mind, one of the greatest challenges Science Service faced.  

**Defining Early Business Operations**

As editor at Science Service, Slosson concentrated on the content side of the organization, writing some articles himself and supervising production of others. His job required being on the lookout for new movements in the various sciences and getting the first news or authoritative evaluations of important discoveries. To meet that goal, Slosson made it a point to attend major scientific gatherings in the U.S. and abroad in search of both topics and authors to cover them. He considered the job of recruiting and cultivating young writers to be especially important and delicate. Slosson declared, "The whole success of the enterprise depends ultimately upon getting a body of eager and able writers in all fields of investigation." Linking his editorial work with practical business concerns, Slosson aimed to procure articles on subjects that he considered most marketable, anticipating the topics of most interest to the public such as historical anniversaries.

By February 1921, the organization had hired Watson Davis as its principal writer and Howard Wheeler, as the business manager to oversee operating policy. Wheeler’s job involved managing the financial details, staying in touch with the newspapers to determine

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140 William E. Ritter, letter to E.W. Scripps, May 13, 1921, SIA RU7091, Box 1, Folder 3.
141 Edwin E. Slosson, "Tentative Estimate of Outfit and One Year's Expenses," n.d. SIA RU7091, Box 1, Folder 2.
what kind and style of articles they desired so Science Service could tailor its offerings, and negotiating with editors of the various newspapers. He was also supposed to help publicize scientific news more generally, to make Science Service known as a bureau of information for all manner of scientific subjects, and to market Science Service in such a way as to make it self-supporting.\textsuperscript{143}

In his Manager's Report of June 1921, Wheeler noted some promising developments, despite the economic downturn. The organization had orders for material from \textit{Good Housekeeping}, the \textit{Independent}, \textit{Popular Science Monthly}, and \textit{World's Work} among others. Wheeler was negotiating with \textit{Century} magazine for that publication to buy a regular feature set of stories from Science Service for each issue.\textsuperscript{144} Such monthly magazines offered a promising route to bring science stories to American readers, but even more than that, Science Service was eager to place its material in daily and weekly newspapers.

Seeking to gain the widest exposure in the shortest time with the lowest cost, Science Service leaders aimed to take advantage of the business of newspaper syndication. In order to understand the operation’s ambitions, then, it is important to understand the background of how newspaper publishing worked in the 1920s. The practice of newspaper syndication had begun in the United States in the late nineteenth century as a way for providers of material to make money, and purchasers to save money. In the 1880s, cooperatives and feature syndicates sold pre-printed material ("patent insides") and printing-plate pages ("boiler plate") to small-town dailies and weeklies, making it possible for them to include copy they

\textsuperscript{143} Smithsonian Institution Archives website for the Science Service collection RU7091, historical overview, http://www.societyforscience.org/history.

\textsuperscript{144} Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.
could not have produced on their own. By the 1890s, publishers of both large and small newspapers were struggling with the costs of production and looking for ways to save money on salaries for reporters, and printing and production workers. Compositors, typographers, and other mechanical workers presented a particular threat, more likely to form trade unions to press for higher wages. Publishers decided to present a united stance against the threat of collective bargaining, and in 1899 the American Newspaper Publishers Association members considered methods of avoiding what it termed "labor dictation." The use of syndicated material was a way a newspaper could attain a large amount of material at a relatively low price, without assuming all the associated costs of news-gathering and production. The content varied but generally included fiction, fashion, and personality profiles, in addition to up-to-date news. According to media historian Gerald J. Baldasty, mass-produced news was usually much less expensive than that produced by the paper itself, a trend that soon led many newspapers to rely on newspaper unions—which are not labor unions—to provide half of their news or more for each issue. Newspaper unions generally provided a partial paper, with many of the pages already printed with material and other pages left blank. When the incomplete papers arrived, local editors filled the empty pages with locally produced material. Trade journals reported the arrangement as a money-saver, and thousands of weekly newspapers used the service. Baldasty noted that Printers' Ink, a journal for the publishing

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business, estimated that in 1894 more than 7,000 weekly papers relied on five newspaper unions for the bulk of their material.\textsuperscript{147}

This late-nineteenth-century syndication system was financially beneficial to both the newspaper unions and the publishers. The newspaper unions bought paper and other materials at reduced rates, repackaged news they got from other sources, and sold advertising for the pre-printed pages. The unions then sold the partially full newspaper to local publishers for what they, with their smaller purchasing capacity, would have paid for the same amount of blank paper. The small newspaper saved money on reporting and production; however, as Baldasty noted, the quality of the newspapers tended to suffer. Editors had little control over the material they received, and much of the news was noticeably recycled. Also, nearby newspapers were likely to carry the same material.\textsuperscript{148} Still, the arrangement was beneficial enough so as not to be abandoned.

Science Service’s E.W. Scripps was intimately familiar with this business of syndication; early in his career, he had recognized the advantage of using common content for those papers he managed for his family's Scripps League of newspapers. In 1887, he mandated that the four newspapers he ran, the \textit{Detroit Evening News}, the \textit{Cleveland Press}, the \textit{Cincinnati Post}, and the \textit{St. Louis Chronicle}, share news amongst themselves as requested. Additionally, his reporters in New York and Washington, DC wrote articles that all four papers used. In 1902, Scripps started the Newspaper Enterprise Association (NEA), a service that supplied his newspapers with cartoons, features, and editorials. By 1907, Scripps

\textsuperscript{147} Ibid., 92.
\textsuperscript{148} Ibid., 92-3.
was operating twenty-four newspapers, and the average cost of the material per newspaper was fifty-one cents per column, or approximately one-twelfth of the average cost of a column in the 1890s. Scripps ordered editors at the papers he owned to use NEA material for at least twenty-five to thirty-five percent of each issue.149 Through this arrangement, the Scripps papers reduced staff size, already small and notoriously underpaid—staff even had to provide their own pencils—and also cut production costs. Though Scripps papers tended to carry less local news, Scripps was unconcerned. He did not generally care about local news, had abandoned the idea of competing for scoops because of the cost involved, and also made it his policy not to antagonize larger nearby papers by treading on their turf.150 Instead, NEA distribution specialized in illustrations—photographs, cartoons, and drawings. Almost twenty-five percent of the non-advertising content of Scripps newspapers was some form of artwork, compared to an average of five percent for most competitors. Scripps believed such visuals were the best device to draw attention to news.151 In 1907, Scripps merged three other press associations he owned to create the single entity United Press Associations, and made its content available to non-Scripps subscribers.152

Given that Scripps was the founder of both Science Service and the NEA, it was logical for Science Service to start work in early 1921 by an affiliation with the very large NEA. However, Scripps expressly stipulated that the NEA should not give Science Service any special consideration in the acceptance and placement of its material. He wanted the

149 Ibid., 43-5.
150 Ibid., 47-8.
151 Ibid., 133-4.
152 Ibid., 21.
organization and its material to earn its way into the business, and believed that it could if there were sufficient public interest. Instead, Science Service writers and editors needed to submit their stories and illustrations to NEA managers for review. Any material that the NEA accepted was then distributed to all subscribing newspapers as part of the regular daily output of the NEA, which guaranteed Science Service payment of three cents a word for text that got used and $3.00 each for photographs. In turn, Science Service paid contributors who were not regular members of the Science Service office at a rate of two cents a word and no less than $1.50 for photographs, assuring Science Service a slight profit on the material.\footnote{Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.}

The NEA connection offered Science Service a convenient early vehicle to distribute its material to Scripps-owned newspapers. Science Service was financially unable to employ its own sales force, and so in the beginning needed to work with a syndicate. As Science Service manager, Howard Wheeler used the arrangement as a learning experience; seeing which material NEA managers chose to use could help him determine the "pulling power of the illustrated Science Service material." But when NEA managers chose not to accept as much Science Service material as Wheeler had hoped, he grew frustrated. Wheeler was particularly disappointed in early 1921 that the NEA had generally declined to use any of the Science Service illustrated stories, since he wanted to gain an idea of how well the reading public received these.\footnote{Ibid.} But the NEA did not want Science Service illustrations to compete
with its own. Due to such lingering dissatisfactions, the NEA terminated its relationship with Science Service later in 1921.\(^{155}\)

Publishing was suffering during the 1920-21 recession; many magazines lost revenue due to the slump in advertising, the high cost of paper and printing, and widespread labor strikes. Some magazines folded, others teetered on the verge and consequently offered less space for additional features. Editors often had more material than they could use and so hesitated to purchase outside manuscripts. Given those business conditions, Science Service had done well in placing articles with prominent magazines such as *Good Housekeeping*, the *Independent*, and *Popular Science Monthly* over its first half-year of work.\(^{156}\)

Newspapers were less affected by the economic downturn, though declining advertising also led them to reduce features and fillers, which Slosson considered the best opportunity for Science Service in placing material. Nevertheless, he had not abandoned hope. Even as Science Service was sending long, illustrated articles to the NEA, Slosson and Wheeler had also been busy marketing shorter, unillustrated articles through a connection with the United Feature Syndicate of New York. Wheeler noted they had been highly successful in securing writers for this type of article, paying the "very reasonable rate" of two cents a word. The syndicate handled all of the sales and promotion of a daily science article of approximately five hundred words, along with a weekly column by Slosson under the title "Four Minute Chats on Science." In this arrangement, Science Service received fifty percent


of the gross sales. During the first six months of its existence, Science Service had also
directly sold special exclusive articles to several major newspapers, including the Kansas
City Star, Chicago Tribune, Washington Post, Minneapolis Tribune, Boston Evening
Times.157

Such successes in placing science articles in some high-profile newspapers were
encouraging, but as manager, Wheeler wanted Science Service to establish its own channels
of distribution that would make it completely independent of the established syndicates. On
April 2, 1921, the organization began issuing a weekly selection of material under the
heading, the "Science News Bulletin", which Wheeler hoped would serve as a foundation for
Science Service to develop its own regular service supplying stories to subscribing
newspapers.158 Watson Davis produced these articles, three hundred to five hundred words in
length, under Slosson's supervision. Science Service mimeographed the pieces in the offices
of the National Research Council and then sent them to directly to newspaper clients, who
could choose how much of the material to reprint and when.159

Since Science Service lacked the funds to establish a traveling sales organization, it
had to conduct all its sales by mail. By July 1921, Science Service had mailed out four-week
trial subscriptions to a list of approximately one hundred twenty-five newspapers and asked
the managing editors to consider signing on for the "Science News Bulletin" on a regular

157 Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.
158 Marcel Chotkowski LaFollette, Science on the Air: Popularizers and Personalities on Radio and
159 Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.
basis. In these mailings, Science Service asked for the opportunity to serve as the "reporter" on a particular paper's science "beat," saying it believed the organization had "already reached the place where we can earn our salary."

After seeing those trial subscriptions, sixteen newspapers chose to become regular subscribers to "Science News Bulletin", including:

- New York Evening Post
- Pittsburg Dispatch
- Asbury Park, NJ Asbury Park Press
- San Antonio Express
- Bermuda Press (Hamilton, Bermuda)
- Detroit Free-Press
- Belleville, IL News-Democrat
- Houston Post
- Bridgeport Post
- Berkeley Gazette
- Birmingham Age-Herald
- Camden Daily Courier
- Ft. Worth Record
- Toronto Star

In testimonials praising the value of Science Service, C. McD. Puckette, managing editor of the New York Evening Post wrote:

> We have found here that your Bulletins fill a real need in providing short scientific notes and fillers which, while always interesting to the reader, still stand the test of being sound and authoritative in the general fields. You should place your service widely.\(^{161}\)

John J. Bushell of the Bermuda Press wrote, “I quite agree with you that the copy which you send out is likely to be of general interest to the public.\(^{162}\)

Wheeler considered that yield encouraging for a new service in a new kind of business, especially given the overall economic climate of 1921. He had anticipated that the growth of the bulletin would be slow, since information from Science Service was competing

\(^{160}\) Ibid. Also see Howard Wheeler, Example of appeal sent to newspapers, July 27, 1921, SIA RU7091, Box 1, Folder 3.

\(^{161}\) Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.

\(^{162}\) Ibid.
with a host of free circulars and pamphlets distributed from government offices and bureaus, and scientific institutions and organizations. Wheeler told the trustees that his aim was to convince newspaper editors that Science Service "had no axe to grind save to create a more general public understanding of and sympathy with the scientist and his work; that we are fostering no propaganda of any sort and that we are attempting only to give an intelligent, understandable and readable survey of important developments in the field of scientific research that have come to our notice during the week."\(^{163}\)

**Defining the Need for Science Journalism and Anti-Sensationalist Ethics**

As noted, Ritter and Scripps had founded Science Service based on their conviction that the future strength of both scientific research and American democracy depended on gaining public appreciation for science through better communication and popularization. Slosson quickly came to share that philosophy. He criticized American newspapers for not providing regular science coverage, drawing a pointed contrast to France, Germany, and "Darkest Russia" as examples of places where he said the newspapers ran a regular scientific department column several times a week.\(^{164}\) A few publications had seen the light, in Slosson’s eyes; as noted above, Science Service's own Watson Davis had started a science column in the *Washington Herald* earlier in his career. Slosson believed that though currently ignorant of the value of science news, good editors would be receptive to pressure to include more. He suggested that there was an untapped interest in science among readers, and that

\(^{163}\) Ibid.

\(^{164}\) Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 9-10.
perceptive publications would be ready to run more science stories, as long as they could be assured of getting a dependable supply of acceptable, accessible material.

Like Ritter and Scripps, Millikan, Hale, and other scientific leaders, Slosson believed that the United States in the early 1920s was at a tipping point regarding support versus criticism of science. In his eyes, it was still possible to convince ordinary Americans that modern research was the key to social and economic progress, to overcome the natural "inertia of the human mind and the general ignorance and indifference of the mass of people." However, Slosson worried, World War I had produced a dangerous strain of "real and active hostility to scientific thought." Chemical warfare had linked chemistry to "malignant power as in the Middle Ages," seemingly tying German war crimes to scientific thought itself. Science had already lost much of the audience that it had in the nineteenth century, Slosson warned, since the scientific community had "ceased to be aggressive and was tamely taking whatever treatment the unscientific and anti-scientific part of the public chose to put upon them." He also feared that the postwar world was experiencing revived theological opposition to science.

Slosson also worried that the modern persistence of superstition and reactionary impulses threatened to wipe away a century's worth of gain for science. He complained that astrology was currently more popular than astronomy and was getting more space in newspapers, that popular coverage often treated chemistry like alchemy and treated medicine like magic. Séances had regained popularity, and Slosson claimed that the early 1920s saw more people practicing necromancy, divination, and witchcraft than at any other time in

165 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 13.
history. Indeed, even Sir Oliver Joseph Lodge, the noted British physicist, had publicly and repeatedly declared a belief in communication with the world beyond. Lodge had studied psychical claims and evidence, and accepted the "spiritistic hypothesis" that "the human body is the transient centre of activity of an influence which existed before, and continues after, organic life." Lodge believed psychic mediums were helping him stay in touch with friends who had passed on. After Lodge's son, Raymond, was killed during World War I, Lodge wrote an entire book describing how spiritualism helped him re-establish communication with his lost son. That book, *Raymond, or Life and Death, With Examples of the Evidence for Survival of Memory and Affection after Death*, was reprinted eight times by the end of the war. It won over many women and men who had also lost family or friends and so found hope in the noted scientist's endorsement of psychic communication. Such trends underlined the frustration that Slosson and other scientific leaders felt, when they expressed concern that without access to good writing about true science, ordinary people were on the verge of sliding back toward appealing superstitions.

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166 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 11.
167 Ibid.
Looking over trends in American life, Slosson was equally disturbed by a sense that recent legislation and demonstrations had tended to suppress freedom of thought and speech. Such restrictions had led to publishers’ self-censorship, forcing newspapers and magazines to avoid topics or positions on those topics that might offend a large segment of society. The restrictive climate threatened to strangle periodicals with large circulation, and to curtail the smaller, more specialized periodicals that had previously catered to specific interests. Periodicals were becoming tamer and more uniform; "deviations in opinion are being flattened out with a steam roller," Slosson said.169

Slosson was, of course, not the only observer troubled by a sense that post-World War I fear and paranoia fostered the targeting of behaviors and groups of people. The wartime focus on patriotism and secrecy had led to passage of the Espionage Act in 1917 and the Sedition Act in 1918, which extended the reach of the Espionage Act and placed limits on speech and other actions deemed threatening or disloyal to the United States. Rising anti-German sentiment spilled over into numerous episodes in Iowa, Michigan, and multiple other states, where localities outlawed the teaching of German or even speaking foreign languages. People harassed or turned in neighbors suspected of having foreign connections and even relabeled streets or clubs with German names.170 Though the Sedition Act was repealed in

169 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2,13-4.
170 Stephen J. Frese discusses limits on the German community in Iowa during World War I and after in "Divided by a Common Language: The Babel Proclamation and its Influence in Iowa History," The History Teacher 39, No. 1 (Nov. 2005): 59-62, http://www.jstor.org/stable/30036745. Frese argued that Iowa governor William L. Harding contributed to the "prejudice and wartime fanaticism" when he issued the "Babel Proclamation" on May 23, 1918, thereby outlawing the public use of all foreign language in public. The law was particularly aimed at German-speaking people and communities, but Harding believed language was key to assimilation, and therefore justified penalties for speaking anything other than "American." He was the only governor to take such an action at the time. This article directs the reader to a significant number of other resources regarding this topic. In "World War I and the Attack on Professors of German at the University of Michigan," History of Education Quarterly 33, No. 1 (Spring 1993): 59-62, http://www.jstor.org/stable/368520,
1920, the climate of suspicion remained. On balance, Slosson indicated, there were fewer champions of freedom of the press and freedom of speech in the United States than before.

Such concerns brought Slosson to a key question: what ethical standards should the new crop of science journalists follow? How could they attract public attention without resorting to sensationalism, how could they report science accurately and fairly while still making it interesting to the average reader? In a cynical assessment of the era’s publishing climate, Slosson sarcastically noted that purveyors of yellow journalism had won a vast number of readers, and all they had to sacrifice were "good taste, high ideals, and scientific methods."171

At the same time, Slosson was not naïve. He knew that sensationalism sold papers and that attracting readers was difficult, especially when newspapers had to compete against movies and multiple other claims on people’s attention and money. Some editors automatically rejected serious presentations of scientific material as too "highbrow" for their customers. Slosson knew that what the average reader was looking for was a "paragraph with a title word ending in –est," as in "fastest" or "slowest," "hottest" or "coldest," "biggest" or

Clifford Wilcox explores the permanent dismissal of six professors of German from the University of Michigan’s, a move that almost completely gutted the German department at the school. Members of the department were charged with unpatriotic comments on and off campus, and none of the professors who were fired from the university were ever rehired there. According to Wilcox, the salient difference existing within the university system was between those who saw the state universities as extensions or adjuncts of the state, as service institutions whose primary aim should be the "expression and inculcation of patriotism," and those who thought of the university as "removed sufficiently from society to make disinterested analysis of issues possible." Other related articles include: Wayne A. Wiegand, "In Service to the State: Wisconsin Public Libraries during World War I," *The Wisconsin Magazine of History* 72, No. 3 (Spring 1989): 199-224, http://www.jstor.org/stable/4636208; and Christopher Capozzola, "The Only Badge Needed Is Your Patriotic Fervor: Vigilance, Coercion, and the Law in World War I America," *The Journal of American History* 88, No. 4 (Mar. 2002): 1354-82, http://www.jstor.org/stable/2700601. Additional sources for mention of the effect of the "Red Scare" on journalism, see David Paul Nord, *Communities of Journalism: A History of American Newspapers and Their Readers* (Urbana: University of Illinois Press, 2001); and Dale E. Zacher, *The Scripps Newspapers Go to War, 1914-18* (Urbana: University of Illinois Press, 2008).

171 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2.
"smallest," and, of course, "newest." He said, "a worship of superlatives is the worst form of idolatry now present." Slosson cited reports suggesting that the average mental age of the American reader was thirteen years old; such an audience would be especially intrigued by sensationalist freaks of nature, stories about "three-headed calves, Siamese twins, and bearded ladies." Curiosity was not inherently evil, Slosson indicated; indeed, perhaps all of science had originated from such impulses. So rather than automatically denigrating these interests, he hoped that Science Service could portray genuine research to be just as fascinating.172

In that manner, Slosson set up his ideal science journalism to walk a fine line, trying to gain an audience without succumbing to the insatiable, pervasive appetite for sensationalism. He proposed that Science Service could play the game to a certain extent; as long as its articles remained accurate, then Slosson could imagine presenting that solid information in a "frivolous or extravagant form." He believed the best plan was to "crowd out falsehood by truth and to present scientific information in a way that will be at least as attractive as the misinformation which now holds the field."173 Slosson knew this was a compromise, and he still worried about the dangers of pandering to the crowd, rather than presenting science in its best light. After all, leaders of the AAAS, NRC, and NAS supported Science Service precisely because its mission was "educating people in the scientific mode of thinking."

172 Edwin E. Slosson, Notes of a “Talk to Trustees of Science Service,” at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2.
173 Edwin E. Slosson, Notes of a “Talk to Trustees of Science Service,” at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 13.
Science Service reflected the optimistic faith that even if American readers had an average mental age of thirteen, even if superstitious practices and sensationalist journalism attracted attention, improved popularization of important scientific news could still win public attention. Like Scripps and Ritter, Slosson saw this as a vital battle for the well-being of American democracy, in which the populace must be educated to achieve a "recognition of the value of science and technology and in the power of discrimination between scientific and unscientific leadership in thought and politics." He hoped to recreate in at least part of the population the spirit of respect for learning that had supposedly existed in years gone by, and to make improving one's mind a laudable pursuit. Far from condemning the current state of American thought, he merely acknowledged that it had changed, and he recognized that science would have to apply new tactics carefully to participate in the market.174

As support for his belief that a sufficient number of American people still had a latent interest in real science that good journalists and editors could reach, Slosson pointed to the record of the popular science magazines then on the market, such as *Science and Invention*, *Popular Mechanics*, and *Popular Science Magazine*. Slosson described the approach of such publications as "chopping up strong meat into small mouthfuls," providing articles that were "sufficiently correct for practical purposes." The drawback, Slosson maintained, was that those popular science magazines primarily attracted interest from a small group of mostly men, never reaching the wider American readership. Science Service aimed to place its stories in mainstream newspapers and generally-oriented magazines, to reach that large, untapped audience which was not deliberately looking for science news but might well read

174 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 15-6.
eye-catching, well-written articles. For the immediate future, Slosson pragmatically suggested that Science Service should seize any opportunity it could get for exposure — settling for fifty words if the papers would not take five hundred. As he told Science Service trustees, what Science Service really wanted to publish was not what the papers wanted to print, which was, of course, the reason that Science Service existed in the first place—or as he put it, "If there had been a spontaneous demand for scientific articles of a high order Science Service would not have been founded."  

The Next Steps for Science Service

Science Service continued its efforts to place material in various outlets, including special columns and articles for magazines, and for newspapers by producing its Science News Bulletin," from which subscribing papers could reprint articles as they chose. By October 1921, thirty newspapers around the country, which reached a total daily circulation of 1.5 million readers, had paid to join this service. Science Service expanded it from a weekly to a daily distribution, and within the first few months, the "Daily Science News

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175 Ibid., 17.

176 In 1921, Slosson reported that Science Service had entered into an agreement with the Century magazine's editor Glenn Frank to produce a science column for the magazine. Further research is necessary to determine if those columns appeared and for how long. Century achieved great success and a circulation of 200,000 after its founding as Scribner's Monthly in 1870. In 1881 the magazine changed hands and became Century. Once known for its abundant and vivid illustrations, Century was steadily losing readers at the time that Slosson made arrangements for Science Service material to appear. After a decade of decline, the magazine folded in 1930. David E. Sumner described Century as "influential among the elite, but limited in popular appeal," The Magazine Century: American Magazines Since 1900 (New York: Peter Lang, 2010), 17. For information about the collection, see http://www.rossettiarchive.org/docs/ap2.c4.raw.html.

Bulletin" was well on its way to being self-supporting, and possibly generating a small profit.\(^{178}\)

Especially once the American economy rebounded from the 1920-21 recession, Science Service gradually expanded its reach through the number of newspapers it supplied with material, and thereby the number of people potentially exposed to science news. Beginning in 1928, the new Sunday magazine of the Newspaper Enterprise Association, part of the Scripps syndicate, began publishing an illustrated feature page on science, drawing each week on Science Service material. By the end of the decade, articles either written by the Science Service staff or commissioned from scientists and edited in-house, had appeared in over one hundred newspapers, potentially reaching over seven million people.\(^{179}\)

Meanwhile, Science Service had expanded its efforts, by creating another publication—Science News-Letter—that aimed to distribute its articles through different channels to a wider audience. Libraries, schools, and individuals had sent Ritter requests to get copies of the stories that the bulletin distributed to newspapers that they could keep for themselves. On March 13, 1922, Science Service also began publishing the Science News-Letter, advertised as "a weekly summary of current science for personal use or use in classes, study clubs, or libraries."\(^{180}\) Individuals could buy subscriptions to the Science News-Letter

\(^{178}\) Wheeler reported the weekly income as $28, and after expenses for mimeographing, mailing, postage, and paying for contributed material, still cleared approximately $8.00. Even with Watson Davis's salary at $20 a week, (plus a guarantee of twenty percent of all profits when there were any), Wheeler expected the Bulletin to at least break even. Howard Wheeler, "Report of Manager of Science Service," 1921. SIA RU7091, Box 1 Folder 3.

\(^{179}\) Howard Wheeler, "Report of the Manager of Science Service," 1921, SIA RU7091, Box 1, Folder 3.

for $5 per year. AAAS members and schools received a reduced rate. Between 1923 and 1926, Science Service attracted a circulation of approximately 1,000 subscribers for the *Science News-Letter*, which consisted mostly of articles carried in the bulletin.

In addition to serving subscribers through both the *Science News Bulletin* and *Science News-Letter*, Science Service also provided some free material for any publication to use, including spot-news—breaking stories such as earthquakes, new discoveries, and explorations. Science Service also distributed, without charge, material publicizing the activities of the various scientific organizations with which it was affiliated. Starting in 1921, Science Service acted as the publicity agent for the National Academy of Sciences, handling all NAS press arrangements, and obtaining, retyping, and mimeographing scientists' conference papers for distribution to 225 newspapers. The NAS paid Science Service $129 for that work, and Science Service also received approximately $100 from the sale of photographs and other material related to the NAS annual meeting. Likewise, Science Service handled the publicity for the Carnegie Institution of Washington, DC, another way to support science popularization.

While such publicity arrangements could prove lucrative and mutually rewarding, management remained careful about making commitments that could distract from the group’s main mission and independence. In particular, Science Service worried that working too closely with other organizations could interfere with selling its own material and cause

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181 Ibid.
183 Howard Wheeler, "Report of Manager of Science Service," 1921, SIA RU7091, Box 1 Folder 3.
confusion, erasing Science Service’s young professional identity. Accordingly, in late 1921, Wheeler turned down the idea of having Science Service handle publicity work for the American Chemical Society.\textsuperscript{185} The ACS offered Science Service $13,000 to take over all its publicity, and Ritter speculated that Science Service could do the work for considerably less, generating real profit. However, he worried that the volume of work would overwhelm his organization and that Science Service would have to "submerge its identity entirely in putting out its service under the sole name of the Chemical Society."\textsuperscript{186} Slosson and Wheeler also feared that becoming the official ACS publicity agents would interfere with Science Service's own business of selling material to newspaper syndicates, because editors would have trouble distinguishing between free material coming from the ACS and the articles sold by Science Service. Editors might start to wonder why they should pay for some information, when other material arrived for no charge. Finally, Science Service risked violating its charter if becoming the official ACS publicity agents meant that Science Service would be expected to "work for the promotion of commercial aims and for exerting influence over pending legislation." Material published for explicit political implications or business interests could be construed as propaganda, which might compromise the image of scientific objectivity. But although Slosson and Wheeler thus rejected the idea of formally affiliating with the ACS, they wanted to help the chemists gain good publicity; Science Service offered to help place ACS news reports with the newspapers with which Science Service had agreements.\textsuperscript{187}

\textsuperscript{185} Howard Wheeler, Memorandum to Mr. Howe, December 28, 1921, SIA RU7091, Box 6, Folder 2.

\textsuperscript{186} Edwin E. Slosson, letter to W.E. Ritter, November 9, 1921, SIA RU7091, Box 1, Folder 6.

\textsuperscript{187} Howard Wheeler, Memorandum to Mr. Howe, December 28, 1921, SIA RU7091, Box 6, Folder 2. Also see Edwin E. Slosson, letter to W.E. Ritter, November 9, 1921, SIA RU7091, Box 1, Folder 6, and Edwin E. Slosson, letter to W.E. Ritter, December 8, 1921, SIA RU7091, Box 6, Folder 2.
In terms of its operating procedures, Science Service continued to evolve. In a 1923 internal reorganization, the organization restructured upper management to eliminate Wheeler’s position of business manager; principal writer Watson Davis won promotion to Managing Editor, while Slosson moved from being editor to Director of Science Service. Underlying tensions remained about the relative roles of scientists versus writers in spearheading science journalism. After Slosson’s death in 1929, Davis might have appeared to be the logical choice to take over the director's position. Instead, some trustees, including famous psychologist James McKeen Cattell, wanted to appoint another scientist like Slosson, rather than someone perceived as a writer. The respected entomologist and biologist Vernon Kellogg, who was also vice president of the Science Service trustees, held the position of acting director while the discord continued.188

By the end of the 1920s, over less than a decade, Science Service had gone from an idea to an institution, widely recognized as a source of science information. Each new endeavor provided the organization with material for its print publications. The organization had also begun to distribute science news through radio broadcasts, as a later chapter will detail. But while the group had gained substantial access to the public through newspapers and radio, its leaders still aimed for a broader definition of success. They remained concerned with the need to cultivate and expand credibility for Science Service, in order to gain an audience and maintain the trust of scientists, newspaper publishers and editors, and the general public. Writers had to turn out clear and engaging news of science, produced in compelling but accurate form that had human interest without sensationalism. Researchers

and journalists had to move past a bad history of animosity, perceived disrespect, and lack of cooperation on both sides.

As a later chapter will discuss, science did make headline news in the 1920s, especially with sensationalized science-related topics, such as the 1925 Scopes trial in Tennessee. Some newspapers were beginning to employ their own science writers, and a wide range of voices clamored for attention. With increasing numbers of people and organizations claiming to represent science, Science Service needed to preserve and protect its reputation not just for news of science, but for the most credible and trustworthy news of science.

**Science Service During The Depression Decade**

Four years after Slosson’s death, Science Service finally went with the known commodity of Davis and appointed him director in 1933. Davis held that position for thirty-three years, until retiring in 1966. The 1930s Depression posed new challenges for Science Service, which struggled to maintain the same quality of material produced while also dealing with a reduced office staff and a mandate to reduce expenses by $10,000. But the organization continued to gain credibility, in part by experimenting with new forms of public outreach, supporting efforts of other organizations, and considering new features.

Despite the business downturn, Science Service leaders remained positive about their organization’s prospects. In 1931, the group decided that unfavorable business conditions made it wise to delay most of its plans for introducing new features. That decision helped Science Service maintain its core function of regularly providing syndicated science stories.
to subscribing newspapers, and it even added an occasional photo print service.¹⁸⁹ In April of
1931, Science Service reported that its circulation of the *Science News Letter* (with its name
changed to eliminate the hyphen) had reached an all-time high of 11,969. Subscriptions and
renewals were at their highest level in the history of the organization, despite depression
conditions.¹⁹⁰ In 1932, Science Service remained on solid financial footing; Davis told the
trustees that its syndicate services had gained in clients, revenue, and the number of readers
reached, despite the "adverse economic conditions at a time when newspapers have been
vigorously curtailing their activities."¹⁹¹

By early 1932, the *Science News Letter* had added approximately one thousand
subscriptions beyond the previous year’s all-time high, from individuals, libraries, and clubs.
Science Service’s separate but connected operation, distributing many of the same articles to
subscribing newspapers, was also thriving. Almost one-third of the newspaper readers in the
United States had the "opportunity" of reading something by Science Service, whether daily
or weekly, according to a 1932 internal report.¹⁹² Syndicate revenue for Science Service rose,
at a time when that was not the case for most publications. Davis and other leaders
interpreted those gains as proof that the Science Service mission was succeeding and indeed,
more vital than ever in the context of social tensions created by the Depression. As a later
chapter will detail, economic crisis led many observers in the United States, from ordinary
citizens right up to President Roosevelt, to question the idea that scientific research and

¹⁸⁹ Watson Davis, "Information Memorandum on Progress of Science Service," January 31, 1931, SIA
RU7091, Box 2, Folder 13.
¹⁹⁰ Watson Davis, "Information Memorandum on Progress of Science Service," April 15, 1931, SIA
RU7091, Box 2, Folder 13.
¹⁹¹ Watson Davis, "Report to the Annual Meeting of Board of Trustees of Science Service, Thursday,
April 28, 1932," SIA RU7091, Box 3, Folder 2.
¹⁹² Science Service, "Distribution of Science Service Material to Newspapers in the United States,"
April 1, 1932, SIA RU7091, Box 3, Folder 2.
technological development necessarily guaranteed progress for all. Research was expensive, and mechanization seemed in many eyes at least partly responsible for creating unemployment. According to Davis, such doubts made it more essential than ever for Science Service to promote public appreciation of the value of science. He told the trustees in 1932:

There is greater need for the efforts of Science Service in times such as these than ever before in the dozen years of its existence. Economic conditions must not enforce a harmful moratorium upon fundamental research. Every dollar withheld from fundamental pure science investigations because of economic stringency will deprive future generations of a many thousand-fold return paid in the coin of a better world to live in, as well as money savings to the public at large through industry. The continued work of Science Service, indirectly and directly through many avenues, had laid a foundation of public appreciation of science and the methods of science. In the emergency that now threatens the continuance of scientific research, Science Service might properly undertake a more direct attempt to awaken the public to the dangers of the present situation.193

Davis believed that Science Service’s message, that ordinary Americans could and should want to hear about science, had gained real influence among journalists, editors, and publishers. Despite the Depression, the Associated Press, International News Service, Universal Service, and some individual newspapers engaged science news editors during the early 1930s, a trend that Davis credited to the increased presence of, and interest in, science news, as championed by Science Service. Such activity helped Science Service, rather than posing a competitive threat. Science Service maintained a time advantage over those science journalists who worked directly for newspapers, able to distribute its articles a week to ten

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193 Watson Davis, "Report to the Annual Meeting of Board of Trustees of Science Service, Thursday, April 28, 1932," SIA RU7091, Box 3, Folder 2.
days before "competitive writers" could catch up, especially those who relied on lifting Science Service copy and printing it as their own. Although some newspapers cheated, by drawing on Science Service material without paying or giving credit, the organization chose not to make any "serious attempt" to prevent that. Davis believed it was ultimately better whenever more good science writing appeared, that any gain in public access to science news "contributes materially to the betterment of the independent reporting of science."  

By January 1933, Science Service reported it was still retaining most of its subscriptions and continuing to operate almost entirely within its budget. In fact, the organization had reached the point of being a self-sustaining business, eliminating any need for additional Scripps support. By March of 1934, *Science News Letter* had gained 83 percent more new subscriptions over the same quarter a year before. Science Service soon added a Western Union teletype to its office, which meant its staff could send longer messages at lower rates, to newspaper offices all the way across the country.

In short, evidence seemed to confirm that Science Service had made substantial progress in fulfilling its mandate to create and support regular distribution of the latest news of research and developments, explained in terms that ordinary readers could appreciate—the essence of a modern science journalism with national reach. By 1934, Science Service material was reaching 109 daily newspapers, which chose to use a varying but often substantial number of articles. Watson Davis estimated that by the middle of the 1930s, approximately 7,500,000 people had the "opportunity," as he put it, to read something by

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194 Watson Davis, "Information Memorandum on Progress of Science Service," January 20, 1933, SIA RU7091, Box 3, Folder 5.
Science Service. Science Service had operated its business shrewdly; by reorganizing the most popular elements of its syndicated service into a "7-in-1 budget service" in 1932, the organization was able to offer subscribing newspapers more value for the price and so retained most of its clients. Davis hoped Science Service could continue growing to reach 200 or 250 newspapers, but he knew that the organization would never get its material into every single paper in the country. No syndicate reached all newspapers, partly because in large cities that had more than one daily paper, typically only one would subscribe to a particular syndicate, while the other chose a different syndicate. Also, small papers in small communities often could not afford to buy syndicate material and could not afford to keep lengthening their paper size to print an expanding amount of material.

There were no guarantees of continued business success during the Depression, of course, and Science Service leaders also worried that "disturbed conditions" in Europe might indirectly hurt Science Service by disrupting business and increasing the costs of newspaper operations, which in turn would affect the ability to attract and retain newspaper clients. In 1938, Watson Davis argued that the deepening international crisis only reinforced the philosophical purpose and social value of Science Service. He wrote that as censorship tightened, propaganda increased, and science research was diverted to military efforts, "there will be greater need than ever for the work of Science Service. We should, therefore, continue steadfast in our activities, increasing in effectiveness the production and distribution

197 Watson Davis, letter to Benjamin C. Gruenberg, October 27, 1934, SIA RU7091, Box 151, Folder 6.
of our reporting and interpretation. The importance and aid of science must more and more be made evident to the public at large."

By July of 1939 Science Service had a net worth of over $58,000. The organization had survived the Great Depression in sound financial condition through careful management. More than that, in expanding its reach throughout the decade, Science Service kept its vision of establishing and promoting science journalism and its ideals of making science news available to the public so that they might be better-informed citizens. *Science News Letter* kept gaining subscribers throughout the poor economic times, and Science Service kept finding new newspapers, magazines, and other outlets interested in reprinting its material. During the Depression decade, Science Service also gained still more credibility as a trustworthy source of science popularization and publicity, a reputation that increasingly led scientists themselves to turn to Science Service to spread information about their research and concerns.

As later chapters will show, ordinary Americans read Science Service material with interest and responded by writing to the organization to seek advice, offer suggestions, complain about editorial choices, and comment on newspaper articles. They criticized perceived undue or careless use of the organization's influence, and they praised the products meant to enhance people's understanding of science, including newspaper stories, books, the newsletter, the radio programs, and the phonograph recordings.

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198 Watson Davis, "Information Memorandum on Progress of Science Service," October 1, 1938, SIA RU7091, Box 4, Folder 5.
The 1940s: Organizational Stress and Wartime Developments

Entering the 1940s, Science Service leaders had reason to feel confident about their work. The *Science News Letter* continued to gain circulation; by late November 1940, it had over 1,000 extra individual subscribers, compared to the same point the year before.\(^{200}\) With its print article distribution business on solid footing, staff members expanded their efforts to include other types of projects, all serving the same mission of making top-quality science news accessible, through different formats. Over preceding years, Science Service had experimented with getting out its message through various non-print media. In 1930, Science Service began broadcasting a set of programs over the CBS radio network, broadcasts that continued throughout the thirties under the title, “Adventures in Science.” In 1932, Science Service produced a set of recordings of famous scientists talking about their work, which had been well-received for education use by schools and clubs, as well as by interested individuals. In March of 1940, Science Service was busy with plans to issue another set of six phonograph recordings, "each about 4 ½ minutes in length… to be sold at a probable price of $3.00."\(^{201}\)

Science Service staff members were also hard at work on another new project in 1940, distributing "Things of Science," a series of experimental kits to promote good science education. As a later chapter will detail, subscribers paid two dollars for a year, and in exchange, Science Service mailed them seven kits over those months, focusing on subjects such as optics, fingerprinting, and fabrics. Each box contained a sample of some unusual or

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\(^{200}\) Watson Davis, "Information Memorandum on Progress of Science Service," November 5, 1940, SIA RU7091, Box 5, Folder 1.  
\(^{201}\) Watson Davis, "Minutes Executive Committee of Science Service," March 9, 1940, SIA RU7091, Box 5, Folder 1.
unfamiliar materials, plus a description of the material suitable for use in teaching, as well as a museum-style explanation that could be used to put the material on permanent display in a laboratory cabinet. Anyone could subscribe, but Science Service leaders particularly hoped that this hands-on, guided exposure to new materials and research principles would stimulate children’s scientific habit of mind, preparing them to become science-conscious adults.

Science Service limited the initial group of subscribers to 1,000, since the organization was unsure of how well the kits would be received and since it had to arrange to procure all the necessary materials well in advance of mailing the kits.202 By November of 1940, the number of orders from schools and families exceeded the supply of kits available by 50 percent, so Science Service immediately increased the number of kits available to 5,000.203 The project was very successful and went on for the next forty years. To this day, some Americans who received the kits as children remember them with fondness, crediting those Science Service products with sparking their interest in science.204

Amidst work on these ambitious projects, Science Service faced a sudden internal crisis. Its assistant treasurer, Howard Bandy, resigned in October 1940, after evidence emerged that he had been embezzling money from the organization for several years.205 An auditing firm initially determined that between 1934 and 1940, his thievery had cost Science Service almost $12,000; the estimates of the loss later increased again by half. The case went

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202 Watson Davis, "Things of Science," advertising circular from 1940, SIA RU7091, Box 5, Folder 1.
203 Watson Davis, "Information Memorandum on Progress of Science Service," November 5, 1940, SIA RU7091, Box 5, Folder 1.
204 For more discussion about attempts at, and methods of, introducing science education into school curriculums, see George E. DeBoer, A History of Ideas in Science Education: Implications for Practice (New York: Teachers College Press, Columbia University, 1991).
205 Watson Davis, "Information Memorandum on Progress of Science Service," November 5, 1940, SIA RU7091, Box 5, Folder 1.
to the Grand Jury of the District of Columbia,\textsuperscript{206} which indicted Bandy on five counts. In December, Science Service treasurer H. L. Smithton stepped down. It is unclear if Smithton offered his resignation because of his lack of sufficient oversight, or if he was asked to resign, presumably for the same reason, but there is no indication that Smithton was in any way implicated in the theft.\textsuperscript{207} The episode revealed severe organizational missteps; Science Service apparently had not continued yearly or regular audits, and the regular treasurer's reports that Smithton provided to the Executive Committee or trustees had failed to raise any red flags for anyone inside the organization.

The fraud threw Science Service into a sudden crisis. The Executive Committee cancelled plans to hold a big twentieth-anniversary celebration in April 1941, since the group had not yet determined exactly how much money had been lost. Also, as a nationally known organization dependent on good relations with national newspapers, Science Service may have felt it wise to keep a low profile during crisis, to avoid bad publicity that might endanger its reputation among scientists, journalists, and the public.\textsuperscript{208} Upon first hearing about Bandy’s theft, one of the trustees offered to pay his own expenses for attending a regular meeting, so as not to further deplete the group’s resources. Davis insisted on reimbursing all the trustees’ expenses as usual, saying that it was "important to get across to those associated with Science Service that from an operating standpoint there is no real financial emergency in connection with the shortages."\textsuperscript{209}

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\textsuperscript{206} Watson Davis, "Minutes Executive Committee of Science Service," December 28, 1940, SIA RU7091, Box 5, Folder 1.
\textsuperscript{207} Ibid.
\textsuperscript{208} Ibid.
\textsuperscript{209} Watson Davis, letter to E.G. Conklin, November 27, 1940, SIA RU7091, Box 5, Folder 8.
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As director of Science Service, Watson Davis felt little sympathy for Bandy, since he saw Bandy as exhibiting very little remorse for the damage he had done. Bandy did not seem to appreciate the seriousness of the "difficulties, financial losses and disorganization" his acts had caused, Davis wrote, and even seemed to exhibit a sense that he had "gotten away with it." Davis bitterly wrote that any attempt to rehabilitate Bandy’s moral character would likely "tax the most skillful in criminology, psychology, or even psychiatry."²¹⁰

Davis told Science Service attorney Dion Birney to ensure that for “the protection of the public,” Bandy would never again be in a position of financial trust where he might defraud other institutions or people.²¹¹ But the Executive Committee of Science Service was primarily concerned with minimizing the organization’s financial damage; it formally recommended to law officers that rather than throwing Bandy in prison, the court should sentence him to probation, conditional on his paying full restitution to Science Service.²¹² In the end, the legal system did just that; in May 1941, Bandy pleaded guilty and was sentenced to two to six years with probation, conditional upon fully repaying the funds he had embezzled. Bandy's brothers pledged to guarantee those payments, to keep him out of jail.²¹³

Meanwhile, auditors had established that Bandy had stolen a total of $14,507. After paying $3,500 for the audit and related expenses, Science Service had lost an estimated total of $18,007, an amount that equates to somewhere between $230,000 and $290,000 in 2011.

²¹⁰ Watson Davis, letter to Dion Birney, April 26, 1941, SIA RU7091, Box 5, Folder 5.
²¹¹ Ibid.
²¹² Watson Davis, "Minutes of the Annual Meeting of the Board of Trustees of Science Service," May 1, 1941 SIA RU7091, Box 5, Folder 5.
²¹³ Science Service, memorandum in file, n.d., regarding sentencing of Howard Bandy, SIA RU7091, Box 5, Folder 5.
buying power. \footnote{214} Fulfilling his legal obligation, Bandy turned over to Science Service some real estate that he owned. \footnote{215} By the end of 1941, that property had apparently sold, for a listing price of $21,500, repaying Science Service even a bit more than it had lost. \footnote{216}

Even at the height of this embezzlement crisis, Science Service leaders remained confident their organization had a bright future. Even as the court system debated whether to sentence Bandy to prison or to probation with restitution, Science Service proceeded with ambitious plans to purchase its own building. For seventeen years, the group had been borrowing space in the National Academy of Sciences building, but as international war tensions intensified activity in Washington, DC, it became apparent that the NAS needed its space for its own activities. \footnote{217} On April 18, 1941, the Executive Committee granted Davis the authority to purchase a townhouse at 1719 N St. N.W. for $27,500, provided that the group could obtain the necessary business occupation permits. That building, which Davis described as quiet and centrally located, had four stories and twenty-five rooms, including a large conference room, a kitchen, and individual offices for the staff writers. The townhouse had been recently repainted and rewired with "fluorescent lights of the most modern sort," and had a new phone system that eliminated the need for a full time operator. Through summer, 1941, Science Service made further renovations, adding two apartments on the top floor to accommodate trustees and others during the crowded conditions caused by the growing defense emergency. In the end, even with renovations and other expenses bringing

\footnote{214}{For a calculation of inflation, see \url{http://www.westegg.com/inflation/infl.cgi}.}  \footnote{215}{Watson Davis, "Minutes of the Annual Meeting of the Board of Trustees of Science Service," May 1, 1941, SIA RU7091, Box 5, Folder 5.}  \footnote{216}{Watson Davis, "Information Memorandum on Progress of Science Service," December 1, 1941, SIA RU7091, Box 5, Folder 3.}  \footnote{217}{Watson Davis, "The Twentieth Anniversary of Science Service," \textit{The Scientific Monthly} 54, (Mar. 1942): 290-291.}
the move’s cost into a range of $37,500, Science Service wound up needing a mortgage of only $15,000, thanks to the income from the sale of Bandy's property.218

By September 1941, the group had moved its entire operation to N Street and proudly declared, "Science Service for the first time in its history occupies a home of its own." The staff planned a formal opening reception and a dedication radio broadcast to take place on Saturday, December 13, 1941, led by Vice-President Henry A. Wallace.219 Despite the national emergency created by the attack on Pearl Harbor, and the formal declaration of war by President Roosevelt just a week before the planned celebration, the events took place as scheduled. On a special half-hour radio broadcast of its CBS "Adventures in Science" series, Science Service marked both the dedication of its new home and its twentieth anniversary. Watson Davis proclaimed the event as a "rededication to the objectives and principles set forth when Science Service was organized in 1921 and in the twenty years of operation since." Along with Vice-President Henry A. Wallace, guests of honor included Vannevar Bush, who was the president of the Carnegie Institution of Washington and the director of the new high-profile Office of Scientific Research and Development; Charles G. Darwin, grandson of the noted evolutionist and director of the National Laboratory in England, and the famous astronomer and Science Service trustee Harlow Shapley.220 In his dedication address, Vice-President Wallace praised Science Service as "one of the splendid agencies for the dissemination of pure truth.” He invoked the memory of its founder, saying, "Scripps was

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218 Watson Davis, "Information Memorandum on Progress of Science Service," December 1, 1941, SIA RU7091, Box 5, Folder 3.
219 Ibid.
a newspaper man himself and knew what some scientists do not know, that truth can be popularized." According to Wallace:

> the ideal of the newspaper man has been joined with that of the scientist and Science Service has been making available in a most unusual way the facts of the ever-advancing science of our day. Science Service is animated with the ideal of serving the people and not exploiting them. The scientists who express themselves through Science Service know how important it is that the science of the future should be the agent of peace and abundance instead of warfare and exploitation. In the year or two immediately ahead, we have a tremendous job to do in defeating those who are using science for propaganda and destruction. In that job our own scientists will play an extremely vital role. When that job is done, science, properly directed, will open a new day, a day of abundance and peace for all the people.\(^{221}\)

Inevitably, Washington’s new war emergency colored the anniversary celebration. Throughout the evening, speakers seized the occasion to emphasize the idea that scientific research and public appreciation of science were essential both to the war and the following peace. Vannevar Bush, who was about to become the leading influence on American science during World War II and shape its support for decades afterwards, reiterated his convictions that men of science would work for peace, as they always had. Using the new rhetoric of wartime commitment, Watson Davis added his affirmation that "science pledges victory."\(^{222}\)

Science Service had good reason to celebrate its twentieth anniversary. While Bandy’s theft had temporarily caused serious disruption within the organization and distracted the staff from their real work of presenting science news, Science Service ultimately suffered no financial loss. Indeed, once Bandy’s depletions had been stopped, its

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balance sheets showed a substantial increase in monthly income by spring, 1942. The group found a new treasurer, and more than that, adopted an improved system of bookkeeping that helped increase both security and accuracy. While the Bandy episode had been a trial—literally—it did not seem as if word had leaked out to the broader science community, publishing world, or general public in any way that harmed the Science Service reputation. As 1942 began, the organization was able to celebrate its accomplishment in acquiring its own headquarters, enjoying praise from the nation’s vice-president.

At the war’s onset, Science Service was still the world's only science news syndicate, which had grown to serve approximately 200 magazines and newspapers not only in the United States, but also in Canada, Europe, Asia, and Australia. Still more impressive, the Science News Letter had outpaced the newspaper syndicate program. By 1940, almost 35,000 individuals, libraries, schools, and other organizations subscribed to Science News Letter. Davis claimed that Science Service material reached "the most intelligent audience in the world." He jokingly added that if any other editor felt the same way, he would meet to challenge him "behind the Cathedral at dawn, provided the space is big enough for my 35,000 scientists, science teachers and other readers whose consuming interest is news of scientific progress."224

Like all American organizations and businesses, Science Service had to adjust to changes and complications once the United States entered World War II. Having the group’s headquarters in Washington, DC created additional challenges; housing in the bustling

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223 O.W. Riegel, "Report to the Annual Meeting of the Board of Trustees of Science Service," April 30, 1942, SIA RU7091, Box 5, Folder 8.
224 Watson Davis, "Watching the Parade of Science," September 1940, SIA RU7091, Box 222, Folder 9.
wartime city became painfully scarce, so Science Service had difficulty in finding someplace for visiting board members to stay when the city was already bursting at the seams with government and military workers.

As subsequent chapters will address, Science Service mobilized its writers, editors and other staff for the war effort. The focus of its news shifted; rather than promoting research as an overall good for the general future of democracy, wartime articles detailed specific ways that science research was aiding military work, both abroad and in the United States. Science Service cooperated with the war effort in a number of ways, including writing pamphlets for the War Department, and providing information from its science connections as requested.

Wartime created new practical and ethical questions with which science journalists had to wrestle. The U.S. military and government wanted to keep up public morale using the media to distribute propaganda stories about how well-equipped the nation was, but at the same time, key weapons programs were surrounded by strict secrecy rules. Such conditions created some difficulty for Science Service reporters, who had to learn to maneuver through wartime regulations. The military invited staff writers to visit its secret research installations, as part of public relations. On at least one occasion, a Science Service writer fell into controversy surrounding protocol and access when he wrote about classified material, as a later chapter will explain. Wartime created new debates about freedom of the press. Science Service leaders had to juggle their responsibilities to serve readers and promote scientific research, while working within military regulations and government needs. Science Service made great efforts to underline its patriotic willingness to cooperate with war officials. Science Service photographers sought and won the necessary official clearance to be placed
on the list of approved visitors to the Pentagon.\textsuperscript{225} War agencies kept a close eye on reporters’ work; after a Science Service photographer got special permission to visit the allergy room at Walter Reed Hospital in 1943, a military representative later followed up to check what had happened to his photographs.\textsuperscript{226} Science Service immediately sent the War Department copies of those articles it had published that contained pictures from the allergy room.\textsuperscript{227}

Overall, Science Service supported the war effort "in ways too numerous to list," according to Watson Davis. The organization offered its Washington building as a civilian defense zone and sector post. But its main function in wartime represented a natural extension of its peacetime purpose, to write articles explaining, examining, and in some cases defending aspects of war-related science. Over previous years, Science Service had built up an extensive reach and influence with readers and with publishers that made it natural for the War Department and other government agencies to seek the cooperation and participation of its reporters.

As the war progressed and finally drew to a close, Science Service publications gradually emphasized a new theme, the need to maintain the gains that science had achieved during the war. Just as business leaders had begun thinking about the need to retool and renovate factories, these advocates suggested, the scientific community would need increased government funding and public support to convert from wartime research to equally important peacetime needs.

\textsuperscript{225} Watson Davis, letter to Gordon F. Swarthout, April 7, 1943, SIA RU7091, Box 254, Folder 8.
\textsuperscript{226} Irwin Barbour, letter to Science Service, October 3, 1943, SIA RU7091, Box 254, Folder 8.
\textsuperscript{227} Fremont Davis, letter to Irwin Barbour, October 12, 1943, SIA RU7091, Box 254, Folder 8.
Between 1921 and the end of World War II, Science Service had twenty-five years of experience in bringing science news to the public on a regular basis in an accessible way. The next chapter explores in greater detail how far those efforts reached and evaluates the extent to which they were successful.
CHAPTER 4

Mechanisms of Impact

The goal of this research and dissertation is to explore the history of how Science Service initiated actions, programs, publications, and other methods in its pursuit of expanding the fragmented and unfocused science popularization efforts of the time, into an organized and sustained model of science journalism. This chapter will examine the many different outreach endeavors Science Service implemented in an attempt to expose the public to the world of science. Ideally, there would be some way to measure and quantify not only the organization's output of material, but also the extent to which its ideas were accepted, and incorporated into the lives and thoughts of the American public. How much did the material matter to people? To what extent did the public, struggling with the end of a Great War, depression economics, and then a Second World War, really begin to develop the "scientific habit of mind" that Science Service founders E.W. Scripps and W. E. Ritter, as well as leaders Edwin E. Slosson and Watson Davis, envisioned? Did Science Service contribute to creating the more scientifically literate citizenry that it believed was essential to a thriving and invincible democracy? In short—did Science Service have an impact?

To attempt to make these determinations, it is essential to establish what serves as evidence, what can be concretely argued, and what can only be inferred. First, "impact" and "exposure" are not the same things. Exposure can occur without impact; impact cannot occur without some aspect of exposure. People can be exposed to material, as in opening the pages of a newspaper, but not experience an impact if they do not see, do not read, or do not become engaged with, the material. The number of articles, column inches, or publications using the material does not tell us what effect it had. Instead, it supports claims for exposure.
For its part, Science Service was careful about claiming impact and, especially in the early days, described its presence in the media as affording the public "the opportunity to read" a portion of Science Service material. This was, in part, because Science Service relied on newspapers' circulation claims as an estimate of the potential number of readers who might encounter its articles. Its own publication, the *Science News Letter*, provided more direct and reliable circulation figures, based on the number of subscriptions paid by individuals and institutions such as schools and libraries. Occasionally, Science Service leaders spoke boldly about impact at a level they believed they could defend. In 1932, Watson Davis told the organization's trustees, "The continued successful functioning of our institution is a demonstration of the fundamental soundness of the principles upon which it is founded and operated." He added, "The continued work of Science Service, indirectly and directly through many avenues, has laid a foundation of public appreciation of science and the methods of science." Likewise, Davis claimed that Science Service's model and success had influenced national press services and newspapers to assign more reporters to cover science stories and devote increasing column inches to science coverage.

Ideally, we might find a high volume of response, some action, on the part of the American public to support the assertion that as an organization, Science Service had a vital impact on people's ideas about science. But in reality, such evidence is limited, elusive, and nearly impossible to quantify. Arthur Molella, Director of the Jerome and Dorothy Lemelson

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228 Watson Davis, "Report to the Annual Meeting of Board of Trustees of Science Service, Thursday, April 28, 1932," SIA RU7091, Box 3, Folder 2.
229 Watson Davis, "Information Memorandum on Progress of Science Service," Jan. 20, 1933, SIA RU7091, Box 3, Folder 5.
Center for the Study of Invention & Innovation, National Museum of American History, Smithsonian Institution, summarized the difficulty associated with measuring impact:

For museum educators or almost anyone involved with popularization of any kind, measuring visitor or audience impact is the holy grail. But actually doing it in any quantitative way is exceedingly difficult, and I don't think anyone has figured it all out yet. So much depends on how "impact" is defined—it seems there are myriad definitions—and what precisely you are measuring. It is even harder for historians who want to capture past impacts. The evidence is there, but it is diffuse and hard to pin down. I'm afraid to say that most impact assessments, current or historical, inevitably rely on anecdotal evidence, unscientific sampling, and best guesses.\(^{230}\)

For historians, establishing evidence of impact often lies somewhere between Justice Potter Stewart's subjective "I know it when I see it" declaration,\(^ {231}\) and a concession to provisional claims—rather than absolute—based on sufficient evidence to surmise impact. In many ways impact is a personal experience, suggesting the recipient's reaction, and very difficult to discern without each person or entity attesting to that effect. Yet it is also possible to quantify, within certain parameters, impact through evidence of exposure to materials or circumstances, as in cases where large numbers of people participate in an opportunity, though their personal experience may be unknown. Proceeding from these caveats, it is possible to make a strong case for the impact, influence, and credibility of Science Service for the time period under consideration.


\(^{231}\) Justice Potter Stewart, *Jacobellis v. Ohio*, 378 US 184 (1964). In his concurring opinion in this obscenity case, Justice Stewart famously stated that he would not attempt to further detail the materials that constituted pornography, adding "But I know it when I see it." [http://law2.umkc.edu/faculty/projects/ftrials/conlaw/obscenity.htm](http://law2.umkc.edu/faculty/projects/ftrials/conlaw/obscenity.htm)
According to a 1936 Schenectady Gazette article, noted psychologist J. McKeen Cattell said, "Our newspapers must be given credit for the constantly increasing interest of the general public in science. We have in America the only institution of its kind in the world, Science Service in Washington which keeps the masses informed…." In 1937, the American Institute of New York City (an inventors' association) presented Watson Davis with an award, citing the way that Science Service had “played such a tremendous part in bringing together science and the human beings over which science holds sway.” G.B. Parker, editor-in-chief of the Scripps-Howard newspapers, then proclaimed "newspapers… reached millions where scientific magazines reached scores," and that in fostering the cooperation of scientists and the press to help people realize the many benefits of science, Davis and his colleagues had performed a "vast public service." Davis seized the occasion to reinforce the principles behind Science Service, speaking about fundamental and applied science as essential elements of civilization, leading to better living and more effective democracy. This occasion confirmed the impact Science Service had on the people present, and implied impact on millions of others.

When a poor, blind, sick woman with an unemployed husband wrote to Science Service during the Great Depression, because she had heard its radio programming regarding blind and crippled children, and thought the agency could assist her in getting help from the Social Security Administration, that was evidence of impact (Chapter 7). She linked the Science Service programming she heard with her own needs, and then contacted the

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organization noting that connection.\textsuperscript{234} Similarly, when a grieving father contacted Science Service in 1937, saying he had heard their radio programming on Tuesday afternoons in the shop where he worked, and also knew the mother of one of the Science Service staff writers, who encouraged him to write, that was evidence of impact (Chapter 7). His desperate search for concrete scientific information about the possible causes of the sudden death of his apparently healthy newborn daughter led him to contact Science Service because he considered it a credible authority.\textsuperscript{235}

Other examples of impact, found in Chapter 7, include Eleanor Roosevelt's request that Science Service seek and assemble information on women working in government science research; FBI Director J. Edgar Hoover's exchange of science and technology innovation information with Watson Davis; and reader reaction to Science Service's decision to accept advertising from Consumers Union. Science Service's many efforts on behalf of the government during World War II also provide evidence of influence and impact (Chapter 8). We also see significant and long-lasting evidence of impact in Science Service's decision to establish the \textit{Science News Letter} in 1922 in response to readers' request for science news, and later to create a retail book department to provide readers with science books for the same reason. Radio programming that reached millions, and high school Science Clubs, and the Science Talent Search (discussed in this chapter) that offered tens of thousands of young people opportunities to experience science firsthand, also logically imply that a portion of those exposed also were engaged and affected—that they experienced an impact.

\textsuperscript{234} Pearl Bridges, letter to Science Service, October 10, 1937, SIA RU7091, Box 182, Folder 5.
\textsuperscript{235} Maurice Caplan, letter to Jane Stafford, May 31, 1937, SIA RU7091, Box 182, Folder 15.
Other examples also speak to evidence of Science Service's influence and impact. On December 24, 1934, the *Pittsburgh Press* ran a two-column wide, full-length announcement of the upcoming meeting of the American Association for the Advancement of Science. The headline proclaimed, "The Eyes of the Scientific World Turn to Pittsburgh Thursday, December 27 to Wednesday, January 2." The announcement featured photographs of people important to the convention, beginning with Albert Einstein. The remaining photographs were of David Dietz, science editor of the Scripps-Howard newspapers and contributor to the *Pittsburgh Press*, and "almost the entire staff of Science Service"—Watson Davis, Frank Thone (biologist and nature writer), Emily C. Davis (anthropology and archaeology), Jane Stafford (medicine), Marjorie Van de Water (psychology), and Robert Potter (chemistry and physics). The announcement promised readers they would not miss "a single detail of the many fascinating discoveries revealed during the week of the convention."236 The *Pittsburgh Press* positioned the Science Service staff as part of a team dedicated to providing readers with accurate and exciting science information. The newspaper deemed their participation worthy of displaying their photographs, though it was unlikely that most readers—still huddling around radios—would have recognized them. The newspaper thus introduced the Science Service staff as offering a key modern information service, while at the same time validating them as credible and trusted sources of science news.

Readers did notice and respond to Science Service material printed in their hometown papers. In a 1938 case a reader, who signed him- or herself "Technocrat," wrote to the editor of the *Pittsburgh Press* to take issue with an article by Watson Davis. "Technocrat"

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236 *Pittsburgh Press*, "The Eyes of the Scientific World Turn to Pittsburgh Thursday, December 27 to Wednesday, January 2," December 24, 1934.
challenged Davis's alarm that dictatorships around the world were squelching scientific progress. Instead, according to the reader, Davis should be concerned that in the U.S., "a thousand boons to mankind remain locked up in the vaults of our leading industrial concerns…"237 It was technocrats who had the solutions, the reader continued, and Davis should not blame foreign dictators for the same conditions that existed here. One letter to the editor is not statistically significant; however, we may credibly hypothesize that occasionally other readers reacted to Science Service material and may have expressed their thoughts to newspaper editors. We may also assume that most reader feedback did not make its way into the newspaper, just as we may conjecture that for every letter sent or published, an unknown number of readers may have held similar convictions. Again, we cannot quantify this assumption—cannot even assemble significant evidence—but we can reasonably assume that this letter regarding articles that came from Science Service was not the only one of its kind.

Far more impressive, and much more quantifiable, was the case of a Science Service article that resulted in the preservation of a cancer research laboratory. As reported in the St. Petersburg Times in January 1948, Jane Stafford, Science Service medical writer, wrote a story about a forest fire that destroyed the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Maine. The invaluable collection of mice bred specifically for cancer research and several buildings were lost. When a past commander of the ladies auxiliary of the VFW read the story, she suggested to another member that they help the laboratory as part of the organization's cancer research fellowship fund. The women anticipated raising $500,000 by asking each of the 500,000 members to contribute one dollar. They planned to present their initial gift of $50,000 later that year, and expected it to go toward rebuilding the students'

laboratory, dining hall, and three residence halls. A follow-up article in the *St. Petersburg Times* three days later showed a photograph of Stafford, two women from the ladies auxiliary of the VFW, and C.C. Little, director of the laboratory, viewing plans for the new structures. Few examples as concrete and quantifiable in nature exist to support claims that Science Service was exerting influence and having an impact. However, given that it will never be possible to amass a vast amount of indisputable statistical evidence of the organization's impact, one solid example of this type is a noteworthy occurrence.

These examples provide evidence that Science Service, a new and unique kind of organization, did have impact, some of which continues to resonate today. Some things defy easy quantification—this is not a case of the number of businesses failing in an economic downturn, or the number of people or animals lost to a virulent disease. But just because something cannot be easily measured does not mean that it does not have value, resonance, or effect. Instead, it presents the historian with the challenge of finding other, less obvious but similarly valid, methods of determining impact. The remainder of this chapter will examine more closely Science Service's syndicated newspaper material, its extremely popular and still published *Science News Letter* (now Science News), radio programming, Science Clubs, Science Talent Search, "Things of Science" kits, and specialized reporting to aid research, in support of the assertion that Science Service did achieve significant impact.

**Science Service in the Newspaper**

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From the beginning, in 1921, Science Service was determined to implement as many methods of popularization as possible to make science news available and accessible to the public. Its main focus was print journalism, and the first logical move, and chief among its early intentions, was to make its way into mainstream newspapers. Science Service leaders and trustees wanted to position science news to be as easily accessible—both in location and presentation—as any other news of the day. As described in Chapter 3, Science Service first made arrangements to place articles in newspapers, and then once the organization was firmly established, it began its own syndicate service to furnish articles to subscribing newspapers. The material for the articles originated in pieces written by editor (later director) Edwin E. Slosson and taken from his many published books, by principal writer and managing editor Watson Davis, by members of the Board of Trustees of Science Service who were men of science, as well as other scientists of their acquaintance, drawing on scientific and medical journals, and information obtained at scientific meetings. Science Service also enlisted the skills of part-time "stringers" to supplement its own output of material. These stringers, who often were graduate students or young professors, were particularly useful for contributions from overseas. Paying the small fee for their services helped Science Service produce a wide range of material aimed at engaging as many readers as possible.²⁴⁰

The primary product of the news service was the "Daily Science News Bulletin," which later became the syndicate's "Daily Mail Report." Science Service sent the "Daily Mail Report" to its client newspapers five days a week, and each mailing consisted of four to eight science news articles. It was comprised of several different elements, including short articles, ²⁴⁰ Smithsonian Institution Archives website for the Science Service collection RU7091, historical overview, http://www.societyforscience.org/history.
longer articles, small bits of science information, unillustrated articles and those with illustrations. Over the years, some offerings endured while others disappeared, and newspapers could subscribe to all, or only some, of the many different features offered. Some options included "Daily Mail Report," "Why the Weather," "Daily Wire Report," and "Nature's Notebook," offered daily; "Isn't It Odd," "Science Shorts," and "Sunday Illustrated Feature," offered weekly; and the "Monthly Star Map," (also known as "Star Story Map" and "Map of the Stars"). Science Service also offered a "Preparedness" file, or "science morgue," of authoritative background stories that could prove timely in the course of the daily news. In 1931, the editor of the Birmingham Post wrote to Science Service that he found the information on hot weather particularly useful, and noted "We are starting it on page one." Yet another feature that appeared in Science Service news syndicate material for a few years was the Cartoonograph. According to historian Marcel LaFollette, it was Slosson's idea for the drawings that used humor to convey technical and statistical information. Local artists, including Elizabeth Sabin Goodwin, drew the entertaining and informative illustrations until 1925 when a fulltime cartoonist was hired. LaFollette observed that these illustrations are a "reminder that graphic communications are nothing new." An example of Goodwin's illustrations follows.

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241 Science Service, "Distribution of Science Service Material To Newspapers In The United States," Apr. 1, 1932, SIA RU7091, Box 3, Folder 2.

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246 Science Service, "Distribution of Science Service Material To Newspapers In The United States," Apr. 1, 1932, SIA RU7091, Box 3, Folder 2.
York Times, and Philadelphia Public Ledger (two). By 1934, a number of foreign newspapers were also subscribing to Science Service material, including five in Canada, three in Europe, and one in Mexico City.

Newspapers came and went from the syndicate service, or changed the options they chose to purchase. Some made changes because of economic conditions, particularly during the Great Depression, when newspapers often did not have enough work for their own staff to do, let alone need to purchase outside material. Others suspended Science Service subscriptions due to outside developments, as was the case when the Mexico City Excelsior had to drop the service for two months because of labor disputes, but then resumed its subscription once matters were resolved. Science Service leaders apparently never saw enough decline at any one time to give them real concern over the viability of their enterprise. To the contrary, in 1932 Watson Davis asserted to the trustees that, "The continued successful functioning of our institution is a demonstration of the fundamental soundness of the principles upon which it is founded and operated…The continued work of Science Service, indirectly and directly through many avenues, has laid a foundation of public appreciation of science and the methods of science."

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247 Howard Wheeler, "Report of the Manager of Science Service," 1921, SIA RU7091, Box 1, Folder 2.
248 Science Service, "Distribution of Science Service Material To Newspapers In The United States," Apr. 1, 1932, SIA RU7091, Box 3, Folder 2.
249 Watson Davis, "Information Memorandum on the Progress of Science Service," (Nov. 23, 1931), SIA RU7091, Box 2, Folder 13.
250 Ibid.
251 Watson Davis, "Report to the Annual Meeting of Board of Trustees Of Science Service, Thursday, April 28, 1932," SIA RU7091, Box 3, Folder 2.
A partial list of publications arranging for special articles or subscribing to the Science Service syndicate service between 1921 and 1938 according to the Information Memoranda previously cited in this chapter for that period:

- Amenia Harlem Valley Times
- Ann Arbor News
- Asbury Park Press
- Asia Magazine
- Baltimore Evening Sun
- Bay City Times
- Beaver City Times-Tribune
- Belleville News
- Bellingham Herald
- Berkeley Gazette
- Bermuda Press (Hamilton Bermuda)
- Birmingham Age-Herald
- Boston Evening Transcript
- Bradford Era
- Bridgeport Post
- Brooklyn Eagle
- Buffalo Times
- Camden Daily Courier
- Carolina Weekly
- Century
- Charlotte Observer
- Chicago Tribune
- Dallas Itemizer-Observer
- Daytona Beach News Journal
- Delineator
- Detroit Free-Press
- El Paso Herald-Post
- Flint Journal
- Forest Grove News-Times
- Fredericksburg Free Lance-Star
- Ft. Worth Record
- Good Housekeeping
- Grand Rapids Press
- Hartford Courant
- Hazard Advertising Co.—New York City
- Houston Post
- Independent
- Jackson Citizen Patriot
- Kalamazoo Gazette

- Kansas City Star
- Lynchburg News-Advance
- Mexico City Excelsior
- Midland Republican
- Milwaukee Journal Telegram
- Minneapolis Tribune
- Montgomery Advertiser
- Muskegon Chronicle
- New York Evening Post
- New York Globe
- New York Times
- New York World
- Norfolk Ledger-Dispatch
- Norfolk Virginian-Pilot
- Pasadena Post
- Paterson Call
- Philadelphia Public Ledger
- Pictorial Advertising Co.—Brooklyn, NY
- Pittsburgh Dispatch
- Popular Science Monthly
- Portland Oregonian
- Richmond News-Leader
- Rocky Mount Telegram
- Saginaw News
- Salt Lake City Telegram
- San Antonio Express
- San Diego Sun
- Selma Irrigator
- Souderton Independent
- Spartanburg Herald-Journal
- Spokane Chronicle
- Springfield Providence Journal
- Springfield Republican
- St. Joseph Gazette
- Toronto Star
- Vermillion Plain Talk
- Washington Post
- Winona Midwest Review
- World's Work
- Young America
In the late 1920s and early 1930s, a small number of newspapers, including the *New York Times*, the *Kansas City Star*, and the *Detroit News* assigned staff writers to specialize in science fields, and devoted considerable space to science stories.\(^{252}\) Most newspapers, however, did not have science writers or dedicated space for science material. As noted before, Edwin Slosson had declared, "If there had been a spontaneous demand for scientific articles of a high order Science Service would not have been founded."\(^{253}\) So it was no surprise that many newspapers used the material as filler, squeezing brief snippets of science information between advertisements for automobiles and the latest clothing fashions.

Newspapers were not obligated to publish the material on specific dates, or in its entirety. Many times newspapers published full articles and credited Science Service as the source. Other times, newspapers paraphrased the material and did not credit Science Service, giving the impression they had generated the material on their own, and making it difficult for historians to compare Science Service's output against its publication rate. Newspaper editors also abbreviated articles, re-titled articles that also changed the focus of the story to make it more enticing for their readers, and delayed publication by weeks, if not months. For example, the *Daily Argus* of Mount Vernon, New York, published Science Service staff writer Martha G. Morrow's 1943 story on raising rabbits for meat on April 14, 1943, under the title "How to Grow Ration-Free Meat at Little Expense."\(^{254}\) The *Pittsburgh Press* published the same material four days later, on April 18, with the title, "If You Can Raise


\(^{253}\) Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 17.

Chickens In Your Back Yard Then You Can Raise This Unrationed Food.\textsuperscript{255} In another case, the \textit{Daytona Beach Morning Journal} printed a story titled, "Billions of Stars Will Be Discovered With New 200-Inch Mt. Palomar Telescope" on April 26, 1948,\textsuperscript{256} while the \textit{St. Petersburg Times} ran the same story a week later on May 2, 1948, leaving out the "200-Inch" reference.\textsuperscript{257} In a final example, Science Service staff writer Marjorie Van de Water, who specialized in writing about psychological matters, wrote a lengthy article on what returning soldiers needed from friends and family to achieve renewed mental health after the war. Two newspapers publishing the story on the same day took decidedly different approaches. The \textit{Pittsburgh Press} published the story on April 7, 1944 with the headline, "Family, Friends Can Help Soldier To Regain His Full Mental Health," and subtitled, "Don't Be Tearful, Managing, Indulgent, or Dependent; Use Consideration."\textsuperscript{258} The article appeared in Van de Water's own words, and with a title meant to convey the essence of the article, if a reader only noted the headline. The \textit{San Jose News} published a similar story on April 7 as well, but presented it much differently. The headline simply read, "Need No Treatment," and the article combined paraphrases of Van de Water's article with quotations attributed to her.\textsuperscript{259} No hint of the article's context could be derived from the minimal wording used in the headline. Neither article ran more than a few column inches. When the article appeared in the \textit{Science News Letter} on April 22, 1944, it encompassed most of six pages and ran under the

\textsuperscript{255} Martha G. Morrow, "If You Can Raise Chickens In Your Back Yard Then You Can Raise This Unrationed Food," \textit{Pittsburgh Press}, April 18, 1943.
\textsuperscript{258} Marjorie Van de Water, "Family, Friends Can Help Soldier To Regain His Full Mental Health," \textit{Pittsburgh Press}, April 7, 1944.
\textsuperscript{259} Marjorie Van de Water, "Need No Treatment," \textit{San Jose News}, April 7, 1944.
title, "Soldiers Wounded in Mind." Photographs and explanations detailed the challenges for family members as well as returning soldiers, and offered practical advice for dealing with the problems. Thus there were three very different presentations of the same important, timely material. These few examples are brief illustrations of how newspaper editors had significant control over how Science Service material was presented to readers. Given those variations, distortions, and delays, I argue that we can best understand Science Service's intent, and content by looking at the Science News-Letter, the organization’s own outlet.

Staff Writers

Science Service had many staff writers over the years, some better known than others. Some, such as Slosson and Davis, often produced pieces that advocated the broad case of science popularization, while others specialized in exploring specific areas of science. What follows is a brief overview of some of the writers' material.

**Edwin E. Slosson** was a prolific writer and author of several books. Many newspapers carried his "Chats on Science," as well as other articles, which covered a variety of topics presented in simple and clear form. A small sample of his work includes:

- "Anarchy in the Human Body" in *Berkeley Daily Gazette* Dec. 12, 1924
- "Science Leading Us to Utopia" in *Evening Tribune* Feb. 21, 1926
- "Scientists to Hear of New Source of Potash Supply" in *Pittsburgh Press* Sep. 6, 1927

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Watson Davis wrote and worked for Science Service for thirty-five years, served on a number of committees, and essentially shepherded the organization from its ambitious beginning just after World War I into the modern Cold War era. Davis wrote on specific scientific topics, and also in more general terms on the importance of scientific research, education, and popularization.

"Pure Air,' Cry In Cities"        Toledo News-Bee        Nov. 19, 1923\(^{264}\)
"Advance of Science"             Sydney Morning Herald    Oct. 3, 1925\(^{265}\)
"Rule by Technology"            St. Joseph Gazette        Jan. 28, 1933\(^{266}\)
"Science Not Convinced That Telepathy Exists"        Herald-Journal        Oct. 22, 1937\(^{267}\)
"Says World's Troubles Rather Closely Related to Productive Capacity"        Ottawa Evening Citizen    June 28, 1938\(^{268}\)
"Historic Oath May Hold Cure for Intolerance"        Berkeley Daily Gazette    Aug. 13, 1938\(^{269}\)
"Hauser Turns Clay Into Synthetic Mica"        Evening Independent    Apr. 28, 1941\(^{270}\)
"Science Clubs for All Ages Meet Throughout America"        Pittsburgh Press        Oct. 26, 1941\(^{271}\)

\(^{264}\) Watson Davis, "Pure Air,' Cry In Cities," Toledo News-Bee, November 19, 1923.
\(^{266}\) Watson Davis, "Rule by Technology," St. Joseph Gazette, January 28, 1933.
\(^{270}\) Watson Davis, "Hauser Turns Clay Into Synthetic Mica," Evening Independent, April 28, 1941.
\(^{271}\) Watson Davis, "Science Clubs for All Ages Meet Throughout America," Pittsburgh Press, October 26, 1941.
**Frank Thone** was Science Service's biology editor and specialized in nature articles.

His articles often appeared under the titles, "Nature's Notebook" or "Nature Ramblings."

"United States Declares War to Death on Fruit Fly in Florida Groves"  
*Lodi Sentinel*  
Jul. 30, 1929

"Fireflies and Glowworms"  
*News and Courier*  
Sep. 18, 1929

"Heat Records of 117 Years Broken"  
*Berkeley Daily Gazette*  
Aug. 31, 1936

"Goldenrod Gets Blamed for Sneezes and Red Eyes Due to Wicked Ragweed"  
*Sarasota Herald-Tribune*  
Jul. 13, 1937

"How to Grow Bigger and and Better Plants"  
*Calgary Daily Herald*  
Jan. 19, 1938

"Frozen Pack Method Aids Canned Food"  
*Pittsburgh Press*  
Nov. 10, 1940

"Soilless Farms Growing Greens for Troops in Japan"  
*Daytona Beach Morning Journal*  
Apr. 23, 1948

"Leaflets Three—Let It Be—Biologist Says"  
*Schenectady Gazette*  
Jun. 30, 1949

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275 Frank Thone, "Goldenrod Gets Blamed For Sneezes and Red Eyes Due to Wicked Ragweed," *Sarasota Herald-Tribune*, July 13, 1937.


James Stokley was affiliated with Science Service for over fifty years. He wrote on astronomy topics for the organization, including the monthly "Star Map," and authored seven books as well. He became the first director of the Fels Planetarium in Philadelphia in 1931, and the director of the Buhl Planetarium in Pittsburgh in 1939. He continued to write on astronomy for Science Service after taking the planetarium positions.

"Only One Slight Mishap in Pouring Giant Telescope"  
_Berkeley Daily Gazette_  Apr. 5, 1934\(^{280}\)

"Map of the Glorious Stars Of Winter Sky Over Tropics"  
_Palm Beach Daily News_  Jan. 8, 1936\(^{281}\)

"Orion Key To March Skies"  
_Sarasota Herald-Tribune_  Mar. 13, 1937\(^{282}\)

"Leo, the Lion, Charges Across Skies"  
_Calgary Herald_  Apr. 1, 1939\(^{283}\)

"Cunningham's Comet Visible"  
_Evening Independent_  Dec. 9, 1940\(^{284}\)

"Jupiter Now Brightest Orb"  
_Evening Independent_  Jan. 29, 1942\(^{285}\)

"Summer Stars Appear—Scorpion Shines On June Evenings"  
_Ottawa Evening Citizen_  Jun. 1, 1944\(^{286}\)

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\(^{282}\) James Stokley, "Orion Key To March Skies," _Sarasota Herald-Tribune_, March 13, 1937.

\(^{283}\) James Stokley, "Leo, the Lion, Charges Across Evening Skies," _Calgary Herald_, April 1, 1939.

\(^{284}\) James Stokley, "Cunningham's Comet Visible," _Evening Independent_, December 9, 1940.


\(^{286}\) James Stokley, "Summer Stars Appear—Scorpion Shines On June Evenings," _Ottawa Evening Citizen_, June 1, 1944.
Jane Stafford wrote about health and medicine for Science Service. She had a chemistry degree, and had written for the American Medical Association's journal, Hygeia before working for Science Service. She was a co-founder of the NASW.

"Expect Wave of 'Confessions' To Lindbergh Baby Crime"  
Ottawa Evening Citizen  Apr. 1, 1936\textsuperscript{287}

"Sport Games Help Prevent Suicides"  
Berkeley Daily Gazette  May 6, 1936\textsuperscript{288}

"Fingerprints Give Insight To Character"  
Miami Daily News  Feb. 28, 1937\textsuperscript{289}

"'New Test Reveals Whooping Cough, Prevents Spread"  
Grape Belt and Chautauqua Farmer  Oct. 8, 1937\textsuperscript{290}

Death Ray' for Microbes Hailed; Is Simple to Use,"  
Berkeley Daily Gazette  Mar. 7, 1938\textsuperscript{291}

"Keep Your Temper—and Your Health"  
Youngstown Vindicator  Oct. 25, 1942\textsuperscript{292}

"Penicillin and Streptomycin Rescue on Death's Brink"  
Daytona Beach Morning Journal  Aug. 13, 1947\textsuperscript{293}

"Petting Dangers Over-Rated"  
St. Petersburg Times  Dec. 14, 1947\textsuperscript{294}

"Perfect Secretary, Bad Mother?"  
Pittsburgh Press  Dec. 7, 1949\textsuperscript{295}

\textsuperscript{287} Jane Stafford, "Expect Wave of 'Confessions' To Lindbergh Baby Crime," Ottawa Evening Citizen, April 1, 1936.
\textsuperscript{290} Jane Stafford, "New Test Reveals Whooping Cough, Prevents Spread," Dunkirk Grape Belt and Chautauqua Farmer, October 8, 1937.
\textsuperscript{292} Jane Stafford, "Keep Your Temper—and Your Health," Youngstown Vindicator, October 25, 1942.
\textsuperscript{293} Jane Stafford, "Penicillin and Streptomycin Rescue on Death's Brink," Daytona Beach Morning Journal, August 13, 1947.
\textsuperscript{295} Jane Stafford, "Perfect Secretary, Bad Mother?" Pittsburgh Press, December 7, 1949.
Marjorie Van de Water wrote on psychology matters for Science Service. She was particularly interested in the psychological issues surrounding war and returning veterans.

"Are Mental Test Questions Silly?"  
*Star*  
Jun. 9, 1935

"Fear of Children Causes Intellectual Race Suicide"  
*Berkeley Daily Gazette*  
Mar. 30, 1937

"How to Find a Husband"  
*St. Petersburg Times*  
Jul. 17, 1937

"Psychologists Probe Group Judgments"  
*Daytona Beach Morning Journal*  
Apr. 20, 1938

"Why Marriages Fail"  
*Pittsburgh Press*  
Jun. 30, 1938

"Instrument for Measuring National Morale"  
*Catalina Islander*  
Aug. 14, 1941

"New Method Would Aid Aircraft Spotters; Navy Men Improve Vision"  
*Pittsburgh Press*  
May 16, 1943

"Be Prepared to Help Returning Serviceman"  
*Milwaukee Journal*  
Mar. 29, 1945

"Cultures of Both Old and New Worlds Follow Same Pattern"  
*Nashua Telegraph*  
Aug. 12, 1949

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296 Marjorie Van de Water, "Are Mental Test Questions Silly?"  
297 Marjorie Van de Water, "Fear of Children Causes Intellectual Race Suicide,"  
298 Marjorie Van de Water, "How to Find a Husband,"  
299 Marjorie Van de Water, "Psychologists Probe Group Judgments,"  
300 Marjorie Van de Water, "Why Marriages Fail,"  
302 Marjorie Van de Water, "New Method Would Aid Aircraft Spotters; Navy Men Improve Vision,"  
303 Marjorie Van de Water, "Be Prepared to Help Returning Serviceman,"  
304 Marjorie Van de Water, "Cultures of Both Old and New Worlds Follow Same Pattern,"
Sample of Science Service Articles in U.S. Newspapers

Science Service syndicate material ran from 1921 through 1964, when it was discontinued. It would be impossible to list, or even know, all of the Science Service articles that appeared in newspapers through the decades. Between the sheer volume of syndicate material Science Service generated, plus some editors' tendency to use uncredited and paraphrased articles, historians could never discover the true amount of Science Service output from the resources available. Even the archived resources of the collection contain only samples of the "Daily Science Bulletin" and the "Daily Mail Report," published between 1921 and 1964, and resulting in approximately 11,000 days of science news production.

What follows are the results of a search of a sample of available archived newspapers published during the 1920s to 1940s. Some of the newspapers sampled are listed in this chapter as subscribing to the syndicate service, and others do did not appear in the lists. This may be because they subscribed after the date of the available subscriber lists, subscribed for only a trial period, or used the material with the "By Science Service" credit but did not pay for the service. As noted, some of this material was available in the supplement to the AAAS publication, Science, and a portion of it appeared in the Science News Letter, so some newspapers may have rationalized their use of the material in that way.

To conserve space the articles are listed by article title (with author's name if applicable), publication, and date, without being footnoted here in the chapter, but are cited in the Works Cited. If no author's name appears, the citations appear with Science Service as the author, along with the title of the article, the name of the publication, and the date of the article. Example:

<table>
<thead>
<tr>
<th>Title of Article</th>
<th>Newspaper Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Meteors Same as Earth Materials&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jun. 27, 1923</td>
</tr>
<tr>
<td>&quot;Notable Progress is Made in Science During 1923&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jan. 1, 1924</td>
</tr>
<tr>
<td>&quot;Sunshine as Medicine&quot;</td>
<td>Calgary (Alb) Daily Herald</td>
<td>Mar. 31, 1924</td>
</tr>
<tr>
<td>&quot;Wonders of the Microscope&quot;</td>
<td>Sydney (Aus) Morning Herald</td>
<td>Oct. 4, 1924</td>
</tr>
<tr>
<td>&quot;The Sun and Our Weather&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Feb. 10, 1925</td>
</tr>
<tr>
<td>(by Charles Greeley Abbot)</td>
<td></td>
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<tr>
<td>&quot;Tennessee Public Thirsts for Forbidden Knowledge&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jun. 15, 1925</td>
</tr>
<tr>
<td>(by Watson Davis)</td>
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<tr>
<td>&quot;An Index of Old Age&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jun. 17, 1925</td>
</tr>
<tr>
<td>(by Edwin E. Slosson)</td>
<td></td>
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<tr>
<td>&quot;Scripps Leave an Annuity for Science Service&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Mar. 31, 1926</td>
</tr>
<tr>
<td>&quot;Favors Teaching of Evolution&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 21, 1926</td>
</tr>
<tr>
<td>&quot;Tomb Robbers&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Feb. 12, 1927</td>
</tr>
<tr>
<td>&quot;X-Rays Imperil Heredity, But Speed Up Evolution&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Aug. 6, 1927</td>
</tr>
<tr>
<td>&quot;Evolution Well Established But Unexplained, Says Botanist&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Apr. 3, 1928</td>
</tr>
<tr>
<td>&quot;Hunting for Nobile Crew Tragic Task&quot;</td>
<td>Pittsburgh Press</td>
<td>Jun. 3, 1928</td>
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<tr>
<td>&quot;Yellowstone Park's Youngest Geyser&quot;</td>
<td>Pittsburgh Press</td>
<td>Aug. 7, 1928</td>
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<tr>
<td>&quot;Programs to be Broadcast&quot;</td>
<td>Pittsburgh Press</td>
<td>Aug. 18, 1928</td>
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<tr>
<td>&quot;Mexican Race Traits Bared&quot;</td>
<td>Pittsburgh Press</td>
<td>Aug. 19, 1928</td>
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<tr>
<td>Title</td>
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<td>Date</td>
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<tr>
<td>&quot;Influenza Increases&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Nov. 23, 1928</td>
</tr>
<tr>
<td>&quot;Einstein Sick, Extends Theory to Electricity and Magnetism&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Jan. 26, 1929</td>
</tr>
<tr>
<td>&quot;Housewives Asked to Help Prevent Spread of Fruit Fly&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>May 25, 1929</td>
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<tr>
<td>&quot;Vast Resources of Manchuria&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Sep. 16, 1929</td>
</tr>
<tr>
<td>&quot;New Institute to Study Problems of the Eye&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Oct. 28, 1929</td>
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<tr>
<td>&quot;Manchurian Authorities Throttle Local Research&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Oct. 31, 1929</td>
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<tr>
<td>&quot;Starts Tapping of Sea Power&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Sep. 17, 1930</td>
</tr>
<tr>
<td>&quot;Songs for Science&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Feb. 15, 1931</td>
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<tr>
<td>&quot;Work for Blind Musicians&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Apr. 16, 1931</td>
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<tr>
<td>&quot;Lifeless Drops May Act Like Living Cells&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>May 8, 1931</td>
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<tr>
<td>&quot;At Meshed, the Sacred City&quot;</td>
<td><em>New York Times</em></td>
<td>May 18, 1931</td>
</tr>
<tr>
<td>&quot;Methods of Improving Man are Discussed by Scientists&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Jun. 6, 1931</td>
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<tr>
<td>&quot;Advice on Ancient Finds&quot;</td>
<td><em>New York Times</em></td>
<td>Jun. 28, 1931</td>
</tr>
<tr>
<td>&quot;Encke's Comet Observed by South American Astronomer&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Jun. 29, 1931</td>
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<tr>
<td>&quot;World Time-Tellers Awarded High Prizes&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Jun. 29, 1931</td>
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<tr>
<td>&quot;Broadcast of Eclipse of Sun is Predicted&quot;</td>
<td><em>New York Times</em></td>
<td>Sep. 23, 1931</td>
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<tr>
<td>&quot;Tiny Insects Aid in Evolution Study&quot;</td>
<td><em>Berkeley Daily Gazette</em></td>
<td>Mar. 16, 1932</td>
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<td>Title</td>
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<tr>
<td>&quot;Ancient Ancestor of Crocodiles Studied at American Museum&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Apr. 25, 1932</td>
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<tr>
<td>&quot;Value Put in Energy Gain&quot;</td>
<td>New York Times</td>
<td>May 3, 1932</td>
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<tr>
<td>(by Watson Davis)</td>
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<tr>
<td>&quot;Boredom is Found to be Cause of Most Time Lost by Workers&quot;</td>
<td>New York Times</td>
<td>Aug. 28, 1932</td>
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<tr>
<td>&quot;Germans Solve Determination of Melting Point of Crystals&quot;</td>
<td>New York Times</td>
<td>Oct. 30, 1932</td>
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<tr>
<td>&quot;Seismologists Knew L.A. Region Was in Earthquake Danger Zone&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Mar. 17, 1933</td>
</tr>
<tr>
<td>&quot;Darwin's Famous Barometer Put on Exhibit at His Old Home&quot;</td>
<td>New York Times</td>
<td>Apr. 17, 1933</td>
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<tr>
<td>&quot;Discovery of Use of Metal Caused Speeding Up of Life Tempo&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 11, 1933</td>
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<tr>
<td>&quot;Blonde Girl Explorer Mystifies Natives of 'Forbidden City'&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 11, 1933</td>
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<tr>
<td>(by Emma Reh)</td>
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<tr>
<td>&quot;The Move Toward Sanity&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 11, 1933</td>
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<tr>
<td>(by Watson Davis)</td>
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<tr>
<td>&quot;Science 'Surprised' at Aztec Tomb Discovery&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 11, 1933</td>
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<tr>
<td>&quot;Cuts in Federal Research Funds Will Lower Standards of Living&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 16, 1933</td>
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<tr>
<td>(by Watson Davis)</td>
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<td>&quot;New Stratosphere Ascent Will Try for Twelve-Mile Height&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 25, 1933</td>
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<tr>
<td>&quot;Fewer Folk, More Bread&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Aug. 18, 1933</td>
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<tr>
<td>Title</td>
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<td>Date</td>
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<tr>
<td>&quot;Ultra-Short Radio Waves&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Aug. 31, 1933</td>
</tr>
<tr>
<td>&quot;Far East Reveals Four Stages of Man's Evolution&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Dec. 6, 1933</td>
</tr>
<tr>
<td>&quot;Radioactivity is Produced by Daughter Of Curies' and Her Husband&quot;</td>
<td>New York Times</td>
<td>Feb. 2, 1934</td>
</tr>
<tr>
<td>&quot;Patient Kept Breathing by Football Bladder&quot;</td>
<td>New York Times</td>
<td>Apr. 15, 1934</td>
</tr>
<tr>
<td>&quot;Make 'Quakes' to Get Data&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jul. 14, 1934</td>
</tr>
<tr>
<td>&quot;Disease May Have Been Benefactor to Mankind&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jul. 23, 1934</td>
</tr>
<tr>
<td>&quot;Thinks Man Ten Million Years Old&quot;</td>
<td>Hartford Courant</td>
<td>Aug. 2, 1934</td>
</tr>
<tr>
<td>&quot;Man Dates From Very Early Time, These Scientists Believe&quot;</td>
<td>Spokane Daily Chronicle</td>
<td>Aug. 11, 1934</td>
</tr>
<tr>
<td>&quot;Constituents of Metals Determined by X-Rays&quot;</td>
<td>New York Times</td>
<td>Aug. 12, 1934</td>
</tr>
<tr>
<td>&quot;Can Science Bring Back Life That Existed in Ancient Eras?&quot;</td>
<td>Spokane Daily Chronicle</td>
<td>Nov. 7, 1934</td>
</tr>
<tr>
<td>&quot;It's 'Spree' That Hurts You Most&quot;</td>
<td>Pittsburgh Press</td>
<td>Nov. 11, 1934</td>
</tr>
<tr>
<td>&quot;Pocket Battleships' Not Cheap&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Dec. 4, 1934</td>
</tr>
<tr>
<td>&quot;Here is Woman Would Do Well in Arctic Area&quot;</td>
<td>Spokane Daily Chronicle</td>
<td>Feb. 11, 1935</td>
</tr>
<tr>
<td>&quot;Bathysphere Combing Depths of Sea Hailed by Inspectors&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>May 10, 1935</td>
</tr>
<tr>
<td>&quot;Rare Solar Eclipse Ends Before it Starts&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Jun. 24, 1935</td>
</tr>
</tbody>
</table>


"Big Piece of Good Weather Needed by Strato-Balloon" Toledo News-Bee Jul. 5, 1935


"Science Upsets Spinach 'Myth'" Toledo News-Bee Sep. 2, 1935

"Every Star Probably Has Nova Phenomenon" Berkeley Daily Gazette Sep. 21, 1935

"First Earthquake in Many Years" Pittsburgh Press Nov. 1, 1935

"Science Predicts Vaccines by Pills" Berkeley Daily Gazette Nov. 16, 1935

"Man May Try All His Tricks, But Ol' Man Weather Keeps On" Ottawa (Ont.) Evening Citizen Mar. 5, 1936

"Present Experimental Plant Making Gasoline from Coal" Berkeley Daily Gazette Sep. 4, 1936

"Physiologist Nearly Freezes to Death in Scientific Study" Berkeley Daily Gazette Oct. 6, 1936

"Rudiments of Speech Center Found in Three Highest Apes" Berkeley Daily Gazette Nov. 2, 1936


"One-Celled Organisms Found to Capture Atmospheric Nitrogen" Berkeley Daily Gazette Mar. 17, 1937

"Rare Solar Eclipse Takes Place June 8" Calgary (Alb) Daily Herald Jun. 5, 1937 (by James Stokley)

"European Bison Dwindling; Only Eighty-Four Are Left" Berkeley Daily Gazette Aug. 20, 1937

"Gehrig Passes Ruth's Run-Driving In Series Mark" Pittsburgh Press Oct. 11, 1937
<table>
<thead>
<tr>
<th>Title</th>
<th>Source</th>
<th>Date</th>
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<tbody>
<tr>
<td>&quot;Squirting Toothbrush, Rouge Spreader Among Gadgets Patented Last Week&quot;</td>
<td>Hartford Courant</td>
<td>Oct. 29, 1937</td>
</tr>
<tr>
<td>&quot;Much is Expected of New Drug in Treatment of Pneumonia&quot;</td>
<td>Spokane Daily Chronicle</td>
<td>Dec. 27, 1937</td>
</tr>
<tr>
<td>&quot;Newspaper Press Model Exhibited&quot;</td>
<td>Pittsburgh Press</td>
<td>Feb. 8, 1938</td>
</tr>
<tr>
<td>&quot;'Earliest Americans' Yield Title to Still Older Race&quot;</td>
<td>Pittsburgh Press</td>
<td>May 11, 1938</td>
</tr>
<tr>
<td>&quot;Scientific Starvation is Means to Stop Cutworm&quot; (by Watson Davis)</td>
<td>Ottawa (Ont) Evening Citizen</td>
<td>Jun. 30, 1938</td>
</tr>
<tr>
<td>&quot;Baseball Vacations Advocated by Mack&quot;</td>
<td>Berkeley Daily Gazette</td>
<td>Oct. 25, 1938</td>
</tr>
<tr>
<td>&quot;Your Health&quot; (by Jane Stafford)</td>
<td>Pittsburgh Press</td>
<td>Apr. 2, 1939</td>
</tr>
<tr>
<td>&quot;Summer Mountain Storms 'Spill Over' onto Plains&quot;</td>
<td>Pittsburgh Press</td>
<td>Aug. 20, 1939</td>
</tr>
<tr>
<td>&quot;Testing Lab to Yield Warships of Future&quot; (by Leonard H. Engel)</td>
<td>Pittsburgh Press</td>
<td>Aug. 20, 1939</td>
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<tr>
<td>&quot;Cancer of Lungs Prevalent Among Radium Miners&quot;</td>
<td>Dunkirk (NY) Grape Belt and Chautauqua Farmer</td>
<td>Sep. 1, 1939</td>
</tr>
<tr>
<td>&quot;What's Behind Ship Seizure?&quot;</td>
<td>Pittsburgh Press</td>
<td>Oct. 27, 1939</td>
</tr>
<tr>
<td>&quot;Eat Enough at Breakfast&quot; (by Jane Stafford)</td>
<td>Pittsburgh Press</td>
<td>Nov. 12, 1939</td>
</tr>
<tr>
<td>&quot;Census Bureau Prepares for Gigantic Task in 1940&quot; (by Emily C. Davis)</td>
<td>Pittsburgh Press</td>
<td>Nov. 12, 1939</td>
</tr>
</tbody>
</table>
"Releasing Uranium Atom's Energy Heads 1939 Science Achievements"  
*Pittsburgh Press*  
Dec. 24, 1939

"Rockets Get Better Flight"  
*Pittsburgh Press*  
Dec. 24, 1939

"Watch Your Holiday Diet"  
(by Jane Stafford)  
*Pittsburgh Press*  
Dec. 24, 1939

"No Hayfever Caused by Ragweed in Japan"  
*Lewiston (ME) Evening Journal*  
Jan. 1, 1940

"'Better Days' Summon All to Outdoors"  
(by Jane Stafford)  
*Pittsburgh Press*  
Mar. 10, 1940

"Science Aids Grocers to 'Go Modern' Packages Get 'Dressed Up' by Industry"  
*Pittsburgh Press*  
Mar. 10, 1940

"Venus Now Shines Brightest"  
(by James Stokley)  
*St. Petersburg (FL) Evening Independent*  
Apr. 23, 1940

"Scorpion Shines in the South"  
*Sarasota Herald-Tribune*  
June 26, 1940

"Latest Gadgets Improve Homes"  
*Pittsburgh Press*  
Oct. 27, 1940

"Desk Worker May Suffer Health Lapse"  
*Pittsburgh Press*  
Nov. 3, 1940

"Scientists Use Plane for Study"  
(by Emily C. Davis)  
*Pittsburgh Press*  
Dec. 7, 1940

"Inhabitants of Siberia Tamed, Rode Reindeer Long Ago, Scientists Claim"  
(by Emily C. Davis)  
*Pittsburgh Press*  
Dec. 15, 1940

"Look! Tail of Cunningham Comet Will Soon Be Visible to Naked Eye"  
*Pittsburgh Press*  
Dec. 22, 1940

"Ancient Life is Revealed"  
*Pittsburgh Press*  
Mar. 30, 1941

"Chemicals Proved Cause of Disease"  
(by Watson Davis)  
*St. Petersburg (FL) Evening Independent*  
Apr. 19, 1941

"Winter Stars Vanish—New Luminaries in Skies"  
*Spokane Daily Chronicle*  
Apr. 26, 1941
<table>
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<tr>
<th>Title</th>
<th>Publication</th>
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<tr>
<td>&quot;America Uses Science to Feed for Fitness as Army Revises its Views on Cooking&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Aug. 4, 1941</td>
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<tr>
<td>&quot;Bossy, the Cow, to Occupy Role of Fashion Aid&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Nov. 9, 1941</td>
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<tr>
<td>&quot;Scientists Plan Trial of Vaccine&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Nov. 23, 1941</td>
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<td>(by Jane Stafford)</td>
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<tr>
<td>&quot;'Pocket Foods' Prove Vital to Defense of America&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Nov. 23, 1941</td>
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<tr>
<td>&quot;Building of 'Victory' Bikes Scheduled to Start April 1&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Feb. 6, 1942</td>
</tr>
<tr>
<td>&quot;Long Study Called Vital to Chemists&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jul. 12, 1942</td>
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<td>&quot;Nearsightedness Called Hereditary&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jul. 12, 1942</td>
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<tr>
<td>&quot;New Machines and Gadgets&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Aug. 27, 1942</td>
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<tr>
<td>&quot;Applicants 'Flood' Shipyard Job Plea&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Sep. 25, 1942</td>
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<td>&quot;Draft-Evading Help Request is Alleged&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Sep. 25, 1942</td>
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<tr>
<td>&quot;The Science Parade&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Nov. 15, 1942</td>
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<tr>
<td>&quot;Mine of Information Found for Study of Indian Language&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Nov. 26, 1942</td>
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<tr>
<td>&quot;New Chemical Removes Salt in Sea Water&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jun. 9, 1943</td>
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<tr>
<td>&quot;New Machines and Gadgets&quot;</td>
<td><em>Toledo Blade</em></td>
<td>May 18, 1945</td>
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<tr>
<td>&quot;New Machines and Gadgets for Americans&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jul. 15, 1945</td>
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<tr>
<td>&quot;Doctors Learn How Body Destroys Pneumonia Germs&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jul. 12, 1946</td>
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<td>Title</td>
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<td>&quot;Paralysis Cases Still Increasing&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Aug. 8, 1946</td>
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<tr>
<td>&quot;Polio Epidemic Decline&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Sep. 6, 1946</td>
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<td>&quot;Invention for Helicopters&quot;</td>
<td><em>New York Times</em></td>
<td>May 24, 1947</td>
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<td>&quot;Sea-Faring Bird Ends Up in Zoo&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Jul. 22, 1947</td>
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<tr>
<td>&quot;Martial Music Routs Starlings&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Jul. 24, 1947</td>
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<tr>
<td>&quot;Husky Hybrid Corn from Runt Pure-Bred Parents&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Jan. 27, 1948</td>
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<tr>
<td>&quot;Glove-Sponge Car Washer&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Mar. 8, 1948</td>
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<tr>
<td>&quot;Modern Living is Made Easy&quot;</td>
<td><em>Toledo Blade</em></td>
<td>May 12, 1948</td>
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<tr>
<td>&quot;More of Star's Unseen Light is Picked Up in Far North&quot;</td>
<td><em>Daytona Beach Morning Journal</em></td>
<td>Jun. 3, 1948</td>
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<tr>
<td>&quot;Polio Increases Slightly in U.S.&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Jul. 1, 1948</td>
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<tr>
<td>&quot;Areas of Brain Hit by Polio Found&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Jul. 16, 1948</td>
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<tr>
<td>&quot;Polio Epidemic Passes Its Peak&quot;</td>
<td><em>Pittsburgh Press</em></td>
<td>Sep. 30, 1948</td>
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<tr>
<td>&quot;New Gadgets&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Nov. 14, 1948</td>
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<tr>
<td>&quot;Portable Planetaria Bring Sky's Phenomena to All&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Dec. 10, 1948</td>
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<tr>
<td>&quot;San Francisco Bay Tube Urged&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Dec. 15, 1948</td>
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<tr>
<td>&quot;New Machines and Gadgets&quot;</td>
<td><em>St. Petersburg Times</em></td>
<td>Mar. 6, 1949</td>
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<tr>
<td>&quot;Measles Cases Drop Reported&quot;</td>
<td><em>Toledo Blade</em></td>
<td>April 7, 1949</td>
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<td>&quot;New Pain-Relieving Drug Found to&quot;</td>
<td><em>Toledo Blade</em></td>
<td>Jun. 21, 1949</td>
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<tr>
<td>Title</td>
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<td>Cause Addiction&quot;</td>
<td>St. Petersburg Times</td>
<td>Aug. 30, 1949</td>
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<tr>
<td>&quot;Early Camera to Be Displayed&quot;</td>
<td>St. Petersburg Times</td>
<td>Aug. 30, 1949</td>
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<tr>
<td>&quot;New Virus Causes Disease Similar to Polio&quot;</td>
<td>St. Petersburg Times</td>
<td>Aug. 30, 1949</td>
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<tr>
<td>&quot;Yellowstone Swan Census Shows Substantial Gain&quot;</td>
<td>St. Petersburg Times</td>
<td>Aug. 30, 1949</td>
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<tr>
<td>&quot;Take Your Polar Bear or Walrus Well Done&quot;</td>
<td>St. Petersburg Times</td>
<td>Aug. 30, 1949</td>
</tr>
<tr>
<td>&quot;Research Agency Can Now Order Weapons Work&quot; (by Watson Davis)</td>
<td>St. Petersburg Times</td>
<td>Oct. 29, 1949</td>
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<tr>
<td>&quot;Sonar Spots Fish&quot;</td>
<td>St. Petersburg Times</td>
<td>Dec. 11, 1949</td>
</tr>
<tr>
<td>&quot;Mongrel Gives Birth to Thoroughbred Pups in Transplanting of Sex Gland&quot;</td>
<td>Toledo Blade</td>
<td>Dec. 20, 1949</td>
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<tr>
<td>&quot;Controversy over Rain-Making Stirs Capital Row on $50,000,000 Research&quot;</td>
<td>Toledo Blade</td>
<td>Jan. 20, 1950</td>
</tr>
<tr>
<td>&quot;Suction Device Retains Fumes from Furnace&quot; (by A.C. Monahan)</td>
<td>St. Petersburg Times</td>
<td>Mar. 4, 1950</td>
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</table>

This review of articles shows a wide range of participating newspapers, spanning the country, and even the globe. Newspaper editors chose those stories they deemed most interesting to their readers, and popular topics appear to be medicine and health, as well as astronomy and archaeology. While it is impossible to quantify the impact of these articles, as their presence in newspapers constitutes only potential exposure, the fact that many newspapers continued to subscribe to Science Service distribution for many years indicates they must have attributed some value—literal or figurative—to the material.
Science News Letter Articles

Science Service began publishing the *Science News Letter* in 1922, a year after the organization was formed, in response to requests from individuals and institutions wanting their own version of the science articles they were seeing in newspapers. Science Service's newspaper syndicate business was not always as successful as hoped, and eventually ended, but the news letter was a huge, and continued, success. Available by subscription for $5 per year, what began as a weekly mimeographed collection of science news stories titled *Science News-Letter*, then *Science News Letter* (minus the hyphen) by 1931, was popular from the beginning. The wide-ranging material in the news letter was taken from the daily science news output Science Service supplied to its subscribing newspapers. Because it could not accommodate all of the daily material provided to the newspapers over the course of a week, the news letter reflected Science Service's editorial choices regarding those articles likely to be most interesting or most important to readers. It included articles of varying length on a vast array of topics, occasionally articles authored for other publications or presentations, and features that appeared on a regular basis, such as Frank Thone's, "Nature Ramblings."

Throughout the 1930s, the news letter continued to gain subscribers despite depression conditions. In November 1931, Watson Davis excitedly reported to the trustees that 88 per cent of recent renewals came from readers willing to pay $7 for a two-year subscription, with the other 12 per cent opting for the one-year $5 offer. Davis noted that he had "never heard of its equal in the field of publishing," especially during such difficult economic times. He congratulated the editorial department for their work saying, "It is indeed a feather in the cap of the editorial department to be able to publish a magazine so good that those of its readers who want it again, want it for TWO MORE YEARS definitely and are
willing to pay in advance for it.\textsuperscript{305} Circulation figures from Watson Davis's reports to the trustees show that \textit{Science News-Letter} had 5,500 subscribers in 1927;\textsuperscript{306} 9,875 in 1930;\textsuperscript{307} 11,969 in 1931.\textsuperscript{308} By 1938, the number of subscribers had almost doubled at 20,882,\textsuperscript{309} and by 1940 the number had risen to almost 35,000.\textsuperscript{310}

Already by 1933, Davis believed there was ample evidence of the influence Science Service, and particularly the \textit{Science News Letter}, exerted over the mainstream media. In a memorandum to the trustees, Davis admitted that when the news letter was first conceived, Science Service leaders had some concern that its presence in the marketplace would conflict with, and possibly dilute, sales of the syndicate material to newspapers. However, there was little evidence that the news letter actually cut into syndicate sales. What Science Service did see was its news letter material reprinted in many places by individuals not connected with the organization, who were not paying for the articles. Ultimately, Science Service had determined that these instances did not present a significant threat, economically or otherwise, to its arrangements with its subscribing newspapers. What's more, Science Service leaders believed the unauthorized use of the material "contributes materially to the

\textsuperscript{305} Watson Davis, "Information Memorandum on Progress of Science Service," Nov. 23, 1931, SIA RU7091, Box 2, Folder 13.
\textsuperscript{307} Watson Davis, "Information Memorandum on Progress of Science Service," Apr. 16, 1930, SIA RU7091, Box 2, Folder 9.
\textsuperscript{308} Watson Davis, "Information Memorandum on Progress of Science Service," Apr. 15, 1931, SIA RU7091, Box 2, Folder 13.
\textsuperscript{309} Watson Davis, "Information Memorandum on Progress of Science Service," Oct. 1, 1938, SIA RU7091, Box 4, Folder 5.
\textsuperscript{310} Watson Davis, "Watching the Parade of Science," September 1940, SIA RU7091, Box 222, Folder 9.
betterment of the independent reporting of science by individuals not connected with Science Service," and that allowing pirated use was consistent with its mission of disseminating science information to the public. So despite the warning against re-publication that appeared in the masthead of every issue, Science Service decided not to make any serious effort to force the abusers to desist. As it was, some *Science News Letter* material was also available in the supplement to the journal *Science*, meaning there was ample access to Science Service material for those motivated to use it without paying for it. Science Service's consolation was that its *Science News Letter*, reached readers seven to ten days before any pirated material could be published and that newspaper editors also received articles more quickly. Davis offered one example of how the *Science News Letter* material was being used—unethically, if not illegally—by no less than the Associated Press. The Associated Press had recently inaugurated a two-column comic feature under the title, "Be Scientific." Its main character, Dr. Dabble, who resembled the Swiss-Belgian physicist Auguste Piccard, was shown explaining various scientific facts—most of which, according to Davis, the feature artist had taken from the *Science News Letter*. Davis defended his assertion by claiming, "this is not surmise as the artist Detje subscribes to the *Science News Letter* and I am informed that he uses it as the source of most of his drawings."^{311} Rather than engage in a turf war, Science Service chose to interpret these actions as imitation being a form of flattery, reflecting its philosophy that the more (authoritative) science available to the public, the better.

Early news letter covers were black-and-white, and featured a wide variety of subjects, including nature photographs as well as innovations in technology. In the 1930s, 

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^{311} Watson Davis, "Information Memorandum on Progress of Science Service, Jan. 20, 1933, SIA RU7091, Box 3, Folder 5."
Science Service changed the covers to include colored borders. By the 1940s, an increased emphasis on war technology and developments was evident on the news letter covers.

Fig. 2. Cover of *Science News Letter* from Nov. 6, 1937. Society for Science & the Public.  

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Fig. 3. Cover of *Science News Letter* from March 20, 1943. Society for Science and the Public. 313

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The Science Service newsletter carried advertisements, which in the 1920s and 1930s commonly promoted scientific equipment by such companies as A. Daigger Company, and science books by publishers such as Macmillan. In 1939, General Electric contracted with Science Service to place ads covering two-thirds of a page in at least six issues in the coming year, and ads by companies engaged in research and development became more common by the early 1940s. The newsletter also occasionally carried advertising for Consumers Union, a decision that resulted in considerable controversy, as detailed in Chapter 7.

Fig. 4. Westinghouse advertisement in *Science News Letter* from March 14, 1942. Society for Science & the Public.

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314 Austin Winant, interoffice memo, Sep. 16, 1939, SIA RU7091, Box 4, Folder 7.
Fig. 5. Radio Corporation of America advertisement in *Science News Letter* from March 11, 1944. Society for Science & the Public.  

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The following is a sampling of articles appearing in the Science News Letter in the 1920, 1930s, 1940s, and 1950s, with greater emphasis given to the late 1930s and early to mid-1940s, demonstrating how the news letter melded general science news with war-related science news. The purpose of this sampling is to provide an overview of the wide range of topics covered in the news letter. With very few exceptions, the articles listed are not mentioned or footnoted in other chapters. Article information appears here in shortened form to conserve space, with full citations found in the Works Cited section. Science Service usually generated news letter articles without author credit, though regularly occurring sections, or special author contributions did have the authors' names. Most of the articles listed here appeared without an author, and appear in the Works Cited with Science Service as the author. Exceptions are noted with the article title, and appear in the Works Cited by the author's name.

Examples:

List: "Scientists Urged to Aid World Settle Problems Peacefully" Aug. 13, 1938

Works Cited: Science Service. "Scientists to Aid World Settle Problems Peacefully."


1924
"Milk Vitamins Killed by Heating in Copper" Apr. 12, 1924

"Balloon Torn from Ground Carries Scientist into Storm" May 10, 1924

"Corn Grown in 70 Days: Ears Buried in Ground" May 24, 1924

"Many Bottled Waters No Better Than City Supply" May 24, 1924

"Meteorologist Dies to Make Airways Safe" Jun. 21, 1924
"Bobbed Hair Threat to Hairpin Industry"  
Jun. 28, 1924

"Tomatoes Possess Radio-Activity"  
Nov. 22, 1924

1925

"New Danish Tuberculosis Treatment to Be Tested by Government"  
Jan. 10, 1925

"Scientist Doubts Franklin Flew Kite in Thunderstorm"  
Jan. 17, 1925

"Doctors Call Powder and Paint Menace to Flappers' Health"  
Jun. 6, 1925

"College Students Prefer Fairness to Brains"  
Jun. 27, 1925

"College Girls Show Speech Defects"  
Jul. 11, 1925

"A Manual of Style, with Specimens of Type by University of Chicago Press"  
Aug. 1, 1925

1926

"Urges Cooperation in Science as in Industry"  
Jan. 9, 1926

"Women's Fingers Work Faster than Men's"  
Feb. 20, 1926

"Heredity and Glands Influence Cancer"  
May 22, 1926

"Whooping Cough Helped by Simple Remedy"  
May 22, 1926

"Tests Show Women Work Faster than Men"  
Jul. 24, 1926

"Science in Daily Life" (by Edwin E. Slosson)  
Sep. 11, 1926

1927

"Science Proves Hobby for Governors and Bankers"  
(by James Stokley)  
Jan. 22, 1927

"Coast Guard Now on Watch for Icebergs"  
Mar. 19, 1927

"Science for the Millions"  
Apr. 23, 1927

"Why Popularize Science?" (by Julian Huxley)  
May 21, 1927
1928
"A Theory of Woman's Sphere" (by E.E. Slosson) Feb. 4, 1928
"The New Atomic Theory" Mar. 17, 1928
"Walrus Near Boston" Jun. 9, 1928
"Seven-Day Weather Forecasts Coming" Jul. 14, 1928
"'Lung' to Prevent Submarine Disasters" (by James Nevin Miller) Nov. 24, 1928

1929
"Television at Stage of 1921 Radio" Jan. 12, 1929
"More Accidents by Women Taxi Drivers" Feb. 9, 1929
"Scientists' Bodies Strong" Apr. 27, 1929
"Are Farmers Dying Out?" May 11, 1929
"Lying as an Instrument of Warfare" Jun. 29, 1929

1930
"Parrot Fever Not Transmitted by Birds Confined to Zoos" Jan. 18, 1930
"Our Universe Part of 'Super-Universe'" Apr. 5, 1930
"Electrons Behave Like Waves" May 3, 1930
"Further Research on Cold Necessary" Jun. 21, 1930
"Man's Efforts to Fly Straight Up" Sep. 20, 1930
"Air Pollution Commission Suggested to Health Officials" Nov. 8, 1930

1931
"Two-Headed Baby Reported to Scientists" Jan. 3, 1931
"More Americans Killed by Autos than by World War" Feb. 21, 1931
"Edison and Slosson Talked of Many Things" Oct. 24, 1931
<table>
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<tr>
<th>Year</th>
<th>Title</th>
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<tbody>
<tr>
<td>1931</td>
<td>&quot;Navy's New Airship Hangar Will Be Built in Sections&quot;</td>
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<td>1932</td>
<td>&quot;Engineers to Refrigerate Concrete in Hoover Dam&quot;</td>
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<td>&quot;Depression and Race Suicide are Blamed on Rush to City&quot;</td>
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<td>&quot;Scientific Party to Occupy Mt. Washington During Winter&quot;</td>
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<td>&quot;Largest Non-Rigid Airship Being Built at Akron&quot;</td>
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<td>&quot;Suicide Increase Not All Due to Depression&quot;</td>
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<td>1933</td>
<td>&quot;No Stocks, Bonds or Debts under Rule of Technologists&quot;</td>
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<td>&quot;Depression Victims Have More Illness Than Chronically Poor&quot;</td>
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<td>&quot;Stratosphere Flight Successful for Science&quot;</td>
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<td>&quot;Intellectually Trained Jobless to Get Immediate Employment&quot;</td>
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<td>&quot;Secrets of American History Sought to Aid Unemployed&quot;</td>
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<td>1934</td>
<td>&quot;A.A.A.S. Declares for Intellectual Freedom&quot;</td>
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<td>&quot;Germans Develop and Grow Nicotin-Free Tobacco&quot;</td>
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<td>&quot;Would You Join a Riotous Lynching Mob?&quot;</td>
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<td>&quot;Bobbed Hair and Tinted Nails Called Self-Mutilation&quot;</td>
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<td>1935</td>
<td>&quot;End of Earth Foreseen When the Sun Explodes&quot;</td>
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<td>&quot;Aviation Problems Solved Under Water&quot;</td>
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<td></td>
<td>&quot;All-Metal Airplanes Not in Danger from Lightning&quot;</td>
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<tr>
<td></td>
<td>&quot;Colds Are Caused by Germ; Weather Can't Bring Them On&quot;</td>
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</table>
"New Comet Found During Search for Minor Planets" Sep. 7, 1935

1936
"Atoms and Cosmic Rays Yield New Science Knowledge" Apr. 25, 1936
"Tiny Movie Camera Films Vocal Cords in Action" Jun. 20, 1936
"Fatigue on the Road Increases Accident Risks" Aug. 15, 1936
"Vaccine for Influenza Is Now Ready for Trial Use" Nov. 7, 1936

1937
"Air Conditioners Challenged to Remove Bacteria from Air" Feb. 6, 1937
"Midwest Conquering Goiter with Iodine in Salt Cellars" Mar. 27, 1937
"Birth Notice of Particle Appears in Physics Journal" May 29, 1937
"Belief in the Miraculous Still Has Large Place" (by William E. Ritter) Aug. 28, 1937
"Industries Without Touch of Science Would Never Be" Oct. 30, 1937

1938
"Decay of German Science Foreseen by Anthropologist" Feb. 5, 1938
"Scientists' Plea Is Move to Save World from Fascism" May 7, 1938
"Scientists Urged to Aid World Settle Problems Peacefully" Aug. 13, 1938
"Scientists Unite!" (by Watson Davis) Aug. 20, 1938
"Defense and Agriculture Take Bulk of Research Funds" Nov. 19, 1938

1939
"Scientific Side of Skiing Studied by Physicists" Feb. 4, 1939
"Men and Technicians Needed in Army Medicine" May 20, 1939
"Airport Lighting System Enables Landings on Bad Days" Jun. 17, 1939
"Spiders Help Fight the War; Their Webs Make Cross-Hairs"  Oct. 28, 1939

"As War Bars Science Advance Scientists Plan for Peace"  Dec. 23, 1939

1940
"Optical Device for Research May Have Military Use"  Mar. 2, 1940

"Scientists of All Americas to Meet in Washington"  Apr. 6, 1940

"Story of 'Baboon Boy' Confirmed by Evidence"  Apr. 6, 1940

"Science Most International of All Human Activities"  May 4, 1940
(Alexander Wetmore)

"Story of 'Baboon Boy' Now Thrown in Doubt"  Jun. 1, 1940

"Hall of Inventions Opens at N.Y. World's Fair"  Jun. 15, 1940

"Honesty is Automatically Enforced upon Scientists"  Aug. 31, 1940

1941
"Counter-Plan for Small Nations Urgent Need for Democracies"  Jan. 4, 1941

"Science Has Not Failed Man; Man Failed to Use Science"  Jan. 11, 1941

"Need Intellectual Defense Even More than Airplanes"  Jan. 11, 1941

"Dangerous for Democracies to Imitate Dictator Propaganda"  Jan. 18, 1941

"Plan Psychological Defense for America's Morale"  Jan. 18, 1941

"Psychologists Organize in National Emergency"  Jan. 18, 1941

"Orchid Imports From Europe Now Cut Off By War"  Jan. 25, 1941

"American Campuses Urged for New Sort of Refugee"  Feb. 1, 1941

"Astrology Lacks Every Scientific Foundation"  Feb. 1, 1941

"New Air Raid Shelter Danger Worse than Epidemics"  Feb. 1, 1941

"Proposes Special Colleges for Science in England's Service"  Feb. 1, 1941
"Uncle Sam Trains Girls to Make Shell Fuses"  Feb. 8, 1941
"Defense Duty of Universities Broader than Problem Solving"  Feb. 15, 1941
"Discretion in Defense of Natural Resources Advised"  Mar. 1, 1941
"Students to be Deferred If Rated as 'Necessary'"  Mar. 22, 1941
"New Invention Will Detect Airplanes by Invisible Rays"  Mar. 29, 1941
"Scientists for Defense" (by Marjorie Van de Water)  Mar. 29, 1941
"German Army Psychologists Make Effective Use of Science"  Apr. 5, 1941
"National Science Fund to Encourage Basic Research"  May 10, 1941
"Germany's Psychological Warfare Plans Revealed"  Jun. 7, 1941
"Fireworks for Defense Aids Safe and Sane Fourth"  Jun. 28, 1941
"Standards Adopted for Technical Abbreviations"  Jul. 12, 1941
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"Science for Defense"  Sep. 6, 1941
"Science Service Backs Science Clubs Movement"  Sep. 27, 1941
"Radioactive Carbon Reveals Secrets of Photosynthesis"  Oct. 25, 1941
"Science for Everybody" (by Watson Davis)  Oct. 25, 1941
"Fundamental Science Faces Serious Problems of Support"  Nov. 1, 1941
"New Science Service Building Located on N Street Northwest"  Dec. 13, 1941
"War and Medicine Led 1941 Science"  Dec. 20, 1941
"No Certain Way to Tell Japanese from Chinese"  Dec. 20, 1941
"National Zoological Park Takes Raid Precautions"  Dec. 27, 1941
1942
"Chaos in the World Makes Business Value Research"
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"Even in War, Science Saves More than it Destroys"
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"Professor Arthur H. Compton New President A.A.A.S."
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"Scientists Pledge Military and Intellectual Victory"
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"America to Have Fastest Fighting Airplanes in World"
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"Pearl Harbor Was Scene of Sweeping Victory for Drugs"
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"How to Guard Against Home Blackout Accidents"
Feb. 7, 1942
"Power for War Industries Will Be Increased"
Feb. 7, 1942
"Worry During War Normal but Shouldn't Harm Work"
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"American Soldiers Receive Daily Rations of Candy"
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"Blueprint for World Peace Needed Now, Say Scientists"
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"New Machines and Gadgets"
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Apr. 11, 1942
"Sciences Will Merge in Study of Post-War Problems"
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"'Cranks' Visiting Washington Are Mostly Harmless, Quiet"
Jun. 13, 1942
"Answers Given to Child's Questions About War"
Jun. 20, 1942
"Why You Should Buy U.S. War Bonds and Stamps"
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"Draft Deferment Recommended for Science Students"
Jul. 25, 1942
"Exchange of Microfilms Helps Science War Effort"
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<td>&quot;Smithsonian Institution Converts to War Projects&quot;</td>
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<td>&quot;Records of Linnaeus Recorded on Microfilm&quot;</td>
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<td>&quot;Jap Aviators; Coiffures May be Shock Protectors&quot;</td>
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"Half Million Scientists"       Aug. 21, 1943
"Demand for Scientists Becoming More Urgent"       Aug. 28, 1943
"Science Books for Blind Developed by Westinghouse."       Sep. 11, 1943
"Super-Bombing Coming"       Sep. 11, 1943
"Victory Gardens Produced 8,000,000 Tons of Food"       Oct. 9, 1943
"Post-War Family Airplane for Over 300,000 in U.S."       Nov. 6, 1943
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"Science Will Need Support"       Nov. 27, 1943
"Malnutrition Death Rate Cut from Over 50% to 0"       Dec. 4, 1943
"Shortages Cause Research"       Dec. 4, 1943
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"Industrial Injuries Cause Great Losses in Manpower"       Jan. 8, 1944
"War Use of Scientists"       Jan. 15, 1944
"New Helicopter Has Stabilizing Device."       May 13, 1944
"'Dream' Refrigerator Has Almost Everything"       May 13, 1944
"Television, When and How" (by Robert N. Farr)       Jul. 22, 1944
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<td>&quot;A-Bomb Radiation Sickness&quot;</td>
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<td>&quot;Assembly-Line Homes&quot;</td>
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<td>&quot;Dispute Is Delaying Peacetime Atomic Energy&quot;</td>
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<td>&quot;Future Atomic Jobs&quot;</td>
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<td>&quot;Good War Crops Spared Europe&quot;</td>
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<td>&quot;Research Must Be Free for Scientific Progress&quot;</td>
<td>Oct. 5, 1946</td>
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<td>&quot;Wartime Research Brought Vaccines Against Diseases&quot;</td>
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<td>&quot;Machines Speed Science&quot;</td>
<td>Jan. 25, 1947</td>
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<td>&quot;Science for Its Own Sake&quot;</td>
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<td>&quot;A-Bomb Story Not Yet Told&quot;</td>
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<td>&quot;Children Escape Terrors of Life in Comics&quot;</td>
<td>Jan. 7, 1950</td>
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<td>&quot;Space Ships No Fantasy&quot;</td>
<td>Apr. 15, 1950</td>
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<td>&quot;Device Picks and Shells Corn&quot;</td>
<td>Aug. 19, 1950</td>
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<td>&quot;Urge Standards for All Airplanes&quot;</td>
<td>Dec. 9, 1950</td>
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The news letter proved to be Science Service's most enduring product. In 1949, circulation stood at approximately 50,000. The annual subscription price was $5.50, only 50 cents more than when it first appeared in 1922.\(^{317}\) While the paper syndicate business ended in the 1960s, as Science Service leaders assumed it would once newspapers began to generate their own science news on a regular basis, the news letter continued. As mainstream journalism devoted more reporters and space to science news, the syndicate material was no

longer necessary to get basis science reporting into American readers' hands. However, the need—and demand—for an engaging, accessible science magazine never waned. In 1966, the Science News Letter name changed to Science News, as it is currently known, and in 2008, the magazine switched from a weekly to the bi-weekly format still used today. Science News is also available electronically at http://www.sciencenews.org/, continuing to engage and shape the public's "scientific habit of mind."

Radio Broadcasts

Since its early years, Science Service was interested in taking advantage of routes other than print to reach ordinary citizens. In 1924, in conjunction with the National Research Council, Science Service began broadcasting radio talks by distinguished scientists. That evolved into a series of Science Service radio talks on "Science News of the Week," that in 1930 was running on twenty-three stations. Another program of science talks developed in 1926, when the program director of the Columbia Broadcasting System (CBS) approached Science Service about the possibility of arranging a regular series of similar talks.

Unfortunately, the lack of transmission facilities prevented the talks from originating in Washington. Instead, Science Service presented a series of talks, known as "Science Snapshots," that broadcast from New York City on Friday afternoons. Rather than having scientists give the talks, an announcer read the prepared scripts. A few months later, CBS suspended the science talks when it needed to sell the time Science Service had been using for a commercial program.319

In March 1930, CBS was once again prepared to offer a fifteen-minute weekly period for science talks, and transmission facilities had improved to allow the program to originate in either New York City or Washington. Rather than having a text read by an announcer, the blocks would feature scientists themselves discussing their research for the audience. Setting up that program, Science Service had already invited nearly thirty scientists as of February 1930, and its organizers were still seeking more. Among the scientists committed to speak were astronomer C. G. Abbot, Secretary of the Smithsonian Institution, and a recognized

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authority on the sun; and paleontologist John C. Merriam, President of the Carnegie
Institution of Washington. Science Service recruited leaders of other prestigious scientific
institutions to participate; George K. Burgess, Director of the United States Bureau of
Standards planned to use the radio show to explain the Bureau's work and how it affected the
public, while Commander N. H. Heck, Chief of the Division of Terrestrial Magnetism and
Seismology of the United States Coast and Geodetic Survey, planned to talk about
earthquakes. Others already scheduled included Paul R. Heyl, Chief of the Sound Section of
the Bureau of Standards who was known as "the man who weighed the earth"; anthropologist
Fay-Cooper Cole at the University of Chicago who studied race problems as viewed by
anthropologists; Johns Hopkins University psychology professor Knight Dunlap, whose
recent work had to do with habit formation; and Edward W. Berry, Dean of the College of
Arts and Sciences at Johns Hopkins University who planned to speak about the ancestry of
trees. Science Service leaders were excited about finding speakers whose topics seemed
especially timely; for instance, since 1930 was a census year, the work of Warren S.
Thompson, Director of the Scripps Foundation for Research in Population Problems,
promised to be particularly relevant. Given how rapidly a wide swath of the American public
had adopted the habit of regular radio listening just since the early 1920s, Science Service
managers felt optimistic that these talks would provide an important supplement to the
organization’s newspaper-related efforts.320 Science Service did not get compensated for
providing the radio talks, but it did not have to pay for the time used. Davis estimated that if

320 Watson Davis, "Information Memorandum of Progress of Science Service," Feb. 18, 1930, SIA
RU7091, Box 2, Folder 9.
they had to pay for the radio time at commercial rates, it would amount to almost as much as the entire expenditures for the organization at the time—over $100,000 annually.321

By 1932, CBS was regularly broadcasting these talks by "prominent men of science" on Friday afternoons. With the cooperation of the National Committee on Education by Radio, of the National Education Association (NEA), Science Service also sent mimeographed scripts of weekly news talks to sixty-four independent radio stations where announcers read them. Science Service considered further distributing the material by making electrical transmission records that radio stations could broadcast, which would allow for uniform presentation; however, the cost was prohibitive. Producing twenty-five records would cost $75. Instead of providing the material to stations for free, Science Service would have to charge stations $3 to $4 a week, and twenty-five stations would have to agree to the arrangements to cover the production cost. While Science Service did not believe that plan would be successful in the current depression climate, leaders were still very satisfied with the "splendid response from the public and cooperation from scientists" that they received.322

Estimates suggested that even with Science Service's contributions, nationwide radio broadcasts in the 1930s included only two and one-quarter hours of science material.323 The organization's radio programming continued in its same form until May 1938, when CBS took over what became known as the "Adventures in Science" program. The network made the program one of its three principal education programs, changed its character, wrote and produced it from New York, and gave it "the very desirable evening time" of Fridays at

321 Watson Davis, "Report to the Annual Meeting of Board of Trustees of Science Service, Thursday, April 28, 1932 by Watson Davis, Managing Editor," SIA RU7091, Box 3, Folder 2.
322 Watson Davis, "Information Memorandum on Progress of Science Service," Oct. 18, 1932, SIA RU7091, Box 3, Folder 3.
7:30 p.m. They introduced dramatizations, continued the guest scientist spot, and added a sociologist commentator to the program. This only lasted until August, when the program was changed again, reverting back to its interview and dialog format previously used by Science Service. By the end of September 1938, with the realignment and reduction of CBS's educational features, the "Adventures in Science" program went off the air.\(^{324}\) The program resumed in early 1939, with Watson Davis more keenly aware of the vagaries of the broadcasting business. The program was moved from evenings to afternoons and from weekdays to weekend, eventually settling into a midday Saturday time slot that continued through the 1950s. Historian Marcel LaFollette characterized Science Service radio broadcasts as projecting "an unrelenting tone of optimism," with a focus on the positive contributions of science.\(^{325}\)

In 1952, Watson Davis lamented that postwar radio gave increasingly less time to science than it had in earlier decades. While he acknowledged radio's power as an entertainment and news medium, he appreciated the fact that networks no longer hired actors to portray scientists and instead allowed scientists to speak for themselves. According to Davis, it was important for listeners to hear first-hand from scientists who had the responsibility of helping people navigate the "mazes of blind alleys and inviting paths" to see what science made possible, "a great and endless adventure, thrilling to tell and know."\(^{326}\)

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\(^{324}\) Watson Davis, "Information Memorandum on Progress of Science Service," Oct. 1, 1938, SIA RU7091, Box 4, Folder 5.


Other Popularization Endeavors

From the beginning, Science Service founders expressed their intent to use whatever methods were available to further their mission and the cause of science popularization. In addition to creating general science articles for the mainstream press and news letter, Science Service promoted specialized reporting to aid research into earthquakes, archaeological explorations, and eclipses, distributed subscription science kits, and ran science clubs and talent searches aimed at drawing young people into the world of science. All those efforts aimed to present science news and information as an essential and ubiquitous part of life. What follows are brief overviews of Science Service's other endeavors in support of science.

Earthquake Research and Reporting

Since 1925, Science Service staff were particularly involved in advancing earthquake research and awareness, helping to locate epicenters and then issuing public reports. Science Service gathered earthquake records by telegraph from the recording stations and transmitted them to the U.S. Coast and Geodetic Survey and the Jesuit Seismological Association. Once resident experts determined the precise epicenters, Science Service transmitted that information to the public through its newspaper outlets, while the two research centers sent the data out to fellow scientists. Science Service sponsored the cooperative effort, which made possible the location of epicenters within eight to twenty-four hours, a determination that previously took many days. In just 1931-32, Science Service helped investigate eighty-one earthquakes, working with more than thirty seismologic stations. The plan made

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327 Watson Davis, "Report to the Annual Meeting of Board of Trustees of Science Service, Thursday, April 28, 1932," SIA RU7091, Box 3, Folder 2.
compelling news, so much so that the Associated Press and other news gathering institutions expressed interest in getting access to the Science Service earthquake reports.

Science Service believed that readers would have a natural interest in earthquakes, both from a scientific and a practical point of view, and accordingly, *Science News-Letter* published numerous articles on quakes. Most notably, Bailey Willis, National Academy of Sciences member, former chairman of Stanford’s geology department, and former President of the Seismological Society of America, wrote multiple articles, including an exclusive firsthand account of the 1925 Santa Barbara, California quake. Several pieces addressed the question of whether scientists might develop the skill to predict earthquakes, a subject on which Willis wrote that "earthquake news, served up as a kind of side dish, is overspiced. It is time for seismologists to give the public plain food. Certain facts we know; others we think we know; still others we infer confidently; others doubtfully; then we guess. The prediction of an earthquake is a guess, which I prefer to call a forecast."328

Newspapers carried Science Service earthquake articles as well. Not surprisingly, the *Berkeley Daily Gazette* in Berkeley, California carried frequent articles on earthquake research. A few examples include an article written especially for Science Service by Edwin T. Hodge, professor of economic geology at the University of Oregon, who wrote on earthquakes’ role in creating the course of the Columbia River in the western United States.329 A 1932 article detailed how the seismograph could detect the way the earth

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"telegraphed" quake information. In 1933, a *Gazette* headline declared that scientists were not surprised by a recent California earthquake; they had known for a decade that Los Angeles was in an earthquake zone. A final example, from 1934, noted that seismographs had recorded the greatest number of earthquakes in several years.

Science Service noted areas where earthquakes had hit frequently and in 1929, passed on a request from the U.S. Coast and Geodetic Survey that “if every person who feels even a mild quake would report to the Survey… the work of the scientists would be greatly aided.” Geologists particularly wanted public accounts of the recent quake in New York State, given that they had few seismograph recordings for that area, and told readers that their reports of whether their windows rattled and which direction lamps swung would help establish an understanding of the quake’s intensity. Science Service staff hoped that support for

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earthquake research would help people perceive science as holding the key to the world around them, as well as make them safer. This effort underlined the two-way ideal of science communication, where interested Americans would learn from researchers’ work but also contributed their own observations to advance knowledge.

**Astronomy and Eclipses**

From the beginning of Science Service's print media, reading audiences had shown significant interest in astronomy articles. Science Service managers were especially excited about the real potential of the new communication technology of the teletype, or printing telegraph machine, to help them cover eclipses of the sun that would take place in April and October of 1930. Eclipses provided some of the most spectacular evidence of science at

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work, and Science Service wanted to be there, ready and able to report it to the public. Science Service arranged what it promised would be "very complete coverage" of the two 1930 spectacular events. Most notably, Science Service promised to bring Americans signed wire stories written by leaders in the astronomy field, as well as advance material prepared and distributed to the newspapers and in Science News-Letter.\footnote{Watson Davis, "Information Memorandum on Progress of Science Service," April 16, 1930, SIA RU7091, Box 2, Folder 9.} Having the wire stories signed by the scientists was meant to give the articles greater credibility, as well as greater human interest to editors and readers. In agreeing to produce signed articles for the general public, the scientists involved showed their willingness to depart from the more traditional approach of academia, which discouraged a single person from taking individual credit for a group project. It also represented a sign that at least some scientists were increasingly ready to trust Science Service to respect their work and their professional concerns. Especially for an event such as a solar eclipse, which seemed to have definite interest for ordinary citizens, these scientists and Science Service agreed that it was important to take advantage of the opportunity to communicate accurate information to the public. In working through Science Service, scientists found an avenue to facilitate that outreach. It promised a way to avoid past problems in newspapers’ approach, when scientists had felt bruised by irresponsible or shallow treatments of their research or their profession.

To begin with, Science Service wanted to explain to American readers precisely what to expect to see in an eclipse and how to understand what was occurring. To help make astronomical science comprehensive to the general public, Science Service relied on James Stokley, a University of Pennsylvania-trained astronomer who at the time, was working...
closely with Philadelphia’s Franklin Institute to help develop its planetarium, only the second in the United States. Stokley was deeply committed to the goal of science popularization and from 1926 to 1977, he wrote a regular column on astronomy for *Science News Letter*. In a special treatment of the April, 1930 eclipse, Stokley told readers that fortunately, the eclipse would be visible in California, a convenient “backyard” for some of the nation’s leading astronomers. ³³⁵ Although that April eclipse would only give American astronomers about a one-second window to take a photograph, Science Service told readers that for the October event, the U.S. Naval Observatory was sponsoring a research expedition to the only location from which the eclipse could be seen—Niuafou, a tiny South Pacific island nicknamed "Tin Can Island."³³⁶ The October 4, 1930 *Science News Letter* carried a two-page article on the upcoming eclipse, complete with diagrams of the October sky.³³⁷

The eclipses of 1930 provided a perfect opportunity for Science Service to show what it could do, as it generated new publicity every week leading up to and following the eclipse. Science Service articles provided the best, and for some readers, the only way to learn about these astronomical events. For example, on October 26, 1930, the *Salt Lake Tribune* reprinted a Science Service article by James Stokley reporting that while rain had hit the Pacific Island expedition an hour before the eclipse, the skies cleared just in time to allow

scheduled scientific observations. Stokley described the nature and purpose of the astronomers’ work, telling readers that their photographs of the corona might shed new light on the composition of the sun’s outer layers and that their observations of stars might verify and measure Einstein’s theory of relativity.338

More than that, exciting astronomical events proved a perfect subject for the new radio efforts of Science Service. A week after the eclipse, a Science Service radio broadcast conducted an interview with Samuel Alfred Mitchell, Scientific Head of the U.S. Naval Observatory Eclipse Expedition, and Director of McCormick Observatory at the University of Virginia. To multiply public access and preserve a permanent record, Science Service then printed an interview transcript in the November 1, 1930 *Science News Letter*. Mitchell described the success of the expedition, the high quality of the forty-one photographs obtained despite the early arrival of the eclipse and poor weather conditions, and the quiet but calm demeanor of the natives on the island at the time of the eclipse.339

The popular astronomy articles remained a regular feature of Science Service material and publicity for decades. *Science News Letter* featured a regular column on astronomy by James Stokley from 1926 to 1977. His best-known articles were the monthly "Star Maps," or "Maps of the Stars," that were usually accompanied by drawings of the positions of the stars and planets. Stokley became the first director of the Fels Planetarium at Philadelphia’s Franklin Institute in 1931, and in 1939, he moved to Pittsburgh to head up the Buhl Planetarium. Stokley continued writing regular articles on astronomy for Science Service, which were accordingly picked up and reprinted by newspapers around the country. Indeed,

as noted before, a monthly “Map of the Stars” and accompanying articles were among the features that Science Service highlighted when starting its 1931 “seven-in-one” distribution service. In a typical piece, on April 23, 1940, the *St. Petersburg Evening Independent* printed an article written by Stokley and distributed by Science Service, which told readers precisely what to watch for in the skies that week, and that they could use “a pair of opera glasses” to identify Venus in the west. The article, accompanied by a full scale star chart for both the north and south-facing skies, gave readers specific instructions on how to follow the Great-Dipper constellation to locate Arcturus and other specific stars.340

Newspapers around the country published other Science Service astronomy articles in addition to the Stokley feature. To note just a few examples, a 1934 Science Service article noted Japanese experiments during a total solar eclipse that revealed its effect on the magnetic field of the earth.341 Watson Davis wrote an article about expeditions of American astronomers who traveled to Siberia and Japan to have better views of a 1936 eclipse.342 In a final example, a 1940 article in the *Youngstown Vindicator* announced "Nation Will See Eclipse of Sun Soon," when the partial eclipse would be visible across the entire country.343


The decision to devote considerable time and effort to astronomy was a pragmatic move. Science Service wanted to engage and entertain, as well as inform, the American public, and it recognized the most promising directions to capture reader interest. Astronomy drew popular press coverage even before Science Service existed, but the group regularized distribution of this news on a national scale and tied it to a bigger agenda for science.

**The Minute-Man Plan**

During the early 1930s, Science Service started a new program to supply consulting scientists to research projects, upon request, working in collaboration with a committee of the Division of Anthropology and Psychology of the National Research Council. This was known as the "Minute Man plan," so called because a group of sixty respected anthropologists and archaeologists made themselves readily available at short notice for special circumstances. By early 1932, these scientists had responded to thirteen investigations of anthropological and archaeological discoveries—often at work sites or other locations, which had unexpectedly turned up evidence of materials of scientific interest. After those experts examined the situation in the field, Science Service reported their findings in its Science Service Research Announcements and in articles distributed to newspapers.\(^{344}\) In January 1933, A.V. Kidder, of the division of historical research of the Carnegie Institution in Washington, DC, wrote to Watson Davis in support of the Minute-Man plan. Kidder wrote that he had just received a research announcement of work the group was involved in. He commented, "Every time I get one of these I am impressed by the

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\(^{344}\) Watson Davis, "Information Memorandum on Progress of Science Service," January 31, 1931, SIA RU7091, Box 2, Folder 13.
importance of the 'Minute Man' activities of Science Service. It is invaluable and serves not only to make available much of importance, which would otherwise be lost or overlooked, but also, which is equally important, to promptly squelch the many unfounded rumors which go about. 345

**Gathering and Disseminating Cosmic Data**

In another move to use its communication power to help researchers share information more efficiently with each other (and ultimately with the public), Science Service undertook a valuable program in physical science. From August 1, 1930 until the beginning of World War II, Science Service gathered cosmic data from observatories for dissemination to scientists. Science Service received information on the solar constant from the Astrophysical Observatory of the Smithsonian Institution, data on magnetic conditions furnished by the United States Coast and Geodetic Survey Magnetic Observatory at Tucson, Arizona, sunspot data furnished by the Mount Wilson Observatory, as well as data on the Kennelly-Heaviside Layer (ionosphere) heights from the U.S. Bureau of Standards. Science Service staff in Washington, DC then assembled those reports into a daily Ursigram, (named after its sponsor, the American section of the Union Radio-Scientifique Internationale), to be broadcast over the powerful Navy radio station NAA. Science Service then made that information available for scientists in various parts of the world, who were able to "correlate the vagaries of radio and other phenomena with such inconstants of nature." 346 As Watson Davis reported to the American Geophysical Union in 1931, Science Service also issued

345 Watson Davis, "Information Memorandum on Progress of Science Service," January 20, 1933, SIA RU7091, Box 3, Folder 5.
weekly mimeographed Science Service Research Announcements containing tabulations in code of the Ursigrams. The material was also provided to the *Journal of Terrestrial Magnetism and Atmospheric Electricity* in Washington, DC, which then published quarterly compilations of the Ursigrams. Those engaged in research could obtain, without charge, explanations and other details about the Ursigrams by contacting Science Service. Plain English versions of the Ursigrams were also available for scientists and communications experts in Europe and North and South America, to help them share extraordinary natural phenomena or other data of interest. Davis appealed to those observing such "inconstants of nature," to telegraph their observations and predictions to Science Service for inclusion in this effort.347

These ventures at assisting exploration and the gathering of data were consistent with Science Service's mission of disseminating news of science to the public. Through promoting earthquake and astronomical research, organizing the cooperative efforts of anthropologists and archaeologists, and the gathering of cosmic data, Science Service supported scientific research. In turn, Science Service gained and reinforced its credibility with the American public, while building an audience for the information gathered.

"Things of Science" Kits

In discussing the many directions of Science Service effort and its potential impact, it is also essential to note the organization’s commitment to using its communication reach to

advance science education and popular enthusiasm. Beginning in 1940, and continuing through 1980, Science Service produced a series of science kits, available to anyone in the country by subscription. While the hope was to engender a curiosity and appreciation of science among young people, anyone could subscribe to the “Things of Science” kits. Watson Davis is credited with originating the idea, which evolved out of Science Service’s earlier practice of mailing samples of new materials to newspaper editors "as a demonstration and reinforcement of articles being sent them."\textsuperscript{348}

Each month, for seven months that first year, and at a cost of $2 for the whole subscription, participants received a small box containing a sample of some unusual or unfamiliar materials. The idea was that the experience of actually handling and possessing these small bits would stimulate the scientific habit of mind that Science Service hoped to instill in all Americans. In later years, the cost increased to $4, but Science Service tried to provide good educational value worth the price. Each unit contained not just the material, but also a description of the material suitable for use in teaching, as well as a museum-style legend for displaying the materials in a laboratory cabinet. The first few kits distributed in 1940 covered optics, fingerprinting, and fabrics. The initial group of subscribers was limited to 1,000 because Science Service was unsure of how well the kits would be received, and its staff had to procure the donated materials well in advance of mailing the kits.\textsuperscript{349} Eight months later, in November of 1940, orders exceeded the kits available by 50 percent, so Science Service immediately made plans to increase the number of kits available to 5,000,

\textsuperscript{349} Watson Davis, "Things of Science," advertising circular from 1940, SIA RU7091, Box 5, Folder 1.
anticipating the very real possibility of selling them all by January of 1941.\footnote{Watson Davis, "Information Memorandum on Progress of Science Service," Nov. 5, 1940, SIA RU7091, Box 5, Folder 1.} Seeing their great popularity, Science Service further increased the number of kits available, to 7,000 in 1946, and 12,000 in 1952.\footnote{George B. Moody is a research staff scientist at Harvard-MIT Division of Health Sciences and Technology with expertise in ambulatory ECG monitoring, signal processing, and data acquisition. See the Margaret and H.A. Rey Institute for Nonlinear Dynamics in Medicine at http://reylab.bidmc.harvard.edu/people/George.shtml; http://ecg.mit.edu/dbpg/; and IEEE \textit{Engineering in Medicine and Biology} (May/June, 2001): 45-50. His website featuring Science Service's Things of Science kits, at http://ecg.mit.edu/george/tos/ provides an excellent in-depth look at the types of kits produced and the topics and materials they covered. Some of the kits listed have links showing the actual materials.}

As the program continued over the years, Science Service varied the contents of the boxes, including samples of strange and unknown specimens, but also leading recipients through experiments with familiar materials. George B. Moody, a Harvard-MIT research scientist, who recalls the impact the kits had on him as a child, described some of the items, including a plastic (polypropylene) one-piece hinge that could flex "hundreds of thousands of times without breaking," and "a silkworm's cocoon, the size of a jelly bean, made of a strand of silk a kilometer long."\footnote{George B. Moody, http://ecg.mit.edu/george/tos/. For more discussion on how the kits were handled, mailed, and subscriber reaction see, Herbert B. Nichols, "Adventure in Small Packages," \textit{Christian Science Monitor} (Jun. 2, 1952): 26, http://ecg.mit.edu/george/tos/misc/adventure-1952.html.} Each February, the Science Service box commonly brought subscribers a new collection of seeds to plant. Other kits brought samples related to synthetic rubber, oysters, coins, insects, rayon, spices, dehydrated food, upholstery, steel, coal, sound recording, and a host of other materials.\footnote{Børge Michelsen, "United Nations Educational, Scientific and Cultural Organization," UNESCO Report on Science Service, May 30, 1949, http://unesdoc.unesco.org/images/0015/001542/154258eb.pdf.}

Approximately one-tenth of the kit subscribers were institutions, and more than half of those were high schools. Colleges, libraries, industrial companies, research stations, and museums represented the other half. The donated materials came from industrial research
laboratories, manufacturers on the verge of releasing new products, research institutions, individual scientists, engineers, and inventors. Kits gave those donors full credit for cooperating in the venture, and included descriptions of how the material was produced and how it might be used commercially.\footnote{354}

The Things of Science kits, ordered by thousands over the forty years that Science Service produced them, undoubtedly stimulated an interest in science in many young people. Though we cannot quantify the number of American children who received, used, and remembered the kits as they grew and chose their educational and professional endeavors, we can intelligently surmise that this creative method of sharing the world of science made an impact on more than a few.

\textbf{Science Clubs of America}

As another venture that extended the Science Service impact beyond the printed page and into the educational world, in 1941, the organization began directing science clubs in American high schools. Science Service assumed the task after the American Institute of the City of New York for the Encouragement of Science and Invention, which had been directing 700 clubs, mostly in the New York state, discontinued its involvement.\footnote{355} By 1949, 13,000 science clubs existed in the U.S., with clubs formed in other countries as well, under the name of Science Clubs of America. Clubs ranged in size from three to 700 members, with most averaging 27 members. The clubs tended to deal in science generalities for children.

\footnote{354} Ibid. Also see, \textit{Nature}, "Science Clubs of America," 148 (Nov. 15, 1941): 590.
ages nine to fifteen, and became more specialized for older children, whose interest focused on fields such as microscopy, radio, and aeronautics.\textsuperscript{356}

Science Service did not charge the clubs for the affiliation, but each club had to have an adult sponsor. The organization distributed the free Science Clubs of America Handbook, which described possible activities, including how to organize and conduct a science fair, how to interact with groups in other states, and get publicity, and how to participate in the annual Science Talent Search. The handbook also suggested books that were appropriate for the clubs, and offered free and low-cost materials.\textsuperscript{357} Over the decades, hundreds of thousands of young people participated in the clubs, and this in turn provided a new mechanism for Science Service to extend its name recognition among the general public.

\textbf{Science Talent Search}

The Science Talent Search was probably the most high-profile activity of the Science Clubs of America, sponsored by the Westinghouse Educational Foundation of the Westinghouse Electric Corporation, starting in 1942, and run through Science Service. Any senior in high school in the continental U.S., who at graduation time could meet the college entrance requirements, could compete in the Science Talent Search. Membership in a Science Club was not required. Contestants wrote a 1,000-word essay on "My Scientific Project," and in the presence of their science teachers, took the approximately 100-question Science Aptitude Examination based on testing students' ability rather than their "fund of information." Usually about 16,000 students started the examination, while 13,000 gave up

during it. The remaining 3,000 exams were sent to the headquarters of Science Clubs of America, along with recommendations from students' science teachers and a copy of the students' secondary school record.358

Psychologists evaluated the results, and the number was whittled down to 300. Of those, a committee chose forty as "trip winners," with the remaining 260 receiving honorable mentions and letters of recommendation to the colleges, universities, or technical schools in which they were interested. The "trip winners" took a five-day, all-expenses-paid trip to Washington, DC, where psychologists and psychiatrists, and the Science Service president interviewed them to determine the final scholarship awards. The top student received the Westinghouse Grand Science Scholarship of $2,800, or $700 per year, and the remaining students received lesser amounts.359 Westinghouse sponsored the program from 1942 to 1998, when Intel took over the high-profile sponsorship and changed the name to the Intel Science Talent Search.360 The 2013 Intel Science Talent Search winner received a $100,000 scholarship, which she plans to use attending MIT.

The Science Talent Search was, and remains, the nation's most prestigious science research competition for high school students, giving exceptional students the opportunity to present their research before nationally recognized professional scientists.361 According to a 2011 New York Times article, "victors and near-victors…have gone on to win seven Nobel

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358 Ibid.
359 Ibid.
361 See the Society for Science & the Public (formerly Science Service) website at http://www.societyforscience.org/sts/history for information about the history of the competition, and lists of competition alumni from 1942.
Prizes in physics or chemistry, two Fields Medals in mathematics, a half dozen medals in science and technology, [and] a long string of MacArthur Foundation "genius" grants.\textsuperscript{362}

In addition to the print material, radio programming, support of research into earthquakes and astronomy and archaeology, distribution of the Things of Science kits, and its organization of the Science Clubs of America and the Science Talent Search, Science Service was also involved with a number of other activities aimed at supporting and publicizing science research. The organization created exhibits for display at World's Fairs, museums, and science fairs, as well as film strips and phonograph records featuring scientists discussing their work. Science Service staff organized science lectures, contracted to edit science books, and helped with the pioneering efforts of microfilm and document preservation. They also created a retail science book service in response to readers' request for access to science books, and covered the meetings of the major science organizations and helped with their publicity efforts. Millions of people were exposed to the combined reach of these myriad endeavors, though quantifiable evidence is elusive. We may count the number of news letter subscribers, or the number of Science Talent Search participants, but that provides only a sketch of the indisputable fact of Science Service's wide-ranging and enduring impact.

CHAPTER 5
Professional and Social Impact

Upon beginning their science popularization mission in the early 1920s, Science Service leaders faced the challenge of making practical and philosophical decisions about the style, ethics, and philosophy of the profession. It was not a matter of deciding whether to follow or break established rules so much as to lead the way in making the rules of this whole new field of science journalism. As much as they struggled with questions about what should be written, they also had questions about who should do the writing. Was it publicity-shy and resistant scientists, or professional journalists who knew how to communicate with the public but lacked specialized science knowledge? Was it seasoned writers who had experience but not in the field of science journalism, or was it the fresh talent and energy of young men and women willing to be trained to write science news?

There also existed some very basic, very important, differences between how scientists and journalists approached their work and the tenets guiding their disciplines. Additionally, each group had longstanding, numerous, and specific complaints about the other, often based on stereotypes but not without justification. Slosson and other Science Service staff set out to encourage better dialogue between the two groups for the benefit of American readers. Before Science Service could secure venues for the publication of its articles, before it could win greater public trust for science in general, it had to find writers who could provide dependable, readable material that would satisfy scientists and draw a general audience.
Seeking Science Journalists

Practically right from the start of their operations, Science Service leaders were consciously thinking about the question of how to create the new type of science journalists they needed, a pool of skilled writers who could satisfy both scientists’ demands for accuracy and publishers’ demands for readability. Edwin Slosson, in particular, moved deliberately. In June, 1921, after Science Service had been in operation for six months, Slosson had already started working to form connections with contributors from the various sciences across the country, who could provide a regular flow of marketable material for him to review, edit, and send out to client newspapers. But Slosson had been very cautious in his negotiations with potential contributors, refusing to make formal commitments to writers until business manager Howard Wheeler assured him that Science Service stood a good chance of being able to place their articles. Consequently, during the first few months of operation, Slosson had not spent a large sum in procuring stories, nor was there much material on hand that seemed unusable. He had rarely paid more than the going rate of two cents a word, and often got good material for one cent or nothing at all. In describing his efforts to Science Service trustees, Slosson explained many of the obstacles involved in the early efforts at popularization, including the difficulty of getting science news articles into the mainstream newspapers.\(^{363}\) He clearly had devoted substantial thought to the question of what type of article was likely to draw in the reading public, but there were other aspects of the challenges as well. Newspaper science had a well-deserved bad reputation with scientists, and convincing them that the quality of reporting could change for the better took time. Before

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\(^{363}\) Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 1-2.
Science Service began the first organized and serious effort to cover science for the newspapers, scientists felt that the press often treated them and their meetings disrespectfully.

Slosson began by trying to convince scientists to contribute articles for the popular press, but finding writers for the service was harder than Slosson had imagined. He had his small group of scientific contacts on whom he could call for credible material, but he was actively searching for more volunteers, whether established and recognized scientists, or young men and women of promise whom he could develop into good writers willing to devote some effort to science writing. In an April, 1921 front-page notice in the AAAS Science magazine, Science Service announced its eagerness to cultivate new authors, to recruit "young men and women in the sciences who have literary inclinations and would be willing to submit to a rigorous course of training with a view to making the writing of popular science a part of their life work." The pitch failed; the notice only drew numerous responses from people seeking a correspondence course that would teach them to write letters. Science Service also circulated requests for contributors to every chapter of Sigma Xi, the honor society of research scientists and engineers with chapters throughout the country, but those letters brought no responses at all.

As much as Millikan, Hale, and other leading scientists of the 1920s supported the ideal of bringing science to public attention, in practice, many scientists still hesitated to dedicate any substantial effort to that often-unrewarding work. They ran the risk of having

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colleagues scoff at such efforts, considering it a futile waste of time to try communicating substantive ideas to the ignorant masses. In March 1921, Slosson contacted George Washington Carver at the Tuskegee Institute and appealed to him to contribute articles based on his research that Science Service could use in its forthcoming syndicated material. Noting Carver's studies of peanuts and sweet potatoes, Slosson asked Carver for two or three 500-word articles, "distinct and readable" and "written up in a bright attractive way." He offered to pay Carver the highest market price for the manuscripts, and also asked that Carver inquire among his faculty and students for potential writers. Carver declined, saying that since his recent appearance before a congressional committee he had been flooded with requests for articles and interviews and feared that anything he wrote would only repeat what he had already said. He did express interest in the goals of the organization, as explained in material Slosson sent along with his request, and offered to help in any other way he could with no interest in monetary compensation.

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366 For a discussion of the earliest efforts at distinguishing American science from British, and science activities in the major cities of the time, see John C. Greene, *American Science in the Age of Jefferson* (Claremont, CA: Regina Books, 2004). See George H. Daniels, *American Science in the Age of Jackson* (Tuscaloosa: The University of Alabama Press, 1968), for an overview of the rise of American science, including the establishment of professional journals. Daniels maintained that the term "popularizer" first came into use in the 1840s, and men pursuing science come to be called "scientists," a term coined by William Whewell. Daniels explained that removing science from the public domain where it had previously resided, through lectures and demonstrations, contributed to scientists being considered "expert," but then obligated them to justify their work in terms of social value to the citizens whose support they hoped to gain. This was necessary, in part, because of the new technologies, such as steam engines, that had obvious practical uses. Daniels described scientists' approaches, tailored to appeal to varying audiences: to government—that it was a matter of national honor to support science; to the public—practical benefits; to conservatives—that science had a "quietistic" function that preserved social order and diverted people's attention from politics and activism often stirred by art and literature; to liberals—that science would bring more social opportunities to all classes.

367 Edwin E. Slosson, letter to George Washington Carver, March 14, 1921, SIA RU7091, Box 7, Folder 1.

368 George Washington Carver, letter to Edwin Slosson, March 18, 1921, SIA RU7091, Box 7, Folder 1.
Likewise, Slosson contacted Thomas Edison in October 1921, soliciting his participation in an effort to produce popular articles on scientific discoveries. Edison's assistant, William Meadowcroft, responded on his behalf, declining the opportunity. He stated that while Edison thought the plan was "fine," he had never written any articles and did not feel capable of doing so. Slosson then countered with an offer to have articles prepared by a competent author, with the input of scientists on the Board of Trustees that would require only Edison's signature, though his comments were also welcome. Meadowcroft once again declined, noting that Edison had an established policy of not signing written articles because he "does not make any pretense of writing, and as he receives an enormous number of requests for articles, statements, etc." he was too busy to participate.

It was noteworthy that in seeking writers, Science Service tried to recruit "women in the sciences." Slosson was ready to respect female intellectual talent and professional ambition; he was married to the former May Preston, the first woman to graduate with a Ph.D. from Cornell University and an activist in the woman suffrage movement.

369 Edwin E. Slosson, letter to Thomas A. Edison, Oct. 17, 1921, SIA RU7091, Box 7, Folder 1.
370 William H. Meadowcroft, letter to Edwin E. Slosson, October 20, 1921, SIA RU7091, Box 7, Folder 1.
371 Edwin E. Slosson, letter to William H. Meadowcroft, October 21, 1921, SIA RU7091, Box 7, Folder 1.
372 William H. Meadowcroft, letter to Edwin E. Slosson, October 27, 1921, SIA RU7091, Box 7, Folder 1.
373 Rhees, "Chptr. III, Part I, 1 mentions May Preston's degree in general. Further inquiry revealed that Preston's Ph.D. was in Philosophy and was bestowed by Cornell in 1880 for a dissertation entitled, "Different Theories of Beauty," http://www.americanphilosophy.net/early_phds.htm. After marrying Edwin E. Slosson, May Preston Slosson moved with her husband to Wyoming, where she initiated a series of lectures and talks for prisoners at the State Penitentiary for Men at Laramie, Wyoming hoping to improve their lives. When the regular chaplain left, the prisoners petitioned the governor to make her their chaplain, and she became the Reverend May Preston Slosson, the only known female chaplain in the United States working in a prison. A lecture series continues in her name at the prison museum. Rudolph DeCordova, "A Lady Prison Chaplain," The Wide World Magazine, 10, (October 1902 to March 1903), 500-504. See also the obituary for the Slosson's son,
Significantly, throughout his long previous newspaper career, E.W. Scripps had not actively recruited or encouraged female reporters. Scripps newspapers regularly courted women readers, running contests, short stories, relationship articles, and similar features designed to attract female interest. The Scripps papers also emphasized practically-oriented information for working women, with articles about ways they could save money on work clothes, or cook cheaply for large families. The papers also supported working women's interests and professional potential for some kinds of work. Editorially, Scripps publications paid tribute to women working outside the home, estimated at more than 20 percent just after the turn of the twentieth century. Articles in Scripps-owned newspapers focused on women in diverse and unexpected professions, including boilermakers, blacksmiths, roofers, brakemen, and butchers, as well as traditional jobs such as stenographers, clerks, and telegraph operators.

An editorial in his Portland Daily News in 1907 stated, "a woman deserved a good job, good pay, and 'the right to do whatever work she chooses and to receive a salary commensurate with that work.'" Yet no evidence exists that Scripps advocated hiring women to work for his newspapers, at least certainly not in positions of responsibility and influence. Indeed, he dismissed the entire gender in 1921, writing, "no intelligent man or woman, who has had occasion to learn by observation and experience, can doubt that women are less capable as directors of business and less capable in matters political than men." Still, individual...
newspapers within the Scripps system may have hired women as office workers and reporters.

But at Science Service, Slosson seems to have recognized the possibility of hiring women as good science journalists. As Margaret Rossiter has documented, elite women’s colleges and some land-grant institutions had graduated an increasing number of female students with science degrees since the late 1800s. Those women faced substantial discrimination in broad categories of education and employment in industry, academia, and government. Many were relegated for years to laboratory assistant jobs, with relative low pay and low status, regardless of their academic credentials or scientific experience. As long as they did not expect to advance, female science graduates were in relatively high demand. According to Rossiter, women with science degrees often "were not only tolerated but were even sought out, especially since their typically lower salaries as research associates would have made them attractive additions to the staff of a laboratory or institute."376

College curricula emphasized teaching future scientists the skills of specialized scientific writing for peer-reviewed journals. Female scientists sought to gain status by communicating within their professional discipline, seeking to win respect from established men in their fields. Given that many members of the American scientific community remained dubious about efforts at popular outreach, engaging in popularization might have

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seemed particularly risky for women, whose status in the professional world of science remained marginal. Especially when Science Service was just starting out in the early 1920s, the novelty of science journalism may have seemed too tenuous to appeal to young female scientists. As it turned out, within about a decade, Science Service would indeed start to attract more women with science degrees to work as writers and editors. As Rossiter has detailed, by the 1930s, women who felt frustrated by their lack of opportunities for good science employment in higher education, government, or industry increasingly embraced alternative routes. Rather than directly challenging men for jobs, women found that positions in science journalism and science-library work allowed them to apply their scientific training in directions more closely associated with traditional gender roles.  

Meanwhile, in 1921, Slosson told the board that the lack of writers with science training was not an immediate catastrophe; he had received more than enough applications from freelance and professional journalists who wanted to write for Science Service. According to Slosson, the work of those skilled writers was generally more usable than typical articles produced by scientists themselves. He speculated that this was because of two

377 Ibid., 262. Rossiter also noted Maria Mitchell, whom she described as "certainly the most important woman scientist in America in the nineteenth century"(12). Mitchell (1818-1889) was taught astronomy by her Quaker father. See Eve Merriam, ed., Growing Up Female in America: Ten Lives (Boston: Beacon Press, 1971). Dividing her time between working as the librarian at the Atheneum on Nantucket Island, Massachusetts and "sweeping the skies" with her telescope, she discovered a comet on October 1, 1847. As the first person in the world to report it, she was awarded a gold medal by the King of Denmark, was elected to the American Academy of Arts and Sciences, and the American Association for the Advancement of Science. In 1865 she joined the faculty of Vassar, where she trained other female astronomers. See also Maria Mitchell, Maria Mitchell, Life, Letters, and Journals (Charleston: Forgotten Books, 2012); Nancy F. Cott, ed., No Small Courage (Oxford: Oxford University Press, 2000); Renée Bergland, Maria Mitchell and the Sexing of Science (Boston: Beacon Press, 2008); Henry Mitchell, "Maria Mitchell," Proceedings of the American Academy of Arts, and Sciences 25 (May 1889-May 1890): 331-43, http://www.jstor.org/stable/20020453; Sally Gregory Kohlstedt, "Maria Mitchell: The Advancement of Women in Science," The New England Quarterly 51, No. 1 (Mar. 1978): 39-63, http://www.jstor.org/stable/364590; Margaret W. Rossiter, "Women Scientists in America before 1920: Career patterns of over five hundred women scientists of the period reveal that, while discriminations was widespread, many women were working hard to overcome it," American Scientist 62, No. 3 (May-Jun. 1974): 312-23, http://www.jstor.org/stable/27844885.
things: their "practice in the art of writing," and their ability to "put themselves in the position of the reader more readily than the professional scientist." However, even with this abundance of willing writers, Slosson was reluctant, and felt it unnecessary, to entrust the writing of scientific information wholly to "the outsider." He contended that even if non-scientists were able to present a point clearly, they could not achieve the "intimate knowledge" of the subject of science. Conversely, he believed that "there is no reason whatsoever why a person actively engaged in scientific reading or research should not also acquire the knack of popular presentation."  

Slosson was effectively asking the question, what were the proper qualifications to fill this relatively new role of the science journalist? Did it make more sense to ask professional scientists to master the skills of writing for the general public, or to ask experienced journalists to master the necessary understanding of science? The answer was unclear. While some of the nation’s highest-profile science researchers clearly supported the cause of science popularization, Slosson did not feel comfortable relying on their willingness to contribute regularly to Science Service, since he knew that time spent writing would represent a great sacrifice for these busy men. Instead, he proposed recruiting writers from the large pool of assistants and students in the research departments of major universities, who would have time to do the work and could well benefit from the extra ten or twenty dollars a week that Science Service articles might net. The impediment he saw was that scientific community standards trained researchers to eliminate personality from their work, and it was personality that was an essential element in making stories appealing to a Science

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378 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 3-4.
While trying to recruit good writing candidates during early 1921, Slosson himself had turned out a monthly article of approximately three thousand words, plus weekly articles of seven hundred words, along with assorted other smaller contributions for Science Service.

**Tensions Complicating the Relationship Between Scientists and Journalists**

In looking at the journalism field itself, Slosson worried that journalism culture often conflicted with the goals and approaches of scientists. One problem was that editors of papers and other publications always wanted articles authored by well-known, prestigious figures, but did not really want what these people were likely to write. Slosson believed that newspapers should not be so obsessed with pursuing the big names in a field, because the average reader was not likely to pay attention to the name of the author so long as the article was interesting. Slosson maintained that Science Service could provide more interesting and valuable substance by recruiting articles from young but enthusiastic researchers. While government employees were prohibited from writing under their own names, Slosson wanted to present articles by them anonymously, or under pseudonyms. Slosson noted that already two of his most valuable writers were writing under pen names.³⁸⁰

Years of mainstream reporting’s neglect and disregard toward scientists and their work had created a chasm that would not be crossed easily. Science Service needed to overcome scientists’ resistance to the idea of newspaper coverage, and to overcome journalists’ perception of scientists as uncooperative. Davis maintained that scientists were

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³⁷⁹ Ibid., 4.
³⁸⁰ Ibid., 5.
justified in their suspicious attitude toward newspapermen because "'newspaper science' was synonymous with inaccuracy and distortion." As the organization creating the pathway for science news to reach mainstream audiences, Science Service had to convince scientists that science news could be written accurately and in an acceptable manner. It took time for evidence of responsible and respectful science news reporting to accumulate. As it did, scientists warmed to the idea of cooperating with journalists to publicize the positive aspects of science, particularly when the post-World War I environment had left people both awestruck and appalled at what science made possible.

From the journalists' perspective, scientists were often uncooperative. They did not speak or write in words the average person could understand. They resisted providing journalists with copies of their conference and meeting papers ahead of time, and thereby deprived the journalists of the chance to read and understand what the scientist was talking about. The Secretary of the American Physical Society (APS) responded to Watson Davis's November 1921 request for a copy of the preliminary program of its upcoming meeting by warning that it could not offer any special explanations of the upcoming papers. The APS wrote to Davis, "We do not print abstracts in advance of publication and we have no arrangements or facilities by means of which we can provide any abstracts in advance of

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381 Watson Davis, “Science and the Press,” *Annals of American Academy of Political and Social Science* 219, The Press in the Contemporary Scene (Jan. 1942): 104, http://www.jstor.org/stable/1023899. Also see Michael Schudson, *Discovering the News: A Social History of American Newspapers* (New York: Basic Books, 1978), for his interpretation of the difficulties between journalists and scientists. Schudson maintained that journalists had to overcome the stereotype of the "old-time reporter," whom he described as "a hack who wrote for his paycheck and no more. He was uneducated and proud of his ignorance; he was regularly drunk and proud of his alcoholism. Journalism, to him, was just a job." According to Schudson, the "new reporter" of the 1880s and 1890s was "younger, more naïve, more energetic and ambitious, college-educated, and usually sober," 69. However, in the 1920s, many of the scientists would likely have remembered the stereotype, or may have known "old-time reporters" who fit that description. Just as scientists had to overcome their sometimes-deserved reputation for being bearded recluses cloistered in ivory towers away from the real world, secretly pursuing the minutiae of their research, so journalists had to overcome a negative reputation as well.
publication.” More than that, the physicists saw no particular value or need in trying to help journalists produce popular reports. The APS told Davis that he should not mind the absence of paper abstracts, since “this will be no hardship in this particular case…there is not a single one of these abstracts that contains anything which would be of popular scientific interest. Our papers are always intensely technical.”

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Journalists admitted they often could not understand scientists' language so, if they had time, they contacted their own science sources for help clarifying complex technicalities. But if the journalist had covered a long or late-night meeting, he did not have the opportunity to investigate further, and so had to go with his best impressions in order to meet the paper's inflexible deadlines. Journalists knew that as representatives of laymen, they needed to be able to translate specialized jargon into forms the average person could understand. Some journalists actually took science courses to try to gain a better grasp of the terms and material involved. Suggestions that scientists might benefit from taking journalism classes to become better communicators were met with indifference, at best.

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It soon became apparent to the directors and editors of Science Service that even if scientists became willing to share their work with the public, there were serious difficulties in using many articles written by scientists themselves. Scientists wrote in the technical vocabulary of their disciplines, language that only exacerbated the difficult and unfamiliar concepts under consideration. If journalists could not decipher what scientists were saying,

382 Dayton C. Miller, letter to Watson Davis, November 7, 1921, SIA RU7091, Box 6, Folder 2.
their jargon and principles certainly would not communicate effectively to the lay public.

MIT physicist George R. Harrison told a classic story as reported in the *Washington Star*:

A New York plumber of foreign extraction with a limited command of English wrote the National Bureau of Standards and said he found that hydrochloric acid quickly opened drainage pipes when they got clogged and asked if it was a good thing to use.

A Bureau scientist replied:
"The efficacy of hydrochloric acid is indisputable, but the corrosive residue is incompatible with metallic permanence."

The plumber wrote back thanking the Bureau for telling him the method was all right.

The scientist was a little disturbed and showed the correspondence to his boss—another scientist.

The latter wrote the plumber:
"We cannot assume responsibility for the production of toxic and noxious residue with hydrochloric acid and suggest you use an alternative procedure."

The plumber wrote back that he agreed with the Bureau—hydrochloric acid works fine.

A top scientist—boss of the first two—broke the impasse by tearing himself loose from technical terminology and writing this letter:
"Don't use hydrochloric acid. It eats hell out of the pipes!" 384

While humorous, this story illustrated some of the challenges inherent in attempting to educate the public about science.

Most of all, scientists simply did not understand how the newspaper business worked.

In the 1920s and 1930s, before many publishers got used to the idea of devoting a specific space and assigning a reporter to cover science on a regular basis, science stories had to compete with other news—breaking news, sports, and weather—for column space.

According to journalists writing at the time, limits on stories were between four hundred and five hundred words, so reporters had to distill those facts that best represented the point of

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the story and put them in a form that made them seem appealing to skeptical editors. The way scientists wrote was the polar opposite of how journalists wrote. Scientists first acknowledged and credited all prior research done in the area, then described their own processes, and finally gave their results. By contrast, journalists were trained to establish basic information: Who? Where? When? What? Why? How? This went in the first paragraph or two, followed by enough explanation to make it understandable, which left little room for discussion of prior research by others.\textsuperscript{385} Scientists perceived this as a lack of regard for their method of explaining their research, rather than a different protocol appropriate to reporters’ own discipline. What they interpreted as disrespect was in fact the harsh reality of limited space in the newspaper.

Journalists responded to charges that they over-sensationalized science reporting by maintaining that science could not get space in newspapers if reporters did not make it sound exciting. Reporters were always trying to get what they referred to as "a good play" for their stories—either a front-page space, a top-column position on an inside page, or some other prominent placement. Such success brought reporters prestige and better pay, so the competition to score well-placed stories may have colored their approach. Subject matter usually determined the play of the story, explaining why so many medical stories got prime spots in the newspaper. Reporters tried to emphasize the most important and most appealing aspects of the story. Even if reporters tried to handle their stories responsibly, they then turned them over to copy desk editors who made adjustments and added headlines. Many times the copy editor chose the wrong or most provocative aspect of the story on which to

focus attention, thereby distorting the reporters' intentions.\textsuperscript{386} As a science writer for the \textit{Washington Herald} in 1920, Watson Davis had prepared a story about a local science meeting, where researchers reported that ragweed, and not goldenrod as traditionally believed, caused hayfever. It was a topic of interest to the general public, and his column got prime placement on page one. However, when Davis saw the paper the next morning he found that a helpful copyreader had "corrected" his story to read that it was goldenrod that caused hayfever.\textsuperscript{387}

Accuracy in science reporting was a major point of contention between scientists and reporters. Ferry Barrows Colton, who served as assistant science editor for the Associated Press during the 1930s, firmly attested that no honest science writer intentionally distorted the facts to improve the play of his story, and that overall, the press made every effort to be accurate. He paraphrased another veteran science writer when he suggested that there are two kinds of accuracy, both legitimate—that of technical journals, and that of newspaper or magazine reports. No scientist would rely on a popular report as a guide; he naturally would contact the researcher involved, to ask any questions directly. But for the average person who was not interested in reading all the technical details, a popular story usually satisfied his interest. According to Colton, a "news story can be accurate in essential details without being complete." Or, as another science writer put it, "a science news story need be accurate only to the first decimal place."\textsuperscript{388} Edwin L. Shuman's 1894 journalists' handbook, \textit{Steps into Journalism}, provided a formula for the proper balance of accuracy and popularity. According

\begin{itemize}
\item \textsuperscript{386} Ibid., 159, http://www.jstor.org/stable/19670.
\end{itemize}
to historian Michael Schudson, Shuman advised that "sparkle" might trump inaccuracy, and accuracy might excuse dullness of style, but that "reliability and sparkle" was the best combination for professional success.\(^{389}\)

Scientists also tended to lack a sense of proportion, in many journalists' estimation. They often seemed overly sensitive about publicity and lacked a sense of humor. Colton believed much of the sensitivity was fueled by the criticism or the taunting that scientists received from their peers, after ill-received press coverage. He advised:

> the cause of good publicity for science would be helped if scientists would venture a little further from their ivory towers, if they would develop slightly thicker skins at times, and not eternally condemn all the press merely because in one isolated instance they have had their work written up in what they consider a somewhat inaccurate or incomplete way.\(^{390}\)

Ultimately, Colton suggested that mutual understanding and cooperation were the best way to promote good relations between the two camps.\(^{391}\)

Many scientists, already resistant or indifferent to suggestions that they reach out to the public, found their excuse in the quality of newspaper reporting of science. From the perspective of many scientists, journalists could not be trusted. The journalists' ineptness sometimes subjected scientists to the ridicule of their peers, or the anger of their superiors, who held the scientist himself responsible for the incorrect impressions. The situation was not likely to improve on its own, and it was this stalemate that Scripps and Science Service sought to break.

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\(^{391}\) Ibid.
Winning Over Editors and Publishers to Support Science Journalism

In addition to mediating the philosophical differences between journalists and scientists, Slosson was also bothered by publishers’ obsession with timeliness, or the idea that something had to be "hot off the press." Editors wanted to claim that a story represented the very latest scientific pursuits, but Slosson described that demand as "an absurdity in scientific matters" because new discoveries usually derived from a slow and orderly process of investigation and testing that could be anywhere from months to centuries old. The best science stories were not necessarily “hot off the press,” he insisted; it was more important for articles to help readers understand topics where they had no prior specialized knowledge.392

In assessing prospects for establishing American science journalism more widely, Slosson saw polar differences separating scientists and the press. Almost everything was different between the two groups—the intensity with which they desired to reach and communicate with the public, their views of time and deadlines, and the fundamental elements of a news story as opposed to a scientific report. The press loved to drop big names in pursuit of human interest, while men of science generally intentionally distanced themselves from personal notoriety, knowing first-hand how many minds and hands had likely played a part in any scientific development or discovery. Newspapers thrived on human interest stories; bold headlines of the early 1920s captured the Sacco and Vanzetti episode, the “Black Sox” World Series scandal, the Hollywood scandal of Fatty Arbuckle, the exploits of notorious criminals, and new stars such as Rudolph Valentino. The scientific profession, by contrast, often tended to eliminate any focus on individual efforts,

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392 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 5-6.
stigmatizing any quest for personal notoriety or acclaim. Albert Einstein himself told the
American Academy of Sciences that the work of individuals was so intertwined with the
work of others that it was unfair to have any one person get the honor for it. As Slosson said,
"science aims to eliminate altogether the element in which the ordinary man and even the
more ordinary woman is alone interested in." Slosson described Science Service's role as that of being a buffer between two
groups of people talking different languages, and likely to be buffeted from both sides it was
trying to help.

Editors naturally had their own perspective on the complications of trying to report
science news. In 1922, J. O'H. Cosgrave, editor of the Sunday magazine section of the New
York City World, responded to criticism from men of science that his paper's coverage of
science included too many mistakes and exaggerations. Cosgrave insisted that he had made
earnest efforts to publish true and interesting stories about science in its magazine section,
material largely drawn from scientific and medical magazines, and also covered any
important scientific discoveries of which editors became aware. He claimed that Robert
Millikan, the U.S. Bureau of Agriculture, and others in the scientific community had sent
letters of congratulations to his magazine for its presentation of science information. But
Cosgrave complained that articles written by science professionals were unfit for the average
reader, written in difficult scientific jargon, and filled with technicalities. He resented what
he saw as disregard for his paper's genuine efforts at credible and readable science reporting,

393 Ibid., 21.
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Again, Science Service leaders were aware of the need to walk a fine line between accuracy and appeal. As much as Slosson scorned newspaper editors’ obsessions with sensationalism and the quest for big names and “hot off the press news,” he also believed that Science Service could again learn something from the general press, as far as how to interest readers by adding a more human element to its accounts, with a humorous slant or human interest angle. He commented, "dehydrated science keeps well in paper packages but needs softening in warm water before serving." He hoped that stories about the history of science could help capture people’s interest, especially by drawing on accounts that tried to convey a sense of how science actually worked and discoveries emerged.

This is, I think, a movement that should be encouraged, for teaching science without reference to its history gives the impression that it is a body of immutable and impersonal laws like the Ten Commandments that were handed down from Heaven on tables of stone…much of the science taught in the high schools is of this dogmatic sort, and the student fails to get the idea that science is a human invention growing and changing and turning this way and that by aggressive personalities or the accidents of history. There is a failure to realize the difference between facts and the forms of facts, and a failure to discriminate between the permanent gains and the ephemeral theories… the person who does not know anything about the history of science and is ignorant of its conflicts and confusion, does not know how to meet rationally the present conflicts of theory or how to distinguish between the legitimate leaders of science and the numerous pretenders.\footnote{Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 22-3.}
So from its start in 1921, Science Service did indeed try to win over both publishers and readers by placing a more human interest spin on science stories. As Slosson knew, while the vast majority of scientists remained unknown to the general public, the scientific community had a few celebrities. A certain amount of hero worship was inevitable, he declared, and "it is not unfair to take advantage of it in increasing the interest in science."

To this end, he made ample use of the visits of the Prince of Monaco, Albert Einstein, and Marie Curie to the United States, all in 1921, to get as much attention as possible for science news. He acknowledged that, without these famous faces, news of oceanography—the Prince's passion—relativity, and radioactivity would likely never have made it into the papers. Prince Albert I of Monaco had developed instruments and techniques for use in the new science of oceanography, and on his visit to the United States, received the Agassiz medal for his contributions from the National Academy of Sciences. Science Service negotiated with the Prince's Director of the Scientific Cabinet and his private secretary to get a set of exclusive photographs of the Prince and then worked to place them in newspapers such as the *Baltimore Sun*.

Marie Curie was another natural focus of public interest, as the first woman ever to win a Nobel Prize, the first person ever to win two Nobel Prizes, and one of the few ever to win Nobel Prizes in two different fields. Her 1903 prize was in physics (with her husband Pierre and Henri Becquerel as co-laureates); her 1911 prize was in chemistry, awarded to her alone. Many major newspapers such as the *New York Times* extensively covered Curie's 1921 visit to the United States, starting coverage with her voyage itself. Subsequent articles

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396 Ibid., 25.
397 Howard Wheeler, letter to editor of the *Baltimore Sun*, April 15, 1921, SIA RU7091, Box 6, Folder 9.
described Curie's visit to the White House, where she accepted $100,000 that American women had raised to help her buy one gram of radium for her research, and Curie's trip to the Standard Chemical Company in Canonsburg, Pennsylvania where the radium was produced.\textsuperscript{398} Science Service joined the parade of coverage; even before Curie arrived, the Science Service "Daily Mail Report" service to newspapers, and its \textit{Science News-Letter}, offered substantial reviews of Curie's work and discussed her impending visit to the United States. In fact, celebrity value made the whole Curie family noteworthy; later, in 1932, when Curie's daughter Irène, a scientist continuing her mother's work on radioactivity, wed fellow scientist Frederic Joliot, the \textit{Science News Letter} noted the marriage under the headline, "Partnerships in Science and Marriage." The brief article noted that the Joliot-Curie couple was following in the footsteps of Marie and Pierre Curie, whose work together had earned the Nobel Prize for physics.\textsuperscript{399}

This celebrity focus drew some criticism within the scientific community, especially given coverage of Marie Curie, whose work and personal life had roused controversy in the

\textsuperscript{398} For a description of the White House ceremony and presentation of the gram of radium to Marie Curie, including how the material itself was handled and packaged, see the National Institute of Standards and Technology (formerly the National Bureau of Standards) website at http://www.nist.gov/pml/general/curie/1921.cfm. Also see Eve Curie, \textit{Madame Curie: A Biography by Eve Curie} (New York: Pocket Books, 1963) for descriptions of Marie Curie's 1921 trip to the United States with her daughters; for a description of the Standard Chemical Company and an extensive number of photographs of the plant and Curie's visit, see http://www.canonsburgboro.com/Curie-WebPage/MCurie&StdChemical.htm. The \textit{New York Times} was only one of many papers to give extensive coverage to the travels and activities of Madame Marie Curie on her visit to the U.S. in 1921. The \textit{New York Times} archives can be accessed at http://www.nytimes.com/content/help/search/archives/archives.html. For the article on Curie's sailing to the U.S. see http://query.nytimes.com/mem/archivefree/pdf?res=9B00EEDB113FE432A25750C1A9659C946095D6CF.

past, often reflecting a blatant bias against women in science. Slosson reported that one chemist had told him he should be ashamed of himself for publishing anything about Madame Curie because "she was vastly overrated and only received attention because she was a woman and had never done anything worth mentioning by herself anyway, and that by booming her we were throwing into the shade the much more deserving American chemists in the field of radioactivity."  

But Science Service continued to take shrewd advantage of the power of celebrities, including Albert Einstein, eagerly covering his visit to the United States in 1921, his lectures at Princeton, his publications, and his work. At every turn, thousands of Americans turned out to see the famous scientist, and the newspapers were there to cover it all. Journalists and readers alike were fascinated by Einstein, as historian József Illy has documented, making his rumpled appearance and wild hair into icons of the brilliant scientist. Newspapers asked Einstein about his impressions of New York skyscrapers—he said he had none because he had nothing with which to compare them—and documented his generous and good-natured answering of reporters' questions, despite his professed dislike for interviews.  

However, as historian Marcel LaFollette pointed out, aside from Einstein and the Curies, there were few high-profile scientists in the early 1920s. As long as reporters viewed science in terms of celebrity chasing, coverage of research and discoveries would be

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400 Edwin E. Slosson, Notes of a "Talk to Trustees of Science Service," at the Meeting of June 17, 1921, SIA RU7091, Box 1, Folder 2, 24.
403 For more on the history of press coverage of Einstein, see George H. Douglas, The Golden Age of the Newspaper (Westport, CT: Greenwood Press, 1999), 129.
"feast or famine," with the press paying more attention to personality than to the substance of ideas. It was this situation that Science Service leaders were determined to change, by laying the groundwork for the public press to cover science consistently, in a manner that was both engaging and intellectually valid. To accomplish that mission, Science Service had to straddle the dividing line between scientists and journalists, but the organization's leaders believed they could accomplish just that. Biologist William Ritter, one of the founders of Science Service, cut to the heart of the tension between the two cultures when he asserted that science "is the embodiment of rational life. Journalism is chiefly dependent on the emotional life." He acknowledged that much of newspaper press was sensational, for example often printing anything lascivious about sex and almost nothing about it that was scientific. But the harsh realities of publishing, Ritter observed, meant "a daily newspaper that is not predominantly yellow is pretty sure to be predominantly red in its balance sheet." He admitted that to the average person, "pure science is as dry as dust and about as useful." He feared that science had not yet achieved much in fields that involved human interest and welfare, so in some ways could not compete with other, more sensational material.

The Rationale for Changing the Public Dialogue of Science

Not only did scientists struggle with their relationship with the press, they also had to contend with the expectations and often incorrect impressions formed by the general public. Whether they were comfortable with the idea or not, scientists were increasingly seen as public servants. Already by the 1920s, science had grown to the point of requiring huge

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amounts of resources—space, equipment, and money. It seemed likely that the public would increasingly be asked to financially support these needs, a demand that required scientists to justify their demands. This history, of changes in the world of science itself, provided the context within which Science Service and leading scientists felt impelled to rethink and improve their relationship with the wider American public.

Science had not always been central to American higher education. Colleges of the 1600s and 1700s commonly copied European ideals of knowledge that revolved around teaching the classics; many institutions proved slow to incorporate the teaching of science. In time, this separation eased, and science became more common as an academic pursuit during the 1800s. Creation of the nation's land-grant college system, following passage of the Morrill Land-Grant Act of 1862, promoted the study of engineering and applied science, which ultimately promoted the creation of new courses, departments, and professorships. This expansion allowed more students to focus on the sciences, though female students still struggled to gain access to these programs. The Johns Hopkins University was founded as a research university in 1876; along with some other American schools, Johns Hopkins adopted new university practices such as the seminar, the colloquium, and the research institute, often modeled on European precursors.406

During the late nineteenth century, within the business world, many industrialists became willing to pay for research, but only that which yielded immediate and practical benefits consistent with their goals. Meanwhile, by the mid-1800s, centralized governments, first in France and Germany, then in Britain and America, increasingly stepped in to initiate

public funding of science, for economic, military, and political purposes. Many scientists embraced the new opportunities to seek support from government, industry, and academia. They recognized that the nature of scientific work itself was changing, no longer a world for gentlemen amateurs who could fund their own research. The shift created opportunities, but also tensions, as men of science, formerly accustomed to an elite status, feared a loss of control in becoming "paid servants of the state and society."\textsuperscript{407}

By the beginning of the twentieth century, "big science" was underway, and most scientists held paid professional posts at universities, government research facilities, or industrial laboratories. Research foundations were another source of support. Funded by wealthy individuals, they often were centers of targeted research that reflected the interests of their benefactors, such as Andrew Carnegie and the science of genetics. "Big science" required big investments and big institutional commitments. As science historian Mary Jo Nye has noted, as early as 1900 some universities "were beginning to look like factories, as huge laboratory buildings were equipped with electrical generators, enormous magnets, vacuum pumps, chemicals and heavy machinery."\textsuperscript{408}

World War I provided opportunities for American scientists to demonstrate that public support of science brought tangible benefits. The National Research Council worked on improving acoustical methods of submarine detection, and ten university physicists interrupted their usual duties to conduct wartime research at New London, Connecticut. The Naval Consulting Board, headed by Thomas Edison, worked on the aerial torpedo; their developments in gyrostabilizers ultimately contributed to postwar advances in automation.

\textsuperscript{407} Ibid.

\textsuperscript{408} Mary Jo Nye, \textit{Before Big Science: The Pursuit of Modern Chemistry and Physics, 1800-1914} (New York: Twayne, 1996), xiv.
and feedback devices. Likewise, chemists became tremendously important to the Allied war effort; Germany had formerly been the world's leader in chemical research and development, so American chemists working for government and industry rushed to catch up on both offensive and defensive measures in chemical warfare.409 Once World War I ended, it was clearer than ever that science had entered a new era. Both in war and in peace, pursuing top-level research would entail gathering the necessary resources: more facilities, more staff, and more money.

Government, universities, industrial laboratories, and private research foundations increasingly replaced the private patron as the source of, and support for, funding. Slosson and other advocates argued that moving ahead in the twentieth century, the public had a right to know what it was being asked to support.410 An increasing number of scientists themselves agreed, feeling that it was a matter of self-interest, as well as a human obligation, to encourage public understanding of scientists’ methods and goals. If scientists were isolated or misunderstood in the court of public opinion and influence, it would endanger prospects for ongoing support, thereby threatening the progress of research itself.411

In seeking to improve their image among the general American public, scientists sought to dispel the stereotypes attributed to them. As physicist N. Ernest Dorsey complained in later years, decades of bad coverage had left people with the idea that the scientific community consisted of:

visionary, unpractical freaks who spend their time in hunting up queer facts and in dreaming fantastic dreams, as harmless imbeciles who putter around at things that are of no interest to any one else, who from a depraved taste talk a jargon that others can not understand, and who once in a while by pure chance stumble upon something that some more sensible individual is able to put to some real use. 412

Scientists resented the "mad scientist" image associated with dramatic, headline-making stories related to the "anti-movements"—antivivisection, antievolution, and others. Many short films designed to show the scientists at work gave the impression they were "figures in long white coats twirling dials, peering at test tubes, and performing much such conventional Mumbo Jumbo." 413 Scientists had to learn to care what the public thought, if only to protect their own interests.

This sense, that the world of science itself was changing to demand an increasing need for public support and financing, fit in with and reinforced the theory prized by Scripps, Ritter, Slosson, and like-minded colleagues, that a democracy was the only truly safe and acceptable environment in which science could thrive. Science Service and many of those associated with the organization in the 1920s and 1930s expressed the belief that democracy could make the post-World War I world safe but first it had to save itself from ignorance and apathy. Indeed, Science Service advocates defined the vigor of a nation's intellectual pursuits as an integral measure of its vitality; they ranked commitment to science alongside other essential components of democracy. According to Watson Davis, "Freedom to practice the

scientific method in the everyday world as well as in the laboratory is of importance equal to freedom of the press and of assembly.414

At the same time that Science Service and many individual scientists asserted that democracy was the best environment for science, they also maintained that propaganda had no proper role in science. Many times these dual claims were made in the same article, without the slightest hint of irony or perceived contradiction. Davis described it as an "essential factor" in science progress that propaganda "should have no more place in dissemination than in research itself. And research perishes when it is linked to a particular idea of government, religion, economics, race or philosophy." He continued, "Not even science must be allowed to become a dictator. Science must set the example for straight thinking, confident that the processes of democracy guided by scientific method and reason will give the effective result." Clearly Davis saw no conflict when he said that research should not be linked to "a particular idea of government" while also extolling the virtues of democratic principles. It may be that the term "propaganda" had taken on a much more insidious connotation during and after a world war, and scientists would never consider what they were saying as a form of propaganda. It is also possible that the way we currently define the term—not by the dictionary but by popular definition—assigns the word a negative meaning while denying a more neutral interpretation. At the beginning of the twentieth century, reporter Ivy Lee, generally regarded as the nation's first public relations agent, claimed that propaganda was "the effort to propagate ideas," and was acceptable as long as

the public knew the source. Michael Schudson observed that, "publicity" and "propaganda" were new terms in the 1920s, both with unsavory connotations, with "propaganda" the worse of the two.\footnote{Michael Schudson, Discovering the News: A Social History of American Newspapers (New York: Basic Books, 1978), 135-7. For a discussion about the psychological nature of propaganda see, Science Service, "Scientist Gives Principles for Practical Propaganda," The Science News-Letter 22, No. 602 (Oct. 22, 1932): 266, http://www.jstor.org/stable/3908085.} Finally, it may be simple rationalization on the part of scientists. Whatever the reason, elitist attitudes, lack of conviction that laypeople could understand science, or a tendency toward protective secretiveness, scientists working in a democracy had to come to terms with their own reticence about sharing their work with the public.

In a 1928 article, "Education, Science and Democracy," Slosson clarified that Science Service did not aim to make people into scientists, since that would be impossible—a scientist was not one who reads science, he was one who makes science. Still, Slosson pointed out, while a musician could always make music, it would have little influence if only other musicians listened. Extending that analogy of the importance of an audience, Slosson believed that news of science still had value for those who, "for lack of time, taste or capacity, can never become professional scientists." He admitted that in focusing on accumulating knowledge, scientists paid little attention to its dissemination. Their papers only catered to a limited audience of fellow specialists, and even some of those would not be able to read technical publications without "propping their eyelids up with toothpicks."\footnote{Edwin E. Slosson, "Education, Science and Democracy," The Science News-Letter 13, No.360 (Mar. 3, 1928): 136. http://www.jstor.org/stable/3903505.}

Slosson made it clear that he did not blame the public for being generally ten to twenty years behind in knowledge of the state of science. Some of the problem was lack of access. He turned to journalists for the solution, since Slosson said a good reporter knew that "anything can be made interesting to anybody if he takes pains enough with the writing of it.
It is not necessary either to pervert scientific truths in the process of translation into the vernacular. The facts are sensational enough without picturesque exaggeration.  

Slosson painted a picture of a chasm, with a public indifferent to science on one side, and scientific men indifferent to the public on the other side. It was the business of journalists to build the bridge that would join the two, and to serve as an interpreter for the various languages being spoken. Slosson acknowledged that it often was not to the scientist's advantage to be written about—in fact it often injured him by causing him to lose esteem in the eyes of his colleagues while gaining no esteem from anyone else. This, in fact, was one of the reasons scientists had their own language, because it was a kind of closed dialogue that only insiders could understand. And therein was the problem in communicating with the public.

This brought Slosson to his most important point—what all of this meant to democracy. Without the ability to understand science, he cautioned, the average citizen might fall for anything, might be impressed by scientific pretenders, might give respect where it was not due. Americans risked losing their ability to discern the real from the fraudulent, insight that was most important of all in a democracy. According to Slosson, "envy of the expert is a common human failing. We none of are free from the desire to look down on those who have the right to look down upon us. We all of us take a secret delight in the humiliation of our superiors, and we rejoice in disclosing the ignorance of those who know more than we do. This natural human weakness becomes a public menace when it is

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418 Ibid.
419 Ibid.
multiplied by a million."{420} Whether Slosson was accurately assessing a flaw commonly held by the mass of society, or revealing an aspect of his own character, he was correct that society appeared to have a love/hate relationship with the cult of the expert. Here were the authorities to whom they could look for insights and instruction, and often did—and who did they think they were? Had people not been doing just fine before at farming, childbirth and medicine, homemaking, family life, community building, and the protection of children and society, all accomplished as their forefathers—and mothers—did, without relying on any "experts"?{421} Still, during the late 1800s and early 1900s, expertise had become a defining feature of American life. Extension agents from agriculture schools offered farmers suggestions on improving productivity, while home economists repositioned bread-baking and other housework as a new science. Professionals possessed specialized knowledge that the average person did not have, and Science Service recognized that situation created new challenges in public communication.


Slosson made a simple declaration: "In science there is only one truth, but an infinitude of falsehoods." Given how central science had become to modern well-being and warfare, an "unsound popular opinion of a scientific question" could even endanger national well-being, in Slosson's view. Therefore, he maintained, a democracy needed citizens with the ability to think, to become well-informed. Because in any form of government, autocracy or democracy, "the real power lies in the people," and they would decide if a nation advanced, stagnated, or declined. Slosson and many like-minded advocates maintained that citizens had a responsibility for actively seeking information about science, while journalists had a duty to serve as bridge-builders and interpreters.

Many American scientists agreed with Slosson, Davis, and other Science Service staff, that they, as professionals, needed to do a better job of communicating with the press, in order to help the American people gain more understanding of important ideas. Speaking as a physicist, N. Ernest Dorsey advised his fellow scientists that although they seldom had the leisure or the inclination to become acquainted with the experiences and thoughts of non-scientists, it was important to make the effort of improving that dialogue. He worried that ordinary people failed to understand the main purpose of scientific research and in 1922, wrote that the only way the public could really learn this was through published accounts of discoveries, of experimental research, of experiments themselves—even ones that were not successful—and explanations of the relationship between facts and research.

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Most American men and women of the interwar period had no formal training in scientific research, and had received only the most elementary of exposure to science principles in school, especially among the large numbers who had never entered college. More than that, academic life had already begun to develop what later observers would call the "two cultures" problem, a growing gulf between the sciences and humanities.424 Especially with the need for "big science" laboratories housing elaborate equipment, science classes and faculty research literally moved into separate buildings on campus. As scientific work became increasingly specialized, it became increasingly set apart from other forms of knowledge—just at the time when the search for public funding seemingly made it more crucial than ever that outsiders be able to appreciate the world of science. If science news was going to reach its target audience, the messages needed to be properly tailored to the audience, an audience most scientists had only recently begun to consider.425

Lending intellectual firepower and institutional influence to this message about the importance of science journalism, Science Service during the 1920s and 1930s was able to draw on support from some of the country's most important and respected scientists. Nationally and internationally renowned men served on the Science Service board of trustees, wrote articles for Science Service publications, gave talks as part of Science Service's radio programming, and appeared and spoke at high profile conferences. They also appeared at Science Service functions, such as the anniversary celebration, adding clout and

visibility to the cause of science popularization. Examining Watson Davis's reports to the trustees and other internal documents yields the following names of scientists and researchers who were affiliated with Science Service in its pre-World War II years:

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation and Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott, Charles G.</td>
<td>astrophysicist, solar research, fifth Secretary of the Smithsonian Institution</td>
</tr>
<tr>
<td>Baekeland, Leo H.</td>
<td>chemist, inventor of numerous synthetic substances, including Bakelite plastic</td>
</tr>
<tr>
<td>Barcroft, Joseph</td>
<td>physiologist, studied oxygenation of blood, nominated for Nobel Prize</td>
</tr>
<tr>
<td>Bartow, Edward</td>
<td>chemist, expert in sanitary chemistry, drinking water purification, wastewater treatment, director of American Institute of Chemical Engineers</td>
</tr>
<tr>
<td>Berry, Edward W.</td>
<td>paleontologist and botanist, scientific editor and administrator at Johns Hopkins University</td>
</tr>
<tr>
<td>Bingham, Walter V.</td>
<td>psychologist, industrial and applied psychology, developed Army Alpha and Beta tests (WWI), Army aptitude tests (WWII)</td>
</tr>
<tr>
<td>Briggs, Lyman J.</td>
<td>physicist, helped develop artificial horizon device for naval vessels, became director of the National Bureau of Standards during the Great Depression</td>
</tr>
<tr>
<td>Burgess, George K.</td>
<td>physicist, pyrometric research, expert in metallurgy, helped in development of camouflage, radio communication, aeronautics, director of the National Bureau of Standards from 1923 to 1932</td>
</tr>
<tr>
<td>Bush, Vannevar</td>
<td>engineer, known for work on analog computers, founder of Raytheon, head of U.S. Office of Scientific Research and Development (OSRD), dean of MIT School of Engineering, President of Carnegie Institution</td>
</tr>
</tbody>
</table>
Cannon, Walter B.  
physiologist, coined term "fight or flight response," president of American Physiological Society

Carver, George Washington  
botanist, inventor, educator, developed methods of crop rotation for soil improvement, famous for research related to peanuts and sweet potatoes

Cattell, James McKeen  
psychologist, first profess of psychology in U.S., developed series of "mental tests," acquired and edited Science, which became the AAAS journal, founded The Scientific Monthly

Cole, Fay-Cooper  
anthropologist, founder of the anthropology dept. at the University of Chicago, witness for the defense at the Scopes Trial

Compton, Karl  
physicist, electronics and spectroscopy, president of MIT

Condon, Edward U.  
nuclear physicist, quantum mechanics, helped develop radar and nuclear weapons as part of the Manhattan Project, director of the National Bureau of Standards

Conklin, Edwin G.  
biologist and zoologist, co-editor of several journals, president of the AAAS

Coolidge, William D.  
physicist, developed improved X-ray tubes for the new field of radiology, director of the General Electric Research Laboratory

DeForest, Lee  
inventor and radio pioneer, considered a "father of the electronic age" for development of the Audion vacuum tube used to amplify weak electrical signals

Dunlap, Knight  
psychologist, early researcher in behaviorism and psychobiology

Flinn, Alfred D.  
civil engineer, director of the United Engineering Society
<table>
<thead>
<tr>
<th>Name</th>
<th>Profession and Accomplishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexner, Simon</td>
<td>experimental pathologist, noted for studies related to poliomyelitis and development of serum treatment for meningitis, first director of the Rockefeller Institute for Medical Research</td>
</tr>
<tr>
<td>Hale, George Ellery</td>
<td>solar astronomer, invented the spectrohelioscope, founded several astronomical observatories</td>
</tr>
<tr>
<td>Heyl, Paul R.</td>
<td>physicist, studies of gravitational constant</td>
</tr>
<tr>
<td>Howell, William H.</td>
<td>physiologist, pioneered the use of heparin as a blood thinner, dean of Johns Hopkins University medical school</td>
</tr>
<tr>
<td>Humphreys, William</td>
<td>atmospheric physicist for the U.S. Weather Bureau, predecessor of the National Weather Service</td>
</tr>
<tr>
<td>Jewett, Frank B.</td>
<td>physicist, developed method for analyzing and synthesizing electric waves, first president of Bell Labs, president of the American Institute of Electrical Engineers</td>
</tr>
<tr>
<td>Kellogg, Vernon</td>
<td>entomologist and evolutionary biologist, director of Herbert Hoover's humanitarian American Commission for Relief in Belgium</td>
</tr>
<tr>
<td>Kettering, Charles F.</td>
<td>engineer and inventor, founder of Delco, head of research at General Motors, developed electric starting motor and leaded gasoline, also invented Freon for refrigeration, and advanced development of the two-stroke engine</td>
</tr>
<tr>
<td>Koppanyi, Theodore</td>
<td>pharmacologist, studies in physiology and cellular biology, structure and function of the eye</td>
</tr>
<tr>
<td>Little, Clarence C.</td>
<td>geneticist, studies in transplant immunology and tobacco research, co-founder (with Margaret Sanger) of the American Birth Control League</td>
</tr>
<tr>
<td>MacDougal, Daniel T.</td>
<td>botanist, leading American authority on desert</td>
</tr>
</tbody>
</table>
ecology, conducted earliest research into chlorophyll, invented the dendograph to measure tree trunk volume

Mather, Kirtley F.  geologist, expert on petroleum geology and mineralogy, assisted the defense at the Scopes Trial

Mees, Charles E.  physicist, researcher in emulsions sensitive to red and infrared and radiant energy of stars

Merriam, John C.  paleontologist, significant studies in vertebrate and invertebrate fossils, particularly the vertebrate fossils of the La Brea tar pits, most notably the sabertooth cat

Millikan, Robert A.  physicist, Nobel Prize for measurement of the charge on the electron and photoelectric effect

Noyes, A.A.  chemist, was acting president of MIT, and major influence on educational philosophy and core curriculum of Caltech

Osborn, Henry F.  geologist and paleontologist, president of the American Museum of Natural History

Pupin, Michael I.  physicist and chemist, extended the range of long-distance telephone communication, founding member of National Advisory Committee for Aeronautics, which became NASA

Rentschler, Harvey C.  physicist, research in photo-electric cells, director of research for the Westinghouse Lamp Works

Shapley, Harlow  astronomer, estimated the size of the Milky Way galaxy and the sun's position in it, helped found the National Science Foundation

Sikorsky, Igor  aviation pioneer in helicopter and fixed-wing aircraft

Sperry, Elmer A.  inventor of gyrocompass and stabilizers used by the U.S. Navy in WWI and WWII
Taylor, Thomas G. anthropologist and explorer, conducted research on expeditions to the Antarctic

Thompson, Warren S. demographer, director of the Scripps Foundation for Research in Population Problems established by Edward W. Scripps

Wetmore, Alexander ornithologist and paleontologist, sixth Secretary of the Smithsonian Institution

White, David chief geologist for the United States Geological Survey

Wright, Orville aviation pioneer, with his brother Wilber developed three-axis control for equilibrium, 28 years on National Advisory Committee for Aeronautics (later NASA)

Yerkes, Robert M. psychologist, known for intelligence testing, and human and primate intelligence and social behavior

Zworykin, Vladimir K. engineer and inventor, pioneer in television technology and electron microscope

The National Association of Science Writers

Science Service did not singlehandedly create science journalism. By the turn of the twentieth century, specialized publications such as Popular Mechanics already existed, though (as noted), they reached only a relatively small audience of mostly male enthusiasts. Furthermore, National Geographic magazine had already begun publishing accurate and understandable articles that incorporated valuable explanatory illustrations. Even in the

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426 This is a partial list of scientists and researchers gleaned from examining the reports to the trustees and other documents related to publication and programming efforts through the 1930s. Undoubtedly many more scientists participated in Science Service efforts, including publications, programming, and other efforts in subsequent years as the organization grew in credibility and access.

427 F. Barrows Colton, "Some of My Best Friends are Scientists," The Scientific Monthly 69,
early 1920s, Science Service was not alone in embracing and promoting science journalism. As the public interest in science grew, several large newspapers responded by employing science editors or by re-assigning men already on staff to focus on science topics. The *New York Times*, *New York Herald-Tribune*, *Washington Star*, and *Detroit News* were among the first to respond. Alva Johnston, a reporter at the *New York Times*, won the Pulitzer Prize in journalism for his reporting of the AAAS meeting held in Boston in 1922. David Dietz remembered this as the first meeting to be covered in a "serious and thorough fashion with a genuine effort to interpret its importance to the public." Eventually a group of science writers attended all of the major scientific meetings. Science Service picked up on, encouraged, and facilitated this inclination among other publishers to devote more serious attention to such stories.428

Science journalism was indeed changing rapidly during the 1920s and early 1930s, in large part thanks to the growing influence of Science Service. In 1936, Dietz, science editor of the Scripps-Howard newspapers, told the AAAS how dramatically the amount and quality of press coverage given to scientific meetings had improved since the 1920s. By the mid-thirties, Dietz declared, it had become standard for large metropolitan newspapers to devote one to five columns of coverage to each day of the AAAS meeting. Such in-depth reporting, Dietz said, fostered "a change of the first order in the character and meaning of these annual meetings.

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meetings. It possesses profound importance for the progress of science, the conduct of
journalism and the future of the nation."^{429}

Dietz praised E.W. Scripps as the first newspaperman to perceive the need for
accurate and dependable reporting of science news at a time when science began playing a
larger role in daily life. Dietz explicitly told the AAAS that it was the 1921 founding of
Science Service that had helped and encouraged other publishers to devote more attention to
covering science. Similarly, Ferry Barrows Colton, of the Associated Press, credited Science
Service with a key role in the genesis of newspaper science reporting. Looking back in the
1940s, Colton believed that Scripps's efforts had led to the expansion of science coverage in
not only newspapers, but also weekly and monthly magazines.^{430}

By the 1920s and early 1930s, Science Service observers, including Slosson, had
reason to be optimistic that a new field of science journalism had started to evolve, with
specialists from some of the nation’s leading newspapers, who dedicated themselves to
science writing on a regular and professional basis. Science Service had helped foster the
climate that encouraged publishers and editors to begin taking science journalism more
seriously and to hire specialists of their own to focus on this material. In particular, in 1934,
Dietz of the Scripps-Howard News Service, as well as science editors from the Associated
Press, the *New York Times*, the Hearst Newspapers, and the *New York Herald-Tribune* moved
to establish The National Association of Science Writers (NASW). Their goal was to gain
visibility, recognition, and prestige for science reporting, as well as to increase their access to

^{430} F. Barrows Colton, "Some of My Best Friends are Scientists," *The Scientific Monthly* 69,
scientists. The NASW defined its purpose as professionalizing its specialty in journalism, “to foster the dissemination of accurate scientific knowledge by the press of the nation in cooperation with scientific organizations and individual scientists.”

Significantly, when these journalists began to organize the NASW, they wanted Science Service leaders to participate. They approached Science Service medical writer Jane Stafford, seeking her input and influence to bring Watson Davis onboard. Stafford was initially skeptical about the group's purpose, as was Davis. In particular, Davis, and Science Service senior biology editor Frank Thone, thought that the NASW's ethical and performance standards were lower than what Science Service had already established for itself. Once the group made significant changes to its focus and methods, Davis agreed to become involved, endorsed the charter, and became a founding member of the NASW. In time, Davis and Stafford each served a term as the organization's president, reflecting the natural alliance of interests between the new profession of science journalism and the institution of Science Service.

In its first months of existence, the NASW gained attention and demonstrated its potential clout by taking advantage of Albert Einstein's 1934 visit to the United States. Einstein was notoriously wary of the press, with a distinct distaste for interviews. But the NASW managed to set up a cooperative interaction, where its writers submitted questions to

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Einstein in advance of an arranged interview, adhering to an agreement that only science questions would be asked.434

During these decades leading up to World War II, advocates of the new science journalism made a strong case that it was well within the scientists' best interests to capture the public's favorable attention. Ferry Barrows Colton observed that science reporting not only helped people gain respect and understanding of science, it also helped them better grasp the scientific habit of working and thinking. This was important because, as Colton wrote later, it is the people "who pay taxes and contribute to endowments to support research."435 Colton cited specific examples of ways that publicity for science had brought unexpected advantages to researchers and institutions, in terms of eliciting public support for their work. Reports of physics research related to the sense of smell had brought Yale University large financial gifts for further work along those lines. After journalists publicized news of stone dart points made by Folsom Man in New Mexico, the Smithsonian Institution received "a flood of letters" from the public, indicating that the same dart points had been found all over the United States and suggesting to researchers that these ancient people were much more widely distributed than first realized. Quite simply, science journalism was reaching a wider and wider audience, and people responded. When a scientist published an article in a technical journal suggesting that feeding baby chicks tobacco of high nicotine content helped them grow better and bigger by preventing disease, that specialized report

received little attention. But when it was published as a newspaper story, the scientist received a huge response from chicken raisers.436

The NASW thrived both before and after World War II, with members who were committed to unbiased reporting on new discoveries and saw themselves as science advocates for a public audience. The group continued to grow, particularly in the post-World War II science climate. Membership increased from 63 members in 1945 to 413 by 1960,437 1200 by 1986, and 1830 by 1993.438 The NASW came to embody the idea Slosson had been wrestling with in the 1920s, that good science journalism demanded a special commitment and a specialized training, to cultivate writers who could work harmoniously with the world’s top scientific researchers and translate their discoveries to capture public attention. In modern decades, this principle became a widely accepted part of institutionalized journalism training. In 1959 the NASW created an independent nonprofit organization, the Council for the Advancement of Science Writing (CASW) to support the development of science journalism programs, including the Taylor/Blakeslee Fellowships for Graduate Study of Science Writing.439

By the end of the 1920s, science had become a larger, more evident part of everyday life. From the celebrity scientist visits of Curie, Einstein, and the Prince of Monaco in 1921, to research facilities springing up on college campuses, to more column space in newspapers dedicated to science news, the average person could not help but be aware that science was becoming more fact than fiction. The scientific community, increasingly dependent on the support of the public, and following the lead of some of their most illustrious members, such as Millikan, Kellogg, and Shapley, slowly warmed to the idea of explaining their research. However, it was not only a matter of selling scientists on the idea of sharing information about their work, but also selling the newspapers on the idea of printing that information. To facilitate this cooperation, Science Service’s mission centered around providing newspapers with handy, accurate, appealing news and feature stories. But making the necessary distinctions about those stories was not always simple or clear. This was a new kind of writing, with no long-established rules. At the same time, questions about the role of propaganda, and concepts like objectivity, were just surfacing in traditional newspaper writing. The next chapters will show that Science Service was not immune to the challenges of weighing sensationalism and entertaining stories against its larger responsibility of establishing credibility for itself and the new field of science journalism.
CHAPTER 6

1920s Case Studies

By the second half of the 1920s, Science Service had begun to find its feet as an institution; it had proven that it could regularly turn out dependable, popularly-oriented science news, and it had established relationships with editors and mainstream publications. Working with some of the nation’s most renowned scientists, Science Service leaders had defined their philosophy about why it was vital, both for the well-being of the scientific enterprise and for the health of American democracy, to cultivate public knowledge about the latest research. Slosson, Davis, and others were helping to establish the new profession of science journalism, the question not just of who was best able to write popularly-appealing science articles, but how. This last question remained the most difficult, the practical, philosophical, and ethical questions of how to balance scientists’ demands for accuracy with publishers’ demands for readability, even sensationalism.

Such problems were not merely hypothetical; this chapter will use three case studies to show how, during the twenties, Science Service struggled with its own ethical, philosophical, and practical decisions about the evolving challenges of science journalism. The institution’s staff had to decide what to do when they did not feel comfortable publishing a medical story that threatened to turn too sensationalistic, the case of a human infant born with a tail. More than that, Science Service staff came to realize that in reporting what seemed like solid, objective science news, they risked antagonizing outside interests – in this case, the tobacco business; science journalism could make enemies as well as friends for
reporters. And most notably, the still young institution of Science Service had to decide what part it would play in one of the most famous events of the decade, the Scopes Trial.

In wrestling with each of these cases, Science Service leaders faced real challenges and risks. Each episode gave Science Service the opportunity to make a name for itself, but also potentially threatened the credibility that was at the core of the organization's reputation as the first and only consistently objective and reliable source of science news. Any misstep so early in the organization's life had the potential to destroy what its leaders had worked so hard to create and believed in so completely. Scientists, willing to believe that there should be some organization for facilitating their interaction with the public, were beginning to trust this organization. Could Science Service survive losing the professional confidence of the leading men of science? A poor decision could create the real possibility that the public, who was just beginning to show frequent interest in science news, might lose faith in Science Service because of a violation of their trust. The founders and trustees of Science Service could not support irresponsible actions when they felt that no less than the survival of democracy was at stake. Where were the lines in each case between advancing the positions of science and science news and devolving into the "three-headed calf" media sideshow that Edwin Slosson so disdained and warned against?

The Scopes Trial

The "Scopes Monkey Trial," formally known as the State of Tennessee v. John Thomas Scopes, and one of several high-profile trials of the time tagged "the Trial of the Century," took place in Dayton, Tennessee, in 1925. It was publicized as a battle between creationism and evolution theory, between religion and science. The general circumstances
surrounding the trial are well-known today. In March of 1925 the state of Tennessee enacted a law to prevent the teaching of evolution in the public schools. In May 1925, the American Civil Liberties Union (ACLU) advertised for a teacher in Tennessee willing to challenge the law. A press release appearing in the Chattanooga Times on May 4, stated the organization's belief that a "friendly test case" could be advanced without costing the willing teacher his or her job, and that "distinguished counsel" had volunteered their services. The goal of the ACLU was to secure a conviction and thus elevate the argument to a higher state or federal court on appeal where it might be found unconstitutional.440

Enterprising citizens and boosters of sleepy and struggling Dayton, a town whose population had dropped by nearly half from the 1890s to the 1920s when the local blast furnace went cold causing business and people to drift away, seized the opportunity to put Dayton back on the map. The trial was sure to be a media sensation, and New Yorker George W. Rappleyea, who managed the nearby coal and iron mines for northern owners, promoted the idea of using the trial as a way to draw attention and money back to the town.441

John T. Scopes, a shy and unassuming high school biology teacher and part-time football coach, who had no family ties to the community and no specific intent to stay in Dayton, agreed to be the defendant in a case to challenge the law. Scopes was known to oppose Tennessee's antievolution law, and accepted evolution as an explanation for human


origins, but neither his demeanor nor his statements were radical or confrontational, making him a perfect candidate for the task.\textsuperscript{442} His classroom use of George W. Hunter's 1914 text, \textit{A Civic Biology}, was not a personal choice or statement; for a number of years, that book had served as the official biology textbook for the public schools of Tennessee and the best-selling text in the field.\textsuperscript{443} Once Scopes was indicted, the text was dropped from the state's approved list, the publisher eliminated a six-page section on evolution for copies sold in southern states, and Hunter began revising the book, ultimately deleting the word \textit{evolution} and charts tracing evolutionary steps of development.\textsuperscript{444}

Prosecutors in the Scopes case accepted William Jennings Bryan as part of their team when he volunteered his service, though he had not practiced law for more than thirty years. He had, however, been a mainstay on the Chautauqua circuit, giving hundreds of speeches about the dangers of evolutionary theory and the falseness of science. The three-time Democratic Party presidential candidate, famous for his "Cross of Gold" speech and dubbed the Great Commoner, was a cherished and respected figure in fundamentalist circles, and his desire for publicity and attention for his cause made him an eager participant. Clarence Darrow was the most famous defense attorney in the country at the time, a champion of

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See also Ronald L. Numbers, \textit{Darwinism Comes to America}, (Cambridge: Harvard University Press, 1998), and http://www.counterbalance.org/history/scopes-frame.html for an overview of various elements relating to the trial, including views by Numbers.

\end{flushright}
notorious criminals, and a leading figure in the American Civil Liberties Union (ACLU). He described himself as an agnostic, though his lifetime ridicule of religion and the Bible made him appear more of an atheist, and he frequently manipulated his use of science to support his personal views of creation and nature. Darrow so enthusiastically seized the Scopes trial as an opportunity to debunk Christianity, particularly once Bryan became involved, that he volunteered his services to the defense, the only time he ever offered free legal aid.445

The theory of evolution was not a new idea at the time of the trial, nor when Darwin published his interpretations of natural selection in 1859. Fossil and biological evidence had been accumulating for decades. However, before Darwin, evolution was thought to be "goal-directed," with each step moving toward perfection, perhaps even intended by God from the beginning. It was Darwin who, in his *The Origin of Species* (1859) rejected the idea of a divine, or even natural, evolutionary goal. Instead, Darwin posited organisms progressing from their initial primitive state toward change, but with no specific goal, perfect or otherwise. Though some religious groups had always expressed resistance to the idea of evolution, it was the combination of Darwin's denial of divine direction, combined with his inclusion of humans in the evolutionary process in his 1871 work, *The Descent of Man*, which fueled much of the fundamentalists' response in America before and during the trial.446

It was never expected that Scopes would be found innocent of violating the Butler Act, so named for the Tennessee representative who had proposed the law, and that was not the goal. Indeed, with Scopes found guilty of violating the law, the ACLU could protest the

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445 Ibid., 96-7, 71-3.
law as unconstitutional. The ACLU hoped for a narrow test case reflecting the organization's resistance to popular movements that interfered with academic freedom.\(^447\) Once Darrow became involved, a development the ACLU did not so much embrace as resign itself to, focus and management of the defense strategy spiraled out of control. The three-pronged defense strategy became "the defense of individual freedom, an appeal to scientific authority, and a mocking ridicule of fundamentalists and biblical literalism," as historian Edward Larson has explained. What started as a limited attempt to challenge a possibly unjust law became a battle between belief systems about the very nature of the origins of human life.\(^448\)

In the weeks leading up to the trial, the town enthusiastically prepared for what they estimated would be 30,000 visitors. Safe drinking water, adequate waste disposal, a temporary tourist camp, one-dollar lunches made by the Ladies' Aid Society, extra train cars, and a freshly-painted courthouse greeted what turned out to be only 3,000 visitors over the course of the trial. Of that number only about 500 actually stayed in the town—others lived nearby and left at the end of the day—and over 200 of those staying were associated with the media in some way. The acerbic H. L. Mencken, and Science Service's Watson Davis were among the journalists there to capture the story for their readers. WGN, the radio station affiliated with the \textit{Chicago Tribune}, arranged for special telephone lines to transmit the story live to Chicago and the wider radio audience. It was the first live broadcast of a high-profile trial, an action the \textit{Chicago Tribune} defended as appropriate because it was not a criminal trial in the traditional sense, and they deemed the defendant immune to harm in the battle of

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\(^{448}\) Ibid., 53, 100-01.
}
Leasing telephone lines to transmit the trial back to Chicago was expensive at approximately $1,000 per day, so live coverage was limited to the more exciting elements of the trial. WGN assured listeners that the broadcasts would not contain inappropriate material. Marcel LaFollette described it as the network saying, "this science would be safe for your living room."450

The actual trial lasted eight days; the jury's deliberations took only nine minutes. Ultimately, Scopes was found guilty of breaking the law and was fined $100, though his conviction was later reversed on technical grounds.451 Because of the reversal, there was no opportunity for appeal, which frustrated the ACLU’s goal of challenging the law in a higher court.452 While the trial is commonly thought of as the highlight of the religion versus science debate in America, in reality the lines were not so clearly drawn. Not all of the southern states banned the teaching of evolution, and not all fundamentalist Christians opposed all evolutionary theories. Furthermore, the trial did almost nothing to reverse the ban on teaching evolution in some public schools, which continued for several more decades.453

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453 Peter J. Bowler, *Evolution: The History of an Idea* (Berkeley: University of California
Though newspapers both in Tennessee and around the nation declared little of lasting value in the wake of the trial, they had given the trial coverage beyond almost any other science-related event up to that point. The *New York Times* alone used five telegraph wires at a time to send reports from Dayton, and collectively journalists wired two million words from Dayton. Then, just as quickly as the firestorm developed, it subsided and became, in Larson's words, "the latest thrill during the kaleidoscopic Roaring Twenties." Dayton's hoped for economic boom did not develop, Scopes left and went to graduate school, Bryan died a few days after the trial, and the creation versus evolution controversy continued to simmer.

The Scopes trial did not occur in a vacuum. It was part of ongoing and accelerating efforts to restrict the teaching of evolution, particularly in schools in the South. Bryan was one of the most famous and vocal Fundamentalists, but he was not alone. The scientific community was aware of zoology and geology professors who had lost their jobs for teaching evolution. The scientific community had to decide whether, and how to address this issue, which potentially represented a political minefield. According to LaFollette, "every scientist seemed to have a different idea of how to respond to Bryan's well-publicized attacks on science," but with so many ideas, and so little willingness to engage in controversy, "their responses remained uncoordinated and restrained."
There were instances of scientists taking action. In 1922, the AAAS became concerned enough by anti-evolution sentiment that it issued a special statement affirming evolution, and decrying as injurious to human welfare attempts to restrict its teaching.\textsuperscript{456} In 1923, physicist Robert A. Millikan, a key supporter of Science Service, spearheaded efforts to mobilize, "a Group of Scientists, Religious Leaders, and Men of Affairs" to issue, "A Joint Statement upon the Relations of Science and Religion." It read:

We, the undersigned, deeply regret that in recent controversies there has been a tendency to present science and religion as irreconcilable and antagonistic domains of thought, for in fact they meet distinct human needs, and in the rounding out of human life they supplement rather than displace or oppose each other. The purpose of science is to develop, without prejudice or preconception of any kind, a knowledge of the facts, the laws, and the processes of nature. The even more important task of religion, on the other hand, is to develop the consciences, the ideals, and the aspirations of mankind. Each of these two activities represents a deep and vital function of the soul.\textsuperscript{457}

As an institution, Science Service initially was slow to take a stance in the evolution controversy. The organization was new, and hoped to serve as a bridge between scientists and the public, not be at the center of strife between the two groups. Additionally, Slosson, the Science Service director, was cautious and hoped to avoid agitation. However, he and others at the organization realized that the trial presented an opportunity to gather and present scientific evidence for evolution as they wanted to, to use their access to prominent scientists to educate and inform the public.\textsuperscript{458}

\textsuperscript{456} Ibid., 17.
\textsuperscript{458} Marcel Chotkowski LaFollette, \textit{Reframing Scopes: Journalists, Scientists, and Lost Photographs from the Trial of the Century}, (Lawrence: University Press of Kansas, 2008), 17.
Even before the Scopes trial, the *Science News-Letter* included the occasional article related to natural evidence in favor of evolution, or on evolution and its relationship to religion. Science Service did publicize and disseminate Millikan's 1923 "Joint Statement upon the Relations of Science and Religion."\(^{459}\) A September 13, 1924 article described an artificial set of bones replicating those of the "ape-man of Java," discovered by the Dutch army surgeon Dr. Eugene Dubois thirty years before, that were being shipped to the American Museum of Natural History in New York for further study.\(^{460}\) The January 10, 1925 edition included a summary of an address presented to the AAAS by a professor from Ohio Wesleyan University, Edward L. Rice, who contrasted Charles Darwin's arguments with those of William Jennings Bryan (more than six months before the Scopes trial). According to Rice, Darwin had not guessed about evolution, as Bryan charged; as a true scientist, Rice said, Darwin had formed hypotheses based on the inductive method and followed those with attempts to verify his impressions to the greatest degree of certainty. By contrast, Rice pointedly declared, Bryan’s arguments used the deductive method, and were based on a literal acceptance of the Bible, an assumption not universally, or even widely, accepted by biblical scholars. Darwin, Rice said, was engaged in an unbiased search for the truth; Bryan was a "special pleader for a preconceived idea." Darwin pursued his work over a lifetime; Bryan's interest was the "mere avocation of a man busy in other lines—the amateur versus the professional."\(^{461}\)


By June of 1925, Tennessee had passed its law, the ACLU had advertised for a participant for its test case, John T. Scopes was onboard, and articles on evolution in the *Science News-Letter* increased significantly. Science Service leaders and scientists themselves felt an obligation and an opportunity to reach out to the public, to supply the press with what they considered correct information about the validity and importance of the theory of evolution. The June 6, 1925 edition contained several articles under the heading "Evidences for Evolution," commissioned by Science Service, and written by respected scientists.462 "Evidences for Evolution: No. 1," written by Charles B. Davenport, Director of the Department of Genetics at the Carnegie Institution in Washington, DC, described scientists’ observations of thousands of forms of animals and plants that did not exist even a century before as "precious" knowledge, and "more significant than the assertions of the clergy."463 "Evidences for Evolution: No. 2," by biologist William E. Ritter, Science Service co-founder and president, picked up on the Darwinian argument that human emotions, and their accompanying physical manifestations, were all biological, caused by stimulation of sense organs, nerves, blood vessels, glands and other bodily elements, and that some, if not all, other animals held these same responses in common.464 The author of "Evidences for Evolution: No. 3," was Vernon Kellogg, entomologist, author of several books on evolution, and permanent secretary of the National Research Council. He explained the difference between variations seen in offspring and mutations, the former being a minor fluctuation

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unlikely to repeat itself, and the latter representing a true change in the organism, a change that repeats itself in future offspring. He offered the fruit fly as an example of a species observed by naturalists to add new forms. Likewise, some plants such as Lamarck's evening primrose made fixed "jumps," evidence of evolution according to Kellogg. Finally, "Evidences for Evolution: No. 4," by George Grant MacCurdy, Curator of Anthropological Collections at Yale, described tools and implements of the Old Stone Age as leaving extinct forms behind as changes occurred, and stated that "cultural evolution has its parallel in organic evolution." With these four articles, all written by respected scientists affiliated with prestigious institutions, Science Service aimed to provide readers with understandable evidence in favor of Scopes's case.

Still more dramatically, the same edition of the *Science News-Letter* included an explicit pledge of support for John Scopes from a substantial set of the American scientific community, meant to attract public notice. Issued by M. I. Pupin, President of the AAAS, the statement described an alliance of "the Scientists of America, 14,300 strong," and their objection to the arrest of Scopes and attempts to prevent the teaching of evolution. The scientists' main assertions were: that there was sufficient scientific evidence of organic evolution to prevent any credible generalization of the evidence as "mere guess;" every scientist of note in the world accepted evidence of organic evolution; the theory of evolution was "the most potent of the great influences for good;" and any attempt to limit by law the

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teaching of evolution would be a profound mistake with the potential to damage and retard human welfare.\textsuperscript{467}

Over subsequent weeks, as the Scopes trial went on, Science Service continued to make its case for evolution, publishing and distributing solid scientific information written in terms that would be accessible to a general audience. For example, another article in the summer of 1925 described the geological evidence for evolution present in the hills and rocks of Dayton itself.\textsuperscript{468} Another piece described the similarities between the bodily structures of man and animals, calling them cousins on a family tree, and told readers that "fitting man into a place in the general family tree of animals is not humiliating, nor dangerous to morals. It does not lower man in the least; it leaves him just the same as before, with all his distinctive and remarkable qualities. A great artist may have very commonplace cousins, but he is a great artist just the same."\textsuperscript{469}
Even as the Scopes Trial moved on, *Science News-Letter* continued to publish and distribute articles about both the science and the politics of evolution. In 1926, one piece by a University of Nebraska professor sought to correct the impression that the teaching of evolution was somehow hindered at his school. Meanwhile, the ACLU was preparing to challenge Mississippi's antievolution law in the courts. Arthur Garfield Hays, a member of

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the Scopes defense team, contacted Science Service to inform readers of plans to attack the Mississippi law through a taxpayer initiated lawsuit rather than a teacher which, though less likely to draw the same public attention as the previous year's trial, would be more likely to provide a better test case and eliminate aspects of "religion, prejudice, and mob emotions."471

Science Service wanted journalists, publishers, and readers to see these pro-evolution articles; that was the whole point of its mission for science popularization. But the story of Science Service’s role in the Scopes Trial actually goes beyond just distributing news, a history that highlights the tough decisions facing this young institution, about exactly what its role should be, in terms of promoting science. Science Service leaders were, in fact, engaged in helping to shape the case for Scopes, but they did not publicize their role in assisting the defense extensively, during the trial or afterward. Readers of the Science News-Letter would have seen many articles supporting evolution theory, but nothing overtly saying that Science Service was attempting to influence the outcome of the trial.

The leaders of Science Service had significant questions to consider: As a new organization, how much of their limited resources—men, money, time—could they afford to use assisting the defense, and what was the best way to go about it? Were they risking their relationships within the scientific community if they pressed fellow men of science to take a

471 Science Service, "Mississippi Evolution Law to be Challenged by Civil Liberties Union," The Science News-Letter 8, No. 263 (Apr. 24, 1926): 4, http://www.jstor.org/stable/3901859. Watson Davis also wrote a lengthy article for the June 25, 1927 Science News-Letter on the controversy then brewing between Henry Fairfield Osborn and Dr. William King Gregory, both of the American Museum of Natural History. Osborn maintained that man and ape did not share a common ancestor, and man was much older in origin than previously thought, possibly 16,000,000 years. Gregory was convinced that men and apes did share a common ancestry, with origins no older than 7,000,000. Complete with illustrations, the article did not debate whether men had evolved over time, but how long a time period that evolution had taken. See "Man's Age Now Set at Millions of Years," The Science News-Letter 11, No. 324 (Jun. 25, 1927): 397-8, 403-04, http://www.jstor.org/stable/3902634.
public stance on the high profile trial? Was there any contradiction between presenting the organization as having high journalistic standards—in fact, attempting to set some of the standards—and clearly taking one side over the other? This is the one area where the leaders did not seem conflicted. They clearly saw their mission as disseminating science news to the public. They were not only journalists; they were science journalists. The Scopes trial was an opportunity to help shape the coverage of a significant science news story, and to make sure that the "facts," as they saw them, got a public forum. However, what they sought was publicity for science more than for the organization itself, at least in the beginning.

In the summer of 1925, Science Service sent managing editor Watson Davis and senior biology editor Frank Thone to report on and photograph the trial. In 2004, historian Marcel LaFollette, who has done significant work in the Science Service archives at the Smithsonian Institution, discovered a cache of approximately sixty unknown and unpublished photographs—both formal and informal—that Davis and Thone had taken in Dayton. Using those photos, LaFollette’s book Reframing Scopes has traced the activities of the two men and their role on behalf of the defense.472

As William Bird of the Smithsonian Institution first pointed out in 1994, Science Service was actually involved with the Scopes trial from the beginning. More than just reporting on the activities, however, Davis and other staff took an active role in advising and supporting the defense team.473 In his assessment of this episode, Bird said that the support Science Service provided to the defense can be considered appropriate because "Scopes more

than earned the support he received. Actually, defendants are entitled to legal representation because they are defendants, not because they "earn" support or counsel. The choice of any news agency or other entity to ally itself with the defense efforts was less likely to be about the worthiness of the defendant—he did, after all, agree to serve as the named defendant in a test case—than the opportunity at hand. Scopes was not a publicity-seeking martyr to a cause he strongly supported. He did not testify during the trial, speaking only at the time of his sentencing, and then with the prompting of his defense team when he called the antievolution statute unjust, and vowed to continue the fight for academic freedom.

Bird was on much more solid ground when he stated that, "It was in the best interest of the news agency itself to organize a successful defense."

474 Ibid.
Service saw the chance to pursue its own agenda of promoting the cause of science and science news and took advantage of it. That Science Service was, first and foremost, a science news agency no doubt made the decision to become involved easier, though not without its own risks. From Slosson and Davis’s perspective, the Scopes Trial represented a compelling public discussion of important scientific ideas, but more than that, clearly it provided a chance to promote the cause of science journalism in general and Science Service in particular. LaFollette noted that "Davis had lined up orders for special reports from more than a dozen news organizations" before the trial began, seizing "an opportunity to demonstrate the importance of science journalism to mainstream news coverage while also increasing sales."  

As previously mentioned, Science Service director Edwin Slosson had been aware of antievolution activity for quite a while, but it was not until the arrest of Scopes that Slosson agreed that Science Service should become formally involved. LaFollette attributed his initial reticence to the anxiety present in the scientific community; many scientists hoped to avoid open conflict with religious leaders, while not conceding defeat at the hands of antievolutionists. Slosson's own personal reservations, as well as concerns about embroiling the organization in conflict, contributed to his initially cautious attitude. Ultimately, a keen sense of the business opportunity for the science news agency, combined with a sense of responsibility to the vision of founder E.W. Scripps, convinced Slosson, Davis, and Thone to

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not only cover the trial, but to offer aid to the defense side, by making available their impressive resources in the science fields.478

Through press releases before the trial, the "Daily Science News Bulletin," and the *Science News-Letter*, Science Service began to publicize the cause of resisting antievolution activities. But more than that, almost immediately, Science Service went from observing the activities surrounding the trial to actually participating in the defense of John Scopes. In fact, after some time in Dayton, Davis and Thone literally moved out of the Hotel Aqua, where most journalists were staying, and into the decaying Victorian mansion known as "Defense Mansion," center of the pro-Scopes legal effort. In her assessment of this history, LaFollette declared that with this move, "their transformation from neutral chroniclers to participant-observers" was complete.479

It is essential to realize that such a move from journalism to participation was not completely unheard of for the organization. In other instances, Science Service writers had already begun to "transcend the role of neutral observer" by becoming involved with astronomy and geology expeditions, not only to lend support to those fields but also to generate copy for Science Service publications. According to LaFollette, Science Service leaders decided that such participation was good, because of their genuine desire to disseminate news of science to a wide audience, complete with first-person accounts that made the news all the more exciting. LaFollette maintained that the concept of journalistic

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478 Ibid., 16-8.
479 Ibid., 18-9, 41.
objectivity was new at the time, and neither Slosson nor the others believed they were behaving unethically when they became involved in the stories they covered.480

Having literally moved closer to the defense lawyers, Davis and Thone, along with other members of the Science Service staff, went to work compiling lists of scientists possibly willing to help the defense team, collecting information about their credentials, affiliations, and how to contact them. During the weeks leading up to the trial, Science Service then sent telegrams, signed "Clarence Darrow," to some of those scientists, asking them to come to Dayton to participate in the trial and testify about the validity of evolution. Watson Davis commented that "evolution is a new idea to the average Tennessee juryman,"481 and so he hoped to help sway the jury by presenting them with clear-cut expert evidence to prove that science was on Scopes’s side. By staying at the same location as the defense team, Davis and Thone were able to meet potential witnesses and participate in strategy sessions with the attorneys, and get to know them. On behalf of Science Service, Thone took candid photographs of the men involved as they went about their work on the trial, though these did not wind up being published in the 1920s (perhaps, LaFollette has speculated, due to sensitivity over Bryan’s death within a week after the trial ended).482

As the trial drew closer, the defense still did not have the witnesses it desired, and some of the scientists who had expressed a desire to be of assistance found themselves otherwise engaged, in some cases possibly intimidated by the notoriety surrounding the contest. Though a group of scientists did eventually arrive, their presence was of little

480 Ibid., 18-9, 41.
482 Marcel Chotkowski LaFollette, Reframing Scopes: Journalists, Scientists, and Lost Photographs from the Trial of the Century, (Lawrence: University Press of Kansas, 2008), 105-06.
consequence since, as it turned out, most of them never got the chance to speak in the courtroom. Only one actually testified, the zoologist Maynard M. Metcalf, and once Metcalf’s testimony veered toward evolution, Judge John T. Raulston ordered that the jury members be cleared from the courtroom. Two days later, under pressure from state leaders to keep the trial brief so as to reduce the amount of ridicule experienced by Tennessee, Raulston ruled against further scientific testimony, a decision that put an end to the defense's plans to present expert evidence in support of evolution.483 By the time of the final confrontation between Darrow and Bryan, scientific evidence played little role in the verbal sparring. Instead, in oral arguments, Darrow used his personal views of religion and science to challenge Bryan’s. But behind the scenes, as LaFollette has suggested, Science Service men served as "semiofficial representatives of the scientific establishment [that] helped lend credibility and authenticity to the defense."484

In the end, even though the trial did not make much actual use of the scientific experts that Science Service had helped mobilize, science reporting certainly gained new popular attention. Founder E.W. Scripps indicated that he was pleased with Science Service's role in the trial, and Science Service made a modest amount of money on articles related to the trial. Additionally, the publicity for the organization's publications increased the number of subscribing clients and boosted sales by thirty percent over the year before.485 Davis and Thone, along with a few others, established a scholarship fund for John Scopes, and though the group was unable to raise the full amount for the three-year graduate course Scopes

485 Ibid.,109.
planned at the University of Chicago, they did raise $2,550, enough to get him well under way.\textsuperscript{486}

Science Service did not publicize its role in assisting the defense. It generated newspaper and newsletter articles for distribution, but did not specifically discuss being involved in defense team efforts.\textsuperscript{487} Nor did the organization use its radio series to make the public aware of its participation in bolstering the defense with science experts, or make its program available for evolutionists to pursue their arguments. While LaFollette described Science Service's silence as "curious," she attributed it to scientists' unwillingness to be involved in public controversy. She speculated that news bulletins for the summer of 1925, which are no longer available, must have included some mention of the trial, even if no other discussion of evolution theory took place.\textsuperscript{488}

In this way, Science Service leaders tried to walk a fine line, taking advantage of the Scopes Trial to promote both science and science journalism, while avoiding controversy by publicizing their actual involvement with the legal case. This history is especially interesting for what it reveals about the way that these key figures of the 1920s were wrestling with questions of ethics, objectivity, and public attention in the realm of science journalism, which was just forming as a discipline. As LaFollette has noted, Science Service's role in arranging for scientists to testify would be considered journalistically unethical today, but at the time Davis and Thone saw the trial as an opportunity to educate the public.\textsuperscript{489} In its role as a

\textsuperscript{486} Ibid., 110-14.
\textsuperscript{488} Ibid., 75.
science news agency, and with its mandate of disseminating news of science to a wide audience through the mainstream media, and in language meant for the average reader to understand, Science Service leaders undoubtedly saw their commitment to the Scopes Trial as consistent with their goals. News of science was just beginning to become part of what the average reader could expect to encounter in the mainstream press. Views on the biblical interpretation of creation of the earth and its human inhabitants had long been widely available from a number of sources—churches, printed materials, Chautauqua speakers, and personal family influence. It is not difficult to conceive of Science Service as seeing an opportunity to bring balance to the viewpoints available. Science Service was not compelled, nor obligated, to reveal its involvement because the organization always had the stated intention of popularizing science news, not all news. The organization made no secret of its agenda of popularizing science. It was bound by its founder and early charter not to engage in propaganda. Beyond that, Science Service made no pretense of objectivity or lack of bias, only the goal of presenting the "truth" of science.

Smithsonian historian of science William Bird has argued that "without Science Service, Scopes would not have had an informed defense." 490 In truth, as noted above, the eight scientists that Science Service helped recruit to come to Dayton did not wind up making any key difference by actually speaking at the trial. The judge only let those men issue written statements that were entered into the record, for possible use in an appeal. They may have advised the defense attorneys, but they never testified before the jury because of the court's ruling that no expert testimony on evolution would be allowed. So scientists'

views could not have greatly influenced the jury's brief deliberations; it was Darrow's questioning of Bryan that resulted in the most dramatic and influential final hours of the trial.\footnote{Edward J. Larson, \emph{Summer for the Gods: The Scopes Trial and America's Continuing Debate Over Science and Religion} (New York: Basic Books, 1997), 153.} And Darrow's questions were based on his own longstanding interpretations and skepticism regarding biblical accounts of creation and miracles—not scientific evidence as provided by the scientists or Science Service.

But even though most of the scientists that Science Service helped bring to Dayton never got the chance to speak in court, local people must have been aware that these men had come to their tiny town for the trial, a knowledge that undoubtedly gave additional weight to the evolution debate. Still, it is impossible to measure to what extent Science Service's participation helped John Scopes and the defense, especially when the goal of the defense was not to win the case but rather to lose it for the subsequent appeal opportunity. It is fair to say that the greater influence was on the public at large, who heard more about evolution in 1925 than probably at any time since Darwin's initial work.

Before, during, and after the trial, Science Service helped supply readers with this increased amount of scientific coverage of evolution, through articles distributed to subscribing newspapers and directly to subscribers to the \textit{Science News-Letter}. The \textit{Berkeley Daily Gazette}, of Berkeley, California, regularly used and credited Science Service material, and the Scopes trial coverage was no exception. In the period immediately surrounding the trial, the paper carried articles titled "Tennessee Public Thirsts for Forbidden Knowledge,"\footnote{Watson Davis, "Tennessee Public Thirsts for Forbidden Knowledge," \textit{Berkeley Daily Gazette}, June 15, 1925.}
"Scopes to Study Geology at Chicago University;"493 "Favors Teaching of Evolution;"494 "Plan to Carry Scopes Case to Highest Court,"495 and "'Monkey War' Collapses in an Even Dozen States."496 The summer of the trial the Catalina Islander of Avalon, California carried Frank Thone's article "Evolution Self-Taught."497 Other examples of Science Service evolution articles carried in newspapers include "Evolution" in the Sydney Morning Herald of Sydney, Australia,498 and "Man Dates From Very Early Time, These Scientists Believe,"499 in the Spokane Daily Chronicle.

Much press coverage of the Scopes Trial was not scientific; many reporters focused on the colorful aspects of the famous personalities involved, while ignoring or distorting the issues of science itself. Science Service proved a reliable source for dependable information about evolution, and more than that, the whole 1925 episode played a key role in the evolution of Science Service as an organization. The decisions that Slosson, Davis, and Thone made, about how to cover and how to get involved with the trial, served as a major test for Science Service itself as a new institution, connected to issues of credibility and authority in this very new area of science journalism.

497 Frank Thone, "Evolution Self-Taught," Catalina Islander, July 22, 1925.
The Tailed Infant

While almost everyone familiar with American history has heard of the Scopes Trial, a less well-known episode in 1928 proves valuable in further illustrating the questions facing Science Service about how to handle issues in the emerging field of science journalism. The situation would raise similar considerations to those that surfaced during the Scopes trial. Though by 1928 Science Service was further established in its mission of disseminating science news, the organization was still very new, still finding its way, and legitimately concerned about appearing to trivialize or sensationalize science. To be at the center of significant and groundbreaking stories served to bring in more readers and more subscriptions to both the news service and the Science News-Letter. But to find itself in the eye of a yellow journalism tempest was the last thing that Science Service could afford in any number of ways.

In the November 16, 1928 edition of the AAAS journal Science, in the "Science News" section composed of supplemental material regularly obtained from Science Service, an article titled "A Seven-Inch Human Tail" made brief mention of a baby born in Knoxville, Tennessee with a tail-like appendage. The article made it clear that the particular appeal of the story was beyond a mere biological oddity when it described the location of the birth as, "Tennessee, the state that outlaws evolution." Combining factual information with innuendo, the article noted that only about twenty-five cases of tailed infants were known to science, but that "every human being, including the late William Jennings Bryan, had a tail at an early stage of life." The article quoted Dr. Adolph H. Schultz, associate professor of physical anthropology at Johns Hopkins University and research associate of the Carnegie Institution of Washington, as saying that humans in the embryo stage have a tail one-sixth the length of
the body that disappears into the body, leaving small bones that form the coccyx at the base of the spine. On rare occasions the "tail" is not absorbed and appears outside the body. The article described this as the biological facts that caused a tail to appear in this "new daughter of the Fundamentalist state." According to Schultz, "man's evolutionary relatives, the higher apes" have less of a tail than man himself, and this remnant tail was evidence of evolution from a tailed ancestor.500

An almost identical version of the article appeared in the next day's Science News-Letter, though the wording was slightly less inflammatory. This version referred to Tennessee as "one of the states that outlaw evolution," not the state. While the reference to William Jennings Bryan remained, no reference to the baby as the "new daughter of the Fundamentalist state" appeared.501 The article originated with Science Service, and it is unclear whether the editors provided the more inflammatory version to Science and then declined to print that version themselves in the Science News-Letter, or if the editors of Science added their own, more confrontational comments, themselves. What is certain is that the irony of a tailed infant being born just a few years later, near the center of the creation versus evolution standoff, did not escape editors of either publication. The alleged tail episode in Tennessee, coming three years and eighty miles from the scene of the famous Scopes confrontation, may well have given Science Service leaders extra reservations and led them to proceed with caution. A few publications at the time made scant mention of the tailed infant. For example, Science Service files retained one clipping dated November 29,
1928 from an unidentified Baltimore newspaper that read, in part, "Special Despatch to The World"— Dr. Adolph P. Schultz, was "eagerly awaiting a specimen of the 'missing link' which is to be sent to him from the Anti-Evolution Centre of Tennessee."502

Science Service editors hoped to bring excitement to their science stories and thereby engage their audience. But they also hoped to resist pandering to the public with salacious stories and a carnival sideshow presentation. The tailed infant story invited just that kind of treatment. And yet Science Service leaders could not automatically dismiss the report. If the story were true, if the facts could be determined and verified and the specimen obtained and examined, Science Service, in its role as the leading voice for science news, would be a natural source for information and articles about the discovery, or at least a trusted intermediary. So in late 1928, Science Service writers and editors began exchanging a flurry of correspondence and negotiations designed to gain credible evidence of the appendage and bring that evidence to some respected science publication. That this birth anomaly occurred so close to the religion/evolution showdown of 1925 no doubt piqued the interest of Davis and Thone, as well as others at Science Service, because of their involvement in the recent Scopes trial.

With the help of Edward J. Meeman, the editor of the Knoxville News-Sentinel, Science Service obtained a photograph (now apparently lost) showing the baby before the supposed appendage had been removed. According to Meeman, the parents of the child had allowed the photograph to be taken, with the condition that it only be used for scientific purposes or to illustrate a scientific article, with the same restrictions applied to any sharing

of the photograph. Meeman then decided it would be best if his newspaper were not involved in any of the dealings regarding the photograph. Instead, he suggested to Frank Thone, that as the biology editor of Science Service, Thone should pursue the baby’s parents to obtain blanket permission in writing to use the photograph in any "proper scientific use," though Meeman doubted whether the parents would permit the photo to appear in any newspapers.

After receiving this photograph of the tailed infant, Thone and others at Science Service apparently began asking contacts within the medical community for their opinion of the story. Some of the experts doubted the veracity of initial reports and suggested that it would be safest to stay away from the subject, unless Science Service could secure absolutely trustworthy scientific evidence. Dr. Morris Fishbein, editor of the Journal of the American Medical Association, wondered if the physician in charge of the baby's case might want to prepare a report for the journal. But "otherwise, I am not even slightly interested," a skeptical Fishbein told Jane Stafford, the main medical writer for Science Service. The story was tainted with all the elements that fed yellow journalism: sensational details, graphic descriptions, and geographic proximity to the Scopes Trial. In a final lurid detail, the baby’s parents apparently were not living together. Given such titillating content, it would be difficult for a respectable journal or other periodical to go near the case and maintain its reputation, without substantial proof and some way to ground the story in science. Other physicians proved less reluctant to embrace the case. After apparently seeing Thone’s

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503 James Stokley, letter to Dr. Adolph H. Schultz, November 30, 1928, SIA RU7091, Box 109, Folder 3.  
504 Edward J. Meeman, letter to Frank Thone, November 30, 1928, SIA RU7091, Box 109, Folder 3.  
505 Morris Fishbein, letter to Jane Stafford, December 10, 1928, SIA RU7091, Box 109, Folder 3.
photograph of the tail, Dr. W. W. Keen of Philadelphia described it as "the most wonderful picture of a tail I have ever seen...I never have seen any so big, it is the champion one. If it were cut off you could use it for a good club." Keen was eager to use the photograph if and when it became possible, and eventually made a monetary offer for the specimen and publishing rights.\(^{506}\)

Pursuing options for using the photograph of the alleged tail, Thone wrote identical letters to the mother and father of the baby, using a carefully respectful and reserved tone. Thone wrote that the photo held scientific value, due to the professionals’ interest surrounding the growth on "an otherwise perfectly normal child." Thone assured the parents that out of regard for their feelings, none of the scientists would publish the photograph without their express permission. But on behalf of those scholars, Thone asked the baby’s parents for consent to use the photo, with the "definite understanding that it is to be used only for the illustration of purely scientific writings, and that they will promise us not to let any newspaper or magazine have access to the picture." Thone continued:

> we ourselves have not used it in our own publications, and shall not do so there or in any other way. It is our desire no less than yours to avoid all suspicion of sensationalism in the matter, out of regard for your child's future welfare. But because of the unusual scientific interest of the event, we are making this request, which we trust you will see your way clear to grant.\(^{507}\)

In promising not to print the photo itself, Science Service effectively sacrificed its own opportunity to publish the story, because editors and readers would likely show little interest without a supporting picture. The philosophy of providing credible news of science, and the

\(^{506}\) W. W. Keen, letter to Frank Thone, December 7, 1928, SIA RU7091, Box 109, Folder 3.

\(^{507}\) Frank Thone, letters to John Nichols and Adelaide Nichols, December 13, 1928, SIA RU7091, Box 109, Folder 3.
determination to avoid sliding into the sensational, made Science Service decline pursuing the photograph for its own use. However, Thone did remain involved as the representative of the men of science and medicine who were interested.

The father of the baby never responded to the letter, which the post office returned as unclaimed. On December 19, 1928, less than a week after she received her letter, Adelaide Nichols, the baby's mother, wrote back to Thone, requesting $25 for the use of the picture, and another $25 for the appendage itself, which she said was in her possession. Nichols explained that she still owed the doctor for the operation and so needed to hear back immediately. Thone contacted Dr. Keen of Philadelphia, who had been so enthusiastic over the photograph of the "champion" tail, and shared with him the mother's letter. Thone said he had already contacted Dr. Schultz of Baltimore, the doctor mentioned in the newspaper article as eagerly awaiting the specimen, but Schultz and his superiors at Johns Hopkins were unwilling to establish a precedent of paying in these situations, no matter how much they desired to dissect and examine the tail. Thone confided that he thought the mother was genuinely in need for money to pay her medical bill, rather than a selfish woman trying to exploit the "notoriety her child has gained." Thone suggested that if Dr. Keen, or any of his associates, were interested in meeting her price, they could possibly view the transactions as an "interchange of donations." He offered to continue as the intermediary in any negotiations, which he described as an "opportunity to do this poor woman a benefit and at the same time get a Christmas present for science of both the specimen and the publication rights to the pictures."  

508 Frank Thone, letter to W. W. Keen, December 19, 1928, SIA RU7091, Box 109, Folder 3.
Then the real haggling began. On December 20, Keen responded that he was sending Thone a check for $25, which he understood to be sufficient to meet the mother’s demands. Keen stated that he would be very happy to have the tail examined by a laboratory to "learn whether there are any lumpy masses at the base of it which could possibly represent caudal vertebrae." He also wondered how the mother had preserved the specimen once it was amputated, and asked if Thone could get a statement from the surgeon as to whether he found any caudal vertebrae at the time it was removed from the child.509

Keen’s question about caudal vertebrae, basically bony structures present in the tails of other mammals, focused on the issue of whether this appendage was biologically a true tail. Human embryos typically have a small fleshy tail that is absorbed into the body as the fetus grows, fusing into what becomes the tailbone. On very rare occasions this fleshy protrusion remains on the outside of the body, but is not a true tail because it does not contain the bones that are commonly present in animals' tails.510 Keen sought to establish conclusively whether or not bones were present in the appendage, either because the case represented a true scientific rarity and he hoped to publish an article in a respected journal, or because Keen saw an opportunity to exploit the odd occurrence of the "champion" tail and its link to the "Monkey Trial" of a few years before.

Thone responded to Keen that he thought the mother was asking for a total of $50 for the rights and the actual appendage, and wondered which Keen would prefer having if the mother would only give one for the price he was willing to pay. In a letter back to Thone on December 24, Keen described the mother as being "a little exacting," and said that while he

509 W.W. Keen, letter to Frank Thone, December 20, 1928, SIA RU7091, Box 109, Folder 3.
thought $25 should cover the costs, he was sending another $10, for a total of $35, for the tail and the publication rights. In exchange, Keen now also wanted statements from both the obstetrician who handled the delivery and the surgeon who removed the tail. To compensate Thone for all his efforts in the negotiations, Keen promised to publish the report in *Science*, the highly respected journal.\(^{511}\) In a letter a few days later, Keen added new conditions, saying he also wanted the names and residences of the parents, to this point apparently only known to Science Service and the newspaper editor in Knoxville, and also to know how many other children they had and which number the tailed baby was—the first child, second, etc.\(^{512}\) He followed with a telegram a few days later, on January 2, 1929, telling Thone, who still held the $35, "DO NOT PAY MONEY UNTIL YOU RECEIVE SPECIMEN."\(^{513}\)

After Thone transmitted Keen’s offer and questions to the mother, she quickly responded by telegram, billed collect. Mrs. Nichols described herself as "in desperate need of funds," willing to accept the $35, and promising that if Thone wired her the money that night, she would mail the appendage the very next day.\(^{514}\) Thone telegraphed back that night that his buyer had ordered him not to send the money until he had the specimen, but that he would pay her as soon as he received the specimen.\(^{515}\) A few days later the mother responded that she would not mail the appendage until she had the money. As a counter-offer, she told Thone she would send a photograph of it made before the operation and would release publication rights for $25.\(^{516}\)

\(^{511}\) W. W. Keen, letter to Frank Thone, December 24, 1928, SIA RU7091. Box 109, Folder 3.
\(^{512}\) W.W. Keen, letter to Frank Thone, December 29, 1928, SIA RU7091, Box 109, Folder 3.
\(^{513}\) W.W. Keen, telegram to Frank Thone, January 2, 1929, SIA RU7091, Box 109, Folder 3.
\(^{514}\) Adelaide Nichols, telegram to Frank Thone, January 3, 1929, SIA RU7091, Box 109, Folder 3.
\(^{515}\) Frank Thone, telegram to Adelaide Nichols, January 3, 1929, SIA RU7091, Box 109, Folder 3.
\(^{516}\) Adelaide Nichols, telegram to Frank Thone, January 7, 1929, SIA RU7091, Box 109, Folder 3.
Exasperated with the time-consuming and unsuccessful negotiations, Thone asked for help from Meeman, editor of the *Knoxville News-Sentinel*, explaining the impasse. Thone suggested that if he sent the money to Meeman, the editor could have the reporter who had worked on the story give the money to the mother and obtain the specimen. Meeman could then send it to Thone who would forward it to Dr. Keen in Philadelphia. Thone added that if Meeman did not want his reporter wasting any time getting more involved in the situation, then Thone would wire both Mrs. Nichols and Dr. Keen and tell them the negotiations were canceled. Thone declared, "this business has been hanging fire so long, and has been requiring so much correspondence, that I am anxious to clear it off."  

Meeman apparently agreed to assist in the negotiations. Thone sent the money to Meeman in Knoxville, but then heard from him by telegram a few days later, that the tail was actually in the possession of Dr. L. A. Haun, the Knoxville doctor who had removed it, and who was unwilling to give it up. According to Meeman, the mother still had not paid the medical bill. Meeman then returned the money to Thone, apparently weary of the whole process himself.  

On January 15, 1929, almost two months after the extensive and seemingly fruitless negotiations began, Frank Thone wrote three letters. In one, he gently confronted Nichols, the baby’s mother, with his understanding that contrary to her claims of possession, the surgeon still had the actual tail. He told her that this concluded their negotiations unless Dr. Keen was still willing to pay for publication rights without the specimen. To Meeman of the *Knoxville News-Sentinel*, Thone apologized for putting him through all the trouble over

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517 Frank Thone, letter to Edward J. Meeman, January 7, 1929, SIA RU7091, Box 109, Folder 3.  
518 Edward J. Meeman, telegram to Frank Thone, January 12, 1929, SIA RU7091, Box 109, Folder 3.  
519 Frank Thone, letter to Adelaide Nichols, January 15, 1929, SIA RU7091, Box 109, Folder 3.
the "confounded tail," described the mother's behavior as "rather queer," and said he was letting the negotiations drop.520

Writing to Keen and returning his money, Thone retraced the long exchange of telegrams, and included a carbon copy of the letter he had sent to the baby's mother. Thone described the mother's behavior as "somewhat peculiar," saying that it not only heightened his suspicions but also caused him to reverse his earlier favorable assessment of her motives. Thone stated that he was dropping the negotiations, suggesting that if Keen wanted to pursue the matter, he should contact Dr. Haun, who had performed the operation, directly to see if any further negotiations were possible. Thone advised that dealing with the mother would likely be impossible, since she had acted in "bad faith."521 In response, Keen told Thone that he indeed planned to contact the operating doctor directly for information. Keen expressed his sympathy for Nichols, saying he could understand her desire to make the incident a "basis of family support," given her poverty and given that the birth of a tailed baby was a rare occurrence. Referring to the Scopes Trial, Keen told Thone that Tennessee was "the most appropriate state for such an occurrence."522

Thone was quite ready to turn his attention to other matters, so when Keen contacted him once more a few days later asking for more information on the appendage, Thone responded with surprise but also with comments designed to bring the matter to a close. Thone advised that Keen could better get the information by contacting the Knoxville doctors directly, because "yours is a well-known name in American surgery, and I am merely a newspaper man, to whom the doctors might not wish to give all the details they would be

520 Frank Thone, letter to Edward J. Meeman, January 15, 1929, SIA RU7091, Box 109, Folder 3.
521 Frank Thone, letter to W.W. Keen, January 15, 1929, SIA RU7091, Box 109, Folder 3.
522 W.W. Keen, letter to Frank Thone, January 17, 1929, SIA RU7091, Box 109, Folder 3.
willing to share with a noted fellow-professional." Thone continued that he now saw nothing to prevent Dr. Keen from publishing any facts then known about the case or that he might be able to obtain. The restrictions had been on the photograph and the use of the appendage, which the mother had not been able to produce in the "show-down." Thone speculated that the mother was not in any position to enforce anything "more than a moral right"; she had no ammunition to do more than protest vainly against further publication of the story.523

Thone then revealed something that he had not mentioned in any previous correspondence on record:

In order to prevent the possibility of some sensational newspaper getting hold of the photograph and publishing it regardless of the feelings of the parents and of the rights of the photographer, Science Service has taken the precaution of placing a copyright on the picture, although we have no present intention of making any use of it. In case the somewhat confused restrictions which now exist against its use should be removed, we should be glad to grant you the privilege of reproducing this photograph without any charge.524

Five months later, Edward Meeman, the Knoxville editor, sent Thone a brief note saying that the tailed baby was doing well and was normal in every way, and they had made no further efforts to obtain the tail.525 With this, the correspondence ended, and the trail of the tail goes cold.

The whole bizarre episode underlines the tensions that Science Service leaders felt to establish the proper tone for their organization during its first decade. By declining to publish any stories or use the photo of the tailed infant, Science Service remained true to the

523 Frank Thone, letter to W.W. Keen, February 21, 1929, SIA RU7091, Box 109, Folder 3.
524 Ibid.
525 Edward J. Meeman, letter to Frank Thone, July 8, 1929, SIA RU7091, Box 109, Folder 3.
philosophy of avoiding sensationalism. But the revelation that Science Service had obtained a copyright on the photograph of the child with the attached tail raises interesting philosophical questions about how Thone and others there interpreted their ethical responsibilities as science reporters. A publisher might consider it good journalistic policy to obtain a copyright on a highly coveted photograph if it came into one's possession and no one else had done it. But if that were the case, why did not Thone suggest that to Meeman, the editor of the *Knoxville News-Sentinel*, who had been first to get the photo? Given that the Knoxville paper was the one that obtained the picture, would it have been more natural for Thone to cooperate with them in copyrighting it, or at least ask if Meeman had any intentions of copyrighting it? Was there anything that actually would have prevented Meeman at the *Knoxville News-Sentinel* or his reporter from giving or selling the photograph they generated? The records do not answer such questions, but possibly Meeman may have considered but rejected the idea of getting a photo copyright for his paper. Alternately, Meeman might have decided that Science Service was a better entity to hold the copyright, because of the organization's national scope and growing reputation as the country's science news service.

Since Science Service held the copyright, any reputable person or publication using the photograph would have had an obligation to credit Science Service. That might have been acceptable if it appeared in a respectable scientific journal, but what if it appeared in a mainstream newspaper, or worse, a tabloid-style newspaper? Was it really the intent of Science Service to protect the parents and the photograph from improper exposure, or did Thone hope that if it ever became possible to use the photograph, Science Service would
have first claim? Again, it is impossible to know the true, and possibly multiple, motives—only that it appears that Science Service never published the picture.

Thone’s stance proved revealing; as sensationalistic as the case seemed, Science Service did not automatically dismiss the accounts of a tailed baby as beneath its dignity. Indeed, the organization put itself forward as the representative of authentic professional interests. Thone devoted hours to all the correspondence and negotiations aimed at obtaining the tail for science. He served as a liaison between men of science, journalists, and the public; that role called for him to work simultaneously with Dr. Keen, with the Knoxville editor, and with the baby's mother. Science Service also met its obligation to the general public, in trying to serve newspaper readers by approaching the material in a non-sensationalist, responsible manner. After all of Thone’s effort, Science Service never published the photos; once it became clear that the investigations could not establish genuine scientific relevance, the obvious sideshow quality of the image could only detract from the group’s credibility. More than that, Thone actively prevented other publications from running the photograph. When the Evolution Publishing Corporation asked Thone in January of 1929 for a copy of the photograph and permission to publish it, he answered that the restrictions on the photograph would prevent either Evolution Publishing or Science Service from publishing it unless the circumstances changed considerably.526

In the early days of Science Service, Slosson and other leaders had acknowledged that realistically, science often needed to be presented in entertaining fashion in order to grab and hold readers’ interest. But when professional responsibility and scientific veracity could not

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justify publishing a story, Science Service rejected the opportunity to cater to public curiosity. Regardless of the entertainment value, publishing the baby’s tail photograph was not consistent with the organization’s ultimate goal of helping the public establish a scientific habit of thinking.

The issues surrounding these two geographically, chronologically, and topically linked events, the Scopes trial and the tailed infant, continued to present themselves to Science Service in the ensuing years. Science journalism still continues to grapple with questions of how to convey scientific matters to the general public and keep their interest, without oversimplifying so much or sensationalizing so much that you misrepresent the science and alienate your sources in the scientific community. Journalists still struggle with the ethics of paying a source, or dealing with a not fully trustworthy source. How much to be involved with a story, versus keeping a reporter's dispassionate observational perspective, must be weighed when deciding whether to cover a story or leave it alone. As in its coverage of the Scopes Trial, Science Service ultimately defined itself as a group to publicize scientific “facts,” actively rejecting the pressure to turn science into sensation.

"Denicotinized" Cigarettes

The final case study from the 1920s highlights how Science Service dealt with science news controversy, how the organization should respond when an outside party claimed that reporters’ interpretation and presentation of science information had caused some kind of harm—in this case, regarding the contentious question of whether cigarettes could be purged of their nicotine content. The August 26, 1928 issue of the "Daily Science News Bulletin," which Science Service sent to its subscribing newspapers, contained an
article with the headline, "'Denicotined' Tobacco Declared a Fraud." The piece, written by Science Service medical writer Jane Stafford, said that chemists who conducted experiments at the Connecticut Agricultural Experiment Station had determined that "denicotinized" or "denicotined" tobacco in products such as cigarettes, cigars, and smoking tobacco was "little more than a fraud." The Connecticut lab’s testing showed that some popular brands of regular tobacco products actually contained less nicotine than the "processed" brands, those that had undergone some form of treatment to supposedly reduce their nicotine content. Stafford’s article added that while the word “denicotined” "is naturally taken to mean practically free from nicotine," scientific analysis showed that "denicotined" processed brands still averaged 72 percent of the nicotine of the unprocessed brands. Accordingly, the Science Service piece reported, these Connecticut scientists recommended that smokers who wanted to minimize their nicotine consumption would do better to buy the standard unprocessed brands known to have a low nicotine content, rather than products billing themselves as “denicotined,” because then the purchaser would have no "false sense of security to lull him into the consumption of a greater amount of tobacco."

Science Service printed the same article in the chemistry section of its Science News-Letter on September 8, 1928. A number of the newspapers that subscribed to the Science Service "Daily Science News Bulletin" chose to reprint this material, including the World newspaper in New York City. Within a week, Hubert Sackett, the president of Bonded Tobacco Company, Inc. in New York (also sometimes referred to as Sackett De-Nicotined

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Tobacco Products), one of the companies whose products the Connecticut scientists had tested, contacted the *World*. Sackett noted that the article had come from Science Service, and accused the newspaper of doing "incal[c]uable harm" by reprinting it.\(^{529}\) In reality, neither the *World* nor Science Service had named any of the products tested by brand; the article only referred in general to processed tobacco products.

After receiving Sackett’s letter, Isaac D. White, director of the Bureau of Accuracy and Fair Play Director at the *World*, wrote to Science Service to inform that organization of the complaint. White inquired as to whether the statement that denicotinization "is little more than a fraud" was quoted directly from the chemists' report or if that was the wording of the Science Service staff writer.\(^{530}\) Frank Thone, biology editor, told White that the Science Service article was based on an article in the *Journal of the American Medical Association*, a copy of which he included so White could see that Science Service had actually modified the statement to read a little milder than the *JAMA* wording.\(^{531}\)

In anticipation of further correspondence, Thone contacted the Science Service attorney Dion Birney, sent him a copy of the complaint, and told him the article was based on a report of the work of Connecticut chemists, which Science Service had found in the *JAMA*. Thone also enclosed a copy of the answer he proposed sending to Sackett, since "he seems to hint at possible litigation." Thone wanted to make sure that his letter did not concede anything that could be used against Science Service in the future. Birney apparently not only

\(^{529}\) Hubert Sackett, letter to the Editor of *New York World*, September 4? 1928, SIA RU7091, Box 100, Folder 6.
\(^{530}\) Isaac White, letter to Watson Davis, September 7, 1928, SIA RU7091, Box 100, Folder 6.
\(^{531}\) Frank Thone, letter to Isaac D. White, September 8, 1928, SIA RU7091, Box 100, Folder 6.
okayed the letter, but also told Thone that he was "a good deal easier on him than I needed to be."\textsuperscript{532}

Following that clearance, Thone sent his letter to Sackett, which declared that Science Service could not see how the article had done any material harm to the tobacco company, because it never mentioned Sackett's company by name. Furthermore, the advertising for Sackett's tobacco products claimed to remove "the bulk" of nicotine rather than all of it, so that automatically excluded Bonded Tobacco Company from the category of "quasi-fraudulent" companies. To appease Sackett, Thone wrote that it was not Science Service's policy "to stand rigidly on its rights in any controversy where mutual concession is possible, but rather if our adversary compel us to go a mile with him, to go with him twain." In that spirit, Thone offered to produce and distribute an article of approximately the same length that would explain the science behind Bonded Tobacco's process of denicotining. To accomplish this, Thone asked Sackett for information on three things: the nicotine content of his tobacco before and after processing, the essential steps in the company's non-chemical process (provided it was patented and the technology not vulnerable to being stolen), and samples of the packages or labels.\textsuperscript{533}

Sackett responded three days later, in no way mollified. He opened by insisting that if Thone could not see the damage that Science Service had done, it would be impossible to enlighten him. Sackett maintained that even without the use of brand names, the article’s general reference to processed tobacco made it seem as if Bonded Tobacco was unfairly lumped in with the others. Also, Sackett claimed that his company had coined the word

\textsuperscript{532} Frank Thone, letter to Dion Birney, September 13, 1928, SIA RU7091, Box 100, Folder 6.
\textsuperscript{533} Frank Thone, letter to Hubert Sackett, September 13, 1928, SIA RU7091, Box 100, Folder 6.
"denicotined" while all the other companies used "denicotinized," so the use of the word "denicotined" also seemed to implicate his products as part of the group labeled fraudulent.534

Sackett declined to share any information about the non-chemical process by which his company’s tobacco was denicotined, because the method was not patented. He noted that it was a vacuum process aided by super-heated steam but would say no more. Sackett said it was impossible to calculate the nicotine content of his tobacco before and after processing, since (as the report from the Connecticut Agricultural Experiment Station had confirmed) the amount of nicotine contained in tobacco varied between plants, and even between the dark and light leaves on an individual plant. Sackett maintained that his firm did remove "the bulk" of the nicotine, and specified that by that he meant "from 60% to 90%". He concluded as he began, with reference to the "harm" that Science Service had done. Indeed, Sackett complained, over the weeks, other newspapers had compounded the damage by further reprinting the article, picked up from the Science Service "Daily Science News Bulletin."535

In the meantime, Sackett also wrote to Edward Monroe Bailey, the scientist who had led the work at the Connecticut Agricultural Experiment Station, asking if he had intended to convey the idea that Sackett Denicotined Tobacco Products were fraudulent—an invitation to self-incrimination if ever one existed. Bailey responded with one sentence: "I would not call your products fraudulent because I think the term fraudulent implies on the manufacturer's part some intent to deceive and I have no such evidence."536 Sackett then passed on Bailey's comment to Science Service, casting it as exoneration rather than the relatively benign

534 Hubert Sackett, letter to Science Service, September 18, 1928, SIA RU7091, Box 100, Folder 6.
535 Ibid.
536 E.M. Bailey, letter to Hubert Sackett, September 13, 1928, SIA RU7091, Box 100, Folder 6.
statement that it was. Sackett also reiterated the "immeasurable harm" that Science Service had caused his company, and asked again for what steps Science Service intended to take to "repair the great injustice" they had done.\textsuperscript{537} Actually all Dr. Bailey had said was that he could not call it fraud without evidence to support intent to deceive—not that it did not exist, not that he did not suspect it, only that he could not prove it from the samples supplied by the tobacco processor.

After almost a month's worth of correspondence on the tobacco issue, Thone wrote to Sackett, telling him that Science Service intended to print a disclaimer related to its earlier article on denicotinized tobacco, a correction that would receive the same circulation as the earlier article had.\textsuperscript{538} The disclaimer, which appeared in the September 23 mailing of the "Daily Science News Bulletin," stated that Science Service had received several letters from Hubert Sackett, claiming exemption for his company from the statements made based on the Connecticut Agricultural Experiment Station report and the comments in the \textit{JAMA}. The disclaimer highlighted Sackett's objection to the use of the phrase, "little more than a fraud," but pointed out that \textit{JAMA} had actually used even stronger wording—"is practically to practice a fraud on the public." Science Service denied intending to single out any company for criticism, suggesting that the phrase about fraud applied to any company whose tobacco packaging conveyed that all, "or all but an insignificant fraction" of nicotine had been removed. The disclaimer then described the Bonded Tobacco Company labels, and pointed out that they stated neither the original nicotine content nor that remaining after processing. The explanation was factual, science-based, and clear. Science Service did not become

\textsuperscript{537} Hubert Sackett, letter to Science Service, September 17, 1928, SIA RU7091, Box 100, Folder 6.
\textsuperscript{538} Frank Thone, letter to Hubert Sackett, September 22, 1928, SIA RU7091, Box 100, Folder 6.
apologetic, but the organization also did not present itself as dogmatically determined to avoid listening to any criticism.539

Sackett still was not satisfied, telling Thone that he had noted "with interest your 'disclaimer.'" He accused Science Service of being unfair by highlighting one denicotining process—wet as opposed to dry—over another, instead of comparing the two in the effect on nicotine content. He added, "you will realize, as a Newspaper man of long experience, that your disclaimer will have very little, if any, counter-acting effect."540

After a further exchange of tense letters,541 Sackett bitterly concluded, "You cannot blame me if I feel that it is with a great deal of reluctance that you are doing anything to remedy the injury you did us."542 Thone responded, "I am afraid nothing can be gained, toward a further understanding between us…." Thone defended the disclaimer’s approach in highlighting the water-based denicotining method over the dry, since as a biologist himself, Thone understood that the water-based system offered the only method approaching scientific accuracy. While the discussion had reached an impasse, Thone noted one more time, "for the record," that despite Sackett's many assertions to the contrary, Science Service had not intended to do any harm to Sackett's company. Thone believed he had been true to Science Service's policy of going more than halfway to address a complaint, even when he did not believe the complaint was justified, as in this case. Significantly, Science Service

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539 Science Service, "A Disclaimer," "Daily Science News Bulletin," September 23, 1928, SIA RU7091, Box 100, Folder 6. The disclaimer also appeared in the Science News-Letter. See Science Service, "A Disclaimer," The Science News-Letter 14, No. 390 (Sep. 29, 1928): 200, http://www.jstor.org/stable/3903878. Editors of subscribing newspapers who may have printed the tobacco article were not required to print the disclaimer. The disclaimer was sent to the editors with the message, "For your information. Should you desire to publish this article, no objection will be made by Science Service."

540 Hubert Sackett, letter to Frank Thone, September 24, 1928, SIA RU7091, Box 100, Folder 6. 
541 Frank Thone, letter to Hubert Sackett, September 26, 1928, SIA RU7091, Box 100, Folder 6. 
542 Hubert Sackett, letter to Frank Thone, October 3, 1928, SIA RU7091, Box 100, Folder 6.
never received any other complaints from the other companies that manufactured smoking products involved in the Connecticut Agricultural Experiment Station testing. Nonetheless, the controversy highlighted the potential sensitivity of business in general, and tobacco companies in particular.

Social historian Richard Kluger has argued that by 1925, neither scientists nor consumers yet had any concrete evidence of the dangers of smoking cigarettes, in an era before the collection of biostatistics. From the 1910s on, there had been limited information from insurance companies hinting at the negative effects of smoking, along with unscientific personal anecdotes. Some well-known people had begun speaking out against smoking, often citing moral or social concerns as well as health questions (for which there was still no conclusive proof). Both Thomas Edison and Henry Ford refused to hire smokers, and other major companies, such as Cadillac, Marshall Field's, and Montgomery Ward, discouraged smoking as well. Ford was sure that an examination of the history of a criminal would most surely reveal "an inveterate cigarette smoker." Beginning in 1910, Thomas Edison made a series of films for the National Association for the Study and Prevention of Tuberculosis (now the American Lung Association), the first movies ever produced for the purpose of public health information. Though the films did not criticize cigarette smoking specifically, Edison's involvement was concurrent with his concern about, and public disdain for, cigarettes. He believed the greatest danger came from acrolein, a compound released by the "burning paper wrapper," though scientific evidence did not support his assessment. When
Congress passed the Eighteenth Amendment outlawing alcoholic beverages in 1919, nervous cigarette manufacturers began to fear that similar legislation could be headed their way.\(^{543}\)

As Kluger has detailed, American policy-makers of the early 1920s responded to the growing misgivings about cigarette smoking by choosing to place new taxes on cigarettes, thereby branding smoking a sin rather than a crime, and adding revenue to both federal and state coffers. The federal excise levy on cigarettes rose to six cents a pack. In 1921, Iowa became the first state to add a state tax (two cents per pack) to the federal tax, and soon other states followed.\(^{544}\)

By the late 1920s, a few hints seemed to suggest that as cigarette use increased, so did lung cancer. The increase was slight—a special study by the U.S. Census Bureau in 1914 found the death rate from lung cancer was 0.6 per 100,000 Americans; by 1925, the rate was 1.7, or three times as many people, though still statistically low overall. Certain urban centers, such as Albany, New York, Boston, and San Francisco had noticeably higher rates. Some observers attributed the higher rates to better detection through improved diagnostic

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\(^{543}\) Richard Kluger, *Ashes to Ashes: America's Hundred-Year Cigarette War, the Public Health, and the Unabashed Triumph of Philip Morris* (New York: Alfred A. Knopf, 1996), 66-7. See also Martin S. Pernick, "Thomas Edison's Tuberculosis Films: Mass Media and Health Propaganda," *The Hastings Center Report* 8, No. 3 (Jun. 1978): 21-7, http://www.jstor.org/stable/3560425. According to Pernick, the Tuberculosis Association was the first nationwide volunteer organization aimed at fighting a specific disease, but tuberculosis had actually been declining for over one hundred years when the organization was founded. Pernick posits that the timing of the organization's founding, and its propaganda-driven agenda, were the results of social changes such as immigration, urbanization, and industrialization. Also see Kevin J. Harty, "'The Knights of the Square Table': The Boy Scouts and Thomas Edison make an Arthurlian Film," *Arthuriana* 4, No. 4, King Arthur in America (Winter 1994): 313-23, http://www.jstor.org/stable/27869082. In 1917, the Thomas Edison Company released the film *Knights of the Square Table*, with the endorsement of the Boys Scouts of America. James Austin Wilder, National Field Scout Commissioner wrote the screenplay and played the Scoutmaster in the film. According to Harty, the film recounts the story of a gang of delinquent boys and their transformation into a Boy Scout troop, and was well-received by critics. Scenes of initiation into the gang included boys being burned by a lit cigarette, to which one reviewer at the time objected, but that were included to show the kinds of activities that occur "when boys go wrong." The making of this film coincided with Edison's work on films for the Tuberculosis Association, and with his own public denunciation of the practice of smoking cigarettes.

tools, such as the relatively new X-ray machine. Then a study published in the New England Journal of Medicine in April 1928 described the systematic comparison of 217 cancer patients with those suffering from other diseases. In those body sites considered most susceptible to showing signs of harm from smoking—the lips, cheeks, jaw, and lungs—all but one of the thirty-five cancer sufferers were heavy smokers. But tobacco users in the group with cancer, only slightly outnumbered tobacco users in the non-cancerous group. So the increase in the number of cancer cases was not as significant as was the location where the cancers were found.545

Because the scientific consensus had so far not linked cigarettes to any "demonstrable harmful effect on human tissue," as Kluger writes, advertisers felt free to tout their products widely. In the mid-1920s, R.J. Reynolds (RJR) was spending $10 million a year in advertising for its industry-leading Camel cigarettes. RJR promoted the pleasure and flavor associated with smoking Camels, and attempted to attract a higher class of customer with print ads that showed male smokers in evening attire at dinner parties, or dressed to play tennis or polo. In marketing its Marlboro brand, Philip Morris directly targeted the ten to fifteen percent of smokers who were women, with the snobbish claim that Marlboro packages "ride in so many limousines, attend so many bridge parties, repose in so many hand bags." To discount the negative stereotype that women who smoked were of questionable character, ads asked, "Has smoking any more to do with a woman's morals than has the color


Yet although studies had yet to link smoking to definitive health damage, cigarette advertising of the late 1920s began to reflect rising controversy over symptoms such as "smokers' cough," and throat irritation.\footnote{Debra Jones Ringold and John E. Calfee, "The Informational Content of Cigarette Advertising: 1926-1986," \textit{Journal of Public Policy and Marketing} 8, Health and Safety Issues (1989): 2-3, 18, \url{http://www.jstor.org/stable/3000308}.} Other critics questioned the "mental efficiency" of smokers, though it was unclear whether smoking itself caused lethargy, or whether "lazy men are the kind that find smoking agreeable."\footnote{Allan M. Brandt, "The Cigarette, Risk, and American Culture," \textit{Daedalus} 119, No. 4, Risk (Fall, 1990): 158, \url{http://www.jstor.org/stable/20025343}. Also see K.L.Lum, et al, "Signed, Sealed, and Delivered: 'Big Tobacco' in Hollywood, 1927-1951, \textit{Tobacco Control} 17, No. 5 (Oct. 2008): 313-23, \url{http://www.jstor.org/stable/20206736}.} Though many observers continued to defend smoking as harmless, the growing undercurrent of concern clearly left tobacco companies uneasy by the late 1920s. That climate of tension may well have fueled Sackett’s 1928 claims that his business had been harmed by Science Service’s publicity for the Connecticut nicotine study.

The whole episode made clear that even if Science Service restricted itself to printing biological and physical “facts” produced by respected researchers and published in peer-reviewed journals, the organization could never be completely immune from criticism. As Science Service achieved more widespread influence, with its material accepted and reprinted in more newspapers and other public venues, it opened itself up to more opposition.

Those who worried about repercussions to business interests did not always see science news...
as impartial. Davis and others assumed that the American people were ready to respect top-quality research, but when that research proved somehow unpalatable, Science Service risked a backlash from interested parties.

These three episodes highlight some of the ethical issues and practical questions that Science Service faced, in deciding what science news to cover and how to negotiate potential minefields of criticism. Its leaders prioritized the need to develop credibility not just for the organization, but for the new field of science journalism as well. By the end of the 1920s, Science Service had brought responsibly researched and reported science news to the public for nearly a decade. Managers had succeeded in distributing a growing volume of information to a growing audience, through newspapers, through the *Science News Letter*, and through radio and other media. Advocates and trustees felt that such expansion proved the value of science popularization, supporting the faith that ordinary Americans were indeed ready to embrace a scientific habit of mind. But the Depression decade would bring new challenges, both for Science Service and for the American scientific community.
CHAPTER 7
1930s Case Studies

The Depression decade of the 1930s was difficult for individuals and businesses alike, and Science Service faced its own challenges as well. People sought answers to their personal concerns and financial worries, just as businesses grew sensitive to anything they perceived as adding to their difficulty of staying afloat during tough economic times. Whether seeking a solution, or a scapegoat for their worries, some turned to Science Service, increasingly seen as the interface between the science community and the public. With almost one-third of the nation's readers having the chance to read Science Service materials in their hometown newspapers, and radio listeners hearing hours of regular science programming each week, the organization became a reliable voice in an expanding world. For many people, Science Service seemed to be a trustworthy place to turn for a variety of answers and help. Private citizens, political and public figures, and businessmen all contacted Science Service—for advice, for assistance, to help publicize their own efforts, or to complain about Science Service's use of its increasing influence. The organization continued to gain an audience and credibility through the 1930s. In the process, Science Service engaged with, and helped shape, national discussions about the social context of science, including the public debate over the issue of “technological unemployment.” Though the problems were not necessarily new, people began to look in a new direction for answers—science—and to Science Service as their liaison.
The Public Seeks Answers from Science Service

People wrote to Science Service. They wrote seeking jobs, asking questions, sharing stories, or recommending techniques they said cured one illness or another. Its staff seemed to come across as a reliable contact point for general assistance, as in the case of a poverty-stricken and blind North Carolina woman during the Depression whose husband made $12 a month, not enough to provide food, shelter, and her medicine. She asked for help getting her message to the Social Security office, and having heard Science Service on the radio talking about the blind and crippled children, thought that the organization might be able to forward her plea to the agency. 549 Medical writer Jane Stafford referred the woman to the State Health Officer in North Carolina, advising her to request help under the Social Security Act. 550

Some letters were more desperate than others. In a letter dated May 31, 1937, Maurice Caplan of Baltimore, Maryland wrote to medical writer Jane Stafford about the death of his daughter. According to the letter, his daughter was judged a "perfect specimen" when born in the hospital, in what was an apparently uncomplicated birth. The baby came home after a few days and showed no sign of illness until she suddenly died four days later. The couple had even engaged a practical nurse, recommended by their family pediatrician, as was often the case at the time for people who could afford the personalized care. Caplan described the baby as "fine & frisky at 12:30 A.M. and at 6:45 A.M. was dead." 551 The father was seeking information, particularly on the thymus gland, which he had heard was often implicated in these kinds of death, as well as any other information Science Service might have. He also asked for any information the organization had for people who wanted

549 Pearl Bridges, letter to Science Service, October 10, 1937, SIA RU7091, Box 182, Folder 5.
550 Jane Stafford, letter to Pearl Bridges, October 18, 1937, SIA RU7091, Box 182, Folder 5.
551 Maurice Caplan, letter to Jane Stafford, May 31, 1937, SIA RU7091, Box 182, Folder 15.
children—"starting with the actual planning—proper prenatal care and care after birth—etc." Caplan told Stafford, "I want to know from a science angle—and on paper," and he was willing to pay any charge necessary to have the information.\textsuperscript{552}

Illustrating how personal the relationship with Science Service was becoming for some people, Caplan said that he had spoken to Jane Stafford's mother the week before, and she was the one who suggested he write to the organization. He told Jane what he had told her mother: "I have heard many of the Science Service Radio broadcasts on Tuesday afternoons—we have a set in our workshop—and I have enjoyed as well as learned many new things…."\textsuperscript{553}

Stafford responded immediately, expressing sympathy at the man's loss, and speculating that this was a case of what doctors called "thymic death." While Science Service had published one or two stories on the subject, they were out of print, and Stafford suspected they were also out of date. An experienced medical writer, she indicated it had been several years since she had seen anything on the topic and believed that doctors were still undecided on the role of the thymus gland in these deaths. She said she would enclose a story she had and keep him in mind should she encounter further information. She also explained to Caplan that as a news service they only had medical information as provided by physicians, so Science Service was not a direct source for material on prenatal preparation

\textsuperscript{552} Ibid. \\
\textsuperscript{553} Ibid.
and childcare. Instead, Stafford said she had contacted the U. S. Children's Bureau and asked them to send Caplan the material they had.554

Such letters suggest that Science Service was indeed registering in public awareness, that some ordinary American men and women regarded the organization as a trusted source not just for information, but also for personal assistance, especially on medical matters. The Caplan case was unusual in the personal level of contact between the man and Stafford’s family, and today’s medical writers would consider it unadvisable, if not the stuff of lawsuits, for them to offer any kind of diagnosis or advice based on a limited knowledge of the case. However, it is significant that Caplan indicated he regularly listened to Science Service broadcasts on Tuesday afternoons, and even mentioned in the letter that he had particularly enjoyed one on stained glass, which was meaningful to him because of his line of work—jewelry and antiques. In his personal distress, Caplan said he was seeking not just information but science information, and he wanted it in writing. He expressed a trust in science as he dealt with an emotional loss, and he wanted the information to be concrete—on paper—as if this would give it greater substance and therefore be more credible. Caplan’s faith in Science Service as a source of facts reflected the "scientific habit of mind" that Scripps, Ritter, and Slosson had hoped to cultivate in audience members from the very beginning.

Eleanor Roosevelt Seeks Science Information

Americans from all levels of society initiated contacts with Science Service during the 1930s—working people, business owners, would-be inventors, aspiring writers, and people in high profile, very visible professions. One of these was Eleanor Roosevelt, wife of President Franklin Delano Roosevelt. The Science Service archives document that in 1933, the organization received a request from the First Lady’s office for information on women currently serving in government scientific research positions. It is unclear how the request was generated and transmitted to Science Service, or what the information was to be used for. But any request linked to the First Lady carried weight; Science Service staff apparently made telephone calls or sent queries to government agencies, asking about their female employees, and then compiled an extensive, though possibly incomplete, listing of the women working in various science fields across federal agencies in mid-1933.555

Scholars of Eleanor Roosevelt’s life have documented how deeply she was concerned with the overall difficulties regarding work for women during the Depression and how much she was interested in expanding opportunities both for working-class and professional women. By the 1930s, American colleges had graduated a visible number of women with science degrees, and so Science Service seems to have served as a resource to help Eleanor Roosevelt assess whether government agencies offered such women any substantial

555 “Women in Government Scientific Research 1933 (Information Requested by Mrs. Roosevelt 4/18/33)” Science Service file indicating material was assembled in response to Eleanor Roosevelt's request on April 18, 1933, SIA RU7091, Box 151, Folder 6. Dated responses from several of the agencies show that they compiled the information on April 17, 1933. Other responses are dated the 18th but refer to a telephone request from Science Service "yesterday," meaning April 17—a day before the file indicates the request was made. It could be a simple clerical error in recording the date on the file, but it must be at least considered that Science Service staff might have begun preparing the material, then contacted Mrs. Roosevelt's office offering her the results of their research. If the offer was subsequently accepted, technically Science Service could say that Mrs. Roosevelt had requested the research.
employment prospects. The contact between Eleanor Roosevelt’s office and Science Service came in spring, 1933, and her book, *It's Up to the Women*, published in November of that year, discussed professional opportunities available to women. Specifically, Roosevelt wrote, "in the professions we [women] can be lawyers, doctors, scientists of various kinds." Her book continued by telling readers, "There are certain services where technical knowledge is necessary and it is quite possible for a woman to fit herself to enter one of these services. Many women have done so and are at present serving as research workers and technical workers."  

In *It's Up to the Women*, Eleanor Roosevelt did not explicitly credit Science Service as the source of her statement about women’s research or technical positions, but the episode underlines that Science Service was actively engaged in helping track a significant development, the evolving history of women scientists in America. As historian Margaret Rossiter has detailed, the federal government actually provided important employment opportunities for female scientists during the early twentieth century, a time when they had trouble getting access to many jobs in business and academia. The Science Service information confirms Rossiter’s assessment that female researchers and technicians were welcomed in some agencies more than others and that regardless of degree qualifications or

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557 Ibid., 213.
558 Margaret W. Rossiter, *Women Scientists in America: Struggles and Strategies to 1940, Volume One* (Baltimore: The Johns Hopkins University Press, 1982), 315. According to Rossiter, during the 1880s and 1890s women's employment in federal science positions depended on certain flexible factors, including the shortage of men available for the positions, the willingness of the employer to hire women, and women becoming aware that there were positions available to them (60-1). Employment of women at all levels of government increased after World War I, and in government science during the 1920s and 1930s it was the more "feminine" fields of home economics, botany, microbiology, statistics and clinical psychology where women made the greatest gains (315). Women's approach during this period was generally more conservative, less confrontational, and focused on "deliberate overqualification," what Rossiter called the "Madame Curie strategy" (130).
length of work experience, women were clustered at the lower ranks of government service.

The Science Service information-gathering effort showed that in 1933, the federal government employed women in the following posts:

| Bureau of Chemistry and Soils: | 5 junior chemists |
|                               | 1 associate microscopist |
|                               | 12 women working as draftsmen |
|                               | other librarians and assistants |

| U. S. National Museum | 1 philatelist |
|                      | 1 curator of herpetology |
|                      | 1 associate in zoology (a note says she is an international authority on crustaceans) |

| Department of Agriculture Bureau of Entomology | 3 assistant entomologists |
|                                               | 5 junior entomologists |
|                                               | 2 scientific illustrators |
|                                               | 11 scientific aides |
|                                               | 10 scientific helpers |
|                                               | other librarians, assistants, and aides |
|                                               | 1 plant quarantine inspector |
|                                               | several women working at experiment stations |

| Bureau of Animal Industry | 1 zoologist |
|                          | 2 associate zoologists |
|                          | 5 librarians and assistants |
|                          | 2 junior scientific aides |
|                          | 5 scientific helpers |
|                          | 1 associate biochemist |
|                          | 1 junior zoologist |
|                          | 1 junior chemist |
|                          | 1 assistant microscopist |

<p>| Food and Drug Administration | 2 junior chemists |
|                             | 3 assistant chemists |</p>
<table>
<thead>
<tr>
<th>Bureau of Plant Industry</th>
<th>48 pathologists, physiologists, illustrators, botanists, cytologists, pathologists, nematologists, aides, and statisticians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Forestry</td>
<td>1 assistant plant ecologist</td>
</tr>
<tr>
<td>Bureau of Home Economics</td>
<td>1 chief of the department (Ph.D.) 1 associate specialist in charge 1 principal home economist (Ph.D.) 2 senior home economists (Ph.D.s) 1 associate specialist in child nutrition 4 assistant home economists 1 senior nutrition chemist (Ph.D.) 1 specialist in foods (Ph.D.) another two dozen specialists in nutrition and textiles, several with Ph.D.s other librarians, assistants, and aides</td>
</tr>
<tr>
<td>Department of Labor</td>
<td>5 medical doctors specializing in child health, a study of children excluded from school because of venereal disease, neonatal and infant mortality</td>
</tr>
<tr>
<td>(Children's Bureau)</td>
<td></td>
</tr>
<tr>
<td>Public Health Service</td>
<td>1 medical officer (M.D.) 2 senior bacteriologists 1 biochemist 2 acting assistant surgeons 1 superintendent of nurses 2 assistant chemists several other statisticians and technical assistants</td>
</tr>
<tr>
<td>Department of Commerce</td>
<td>133 women engaged in scientific clerical or testing work, including work in radio, electrical, metallurgy, thermometry, and engineering mechanics, fuels, radium, weights and measures</td>
</tr>
<tr>
<td>Bureau of Foreign and Domestic Commerce</td>
<td>1 geographer</td>
</tr>
<tr>
<td>Organization</td>
<td>Positions and Responsibilities</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Bureau of Fisheries</td>
<td>1 associate aquatic biologist (Ph.D.) 1 junior aquatic biologist</td>
</tr>
<tr>
<td>Department of Geologic Survey</td>
<td>7 working in paleontology, structural geology, mineralogy, fuels, and coal</td>
</tr>
<tr>
<td>St. Elizabeth's Hospital (Department of the Interior)</td>
<td>1 psychologist 1 bio-chemist 1 women's psychiatrist 2 psychiatrists 1 bacteriologist</td>
</tr>
</tbody>
</table>

Interestingly, the information that Science Service compiled included not just the basics about which agencies employed women in which positions, but also included some details about the women’s marital status. Given that each agency recorded only its own personnel, Science Service acted as a centralized collector and a handy repository for this data on female federal science employees.\(^{560}\)

This episode about the collection of data on women scientists illustrates a larger point about the significance of Science Service as an organization. Based in Washington, DC, Science Service was in a particularly advantageous position to communicate with and cultivate relationships with the federal government. This was especially important, since during these inter-war decades, government agencies were increasingly involved with supporting scientific and technical work, demanding and using the results. Groups such as the National Bureau of Standards, the U.S. Department of Agriculture, the U.S. Bureau of Mines, and the military, among many others, had natural long-standing relationships to the

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\(^{559}\) Science Service file indicating material was assembled at Eleanor Roosevelt's request, April 1933, SIA RU7091, Box 151, Folder 6.

\(^{560}\) Ibid.
physical sciences, natural sciences, and engineering. Roosevelt’s New Deal program intensified those trends, through the science and technology-related work of the Tennessee Valley Authority, Civilian Conservation Corps, and other “alphabet soup” agencies. More than that, Roosevelt’s New Deal programs placed a new premium on social science research, bringing in economists, sociologists, and other experts to consult on unemployment rates, business trends, and more. Henry A. Wallace, Secretary of Agriculture, actively engaged questions about science during the 1930s, and his views fully accorded with the opinion of Science Service leaders and most of the mainstream scientific community, that the Depression could not be allowed to interrupt research. In a speech to the American Association for the Advancement of Science in 1933, Wallace declared that science and engineering, through conscientious planning and consideration of society's needs, could free people from "the grind of toil and the terrors of economic insecurity." This improved quality of life would allow Americans a greater enjoyment of the arts and sporting activities and, particularly important to Wallace, support "the idle curiosity of the scientist himself," a return to basic science as the source of a good life, as historian A. Hunter Dupree noted.561

J. Edgar Hoover, the FBI, and Science Service

While connections between Science Service and researchers at some of the government agencies mentioned could evolve naturally and logically, the 1930s brought a less predictable but interesting connection between Science Service and the Federal Bureau of Investigation (FBI). Formally known as the Division of Investigation of the U.S.

Department of Justice, the FBI was founded in 1908. In its early years, the agency struggled to gain the public and federal government support and cooperation it needed to pursue the criminal element in the United States. It also fought to establish its reputation and credibility against growing complaints about FBI inefficiency and politicized investigations. Lawyer J. Edgar Hoover joined the department in 1917, became Assistant Director of the Bureau in 1921, and was named Director in 1924 with a mandate to clean up the agency. The reform-minded Hoover sought to improve the reputation of the Bureau by initiating stricter standards for potential agents, including background checks, requirements for a higher level of education, physical tests, and a two-month training period for new agents. Not coincidentally, Hoover believed that the FBI could perform better by making greater use of the evolving sciences behind criminology, especially fingerprints.\footnote{U.S. Department of Justice, Bureau of Investigation, \textit{The FBI: A Centennial History, 1908-2008}, 28, book online at http://www.fbi.gov/about-us/history/a-centennial-history.}

The history of fingerprints for identification possibly dates to as early as China's Former Han dynasty (202 BCE—220 CE), where archaeological evidence shows the use of fingerprints on clay seals to sign documents.\footnote{Simon A. Cole, \textit{Suspect Identities: A History of Fingerprinting and Criminal Identification} (Cambridge: Harvard University Press, 2001), 60.} European writers first described papillary ridges in the late seventeenth century, and the practice of collecting fingerprints began in British India in the mid-1850s, where overwhelmed administrators sought to prevent fraud and impersonation among native employees in collection of pensions.\footnote{Ibid., 61, 63-4.} By 1902, the New York City Civil Service Commission adopted the practice of collecting fingerprints (dactyloscopy) to discourage imposters from taking civil service examinations for others for police and fire department jobs. Meanwhile, law enforcement agencies also seized on the
potential for using fingerprinting in criminal cases. The New York Bureau of Prisons implemented the system in 1903, and demonstrated it as part of the Bureau's exhibit at the 1904 Louisiana Purchase Exposition in St. Louis.\footnote{Ibid., 135, 137.} By the 1920s, fingerprinting was the preferred identification method in the U.S. and as historian Simon Cole has pointed out, the technique impressed observers as "fashionably modern" because of the mechanical process involved, similar to other duplication processes of the time such as the letter press.\footnote{Ibid., 3, 32, 163-166.}

Various law enforcement agencies in the U.S. had been collecting fingerprints since the early twentieth-century, but by the 1930s, the FBI’s fingerprint files had expanded so rapidly that searching them for matches became increasingly impossible. In his first year as Director, Hoover began consolidating the two major fingerprint collections in the U. S. for his new Identification Division, and by 1934, the FBI started using IBM punch-card machines to help sort out fingerprints. Other law enforcement agencies and departments around the country soon also embraced this technology, which the FBI helped make available and effective.\footnote{U.S. Department of Justice, Bureau of Investigation, The FBI: A Centennial History, 1908-2008, 28, book online at http://www.fbi.gov/about-us/history/a-centennial-history.} Hoover was committed to introducing scientific practices, new investigation technologies, and modern forensics standards to the Bureau, as a way to multiply its effectiveness and power in pursuing gangsters and other 1930s targets. Another endeavor of Hoover's was the scientific crime lab. He had encouraged his agents to stay abreast of developments in science that might benefit their work, and by 1930 the agency was hiring
outside experts on a case-by-case basis to help solve crimes. By 1932, the agency's first technical laboratory for scientific examinations and analysis was fully established.568

This interest in science and its benefits to society might have been enough to forge a relationship between Hoover and Watson Davis, but their connections went deeper than that. Davis and Hoover both grew up in the Capitol Hill neighborhood, and both graduated from George Washington University, just one year apart.569 It is unclear when they met or how well they knew each other, but on February 3, 1934 Davis sent Hoover a letter and a copy of the February 2 Science News Letter, which contained an article titled, "Scientific Crime Detection Praised by Congress Committee." Davis indicated that Science Service would like to keep an eye on the FBI’s new techniques and requested that the Bureau put his organization on the mailing list to receive all articles issued by the Division in the future. A response from Hoover promised to keep Science Service updated on FBI news and thanked Davis for the complimentary nature of the Science News Letter article.570

Hoover was proud of the significant changes that he had made in his ten years as director of the FBI, especially in adopting the latest innovations in scientific prevention and analysis of crime. For him, Science Service represented an excellent avenue to publicize those accomplishments to his Washington colleagues and to the American public at large. In late 1934, Hoover sent Davis a copy of a nine-page speech he had delivered at the Attorney

570 J. Edgar Hoover, letter to Watson Davis, February 8, 1934, SIA RU7091, Box 155, Folder 1.
General's conference on crime, addressing the subject of "Detection and Apprehension—A Means of Prevention."\textsuperscript{571} In that address, Hoover declared that the nation was at a turning point in its fight to eradicate crime, but that it would take a strong system of authorities working together to thwart the "desperate men and equally desperate women" who had formed an "intricate system of fraternization among lawbreakers." In colorful language, Hoover celebrated the success of the Special Agents who had caught or killed well-known criminals such as John Dillinger, "Pretty Boy" Floyd, "Baby Face" Nelson, and numerous others. In order to empower his agents to outthink, outrun, and outgun evildoers, Hoover said, the FBI needed to be scientific. Its new agents were educated, well trained, able to enter the criminal mind, and trained in the Crime Laboratory on scientific methods of testing for bloodstains and ballistics, as well as the peculiarities of various guns. As Hoover put it, "we do not pursue men, we pursue facts." He described the 4,700,000 fingerprints on file and at the disposal of federal, state, and city agents and police. This was, he said, a "Library of Cooperation, an American Encyclopedia of Criminals."\textsuperscript{572}

Science Service staff knew that the subjects of gangsters, crime-hunters, and almost-magical forensic technology were guaranteed to draw readers. Even before the Davis-Hoover correspondence, \textit{Science News Letter} had already published occasional items on the techniques and significance of fingerprinting, as well as its biology. The subject continued to attract interest through the 1930s and the World War II era. For instance, a three-page article in \textit{Science News Letter} on the similarities and differences between twins, published in

\textsuperscript{571} J. Edgar Hoover, letter to Watson Davis, December 11, 1934, SIA RU7091, Box 155, Folder 1.
\textsuperscript{572} J. Edgar Hoover, "Detection and Apprehension: An address delivered by John Edgar Hoover, Director, Division of Investigation, U.S. Department of Justice, before the Attorney General's Conference on Crime, Washington, DC, December 11, 1934," SIA RU7091, Box 155, Folder 1.
January 1931, noted that the fingerprints of twins were slightly different, but that even experts had difficulty determining which twin had made the print. A June 1932 article struck a slightly alarmist note in calling kidnappings "frequent," (the Lindbergh baby kidnapping occurred March 1, 1932), and described the process by which individuals could take their own fingerprints at home for possible use in identification. According to the article, no date for the print was necessary because fingerprints stayed the same from birth until after death. Other articles in *Science News Letter* specifically publicized the fingerprinting work of government experts; one piece explained the punch card system being used by the Department of Justice to sort and store data, while another speculated that in the face of such science, future criminals might resort to deliberately contracting leprosy, which obliterates fingerprints, to avoid being identified. A 1936 *Science News Letter* described the many different machines and processes the FBI was using to fight crime, including microscopes to examine fingerprints, photography, x-rays, and chemistry to evaluate blood and other substances. By 1939, *Science News Letter* described the new, specially built precision microscope the FBI was using, capable of magnifying samples 1,125 times, that

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could evaluate "a single hair from the clutched hand of a victim." As always, newspapers around the country had the option to reprint such Science Service material, and for one, the *Pittsburgh Press* reprinted that microscope piece, under the attention-grabbing headline, “Crime Found in Split Hair.”

Fingerprints were a topic with guaranteed public interest that also served the strategic institutional ends of both Science Service and the FBI. In corresponding with Davis, Hoover recognized Science Service as an important vehicle for publicizing his vision of modern investigation in partnership with science. Washington, DC was a town that thrived on connections and influence, and it may be that, friendship aside, Hoover and Davis had a mutually beneficial professional relationship that helped give credibility to each other's endeavors. Science Service had a wealth of science professionals on whom it could call for advice and information on the latest discoveries and techniques, and the FBI was seeking every advantage it could find to aid in its mission of ending crime. Hoover had the federal government's authority and endorsement to pursue his agency's activities, and Science Service was seeking new and true uses of science that it could share with its readers to keep them engaged and to support the organization's assertion that science had meaning and value for the average citizen. Both Hoover at the FBI and Davis at Science Service wanted to associate their organizations with the latest scientific advances, publicizing that commitment as a way to gain clout and credibility. The link between the two groups continued even after World War II, when Science Service continued to publicize the FBI’s latest scientific

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advances in crime-fighting. A 1945 *Science News Letter* article noted that new highly sensitive plastics were available to replace plaster of Paris for making impressions, sensitive enough to allow the taking of fingerprints from a plastic cast of a hand.\(^{580}\)

For Science Service, covering news of developments in criminal detection and apprehension provided the opportunity to delve into exciting and sensational material without compromising the organization's journalistic standards. Here were examples of science that were nearly as exciting and dramatic as the "cops and robbers" movies so popular at the time. That the FBI willingly shared some information with Science Service added to the credibility of not only the stories but also of Science Service as a reliable resource for the public. If no less than J. Edgar Hoover trusted Science Service, so could the average citizen.

**Consumers Union**

Despite its growing reputation for credible and trustworthy science news, not all of the comments and correspondence that Science Service received was complimentary or positive. Some readers sent letters asking for clarification, or challenging Science Service to rethink its position on something. Other times the tone was more accusatory; some people or organizations took exception to advertising that appeared in the *Science News Letter*. Others objected to the particular stances—even implied stances—that Science Service took on

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topics. Other reactions proved downright hostile, from critics who implied some damage had resulted from the editorial and management choices, and implied that legal action might follow, as in the cigarette nicotine case of the late 1920s discussed in the previous chapter. Such criticism represented the flip side of the visibility Science Service had achieved as the voice for science news—a voice that people listened to. As a high-profile organization and a national source linking the science community with the larger public, Science Service came under close scrutiny, and opened itself up to criticism when it appeared to endorse or support controversial products, ideas, or interpretations.

Almost from the beginning, Science Service had accepted a small amount of advertising in its Science News-Letter, mostly for science books or science equipment. The January 1927 Science News-Letter included a small advertisement for two books. The New Universe by Baker Brownell, was described as suggesting "a world view of things and discusses the deep relationship of man's modern, scientific, social, spiritual, artistic, and philosophical problems; and Stories in the Stone by Willis T. Lee, a "personally conducted tour" of rock formations to trace the Earth's development. Other early advertisements included the Popular Guide to Radio, and pocket microscopes. However, with the mandate of being self-supporting as much and as soon as possible, the organization increasingly accepted other types of advertising that the staff deemed consistent with the intent and mission of Science Service. A June 1928 advertisement featured the Leica "Universal Camera," small enough to fit in a vest pocket, and capable of providing negatives.
that could be used to make transparency rolls up to ten feet for classroom instruction. Also, the Williams and Wilkins Company was a frequent advertiser of a variety of books in *Science News-Letter*. The book company's March 2, 1929 two-thirds page ad had a bold headline, "The Urgent Issue of Sex Education." It listed five books described as "reliable, unemotional books on various aspects of the most discussed question in history. Titles included: *The Hygiene of Sex*, *The Invert* (homosexuality or that "topsy-turvy condition"), *Problems of Human Reproduction*, *Conservation of the Family* on the biological reasons supporting monogamy, and *Birth Control*, from a "symposium of twelve authorities." That practice of taking less traditional forms of advertising sparked a revealing controversy, when readers expressed dissatisfaction with the advertising that the *Science News Letter* ran for the Consumers Union of the United States.

In the late nineteenth century, consumer activists began working to expose the hidden dangers consumers faced, including unsanitary food items, the practice of false or inaccurate labeling, and excessively high costs. Progressive Era sensibilities fit neatly with activists' desire to educate and inspire, some would say incite, consumers to demand information about the growing list of products they were being offered. The consumer movement of the 1930s was "unprecedented in its diversity and prominence," according to historian Lawrence B. Glickman, author of *Buying Power: A History of Consumer Activism in America*. During that era, Ruth Brindze wrote a consumer column in the *Nation*, and the many consumer organizations and cooperatives spawned a host of pamphlets and magazines, including

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Consumers' Digest, Consumer, Woman Shopper, Consumer Shopping News, Organized Consumer, Consumer Education, and Consumers' Guide. Glickman speculated that this focus on consumption, while seemingly inconsistent with the deprivation of the Great Depression, originated in politicians' and other intellectuals' assertions that consumption was a root cause of the depression and that national prosperity demanded development of a "consumerist political economy." During the 1930s, John Cassels, director of the Institute for Consumer Education, called for a "science of consumption," while other advocates hoped that a consumer movement would stabilize economic trends and help erase class distinctions, at least where consumptive power was concerned. To that end, Stuart Chase, an accountant, and F.J. Schlink, an engineer, wrote the popular 1927 book *Your Money's Worth*. Its main premise was that "ordinary consumers—ignorant of the workings of the large corporations that produced the nation's consumer goods—were being systematically bilked."

Chase and Schlink saw themselves as men of science, and presented themselves as experts capable of guiding consumers to wise decisions. At the urging of their readers, the two men established Consumers' Research (CR) in 1929, a subscription service and the "world's first consumer-product-testing service." With a staff of skilled and educated technical and professional investigators working in its laboratories, CR had 58,000 subscribers to its newsletter by 1935. The group recommended or criticized specific products by brand, which, while helpful to consumers, was particularly irksome to businesses. The business press accused CR of trying to turn female consumers into "militant activists." For its

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part, CR was very careful to distance itself from radical social movements, and even other consumer movement activities. Its leaders considered consumption a personal, not social or class-based, activity. Historian Charles F. McGovern, author of *Sold American: Consumption and Citizenship, 1890-1945*, has maintained that a large part of the reason Consumers' Research refused to affiliate itself with other consumer movements and efforts was Schlink's "autocratic manner and inability to work with others that made him a menace rather than a friend to the consumer." CR saw themselves as leaders not needing a popular movement with which to associate to be credible. Nor did they think that consumers could achieve the scientific insights necessary for responsible consumption on their own, despite such assertions by groups like the League of Women Shoppers.

Though Consumers' Research prospectus declared that it "holds no brief for any particular kind of economic conduct or social or political order," McGovern noted that its assumptions about the marketplace led the group to a critique of American capitalism. The organization counseled members to read labels, question merchants, learn sales tactics, and become discriminating readers of advertisements. And of paramount concern, according to

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McGovern, CR material "urged consumers to remember always that neither manufacturers nor retailers operated for the public's benefit." Along with their own expertise, the staff worked with an outside circle of scientists and professors, and the organization also had a good working relationship with scientists at the National Bureau of Standards, Electrical Testing Labs, universities, state extension bureaus, and some manufacturers. They focused on functionality, efficiency, safety, durability, expense, packaging, and product benefits, though not the labor conditions under which the products were manufactured. Subscribers paid one dollar a year for a bimonthly news bulletin, and had to adhere to a confidentiality pledge that barred subscribers from sharing the information with anyone outside their immediate families. Libraries and other institutional subscribers could obtain a General Bulletin not containing specific product tests but filled with practical information.\[591\]

In 1935, CR fired three workers for forming a union chapter, and forty-one clerical and technical workers, tired of low wages, poor working conditions, and Schlink's difficult managerial style, walked off the job in support. Workers walked the picket line for months, with support from other consumer groups such as the League of Women Shoppers. The workers saw it as a "struggle for the soul of the consumer movement," and condemned management for its hypocrisy in failing to support the worker-consumer. Businesses, the business press, and "right-wing red hunter" Elizabeth Dilling, found it amusing and even thrilling that such dissention had befallen Consumers' Research, an event that Glickman has referred to as "the strike in the Temple of Consumption." In 1936 the National Labor Relations Board found CR guilty of engaging in unfair labor practices and ordered the

workers reinstated with back pay. In 1936, rather than return to the CR, a group of strikers decided to form their own organization, Consumers Union (CU), in New York.⁵⁹²

Consumers Union hoped to avoid the problems that befell CR by taking a pro-labor approach, charging less for membership, and focusing not only on the products' qualities but also the working conditions under which they were produced.⁵⁹³ A 1936 announcement in Printers’ Ink, placed by the organization itself, mentioned that two of its directors and officers had previously been involved with Consumers' Research, Inc. "until it suffered capitalistic pains in the form of a strike."⁵⁹⁴ Later advertising explained that Consumers Union was a strictly non-profit corporation formed under New York law to give consumers "accurate, trustworthy information—based on laboratory and actual use tests conducted by expert staff technicians and impartial consultants—on the comparative value of competing brands of widely-advertised products."⁵⁹⁵ CU cooperated with other consumer-focused groups and encouraged member participation. The group made efforts to reach low-income workers by producing a low-price, limited-focus edition for subscribers who could not afford the three-dollar annual rate for its publication, Consumers Union Reports. CU valued its connections with the labor movement,⁵⁹⁶ although it worked to remove suspected leftists

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Starting in late 1936, Consumers Union began running advertisements in *Science News Letter*, promoting its mission of helping Americans make informed, wise purchasing decisions. One of the first ads offered consumers assistance in comparing electric shavers, men's shirts, fuel (coal as opposed to oil), and tooth pastes and powders.598 Another ad in January 1937 carried the headline, "Are Nose Drops Safe?" and claimed that of the thousands of children who would die of pneumonia in the current and coming years, hundreds of those deaths might be caused by the nose drops parents gave their children. The ad promised that a subscription to the monthly *Consumers Union Reports* would include an article naming the dangerous brands by name so unwitting parents could better protect their children.599

Such advertisements seemed noncontroversial enough and politically innocuous. But in December 1936, O.E. Norman, the Superintendent of the Education & Library Division of The Peoples Gas Light and Coke Company of Chicago, sent a complaint letter to Watson Davis. Pointing to the Consumers Union list of board members and officers, Norman alleged that seven or eight of them had been connected to Communist activities. As evidence, Norman offered page-number references from the book, *The Red Network* by Elizabeth Dilling.600 Norman told Davis it seemed fairly obvious that the two organizations, the new

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Consumers Union of the United States and the defunct Consumers' Research, "are dominated by radicals whose main purpose is to subtly undermine the confidence of the American buying public." Norman suggested that Davis could find further damning evidence against Consumers Union in the U. S. Chamber of Commerce reports on "Sub-Versive Organizations." He asked Davis if Science Service really wanted to "communistically aid and abet dominated organizations by inviting readers of your high grade magazine to subscribe, to services which seem to be so highly sub-verseive."⁶⁰¹

In response to this challenge, Davis assured Norman that Science Service had no intent of supporting any illegal activity, but that he had personally seen reports issued by both Consumers Union and Consumers' Research, which showed him nothing subversive "in any illegal sense." Indeed, Davis suggested, these organizations were "conducting a business in just the same way that the Peoples Gas Light and Coke Company is in the sense that they are rendering a service to their clientele and being paid for it." More than that, Davis suggested, in order to maintain American freedom, the First Amendment of the Constitution promoted a spirit of democracy in which "we should all strive to prevent limitation of the freedom of discussion and inquiry." Davis concluded:

> It does not seem to me that the political affiliation of officers or organizations or corporations should enter in any way into the question of whether advertising of such organizations should be accepted by the magazine.⁶⁰²

As it turned out, Norman’s letter of protest did not represent an isolated complaint. On January 8, 1937, Science Service received a letter from Elvin Killheffer, of E. I. Dupont DeNemours & Company, who said that he was surprised to see the page of advertisement for

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⁶⁰¹ O. E. Norman, letter to Watson Davis, December 3, 1936, SIA RU7091, Box 183, Folder 10.
⁶⁰² Watson Davis, letter to O. E. Norman, January 12, 1937, SIA RU7091, Box 183, Folder 10.
the Consumers Union in the previous week's edition of *Science News Letter*. The advertisement in question focused on nose drops, vacuum cleaners, fountain pens, and electric irons.\(^603\) Killheffer queried Davis as to whether he had actually seen any of the Consumer Union's editions, whether he knew who the people were who published it, and if he believed that they confined themselves to the facts. Killheffer wrote, "I personally have been taking their publication for some time and about the last place that I would expect to see an advertisement about it is in a publication devoted to science."\(^604\)

In his response letter, Watson Davis again personalized his retort by referring to the situation in terms that could easily apply to his critic, saying, "it seems to me that what they..."

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\(^604\) Elvin H. Killheffer, letter to Watson Davis, January 8, 1937, SIA RU7091, Box 183, Folder 10.
are attempting to do is to make the same critical examination of consumers goods that the purchasing agent of an institution or corporation would do if that institution or organization had a testing laboratory." Davis admitted that he was not qualified to attest to the complete accuracy of Consumers Union claims any more than he could speak authoritatively on the medical and chemical research that Science Service published. But Davis said he believed that readers were welcome to challenge Consumers Union on any supposed factual errors and expect that organization to correct any mistakes. Davis concluded, "I see no particular harm in allowing intelligent people, such as subscribers of the *Science News Letter* seem to be, to use their judgment as to whether they want to read Consumers Union reports."  

A final challenge to the Consumers Union advertising came at about the same time, from A.C. Spetnagel of Chillicothe, Ohio, who declared that his hardware company was "strongly against consumer cooperatives." Spetnagel wanted to know if this was paid advertising, or "are you in favor of the Consumers Union of U. S. and consumer cooperatives in general?" After receiving a response from Science Service, Spetnagel wrote back to thank Davis for being "frank" about carrying the advertising. Spetnagel remained disappointed that Science Service accepted advertising "of this class," since he considered organizations such as Consumers Union to be acting "strictly against the independently owned and operated businesses of The United States. Businesses of all kinds are hampered enough." Spetnagel admitted that perhaps it was not his place to criticize the type of

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605 Watson Davis, letter to Elvin H. Killheffer, January 12, 1937, SIA RU7091, Box 183, Folder 10.
advertising the organization accepted, but said he hoped that Science Service would reconsider.\textsuperscript{607}

Science Service continued to print Consumers Union advertising through 1940, ads that offered readers a CU membership to obtain buying advice on electric shavers, radios, cars, gloves, men's suits, and other everyday items. But the episode illustrated the riskiness of venturing into areas outside the pure physical and natural sciences (even in accepting paid advertisements), the same factor that had made Davis and other dubious about reporting on the social sciences. Science Service had worked to build up its reputation as a credible source of facts, but in the political climate of the Depression period, anything hinting at politics could rouse controversy. Regardless of the charges of Communism, Consumers Union did operate from an openly left-wing perspective. The organization sought to cultivate a good relationship with the labor movement and issued special appeals to working-class Americans, which made it inherently suspicious in many eyes. Schlink, bitter after the strike at Consumers' Research and the way his organization was subsequently eclipsed by Consumers Union, became a devoted anticommunist. Certain that anyone associated with CU was a communist, or at least suspect, he kept a "Red Rope" file on consumer groups and activists with supposed ties to communism.\textsuperscript{608} In an era of "guilt by association," sometimes an accusation was as good as confirmation. All of the men who wrote to Watson Davis were businessmen, and during the 1930s, the business community had first been thrown on the defensive, and then went on the offense, attacking anyone and anything seeming to question free enterprise.

\textsuperscript{607} A.C. Spetnagel, letter to Watson Davis, January 28, 1937, SIA RU7091, Box 183, Folder 10.
Franklin D. Roosevelt's relationship with the business community was troubled from the beginning. According to historian Robert S. McElvaine, although Roosevelt came from a wealthy background, he never considered himself in league with the "money-makers," largely because his ancestors had already made his money. When he referred to "these millionaires," he portrayed himself to the public as an outsider to wealth while garnering the accusation of being a traitor to his class from other moneyed people.609 From the beginning of the Depression, businessmen had been blamed for the downfall, and any hopes they had of that changing soon were dashed by the election of Roosevelt in 1932. His campaign reflected the mood of the country when he charged that a small group of selfish opportunists had manipulated banking and business, and that the restoration of economic order would include a "wiser, more equitable distribution of the national income."610 With the implementation of the National Recovery Administration (NRA) in June 1933, anxious businessmen were forced to accept that the climate of laissez faire had ended and government, to what extent yet unknown, would be much more involved. The largest businesses in each industry were allowed to participate in establishing reasonable prices for goods, but had to accept labor reforms—minimum wages, maximum hours, improved working conditions, elimination of child labor—they had resisted for decades.611 For a number of reasons, including business manipulation of the codes that guaranteed their profits but undercut purchasing power for the consumer, the NRA was a failure. In 1935, in the case of Schecter Poultry Corp. v. United States, the Supreme Court ruled the NRA a misuse of legislative power and the program

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610 Ibid., 127.
611 Ibid., 158-9.
According to McElvaine, businessmen hesitated to oppose the president in the earliest
days of his first administration; his prestige was on the rise while theirs had suffered
tremendously. Some of the programs were actually acceptable to business leaders, and even
as the First Hundred Days brought new legislation, business resisted openly opposing
Roosevelt. Historian T.H. Watkins has described businessmen and industrialists as having
"demonstrated a kind of terrified passivity" in the beginning, but within months, many came
to regret having "relinquished their nearly untrammeled power over the economy." Facing
pending new regulation of the stock exchange, and the transfer of air mail concessions from
private carriers to the Army Air Corps, businessmen vigorously charged that Roosevelt's
liberal and power-hungry "Brain Trusters" represented communism at work. Roosevelt's
1935 re-election campaign proposals to dissolve any utility companies that could not prove
they served a valid economic purpose became the breaking point between the president and
businessmen. That April, the United States Chamber of Commerce voted to oppose the
president's list of progressive proposals, and accused him of trying to "Sovietize America." Watkins maintained that most businessmen saw the regulatory programs as "the tactics of a
government out to enslave business, stifle free enterprise, pander to the demands of radicals
of all stripes, and give labor the power to dictate wages, hours, and other matters most
businessmen and industrialists still believed the legitimate province of enlightened

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612 Ibid., 160-2.
613 Ibid., 251.
Roosevelt’s 1935 call for a "cradle-to-grave" social insurance program, which became the Social Security Administration, brought more accusations of "socialism" from businessmen. He campaigned against business's "entrenched greed" and their desire to regain "selfish power." Some angry businessmen responded by distributing messages in employee's paychecks saying the new Social Security tax would require them to wear metal identification dogtags, and there was no guarantee they would ever recoup their payroll deductions. By the time of the 1936 election, and with Roosevelt's call for a new tax on undistributed corporate profits, the relationship between the president and business was broken.

Roosevelt’s New Deal alignment with working class sentiments and public criticisms of business rekindled American tensions over communism, already seen in the “Red Scare” of the previous decade. Evidence suggests that Communist Party membership rose from 9,000 in 1931 to 75,000 by 1938. In fact, the number may have been higher because, as historian Michael J. Heale noted, membership in the party could turn over by as much as fifty percent in a year. The Communist Party organized Unemployed Councils to agitate for jobs, displayed their flag at a children's camp, demonstrated on behalf of the Scottsboro boys, and

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619 Ibid., 360.
agitated at labor demonstrations.\textsuperscript{620} According to Heale, Communists were, in fact, attempting to gain influence with members of the government during this period, adding legitimacy to popular accusations and concerns.\textsuperscript{621} In the early 1930s, states resurrected their World War I anti-subversion laws to break up suspected communist demonstrations. Publications, such as Dilling's 1935 book \textit{The Red Network}, circulated lists of organizations supposedly influenced or infiltrated by communism, predicting the downfall of America.\textsuperscript{622}

As the Depression heightened these tensions over class identity, political power, and economic philosophy, then, the conflicts spilled over into many areas of life. Science Service, whose stated policy was to avoid all forms of propaganda, had made a pragmatic business decision to carry the Consumers Union advertising, part of the organization’s broader aim to maintain, financial stability. Yet that seemingly unbiased decision left Science Service open to charges of possible communist sympathy, due to Consumers Union's pro-labor stance and businessmen’s extreme sensitivity to any perceived attacks.

As any organization gains public visibility, of course, it is almost inevitable for it to receive letters of complaint, justified or not. But the significance of the 1930s controversy over Consumers Union advertising in \textit{Science News Letter} reflected a far deeper phenomenon. Ever since the mid-nineteenth century, American advocates of scientific and technological development had grown increasingly close to the nation’s business community.

Establishment and expansion of research laboratories at General Electric, Bell Telephone, General Motors, DuPont, and many other major corporations seemed to underline

\textsuperscript{621} Ibid., 99.
\textsuperscript{622} Ibid., 105-07. Also see, Larry Ceplair, \textit{Anti-Communism in Twentieth-Century America: A Critical History} (Santa Barbara: Praeger, 2011), 33-52.
the idea that scientists and engineers could transform abstract knowledge into tangible benefits by working hand in hand with large companies. The Roaring Twenties supported a faith that the partnership of science, engineering, and business could promote seemingly-endless United States progress, manifested in a continued stream of economic growth and new, exciting, and affordable consumer goods. The nation’s economic crash suddenly called into question these assumptions that science and engineering should regard themselves as allies of corporate interests and that this alliance was guaranteed to increase American well-being. The Depression highlighted this question of the proper relationship between science and the conservative business establishment, in a highly public debate over the issue of “technological unemployment,” a controversy that soon drew in Science Service.

Science Service and the "Technological Unemployment" Debate

The organization continued to gain an audience and credibility through the 1930s, in part by experimenting with new forms of public outreach. In the process, Science Service engaged with, and helped shape, national discussions about the social context of science, including the public debate over the issue of “technological unemployment.” The leaders of Science Service might prefer to think of their work as objective and non-partisan, but in the eyes of many critics, economic tensions during the Depression raised new issues about the political implications of science’s alliance with American business.

By the beginning of the 1930s, many people had developed a love/hate relationship with "progress," believing both in the promise of modern science and technology in American life, but also that something had at least temporarily gone wrong, that overly rapid technological change might be at least partly responsible for many of the country's problems.
Economic depression conditions, high unemployment, uncertainty about the future, and the increasingly fast pace of life, left many wondering where to find answers and where to place blame. Science, as the source of research that led to many technological and industrial changes, and engineering, the activity of converting theories and substances into physical systems, processes, and products, sometimes bore the brunt of people's frustrations and fears.

Historian Amy Sue Bix has addressed the issue of technological unemployment during the Great Depression in her book, *Inventing Ourselves Out of Jobs?: America's Debate Over Technological Unemployment, 1921-1981*. According to Bix, one instigator of the science/engineering versus society debate was sociologist William Fielding Ogburn.623 Ogburn's 1922 book, *Social Change with Respect to Culture and Original Nature*, acknowledged the influence of science and engineering on economic and other social factors of modern life. At the same time, Ogburn posited a theory of "cultural lag," when the pace of change outstripped society's ability to adjust, leaving many aspects of life—particularly employment—in serious jeopardy. Once the Depression set in, many observers linked the spread of job loss to Ogburn's “cultural lag” theory, fearing that mechanization displaced workers faster than business could create new jobs, leading to “technological unemployment.” Earlier in the century, Taylorism, the efficiency movement that transformed the factory floor and sometimes the home, had increased productivity while alienating workers. The growing profession of industrial engineering had promoted the idea that modernization could keep accelerating the pace of business, turning out more and better products.

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material goods at more affordable prices. But with the Depression, critics warned that
workers were paying the price for technological change, blaming it for job cuts in fields as
wide ranging as brickmaking, road laying, restaurant cooking, farming, and the musical
entertainment field.

Discussions of technological unemployment occupied pages in American newspapers
and magazines, fueled heated political debate, and drew attention from both labor unions and
the general public. That focus left scientists and engineers concerned about possible public
backlash, and perhaps even calls for a moratorium on science research and technological
development, as people confronted the changing realities of the workplace and economy.624
In a combination of self-interested protectiveness and genuine concern, scientists and
gineers formed committees to consider the ramifications of their work and what
responsibility, if any, they should feel for its results. To head off any Depression-era calls for
slowing the pace of scientific and technological innovation, scientists and engineers staged
public events essentially designed to portray anyone who doubted the benefits of scientific
and technological progress as either ignorant or a troublemaker.625 Significantly, two of the
scientists who led the effort to downplay and counter talk of technological unemployment
were physicists Robert Millikan and Karl Compton, both closely affiliated with Science
Service.

As an organization dedicated to presenting a positive image of science, Science
Service's publications rarely highlighted possible negative outcomes of science and
technology. One exception was a 1932 article in Science News Letter detailing the 70,000

624 Amy Sue Bix, Inventing Ourselves Out of Jobs?: America's Debate Over Technological
625 Ibid.,183.
telephone operators, or two-thirds of the operator workforce, reportedly displaced by the implementation of the dial telephone system. The article took no position on the conversion except to note that the public was growing "more fully accustomed to spinning the dial." But otherwise, the Science Service perspective echoed arguments presented by leading scientists themselves, such as Millikan and Compton, who meant to bolster public confidence in the future as envisioned and engendered by science and technology. In a 1934 article, Science Service writers asserted that national science leaders were "armed with facts" to show that new industries created through scientific and technological innovations employed more people than the old industries they replaced. In that piece, *Science News* Letter also reprinted President Roosevelt's brief and lukewarm endorsement of the connection between scientific research and national progress, where Roosevelt said there was reason to question whether science was responsible for the current economic ills. According to the president, it was more accurate to say that, "the fruits of current scientific thought and development, properly directed, can help revive industry and markets for raw materials."627

As an organization intended both to support the work of science and to promote its public appreciation, Science Service threw its weight behind the effort to discredit talk of "technological unemployment" and to reassure Americans that over the long run, scientific research and technological development would bring prosperity and progress. In November 1936, Science Service joined the American Society of Mechanical Engineers (ASME) in mounting a Centennial Celebration of the American Patent System. The lavish pageant and

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associated publicity all aimed to highlight triumphs of engineering. As part of the Centennial Celebration, Science Service leader Watson Davis staged a “Research Parade,” which added a narration of progress to an evening of live science demonstrations. That event, held at the National Academy of Science in Washington, DC, spotlighted thirteen areas of present-day research that seemed to promise future industrial growth and consumer benefits including direct current transmission, solar power, polarized light, inaudible sound, sound reproduction, the electron image tube, new testing methods for consumer products, glandular extracts, lignin—a cellulose forest product, chloroprene (synthetic) rubber, new forms of glass, and synthetic fibers. In its publicity for the Science Service “Research Parade,” Science News Letter described all these innovations as "scientific infants," areas for exploration that promised to grow into entirely new industries and consumer goods, showing the potential of such "children of [the] laboratory."\(^{628}\)

As befitted a celebration of the American patent system, Science Service and the ASME climaxed the evening by hosting a banquet at the Hotel Mayflower, where the menu consisted entirely of patented foods. Guests received tickets that were "licenses" to eat the food from the companies holding the patents on the food products. Watson Davis described the dinner as exemplifying "the achievements of science and invention which have made it possible to prepare an entire meal without thought of season, distance and climate."\(^{629}\)

Watson's use of the term "invention," to describe the food products achieved through the


application of science to new and emerging processes, can also be interpreted as acknowledging the role of *technology* in scientific developments. This public acknowledgement noting the interdependence between science and technology reflected a trend for Science Service to direct increasing attention to technology, a trend that would accelerate later, when Science Service published material appealing for greater financial support for science after the Second World War.

In claiming natural links between science, engineering, patenting, business, and national progress, Science Service and the ASME used rhetoric and imagery that drew a sharp contrast between the past and present, and that highlighted the promise of a future made bright by science. The musical entertainment consisted of both an 1840 melodeon and the newest Hammond electrical organ. The lighting in the banquet hall began entirely with candlelight to simulate 1836 conditions, then became bright with the intensity of a photoelectric cell that used enough electricity to power all of the hotel's needs that night for elevators, lighting, and air conditioning. Overhead, an airliner's short wave broadcast honored the great inventors of the century. The message was that science meant progress, and progress was good. For supporters who could not make it to Washington, DC, Science Service staged similar, if less grand, dinners and ceremonies in ten other large cities as well.630

National heroes of invention attended the Science Service/ASME patent system’s centennial, including aviation pioneer Orville Wright; Leo H. Baekeland, chemist and inventor of an early plastic; William D. Coolidge, physicist and inventor of the improved x-
ray tube; and Lee DeForest, radio pioneer and inventor of vacuum tubes. The spectacle and presence of so many noteworthy men of science and industry drew significant press coverage to this Science Service event. For example, the New York Times ran numerous pieces with headlines such as "Patent Centennial Peers Into Future," "Scientists Hail Patent Centenary," and "Roosevelt Praises Fete."

From the perspective of Science Service and its allied science boosters such as Compton and Millikan, the Depression had, if anything, reinforced the urgency of getting Americans to appreciate the value of scientific research and technical development, not just in spurring long-term business growth, but in advancing American democratic strengths. In 1937, the American Institute of the City of New York presented an award to Watson Davis, citing the way that Science Service had “played such a tremendous part in bringing together science and the human beings over which science holds sway.” G.B. Parker, editor-in-chief of the Scripps-Howard newspapers, noted that "newspapers… reached millions where scientific magazines reached scores." He proclaimed that in fostering the cooperation of scientists and the press to help people realize the many benefits of science, Davis and his colleagues had performed a "vast public service." Davis seized the occasion to reinforce the principles behind Science Service, speaking about fundamental and applied science as potential saviors of civilization, leading to better living and more effective democracy. In

speaking to the American Institute, Davis cautioned that while “not even science must be allowed to become a dictator,” scientific work illustrated the world’s most sound thinking. He remained confident that the processes of democracy would bring about an appreciation and utilization of science in every-day life.635

In continuing to assert the value of science throughout the Depression, Science Service worked with, and through its publicity, and boosted similar efforts by other scientific organizations. For example, Science News Letter announced the AAAS's plan to launch a two-year study of the impact of science on society, in which AAAS conferences would address subjects such as the way science affected living standards and the economic system.636 Through these efforts, Science Service not only increased its own credibility and influence of Science Service, but also strengthened the allied organizations that it supported, the profession of science journalism, and the cause of science popularization.

As it turned out, American involvement with World War II swept away Depression-era concerns about technological unemployment and about the relationship between scientists, engineers, and business. More than that, the international crisis gave Science Service the most powerful rhetorical weapon of all, the patriotic claim that science journalism served the war effort by helping ordinary people understand and appreciate the value of science in helping defend democracy and freedom not just in the United States, but around the globe.

CHAPTER 8

1940s Case Studies

As the 1930s ended, Science Service was well established and on solid ground. The organization had withstood the Great Depression with very little financial impact. The normal office functions associated with business—trying to attract new customers, creating and enforcing office rules, budget concerns—all took place against the backdrop of the increasing business and government activity in Washington, DC as the situation in Europe worsened and war loomed. Science Service had continued to expand its reach, both in the scientific community and in the press, and was gaining the confidence of science professionals as well as the public. In short, evidence seemed to confirm that Science Service had made substantial progress in fulfilling its mandate to create and support regular distribution of the latest news of research and developments, explained in terms that ordinary readers could appreciate—the essence of a modern science journalism with national reach.

Science Service Anticipates the Next World War

As the 1940s began, the Science News Letter continued to gain circulation; by late November 1940, it had nearly 35,000 individual subscribers, 1,000 extra compared to the same point the year before. Science Service was still the world's only science news syndicate, serving 200 magazines and newspapers in the United States, Canada, Europe, Asia, and Australia, and while the print article business was on solid footing, the Science News Letter had outpaced the newspaper syndicate. Subscriptions to the news letter also gave

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637 Watson Davis, Information Memorandum on Progress of Science Service, November 5, 1940, RU 7091, Box 5, Folder 1.
Science Service a more reliable method of measuring reader interest, since these were subscriptions sought out and paid for by individuals and institutions. These subscription statistics provided Science Service with a more accurate indication of the public's demand for science news than the newspapers' circulation estimates, which ultimately spoke only to the number of people who might see the newspaper, not the number of people seeking or reading science news.

Through these two mechanisms, Science Service had an extensive reach to, and influence over, the reading public. That was especially true during the 1940s, when war-related news understandably occupied more space in the news letter as conditions worsened in Europe, and the United States officially entered the war. Science Service was in the position to not only provide news of science as applied to the war, but also to shape and influence the public's opinions by what they chose to present and how they interpreted that material. Examining a sampling of news letters, published shortly before, during, and after World War II makes it possible to discern trends, tones, and intent as Science Service wielded that weapon known to be mightier than the sword—the pen.

From the start, Science Service had an agenda of promoting the value of scientific research to the American public in general. Accordingly, the organization’s reporting paid close attention to how much support the United States offered for scientific research, in what fields, and on what conditions. In the mid-1930s, Science Service articles appeared in subscribing newspapers, and in many Science News Letter articles based on that newspaper material, that addressed national and international concerns about the possibility of another war. These articles focused on perceived threats to science research, funding for that research, and developments in various government departments and public committees
related to research and preparedness. The *Science News Letter* for July 15, 1933, decried the closing of several laboratories because of reduced funding, including the Altitude Laboratory at the National Bureau of Standards (NBS) where engineers tested airplane motors on the ground under conditions similar to those of high altitudes.638 The same edition sarcastically criticized the federal government's "economy" move to close the NBS photographic film laboratory, a facility that the article described as having taken a decade to build, and the closing of which would yield only $10,000 in savings. The article highlighted defense-related implications, warning that the closure would leave the government to rely on a handful of commercial film companies whose knowledge of the special requirements of military filming was limited. According to the article, "In peace time, this is a serious situation. In war time, it might be disastrous."639 Another article in the same edition sounded an alarming tone with the headline, "Public Safety In Air Endangered By Slashes." To save $60,000, the government was firing sixteen aviation engineers, aviation operators, and other skilled workers at the National Bureau of Standards testing plant in Arlington, Virginia, whose jobs had been to certify airplane engines as safe. The new plan trusted engine manufacturers themselves to certify their products as safe, with only one government inspector to oversee the whole process. Some aviators found news of this change disconcerting, according to Science Service writers, who warned that the loss of objective testing facilities threatened the safety of fliers and the flying public.640 The research cuts that Science Service documented

were not limited to the NBS; *Science Newsletter* bemoaned the prospect that the Bureau of Mines was slated to lose one-fourth of its personnel as well.641

Taking an uncommon approach, one Science Service article on the closing of the NBS Information Service on Metallurgy highlighted the pending discharge of a female research worker. As already noted, Science Service was tracking government employment of female scientists during the 1930s, and this particular piece began by stating that the staff being fired by the federal government "does not consist of long-haired men with peculiar notions," referring to a common stereotype of scientists. Instead, it described Marjorie G. Lorentz as "typical of young woman scientists who are being dismissed," suggesting she was one of several. According to the article, Lorentz had experimented with many sorts of metals and reagents, had made convenient tables showing the best reagent for use with each metal, and had her work published as part of the Bureau’s distribution of scientific papers. She also ran an exchange of information center for information on metallurgy, wrote abstracts for all the current publications on metallurgy, and indexed them in an "up-to-the-minute file" believed to be the only such information file on metallurgy open to the public in the U.S. She compiled several books on metals, as well as answering metallurgy questions via telephone calls and letters from the public, at the rate of over one hundred per month. In describing the role that Lorentz played in advancing and communicating knowledge about metallurgy, Science Service writers sought to document their conviction that federal cutbacks in funding seriously endangered American scientific work.642

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Given that since World War I, scientific research seemed to be tied increasingly tightly to government priorities and sponsorship, and given that Science Service itself was based in Washington, DC, it was natural and important for Science Service staff to closely monitor science-related developments in public policy. For example, a 1933 Science News Letter article praised President Roosevelt for appointing men with years of "experience as executives in charge of the nation's foremost scientific organizations and institutions" to join the Science Advisory Board of the National Research Council. Not coincidentally, several of those research leaders named to this nation’s high science position were also allies of Science Service itself; most notably, MIT President Karl Compton who had long been affiliated with Science Service.643

Effectively, the Science News Letter served as a vehicle for top researchers such as Compton to explain their convictions about why scientific work done by the NRC was

643 Science Service, "Roosevelt Appoints Science Advisory Board," The Science News-Letter 24, No. 645 (Aug. 19, 1933): 123-4, http://www.jstor.org/stable/3908846. In addition to Compton, other members of the Science Advisory Board in 1933 included W.W. Campbell, President, National Academy of Sciences; Isaiah Bowman, Chairman, National Research Council, and Director, American Geographical Society; Gano Dunn, President of J.G. White Engineering; Frank B. Jewett, Vice-President, American Telephone and Telegraph Company (AT&T), and President, Bell Telephone Laboratories; Charles F. Kettering, Vice-President, General Motors Corporation, and President, General Motors Research Corporation; C.K. Leith, Professor of Geology; John C. Merriam, President, Carnegie Institution of Washington; R.A. Millikan, Director, Norman Bridge Laboratory of Physics, and Chairman of the Executive Council, California Institute of Technology, Pasadena, California.
nationally valuable, especially in high-priority, top-secret areas. In October 1933, another News Letter piece claimed that while the Science Advisory Board had six committees of experts working on problems too "pressing and of a confidential nature" to reveal, experts in scientific, economic, social, and business realms were evaluating every problem from all points of view to arrive at the best recommendations to the government. As president of the Board, Compton explained that there were distinctions to be made between the technical services that the government would provide and those best left to private enterprise. Compton told Science Service reporters that the NRC was studying the wise selection of projects so as not to interfere with the country’s essential technical services and also evaluating the issues raised when it seemed advisable for government and private agencies to work together.644 Another article in Science News Letter the following year offered readers slightly more detail about areas of particular scientific interest to government researchers, which included weather forecasting, railroad activity, geological and mineralogical statistical information, industrial cooperation for the establishment of trade and commercial standards, surveying and mapping, and land use and soil erosion. In its presentation of these developments, Science Service seized the opportunity to stress that government was marshalling the nation’s top experts, both scientists and administrators, to undertake studies aimed at rapidly achieving effective approaches to the situation at hand. The article concluded by emphasizing that none of the committee or Board members were being compensated for their participation, to underline the idea of science in the nation’s service.645

In a follow-up piece at the end of 1935, Science Service emphasized that over its two-year term of appointment, the Science Advisory Board had made specific recommendations for more complete mapping efforts, topographic work designed to support all means of infrastructure and encourage commerce and industry, reforms to the patent procedure to reduce duplication and litigation, resolution of questions related to practical land use, and greater financial support for public health initiatives to eradicate disease.\(^{646}\)

Again, during the 1930s, Science Service directed Americans’ attention both to the constructive contributions that scientific experts were making under government auspices and to the danger that Depression-era budget cuts would endanger such progress in future. Discussion of such matters focused often on the topic of military readiness, especially as the decade progressed, within the context of rising international tensions. *Science News Letter* articles, gleaned from the newspaper syndicate "Daily Mail Report," increased coverage related to advances in tactics, weaponry, and other war-related technologies, in anticipation of the next war. These articles served to both inform and reassure readers that the science community was working in tandem with the federal government, as well as with private institutions and laboratories, to meet the coming challenges of a war that might involve America directly, or at least its overseas allies. One 1933 article described the improvement in American-made bullets, further refining Germany’s development of a "boat tail" bullet during the First World War. Researchers working with the U.S. Army had created bullets with tapered ends resembling a boat's stern, resulting in higher velocity and accuracy,

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Similarly emphasizing that the American military could and should learn from foreign research (even that performed in potential enemy countries), a 1934 newsletter article reported on altitude studies conducted at a German hospital that revealed that for safety, aviators needed to carry carbon dioxide as well as oxygen when flying at high altitudes.648

By 1939, industrial mobilization and production in support of the Allies was helping fuel America's post-Depression economic rally, though it was still not clear the extent to which the U.S. might participate in immediate combat. The United States was gearing up for World War II, and Science Service was documenting further technical advances, such as the development of a 25-pound two-way facsimile unit that aviators could use to transmit vital intelligence about troop concentrations and gun emplacements, much faster than returning to base to deliver such information.649

Over the years leading up to America's entering World War II, the relationship between Science Service and the national press continued to evolve. While newspapers continued to carry Science Service articles dealing with science topics, and some articles related to scientific military developments, it does not appear that many printed—or openly credited—large amounts of Science Service material related to the war itself. During these months, newspapers were increasing their own coverage of the war, and editors may not have

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needed or desired this extra material. Or perhaps they truly did identify Science Service as a source of *science* news, and did not associate it as readily with more general news. Even so, evidence clearly shows that publishers around the country continued to draw on Science Service stories connecting scientific research to military concerns. To note just a few examples, the *Pittsburgh Press* in 1938 reprinted Science Service material regarding Russia's intent to convert Leningrad into a "gigantic naval base," as well as Watson Davis's editorial claiming that the "great men" of science felt pessimistic about civilization's ability to survive, culturally and intellectually, another world war. The *Berkeley Daily Gazette* carried a 1939 article by Science Service aviation writer Leonard H. Engle, who claimed that Italy's air tactic of approaching silently from the sea, used by Italian airmen during the Spanish Civil War, could actually "boomerang" against Italy during a new war, because so many of its major metropolitan centers were on the seacoast.

But again, while it is evident that Science Service continued to succeed in placing its reporting with national newspapers, it is in the *Science News Letter* where the clearest evidence of Science Service's war reporting is seen. To begin with, it is vital to recognize the significance of the fact that the organization actively chose to reproduce many of its war-related newspaper articles in its weekly news letter, rather than sticking only to basic science stories. That trend reflects the organization's attempt to meld and reflect readers' interests in current events as well as science news, its conviction that the importance of science lay in its social context and did not stop behind laboratory doors. Many of the news letter articles

focused on the strategic planning necessary for the war effort in the U.S. and abroad, while others pressed for continued financial support for scientific research. For instance, a 1939 piece noted that Britain was determined not to repeat the mistakes of World War I, when it had allowed British scientists to join the fighting forces indiscriminately, resulting in losses to research and the end of "brilliant career[s]." At the same time, the news letter reported that German science was on the decline, owing to tight controls on research and teaching, a pattern it documented by observing that German research journals were printing fewer articles by their own nationals and more articles by foreign contributors.

To reinforce its call for the American government and the American public to support scientific research as a crucial part of wartime preparation, Science News Letter compared the rhetoric regarding science and war as used by the U.S. ally Britain and the aggressor Germany. It quoted Nature, the leading British science journal, suggesting that scientific men in the United Kingdom were completely dedicated to the task of winning the war, saying, "science as an intellectual pursuit and discipline must remain in abeyance." Science Service writers quoted Nature, saying that Britain’s typical scientific researcher had decided to "lay aside his just misgivings whether the greatest force of the human intellect should thus be harnessed to the forces of destruction." Instead, "the energies, the abilities, and the knowledge of each and every individual with scientific training must be directed without remission to the service of the Allied cause." Next to that description of British wartime science, Science News Letter pointedly ran a column quoting Die Umschau, a widely read

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German weekly science publication, as saying, "German science and technology will support the Fuhrer 'to the utmost.'" Science Service added quotations from a supplementary leaflet, saying, "like the German workingman, the German scientist pledged himself to do his part toward the strengthening of the people." While the buildings and highways were obvious evidence of the Fuhrer's accomplishments, "less evident, but not less important, are the fruits of German science...German science and technology will venture every pledge."655 The implication was clear; if scientists in both the Allied and Axis powers had vowed to support their respective governments, the United States also needed to consciously mobilize all its intellectual and technical resources.

By 1939, the international situation had become grave enough that Science Service writers no longer criticized military spending for taking money away from scientific research without justification. Instead, Science News Letter increasingly linked research itself to the issue of preparedness, portraying American scientists as ready and eager to support war needs and help win the peace. For example, one September 1939 article reminded readers that preparations for the First World War had been unnecessarily hurried and costly, due to delays imposed by the isolationists who had pushed so hard for this country to stay out of the European conflict in 1914. Science Service called for Americans not to repeat that mistake, to pay more attention to science and technology, starting immediately, in recognition that the United States could, once again, be drawn into hostilities. To bring readers up to date on the latest weapons, Science News Letter printed lengthy discussions of the infantry rifle, the

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quick-firing light field gun, heavy artillery pieces mounted on railway carriages, hand grenades, and anti-tank weapons.656

Reassuring readers that America was more than ready for whatever was to come, several articles reported positive news on military-related research and development. One 1939 news letter article reported that the United States was well-prepared industrially to meet the coming challenges, that business managers had been made aware of the tasks assigned to them and were confident that they could meet expectations.657 Another article focused on the declaration by Vannevar Bush, president of the Carnegie Institution, that the protection of civilians was the primary duty of science during the current war emergency. Science Service reporters quoted Bush as saying, "the same science which saves life and renders it rich and full, also destroys it and renders it horrible." Science could both develop a terrible weapon and the defense against it, and it was the obligation of scientists to remain vigilant about preserving life, and not grow detached from the struggles people faced.658

Other Science News Letter articles from 1939 focused on some of the philosophical questions and issues related to the war. One article declared that the war was expected "to

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answer the biggest question in military science today: Can the airplane win a war?"  

Another article called upon scientists to help protect democracy by fighting their own inclinations toward propaganda, prejudice, and animosities. A third piece, bearing the provocative title, "How to Sell a War In Three Easy Lessons," described the moral lessons to be drawn from the World War I-era Committee on Public Information, as documented by newly released files of journalist George R. Creel. Science Service told readers that working with that old War Department material, Princeton researchers were documenting how Creel "sold America to the Allies." Pressuring newspapers to cooperate with their propaganda efforts, Creel and his aides secured 20,000 columns of news per week during the war, issued and distributed 75,000,000 pieces of literature by enlisting the cooperation of large groups such as the Boy Scouts, and generated interviews with military leaders, casualty lists, and a weekly digest of war news for smaller papers. Acknowledging that enormous effort, Science Service cited Creel's successful censoring and controlling of newspapers during the First World War as possibly providing a blueprint for methods that might be applied again, should the current threats turn into all out war for the United States.  

During 1940, Science News Letter military-related coverage continued. Articles detailed a wide range of topics, including the way that hospitals and medical schools were enthusiastically responding to the War Department's request to organize as they had for

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World War I, the fact that government might require "ham" radio operators to be fingerprinted at their local post office, and the way that federal agencies were using high-speed punch card systems to transfer employees to essential defense jobs. Another *Science News Letter* article identified three major medical problems America faced in arming for defense: bringing all potential draftees into acceptable physical condition; protecting the men in camps from health threats such as meningitis, influenza, pneumonia, syphilis, and other diseases; and recruiting, training, equipping, and assigning doctors, dentists, nurses, sanitary engineers and others for defense industries. A three-page article detailed America's food defense efforts, contrasted with European countries' fears that famine would devastate their population in the coming years. Citing the amount, variety, and safety of U.S. food supplies, Science Service authors traced the evolution of vitamin studies that had improved the overall quality of the American diet between World War I and World War II.

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Science Service also covered the tricky subject of how to keep scientific research and development going during a period of crisis. Observers already anticipated that wartime would create drastic shortages of personnel, especially those with higher education or other specialized credentials. The U.S. Employment Office had started efforts to recruit extra defense workers for private industry, while the U.S. Civil Service was scouting new employees for the actual government itself. The goal was to ensure that the country’s most skilled experts were optimally employed to advance national military readiness, not wasted in non-essential positions or drafted. Scientific leaders and educators pressured government to write such protections into policy, and as Science News Letter documented, in July 1940, the War Manpower Commission under the Office for Emergency Management created a new National Roster of Scientific and Specialized Personnel. That record-keeping effort registered scientists and specially trained experts in science-related fields, men and women who voluntarily submitted their professional and personal information, including details about their credentials, education, and even hobbies. Science Service implicitly assured readers that American researchers were eager to contribute to national welfare, noting that approximately 150,000 individuals had signed up over the first four months, and promoters hoped that the list would grow to as many as 500,000. In a 1941 progress report, Leonard Carmichael, President of Tufts College and Director of the National Roster program, explained that it was difficult at that early stage to determine the success in getting responses from scientific personnel. However, the first questionnaires, which were sent to physics and astronomy professionals, had already yielded 6,045 fully completed questionnaires out of 7424 sent. Leonard Carmichael, "The National Roster of Scientific and Specialized Personnel: A Progress Report," Science, New Series 93, No. 2410 (Mar. 7, 1941): 217-9, http://www.jstor.org/stable/1668185. See also Leonard Carmichael,
October 1943 had grown to include 71,511 chemists, 7,297 mathematicians, 10,080 physicists or astronomers, 4,559 radio engineers, 14,729 electrical engineers, 408 professional philosophers, and 142 speleologists (cave specialists).669

The *Science News Letter* continued to publish war-related articles along with other science material, as the United States inched forward to formal involvement in the hostilities. Occasionally Science Service editors would dedicate an entire issue to military-related stories, but generally non-war science material still made up half to two-thirds of each weekly edition during the war. Subjects of these pure science articles ranged from nature topics to geology, astronomy, weather, medical developments, and occasional scientific oddities. In 1941, the newsletter also began carrying a "New Machines and Gadgets" section, subtitled "Novel Things for Better Living." The section was made up of brief descriptions of new innovations such as nylon bristles for brushes, a combined nail file and tie clip, a glove with a slit along the forefinger so one's trigger finger might always be available,670 a soft clip to attach a cow's tail to a tendon in its leg to prevent it from swishing the milking person in

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the face,\footnote{Science Service, "New Machines and Gadgets," \textit{The Science News-Letter} 40, No. 15 (Oct. 11, 1941): 238, \url{http://www.jstor.org/stable/3918091}.} frequency modulation for radio that eliminated much of the static,\footnote{Science Service, "New Machines and Gadgets," \textit{The Science News-Letter} 40, No. 17 (Oct. 25, 1941): 270, \url{http://www.jstor.org/stable/3917585}.} and a portable drill capable of drilling around corners.\footnote{Science Service, "New Machines and Gadgets," \textit{The Science News-Letter} 40, No. 24 (Dec. 13, 1941): 383, \url{http://www.jstor.org/stable/3918275}.} Science Service had originally resisted the idea of including gadgets and "how-to" advice, not wanting to duplicate hobbyist magazines already available, or compromise its position as a purveyor of serious science news. However, in keeping with its intention to provide science in an engaging manner, and in an effort to be responsive to reader interests, the gadget articles ran in both the news letter and the syndicated newspaper service. Science Service's mix of war and non-war material struck a balance between the international emergency of a world war, and its philosophical commitment to scientific research as valuable in itself, apart from military applications.

\section*{Science Service Provides Information to the Public During the War}

Once America formally entered the war, Science Service continued to provide readers with information related to war-related science news, and also began to provide information to, and about, government science initiatives, agencies, and departments. Early in the war, news letter articles began to focus on the possible benefits of, or lessons learned from, the war, whether obviously related to science and technology, or in areas such as propaganda or psychology. As always, the organization continued to encourage the public to not only look to science for answers and reassurance, but to support that science as an important contributor to the overall quality of human life.
As Science Service Director, Watson Davis assumed a high-visibility position as a respected commenter on the state of American scientific research and its role during a time of international crisis. Publishers, newspaper editors, teachers, and the general public had come to identify the Science Service name with reliable information, and in turn, Davis felt responsible for communicating the importance of science to those audiences. In a July 1941 speech to the National Education Association’s Department of Science Instruction, Davis championed science as the preserver of democracy, using new wartime arguments to further justify the original mission of Science Service. Davis declared that the "Creative and aggressive application of science" was necessary to fight the "forces of darkness." Over previous years, he noted, some critics had linked innovation and invention to chemical weapons, airplane bombing, and other terrible weapons of the Great War, worrying what new terrors another world war might bring. But Davis said that the scientist should not be blamed for what the world did with his "brain children," any more than the mother of a soldier, a human child, should be criticized for her son's actions in war. Using a more graphic analogy, Davis declared, "the butcher knife is no less necessary and useful because a few misguided individuals use it to slit human throats."674

More than that, Davis maintained, research, experimentation, and invention were valuable as both the creators of war technologies and the means of protection against the same. He described it as "comforting" to know that scientists were working hard at university and industrial laboratories on secret problems related to the defense situation. Davis made it a point to tell the NEA’s science teachers that accelerated research was taking

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place in engineering and aeronautics, the National Bureau of Standards, the U. S. Bureau of Mines, and the U. S. Geological Survey. The National Research Council had over 200 secret projects underway, and a fourth of the physicists in the country were working on those projects. Another project, the National Inventors Council, was currently evaluating the more than 30,000 suggestions made by the public, and Army and Navy officers were willing to consider new ideas. Beyond such applied research, pure science also proved relevant to wartime, Davis said. As an example, he cited the work of Mayo Clinic nutritionist Russell M. Wilder, Chairman of the National Research Council's nutrition committee, who theorized that Hitler was manipulating the critical vitamin thiamin to influence the outcome of the war. A small thiamin deficiency leads to irritability, but a large or lengthy deficiency leads to depression, exhaustion, and feelings of inferiority. Wilder believed the Germans were using "thiamin starvation" in the occupied countries so the citizens there would be more submissive.

Over the long term, Davis promised, war-related developments in the sciences would create broader social benefits for the public sector. As practical spinoffs already in sight, he pointed to chemical cures for diseases through sulfa drugs, frequency modulation radio, innovations in aviation, and the creation of new synthetic plastics made from a wide variety of substances. Other likely advances included new nutrition knowledge that might end "hidden hunger," new advances for mental disease such as shock treatments for

schizophrenia, new methods applied to studying animal and plant genetics, and even a new understanding of the extent and composition of the universe.676

Returning to the mission of Science Service, Davis urged his audience of science teachers to take the offensive, and spread the scientific attitude and the scientific method into English, history, and language classes as well as into athletics. To that end, he encouraged teachers to embrace a number of tools, including many created or promoted by Science Service: radio programs, phonograph records, motion pictures, newspapers and magazines. Davis asserted that the scientific way and the democratic way were one and the same, and that science could ensure and improve democracy’s function if scientific methods found their way to the public.677

In the stories it produced and distributed, Science Service sought to assuage people’s fears by promoting the past, present, and future benefits of research and development, while also asking for support and assistance from the public. For instance, Science News Letter in September 1941 analyzed the vast improvement in soldiers' health thanks to vaccines. Cholera, tetanus, smallpox, and typhoid cases had fallen to very low rates among military ranks, and if there was infection, the patient was far less likely to die than he was in the previous war. Thanks to inoculations given at induction, plus other protective and preventive measures, the Army considered its soldiers to be in excellent health, Science Service told readers.678

676 Ibid.  
677 Ibid.  
Another 1941 *Science News Letter* article declared that national defense work had resulted in more jobs for the physically handicapped. At the Third Annual Congress on Industrial Health, a Boston physician noted over 3,000 handicapped workers working in the defense industry in the northeastern area of the country alone. The physician estimated that disabled workers could handle three out of every ten jobs competently if properly evaluated and placed. Other articles launched a call for young and alert civilian women to train as airplane "plotters" to work in information centers listening for signals of air attacks, told readers that scientists believed that wartime cooperation between the best minds could create a long-term "new world" of peacetime improvements, and cheerfully reassured American women that industry had devised satisfactory substitutes for cosmetics, saying, "relax, girls, and use that bright red lipstick."  

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Throughout the war, Science Service continued to describe and explain innovations and developments in war training, science, and technology, along with a wide variety of articles on nature, chemistry, medicine, physics, earthquake detection, scientific oddities, plant and food science, animal and sea life, psychological matters, celestial and planetary science, radio and television technology, meetings of scientific societies and organizations, and other topics. Science Service also offered readers insight into unusual links between pure knowledge and military application. For example, in a February 1944 piece on the art and science of natural camouflage, Frank Thone, who often wrote nature articles for Science Service, described Adam and Eve as the first, though unsuccessful, "camoufleurs." Detailing the basic, longstanding principles of camouflage, Thone suggested that even in modern warfare, leaves, grass, vines, and trees were successful in hiding tanks and guns, more valuable than the thickest armor. Thone told readers about ways that officers working at the Army Corps of Engineers training center near Washington, DC were working to develop new methods of concealing man and machinery for a strategic advantage. Or, as the article put it, what Hitler and Tojo did not know would not hurt them—until it jumped out and bit them.683


Through the war years, the *Science News Letter* continued to balance informing the public about military and other war-related developments with covering general science news. As the war began to wind down, articles increasingly focused on new opportunities for both civilians and returning military personnel, new products resulting from war research and development, and new ideas for ways that machines and processes could be modified for civilian use. In terms of postwar science policy, Science Service material addressed the vital, rapidly-emerging question of what the role of science should be in the new post-war world and what should be the proper relationship between science and government. The organization had a deep stake in such questions about the financial, political, and philosophical future of research. The man at the center of such discussions was Vannevar Bush, who headed World War II’s Office of Scientific Research and Development. Science Service reported that Vannevar Bush predicted a dramatic increase in scientific ideas during peacetime, once scientists, freed from the burdens of meeting the war crisis, could reclaim their freedom to pursue the "new stock of dammed-up ideas" that had occurred to them during the war. While Bush bemoaned the necessary sacrifice of scientific minds and energy to meet immediate war needs, he also believed the aggressive education of brilliant young minds after the war would speed the recovery of scientific resources and mental energy.684 A three-page 1945 news letter article by Martha Morrow anticipated a baby boom of war "grandchildren," born approximately twenty years after the end of the war, predicted trends toward smaller families, quiet suburban living, smaller houses without servants, greater

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cultural opportunities, a decrease in farms and farm families, a larger minority population, low infant mortality, and improved longevity.685

Science Service used its print articles to address as many social concerns and interests as possible, trying to appeal to many segments of the public. Articles in the *Science News Letter*, in particular, offer a historian the best illustration of those topics Science Service thought most relevant, because it is there that we see how the organization deliberately selected material in condensed form, drawn from the larger output sent to newspapers. Newspapers were free to select, re-title, excerpt, delay, and otherwise manipulate the science articles they received through the syndicate arrangement; for that reason, Science Service material printed in their publications does not necessarily reflect the organization’s own priorities. The *Science News Letter*, by contrast, was composed of articles chosen by Science Service editors themselves and presented in the form the organization believed best represented its intentions and viewpoints. It constitutes, therefore, the more accurate articulation of Science Service’s institutional personality as well as its print output.

**Science Service Cooperates with the War Effort**

When war began, government agencies drew on experts as a valuable resource, and as recognized masters of communicating scientific information, Science Service staff (already based in Washington, DC) had tangible experience to offer. On December 27, 1941, just three weeks after the attack on Pearl Harbor, Paul V. McNutt, head of the Federal Security Agency, asked Science Service’s Watson Davis to serve as a consultant on the FSA’s

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Committee on Information Procurement and Assignment Service. 686 The FSA was among Washington’s largest agencies and coordinated efforts connected to health and education. Davis quickly agreed, telling McNutt, "any service that can be given the government in this emergency that is in my power will be forthcoming." 687

During the war, Watson Davis also served as a member of the National Inventors Council, established by the Secretary of Commerce in 1940, which functioned in close connection with different branches of the U.S. military. Charles F. Kettering of General Motors chaired the fifteen-member Council, which brought to the government's attention discoveries, mechanisms, and suggestions made by civilians, and that might have war applications. 688 The National Inventors Council was closely related to the Patent Office, but was not part of it. 689 The War Department made lists calling public attention to specific fields in which new ideas were welcome, including rocket-propelled projectiles, searchlights and flood lights, improved tank designs, better aircraft brakes, ice prevention devices, refueling

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686 Paul V. McNutt, telegram to Watson Davis, December 27, 1941, SIA RU7091, Box 227, Folder 5.
688 Watson Davis, "Information Memorandum on Progress of Science Service," Nov. 5, 1940, SIA RU7091, Box 5, Folder 1.
equipment, and improved bomb- and gun-sights. Free-lance inventors, eager to help with the war effort, sent a large volume of communications to the White House and other government departments, and in an attempt to establish order out of that chaos, engineers and others with technical knowledge sifted through those submitted ideas. In 1941 the Council examined more than 35,000 of the 122,000 inventions and suggestions that it received; though the group had no laboratory or funds to develop pilot models, the Council forwarded a number of ideas to the military. Through his experience in observing and facilitating public science thinking, Davis’s work with the National Inventors Council represented a logical extension of Science Service's commitment to assist the war effort.

Science Service also gained and sought to serve a new audience—to bring wartime information about scientific and technical advances not just to civilian readers, but also to military men themselves. Many soldiers, sailors, pilots, and others had enlisted or been drafted out of college, and many hoped to return to finish their degrees once peace arrived. The government and universities alike believed and hoped that many veterans would be particularly interested in studying science and engineering, which had proven so crucial during war. The military saw men’s knowledge as a resource, but also appreciated the morale-building value of reading and curiosity. A number of wartime organizations created

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691 Advocates during the early 1940s considered the National Inventors Council to be much more valuable and effective than a similar effort during the First World War, when ultimately only one idea of the tens of thousands submitted proved to be worthwhile. American Institute of Physics, "National Inventors Council," Journal of Applied Physics, 14, (Aug. 1943): 385-8, http://dx.doi.org/10.1063/1.1715004.
and distributed reading material to men at the front, everything from cheap paperback editions of popular novels, to specialized sophisticated information.

Given the prominence of Science Service in producing readable discussions of science over previous years, the organization became a special wartime resource. Most notably, in 1942, a representative of the Red Cross asked Harvard College Observatory director Harlow Shapley to construct some star charts showing the names and positions of the bright southern stars visible on a clear night from Guadalcanal, for distribution to soldiers on shipboard. Shapley was happy to accommodate the request, but he thought men captive on long, tense but otherwise boring voyages would be interested in more than just the stars. He proposed creating a simple scientific guide to the many things the men were likely to see from the ship's rail, such as clouds, whales, waves, and sea birds. Shapley had long been associated with Science Service, and so he and the organization collaborated to produce the 1943 book *Science from Shipboard*. The 268-page book actually originated with Shapley's radio talk as part of the regular Science Service "Adventures in Science" program on CBS. Shapley and his colleagues at the Harvard Observatory wrote the text, edited the material, and created the illustrations. They also enlisted the assistance of the Boston-Cambridge branch of the American Association of Scientific Workers, drawing information from biologists, a navigator, two ship engineers, a geographer, a weather expert, an ornithologist, the astronomers, and a group of artists.692 Chapters in the book included "Sun, Moon, and Planets," "Time, the Calendar, and the Sundial," "The Stars the World Over," "Stars and Nebulae," "Navigation," "Ocean Islands and Shore Lines," "Sea Life," "Oceanic Birds," and

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"Your Ship." The final chapter, "Yourself," dealt with seasickness, the effects of cold on the body, balance, vitamins, malaria and other illnesses, infections, and mental issues.\(^693\) *Time* magazine referred to *Science from Shipboard* as a "chatty, pocket-size book…to answer the questions that landlubbers debate at sea," with each chapter written by a "top-drawer expert."\(^694\) The Red Cross distributed the book to soldiers without cost.

Like so many other civilian organizations during World War II, Science Service made great efforts to underline its patriotic willingness to cooperate with government and military officials. Information flowed in two directions; Science Service staff depended on government access to be able to write their articles on wartime research, but federal officials themselves made use of Science Service publications for their own ends. Over preceding years, government representatives, like the broader reading public, had come to recognize and value Science Service as a trustworthy, useful source of knowledge about the latest research. To note just one instance, back in 1932, the Office of the Chief Signal Officer of the War Department wrote to Science Service to request more details regarding an article in the *Science News Letter*, which mentioned that "a pliable rubberized material, resembling leather but not greatly affected by moisture, has entered the field as a competitor to leather."

The War Department noted that such a new material "might therefore exert a decided influence upon industrial planning for National Defense," since both leather and rubber fell into the category of "strategic" raw materials. Accordingly, the Chief Signal Officer’s staff asked Science Service for more information about the composition, properties, and potential

sources of supply of this leather substitute. Within three days, a Science Service writer replied that the material was a DuPont product and recommended the War Department contact the company directly for further details.

Wartime gave government officials extra reasons to reach out to Science Service, finding its articles a valuable resource. In early 1943, for instance, the War Relocation Authority in New York City asked for a *Science News Letter* article about the West Coast evacuation of Japanese residents, and Watson Davis immediately sent a copy. The United States War Department and other federal agencies treated information as a tool of war, especially regarding vital topics of science and technology. In March 1943, the Army Administration School wrote to Watson Davis for permission to reprint Science Service material. Five months before, the *Science News Letter* had printed an article titled, "Picking Flyers," which discussed the procedures by which the military selected its aviation cadets. The Army Administration School now wanted to use that article in a special course for its men, and Davis instantly agreed.

On a broader scale, Science Service helped the War Department by furnishing textual material for pre-induction training courses in high schools, both through newspapers and the production of low cost texts. Staff members produced a short text, "Fundamentals of Electricity," in cooperation with Westinghouse Electric & Manufacturing Company. A quarter million copies of the booklets went to the War Department, and Science Service and

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695 A.M. Shearer, letter to Science Service, April 1, 1932, SIA RU7091, Box 141, Folder 2.
696 Watson Davis, letter to A. M. Shearer, April 5, 1932, SIA RU7091, Box 141, Folder 2.
697 Robert M. Cullum, letter to Science Service, February 1, 1943, SIA RU7091, Box 254, Folder 8.
699 Gordon L. Wadmond, letter to Watson Davis, March 8, 1943, SIA RU7091, Box 254, Folder 7.
700 Watson Davis, letter to Gordon L. Wadmond, March 8, 1943, SIA RU7091, Box 254, Folder 7.
Westinghouse distributed another 100,000. Another 50,000 copies were reprinted in a more conventional paperbound form of the *Infantry Journal*, 25,000 of which were for use by the Army itself and the rest available at post exchanges for twenty-five cents per copy. Science Service began working with International Business Machines (IBM) to produce two similar booklets, on "Fundamentals of Machines" and "Fundamentals of Shopwork." But just as the text was completed and ready to go to press, IBM cancelled the project, apparently due to the War Production Board's limitations on the use of paper and also to the objections of book publishers, who resented the inexpensive production and distribution of the booklets.\(^{701}\)

Wartime needs temporarily reshaped American media; advertisers turned out official slogans and propaganda pamphlets, while Hollywood and Walt Disney cooperated with government to produce special military films. Science Service joined this pattern, undertaking new projects to serve specific wartime needs. Beginning in October 1943, Science Service issued versions of the *Science News Letter* in miniature, or 6 x 8 inches. This special-edition *Overseas Science News Letter* was printed on lightweight paper, and compressed a month's worth of issues of the *Science News Letter* into sixteen pages. Science Service itself sold copies of the *Overseas Science News Letter* for $1.25 per year, which included first-class postage so the magazine would arrive as quickly as a personal letter did.\(^{702}\) Regular domestic editions of *Science News Letter* invited subscribers to buy copies of the overseas version “for friends and relatives in uniform Overseas.” It promoted these wartime subscriptions as something that “solves your overseas gift problem—for Christmas

\(^{701}\) Science Service, "Information on Progress of Science Service," October 24, 1942, SIA RU7091, Box 5, Folder 9.

or otherwise.” Science Service promised, “this international edition will contain only the scientific news of interest to the men and women overseas. Such material as how to dehydrate food, diet hints for blood donors, immunization of children against disease—news important to us here but not vital to them there—will be cut out in order to pack… the scientific information of greatest interest and use to members of our armed forces wherever they are.” Science Service also planned to make the special version available to other parts of the world where overseas distribution of the regular news letter was problematic.

Meanwhile, Davis and other Science Service leaders also had to figure out how to adapt their normal journalistic practices to operate in the new wartime environment for information. They had to juggle responsibilities to serve readers and promote scientific research, while working within military regulations and government needs. Again, authorities regarded Science Service as a useful, reputable partner in feeding desired ideas to the American people. Even as War Department officials remained vigilant to police against any inappropriate release of classified information in popular publications, they also courted journalists to write positive stories about war successes of science, technology, and medicine.

In April 1943, the War Department Bureau of Public Relations wrote to Watson Davis with an offer from the Under Secretary of War, trying to organize a press visit to Army installations. In particular, the War Department wanted to set up some special trips for science writers, to allow a behind-the-scenes look at the production line, research, and


Although the immediate timing proved awkward, Davis responded that Science Service would be delighted to participate later, because the organization had felt itself at a disadvantage at times when a lack of access to special demonstrations meant that writers could only offer general information about a topic. Within another few weeks, the War Department public relations office wrote to Davis again, this time inviting him to visit the laboratories of the Quartermaster Corps Clothing Depot in Philadelphia to examine the testing and research methods the Army had adopted for clothing. The visit, designed specifically for science writers, planned to focus on the science behind textile inspection and manufacturing processes, along with a brief trip through the flag factory. Similarly, in May, 1943, Lily Lykes Shepard, news writer for the Women's Interests Section, Publications Branch, of the War Department Bureau of Public Relations, offered Science Service medical writer Jane Stafford a chance to tour the convalescent facilities set up for "men and women of the Army" in Forest Glen, Maryland. It is unclear whether Davis followed up to send a representative on the Army installation visit, or if Jane Stafford, or any other female Science Service representative, actually attended the WAAC experience. But the record shows that overall, Science Service was quite involved during the World War II years with reporting on military science, technology, and medicine, within secrecy limits.

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705 Baird F. West, letter to Watson Davis, April 1, 1943, SIA RU7091, Box 254, Folder 8.
706 Watson Davis, letter to Baird F. West, April 6, 1943, SIA RU7091, Box 254, Folder 8.
707 Baird F. West, letter to Watson Davis, April 14, 1943, RU 7091, Box 254, Folder 8.
708 Lily Lykes Shepard, letter to Jane Stafford, May 5, 1943, SIA RU7091, Box 254, Folder 8.
Robert Farr and the Controversial Radar Story

Of course, Science Service had to be careful that its attempts to provide readers with news of the latest wartime science did not run afoul of the established government protocols for dealing with military information. World War II’s military-scientific world pursued multiple top-secret innovations; beyond the Manhattan Project’s nuclear weapons, Allied researchers also created and improved computer technology, the proximity fuse, sonar, and radar. According to historians Alan I Marcus and Howard Segal, radar (radio detection and ranging) “was as much a British as American invention and predated World War II.” But building on those early developments, American researchers added crucial wartime innovations to radar, including the duplexer, XAF (sea radar), the first precision radar, the first airborne radar, as well as radar countermeasures.709

Journalists and their publications, who policed themselves with few violations and little government enforcement, mostly censored their own material during World War II and did not deliberately push the boundaries. However, the American military had kept radar information closely guarded since the beginning of the war and imposed specific restrictions on publication of technical details. According to journalism historian Michael S. Sweeney, in April 1943, the Office of War Information released a special 800-word statement to clarify the Army and Navy position, which carefully articulated what radar information should remain secret. Writers were allowed (even encouraged) to produce items on radar's history, the scientific principles involved, and its military use in locating ships and planes, but the statement warned that any additional information could potentially help the enemy and

therefore no further information would be forthcoming. On July 27 of that same year, President Roosevelt endorsed the continued ban on radar news, and two days later, officials told all editors and broadcasters across the country that all items discussing radar, known as the "secret weapon," had to be submitted to, and cleared by, the Office of Censorship or another government authority.\footnote{Michael S. Sweeney, *Secrets of Victory: The Office of Censorship and the American Press and Radio in World War II* (Chapel Hill: University of North Carolina Press, 2001), 196-7.}

Despite those specific regulations limiting public discussion of the latest radar technology, a disturbing number of leaks continued. Byron Price, appointed by Roosevelt to be Director of the Office of Censorship, realized that in fact, enemy forces probably already were aware of the technical information that the Army and Navy fought to constrain. More than that, Price believed that high-ranking government officials were often the source of leaks, making attempts at control pointless. Price sought to reduce the restrictions on radar, and by the end of February 1945, the Office of Censorship had dropped its restrictions on radar stories, except for specific references such as tactical operations or countermeasures. By the end of March, the Army and Navy changed their positions as well, and the announcement that radar publicity was essentially unrestricted came in August 1945—just as the war ended.\footnote{Ibid., 197. Also see, Michael S. Sweeney: *The Military and Press: An Uneasy Truce* (Evanston, IL: Northwestern University Press, 2006);}

But before then, the evolving and disputed government position on censorship of radar information had entangled Science Service in trouble. Staff writer Robert Farr produced an article on radar, which Science Service released for publication on February 20, 1945. Farr's article was titled, "RADAR—THE INVISIBLE EYES OF WAR—WILL
SAFEGUARD CIVILIAN LIFE IN PEACETIME: BASIC FACTS ABOUT RADAR REVEAL WHAT IT IS AND HOW IT WORKS." Farr began with a simple analogy to a person shouting at a cliff and waiting for the echo of the sound waves; he explained radar technology as the same action, only using ultra-high frequency radio waves. His piece provided a brief history of how radar had been discovered and how Allied scientists’ cooperative efforts made it available and effective. Farr reported that the war’s first successful strategic use of radar came on November 14, 1942, enabling an Allied warship to detect a Japanese vessel more than eight miles away and fire explosives squarely onto its deck. Farr credited radar’s installation on airplanes, on ships, and on land with having helped ensure key Allied victories. He described how anti-aircraft defenses used radar to detect incoming planes in the fog and darkness from over 100 miles away, how radar sets on fighter planes helped pilots get a range for their attack on enemy planes, and how the Navy used radar to spot submarines when they surfaced at night to recharge their batteries.712

Farr declared, "so far as may be told without endangering our own forces or helping the enemy—this is the story of radar." His article linked the successful development of radar to a moral about the value of investing in future scientific research. He wrote, "nearly a quarter-century ago scientists realized the value radar might have…evidence that in the postwar world scientific projects must be supported as insurance for our future security." His article predicted that once war ended, radar would offer Americans tangible peacetime benefits. Radar sets mounted in locomotives could reduce railroad accidents by enabling the engineer to detect trains on the same track or other potential trouble, even on a moonless

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night. Ships with radar could detect icebergs and other hazards, or safely navigate dangerous and foggy harbors without colliding with other vessels. Commercial airline pilots would be able to fly in bad conditions and detect objects in planes’ paths, such as high-tension wires, radio antennae, and mountains. Even automobiles might be equipped with radar some day, Farr’s article predicted.\textsuperscript{713}

The Science Service sales department placed a version of Farr’s story in the May 12, 1945 edition of \textit{Liberty} magazine. Apparently, \textit{Liberty} chose to save space by making poor changes; while Farr’s original article had listed several industrial companies involved with the development of radar, \textit{Liberty}’s editors cut the mention of all the commercial interests—except Westinghouse. Farr apologized to executives at General Electric for the way that \textit{Liberty} had "cut the pants off" his story and asked the company to let him "out of the dog-house."\textsuperscript{714}

As it turned out, publication of Farr’s story proved even more problematic. Within one week after it appeared, Colonel G. R. Johnston of the Public Relations Office of the Army Air Corps wrote to Farr, accusing him of having violated government procedures in reporting on radar. In collecting material for his story, Farr had toured Wright Field, Ohio, where the Army was conducting research and development for the Air Corps. As a condition of that visit, Farr had signed a security agreement saying that he would submit all material prepared on the basis of information gathered there to the War Department Bureau of Public Relations. This was customary during World War II for all writers gaining access to military installations. Farr had also committed himself to submit any articles for pre-publication

\textsuperscript{713} Ibid.
\textsuperscript{714} Robert Farr, letter to E. L. Robinson, May 11, 1940, SIA RU7091, Box 272, Folder 6.
review to a major and a captain at Wright Field. Subsequently, Farr indeed submitted an article to the Office of Censorship, which passed it, but that version had not mentioned radar. More than that, Farr had never submitted his piece to the War Department Bureau of Public Relations for review, a grave error in Johnston’s book.715

Johnston also complained directly to Watson Davis in more forceful tones, accusing Farr of having put "this Headquarters in a rather embarrassing spot." He reminded Davis that when Farr had visited Wright Field, officers there had offered him ample cooperation in gaining background material on the use of electricity in big bombers. In fact, Johnston surmised that someone escorting Farr around had been somewhat too friendly and allowed Farr to see certain radar equipment—off the record. Johnston complained to Davis that according to records at the Office of Censorship, Farr had denied to them that any of his material came from military sources. Then, according to other journalists, Farr reportedly bragged to them that he was able to get any military information he wanted and print it without review by any military authority, only the Office of Censorship. Since then, Johnston complained, the other journalists had "swarmed down upon [the] War Department Bureau of Public Relations and ourselves, only to find that the information was still classified."716 Johnston appealed to Davis as one newspaperman to another, saying that he knew that Science Service was well respected, and he could not believe that Davis condoned any activity that reflected poorly on the organization. Given Farr’s sins, however, Johnston said he would be very reluctant to show Farr anything more of the Command's operations. Even

716 G.R. Johnston, letter to Watson Davis, May 19, 1945, SIA RU7091, Box 272, Folder 6.
worse, he wrote to Davis, "I know the people he obtained his information from here certainly would distrust any Science [Service] representative."

As it turned out, military officials may have been particularly sensitive at the time to any perceived violations of secrecy, since the Science Service episode followed closely on the heels of a broader international controversy over publication of highly sensitive information. In his letter to Davis, Colonel Johnston explicitly condemned Farr’s action by saying, "if the reports are accurate, that this affair is in the category of the now famous Edward Kennedy's story on the surrender of Germany and, if so, violates the ethics of the newspaper profession." With that sentence, Johnston linked Farr's actions to a situation that had occurred only weeks before. Edward Kennedy, the Associated Press's Paris bureau chief, had been part of a group of journalists flown to the signing of Germany's surrender on May 6, 1945. The reporters were not told until they were in the air where they were going, and authorities told the pressmen that there was a news embargo on the story until the formal surrender and various ceremonies had taken place. Once he arrived back in Paris, Kennedy decided that past news embargoes had been related to military security, but this case was political, and he intended to publish the story. A few hours later, Kennedy called the London bureau and told them of the surrender, and the story hit the wire service several hours before the government wanted it officially released. General Dwight D. Eisenhower was furious,

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717 Ibid.
718 Ibid.
and Kennedy was discredited, sent back to the United States, first suspended from his Associated Press work, and then fired.  

Both at the time and since, government authorities, press representatives, and other observers argued bitterly about interpretations of Kennedy's actions. Some savaged him for violating press ethics in a way destined to reflect poorly on all journalists, while others lionized him for taking a heroic stance against the oppressive nature of inappropriate censorship. Clearly the military viewed the Kennedy event as a despicable breech of ethics and security, and Colonel Johnston's suggestion that Farr's transgression was akin to Kennedy's (which had occurred only two weeks before) must have made Watson Davis tremendously uncomfortable. Though Germany had surrendered, the war in the Pacific was still raging, and even when the war completely ended, no doubt Science Service hoped to maintain the good relationships it had established with the military so as to protect future access.

Given the explosive nature of such accusations, Farr immediately replied to Colonel Johnston, stating that he was fully aware of the restrictions on writers visiting military installations, and that as a Science Service writer, he was happy to abide by the rules. However, he said, Johnston had been "misinformed" as to the sources Farr had used. Farr maintained that his Liberty piece did not actually contain any information gathered at Wright Field, so therefore he had not been under obligation to have that article reviewed by the War Department. The Censorship Office had cleared his article based on the prospect of prior

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publication, and he had satisfied their requests at that time for specific evidence of his sources. This was the same article he had proposed earlier.\footnote{Robert Farr, letter to G. R. Johnston, May 21, 1945, SIA RU7091, Box 272, Folder 6.}

While the matter appeared settled between Farr and Johnston, Watson Davis was desperately trying to piece together what had happened before he made any official response on behalf of the organization as a whole. Davis could not allow Science Service to be labeled as having violated the War Department's rules. Nor did Davis want to unfairly accuse any member of the Science Service staff, or make it appear, internally or publicly, that the organization was anything but completely cooperative and supportive of the war effort. On May 25, in a handwritten note rather than the usual typed memoranda, Davis asked Farr several things:

"When were you at Wright Field, exactly?"
"Give me copy of Feb. 20, 1945 story & old copy showing when it was written and clearances"
"Just what on radar were you shown at Wright Field?"
"Why are originals of copy & letters at Bu. Public Relations, War Dept. (as you stated on phone)?"
"Why send the original clearance letter to Liberty, without leaving a copy here?"\footnote{Watson Davis, handwritten note to Robert Farr, May 25, 1945, SIA RU7091, Box 272, Folder 6.}

Again, Farr defended himself immediately. He provided the dates of his Wright Field visit, attached the copy that Davis requested, listed those subjects discussed on his visit, and explained why various copies of his materials had ended up at different offices.\footnote{Robert Farr, memorandum to Watson Davis, May 25, 1945, SIA RU 7091, Box 272, Folder 6.} Explaining the situation further in a follow-up memorandum, Farr included the documentation for his story, and claimed again that the information in his story did not come from the Wright Field visit. In his own defense, Farr pointed out that he wrote the original story in October 1944,
gave it to the Office of Censorship then, and they turned it down. Farr did not say why, but possibly on grounds of secrecy. He resubmitted the same story—he did not mention whether he made any adjustments—and this time it passed the censors. All of this occurred several months before his Wright Field visit. He did not believe he had violated any security or agreements.723

It appears that Farr became entangled in the bureaucratic wrangling between military authorities and the Censorship Office over exactly how strictly to impose secrecy on technical information. Farr had initially submitted his article to the Office of Censorship in October of 1944, when restrictions were tighter and it was rejected; by the time he resubmitted it, the Office of Censorship was in the process of decreasing its own restrictions. Science Service released it for publication in late February 1945, but Liberty magazine did not publish it until May 1945.

Accordingly, Davis wrote to Johnston to back up Farr’s claim that he had not included any information from his Wright Field visit in his story. Davis concluded by assuring the colonel, "our files are open to you or anyone designated by the War Department for purposes of your viewing our records and files in connection with your charges."724 Watson Davis's primary concern was protecting Science Service's reputation for credibility and ethics. Even the suggestion of wrongdoing in wartime risked exposing the organization to suspicion and rumor. The episode underlined the increasingly difficult nature of publicizing scientific and technical advances in an era when such work was ever more

723 Robert Farr, second memorandum to Watson Davis, May 25, 1945, SIA RU7091, Box 272, Folder 6.
closely tied to classified defense knowledge. Science journalists, working for Science Service
and other operations, would need to figure out how to navigate such challenges, to provide
exciting and novel stories to interested readers, while not endangering national security or
antagonizing authorities.

In 1944 Max B. Cook, the Promotion Editor for the Scripps-Howard newspaper
syndicate, wrote to Watson Davis to compliment a series on war gases produced by Science
Service that his papers had carried. Cook took the opportunity to praise Science Service more
widely for creating editorial acceptance of science news in the newspapers. According to
Cook, the "bangup stories" from Science Service often appeared on the first page, and all of
them had "a science angle." Especially given wartime challenges, Cook wrote, Science
Service had "delivered in a big way," and he predicted that grateful publishers and readers
would remember that in years to come. "I think you will find that when war ends Science
Service will have accomplished as though thousands of dollars had been spent in a heavy
nationwide promotional campaign."725

Aside from the radar episode, wartime relationships between Science Service and
government remained positive and in general, mutually beneficial; authorities took advantage
of press outlets to distribute morale-boosting stories, while writers gained a timely,
compelling “hook” for news about science and technology. Overall, Science Service
supported the war effort in a multitude of ways. The organization offered its Washington
building as a civilian defense zone and sector post. But its main function in wartime
represented a natural extension of its peacetime purpose, to write articles explaining,
examining, and in some cases defending aspects of war-related science. Over previous years,

725 Max B. Cook, letter to Watson Davis, December 4, 1944, SIA RU7091, Box 264, Folder 3.
Science Service had built up an extensive reach and influence with readers and with publishers that made it natural for the War Department and other government agencies to seek the cooperation and participation of its reporters.

As the war progressed and finally drew to a close, Science Service publications gradually emphasized a new theme, the need to maintain the gains that science had achieved during the war. Just as business leaders had begun thinking about the need to retool and renovate factories, scientific leaders suggested that their research community would need increased government funding and public support to convert from wartime projects to equally important peacetime needs. Science Service wanted to play a crucial role in such policy discussions about the proper postwar relationships between science and government, and indeed, it did.

**Science Service at the end of the 1940s**

Even before the end of the war, Science Service print material, particularly the *Science News Letter*, began to change the focus of many of its articles to peacetime concerns. The newsletter retained its wide-ranging articles related to medicine and health, astronomical discoveries and phenomena, and countless other natural, mechanical, and chemical topics. As detailed in Chapter 3, funding for science, particularly basic research that had been shelved during the war emergency, once again became an important topic. Articles also noted that many discoveries and innovations achieved during the war would have civilian applications after the war. One article described a public demonstration of the conversion of temporary military housing used for barracks and dormitories into emergency
housing in the post-war crisis. Yet another told of six hundred 30-pound smoke-pots, previously used to create a protective screen for troops rushed to Vermont orchards to warm the McIntosh apple crop threatened by below-freezing temperatures. Yet another article highlighted how war research had resulted in vaccines for diseases various, including the cattle plague rinderpest, two poultry diseases, and an improved antitoxin for botulism, and new antibiotics. Other research yielded better pesticides, herbicides, and treatments for citrus tree diseases, and fish hatchery diseases.

However, along with the rosy visions of the post-war environment were public concerns regarding the fierce displays of battlefield science and technology, as well as the devastating destruction of Hiroshima and Nagasaki. Science Service attempted to explain and reassure the public at the war's end as it had done as the war began. Articles also explained the effects of radiation on animal life and the human body, and explained that the people of Japan would have to be monitored for many years for the full effects and outcomes to be known. Other articles attempted to ease the public's fears by focusing on improvements in

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radar that would aid commercial flight,\textsuperscript{731} the employment opportunities for men returning with technical skills,\textsuperscript{732} and the ten tons of German patents retrieved by American forces and currently being sorted for those most useful to the United States.\textsuperscript{733}

In 1950, Science Service published the book \textit{Atomic Bombing: How to Protect Yourself}, prepared by Watson Davis, Jane Stafford, Marjorie Van de Water, and two other staff writers. In the Foreword, Davis declared, "When danger is known, something can be done about it. Ignorance is a breeder of false security. We are convinced here in America that the right to know is as precious as our strength to resist the forces in the world which would like to enslave us in ignorance."\textsuperscript{734} It was a practical guide to understanding what an atomic bomb could do, the kinds of radiation and radiation poisoning, decontamination, preventing panic, medical first aid for burns and shocks, plans for a simple shelter, and the peaceful uses of atomic energy, along with these practical suggestions, the book reassured readers with the comforting affirmation, "LIFE WILL GO ON." Come what may, "the world will continue in its orbit, peopled by human beings, who will carry on the civilization so painfully evolved through the ages."\textsuperscript{735} While pessimists and other voices of doom might predict disaster, Science Service sought to present readers with information based on solid research and

supported by the many scientists and science professionals to whom it turned, as it had for thirty years, and trust that the public had grown to trust both Science Service and science itself.

Fig. 6. Smithsonian Institution, National Museum of American History.
CONCLUSION

World War II had not interrupted the efforts of Science Service to communicate important science information to the public; if anything, wartime had allowed the organization new opportunities to reach special audiences, as in its overseas newsletter for military personnel and the use of its articles in government programs. By war's end, Science Service was well positioned as the nation's pre-eminent organization in science reporting, an authority that paved the way for continued growth of modern science journalism.

Back at the end of World War I, when Edward W. Scripps and William E. Ritter began thinking and talking about creating an organization for the purpose of facilitating the dissemination of science information, their venture had been, in many ways, radically novel. Few examples or previous attempts at science popularization existed to serve as competition or caution. Scripps and Ritter’s commitment to bolster public appreciation of science resonated with leading national scientific societies of the time, which provided invaluable philosophical and practical support as the new Science Service got off the ground. These advocates shared a faith in the larger principle of science as a key to the health of a modern democratic society. Scripps offered the solid funding to pursue this mission, Ritter offered practical organizing mobilization, and some of the nation’s foremost researchers served as early advisers and contributors.

At the same time, Scripps and Ritter faced several complicating factors. Scientists of the early 1900s had often shown a deeply ingrained resistance to share their research and discoveries, partly due to bad past experiences with reporters who played science for ridicule and subjected researchers to criticism. Their new organization had to convince experts that it
was not only safe, but important and worthwhile for them to dedicate time and energy to working with the popular press. More than this, there was no precedent for American newspapers printing science news on any regular basis or in professional tones; readers did not know to expect it, and publishers did not believe at first that there was latent public demand for such information. But Scripps had built his own publishing empire based on discovering and sharing the stories of what people did, good and bad, and funded projects for others to pursue the same kind of work. His extensive experience convinced him that the mainstream newspapers were a vital but untapped conduit for extending news of science to the largest audience possible—what he described as the "95 percent" of the American public who depended on newspapers as their classroom for continuing education.

Significantly, the American scientific community of the early 1900s deeply believed that a democracy was the only environment in which science research could truly flourish, unfettered by government restraints and interference, and free to search for results without the constraints of an agenda-driven philosophy or system. Yet political scientists and observers of the era right after World War I warned that a democracy was both resilient and fragile; it could withstand many assaults, but crumble from the corrosive effects of apathy. For a democracy to be truly strong and invulnerable, it needed an intelligent populace that would value and protect it. Scripps and Ritter believed that the definition of an intelligent people must include an understanding of, and appreciation for, science and its benefits. Those assumptions became the building blocks of an organization to form and lead the new and evolving genre of science journalism.

In the early 1920s, the newly created Science Service was the only institution of its kind; the first and only attempt at a sustained and consistently credible effort to discover,
decipher, interpret, and disseminate science news for the public in accessible form through the media of the day—the newspapers and radio, along with school programs, and communication efforts that directly supported researchers by helping them gather and share data. Science Service found growing success in convincing large and small newspapers around the country (and abroad) to purchase its syndicated material, but also decided to create the highly popular and enduring *Science News Letter*, in response to readers' requests for a more consistent supply of science news that they could keep for themselves. The news letter distilled those stories it deemed most salient and likely to grab readers' attention from the wider flow of material sent to the newspapers, enabling Science Service to create a news product that set up a direct line of communication from writers to readers (without the intervention of newspaper editors) and survived well beyond its newspaper syndicate.

In this pioneering venture, Science Service resolved from the start to stay away from the sensationalist treatments of science that in the past had tried to grab public attention by misinterpreting the facts. That method of seductive but careless reporting was not acceptable to Science Service. Its leaders challenged people to embrace the science—not the sideshow, earning a name for presenting responsible, credible, and engaging material. The credibility of Science Service and that of the information it presented were inextricably linked in the minds of the organization and its audiences (publishers, scientists themselves, and potential readers). From their perspective, the cause—democracy itself—was too great to allow anything but due diligence.

Equally important, Science Service persuaded scientists for the first time to systematically and genuinely cooperate with journalists. The scientific community had a reputation for being secretive, uncooperative, and elitist. While researchers complained that
journalists rarely got the story right, they guarded the very details that journalists sought, or resisted translating their secret jargon so the mere layman could understand. But the scientific world was changing by the early twentieth century, putting an increasing premium on the quest for funding, especially from public sources. As researchers realized this cold reality, that the very people they tended to hold in a certain contempt, as the unwashed intellectual masses, increasingly influenced science research funding, many of them became more willing to attempt true communication about science. Science Service also built confidence by assembling a board of trustees that included scientists who were affiliated with the most prestigious universities and science organizations. Science Service was careful to hire reporters who were well versed in scientific knowledge and could establish a good dialogue and rapport with researchers. Those strengths allowed Science Service to survive internal mistakes and economic difficulties during the Depression years, paving the way for its wartime significance, when the federal government often turned to Science Service for information and for help in spreading positive messages about science as an aid to victory.

As World War II ended, Science Service was free for the first time to report on the Manhattan Project and other previously secret innovations. *Science News Letter* articles appearing in the months and years following Hiroshima described how atomic bombs "assembled themselves," to prevent premature detonation, and provided names of scientists who could now be openly credited with key developments in atomic research. While nuclear bomb production had previously been top-secret, postwar Science Service

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articles lifted that veil, producing fact-filled descriptions of the atomic bombs. For example, reporters described how experts intensively monitored levels of radiation exposure to protect those who worked on the bomb, by using newly developed film badges and pocket meters, plus frequent physical examinations, and extra protection measures such as shielding by airtight concrete walls.\textsuperscript{738} Science Service sought to address the widespread public interest in the new nuclear weapons through detailed coverage during late 1945 and 1946. Some articles detailed the effects of radiation,\textsuperscript{739} while others tried to keep the public from misunderstanding the nature of military and scientific tests conducted on Navy ships. The director of the Los Alamos Laboratory of the Manhattan Engineer District cautioned the public against reading too much into available images of bomb damage, saying "Only by the most careful, unbiased and technical interpretation in military and naval circles, in the offices of overall military strategy and in the public press can the test be given its proper weight and meaning."\textsuperscript{740} In addition to recapping how wartime science had developed and used the bomb, Science Service immediately began covering postwar developments, including the ongoing testing of nuclear weapons at Bikini Atoll in 1946. One article (with the admittedly rather sensationalist title "Bikini Breath of Death,"\textsuperscript{739}) described the lethal fog of radioactive water droplets and fission byproducts that lingered much longer than expected. The article reported that since Navy biological experimenters had not expected to see such a long effect, they were caught off-guard and had not placed enough animal subjects in the exposed areas,

so they lost the opportunity for extensive testing on a large sample.\textsuperscript{741} The Science News Letter also reported on one of the most important policy and political aspects of postwar nuclear reality, the fierce debate among scientists, the military, and other parties about whether future nuclear research should fall under civilian or military control\textsuperscript{742}, a debate that led to creation of the U.S. Atomic Energy Commission.

More than that, during the months immediately preceding and following the war's end, Science Service became part of the broader debate within government, within the scientific community, and within the public press, about the postwar future of science. Even before peace arrived, scientists and other observers had begun to speculate, write, and discuss what would be the future shape of American research, how the modern relationship between science and society was continuing to evolve, and where scientists could find funding for ever-more-expensive projects. Advocates believed that World War II had brought tangible gains for science, bringing it out of the Depression-era malaise to a new level of government support, influence, and esteem. \textit{Science News Letter} spoke for many of the country’s leading scientists in promising that wartime innovations were about to bring ordinary citizens a flood of peacetime social benefits. Articles told readers about the wonder of vaccines, greater awareness of mental health issues and treatments, innovations in aviation, and many other war-related science and technology applications, ready for conversion to new civilian applications. The newsletter also frequently covered the advice and observations of Vannevar Bush, who had directed the Office of Scientific Research and Development during


the war, and who had been involved with Science Service for years. In 1944, President Roosevelt asked Bush to prepare a report on guiding science into the postwar era, as Science Service reported, and the resulting document *Science: The Endless Frontier* proved highly influential. Articles in the newsletter explained to ordinary readers Bush’s recommendation for establishment of a peacetime science agency, an idea that harmonized well with Science Service’s own conviction that government and public investment in scientific research was vital to American economic and social growth. Bush’s Cold War prediction, that science in the western world would outpace Soviet science because of the unfettered nature of scientific research in a democracy, also matched the philosophy of Science Service’s advocates.

In addition to following up on the scientific and science policy outcomes of World War II, the postwar work of Science Service also kept readers aware of the scientific dimensions of the emerging Cold War. In August 1949, the Soviet Union conducted its first atomic weapons test, destroying some Americans’ complacent assumption that the U.S. would enjoy a nuclear monopoly for years to come. That development accelerated and intensified awareness and alarm within government and among the public about what would happen if the U.S. became the target of enemy attack in a future nuclear war. Scientists, writers, and other observers rushed to comment (with varying accuracy) on the implications

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of the nuclear threat. As people began to consider that work on the hydrogen bomb might unleash even more powerful and destructive forces, debate focused on the "Frankenstein" monster elements of such research, as well as the geopolitical and "psychological" advantages of having such a weapon at hand.\textsuperscript{745} People lived with the threat of what historian Robert A. Jacobs described as a "push-button war." From factual (and not so) stories in newspapers, to popular movies such as \textit{The Incredible Shrinking Man}, and \textit{Them}, the fear of human and animal life becoming distorted after exposure to radiation created a world where science fact was as scary as science fiction.\textsuperscript{746} Science Service staff, by then thirty years into their mission of informing and engaging the public about science, sought to defuse the most inaccurate and alarmist elements of this Cold War bomb fear. Most notably, the organization produced a 1950 book \textit{Atomic Bombing: How to Protect Yourself}—a "how to" of practical and reassuring advice in the event of a nuclear attack.\textsuperscript{747}

As the 1940s drew to a close, Science Service remained the country's leading source of credible science information. Over succeeding decades, science journalism would continue to expand in the United States, given the evidence that it was possible, worthwhile, and important to cover the latest research advances in accessible terms. Many postwar newspapers and magazines added science reporters and dedicated entire columns for coverage of science news, building directly on the example and model that Science Service had already provided. For its part, Science Service continued to present science news to the public, though it ended its newspaper syndicate service in 1964, essentially succeeding in its

\textsuperscript{746} Robert A. Jacobs, \textit{The Dragon's Tail: Americans Face the Atomic Age} (Amherst: University of Massachusetts Press, 2010): 3, 12, 15.
goal of increasing the amount of credible science reporting to the point of making that function obsolete. The *Science News Letter* continued as a weekly publication, and in 1966 became *Science News*, which is now published bi-weekly. Though the construction of the articles has changed to better suit the contemporary reader, the intent of *Science News* today remains the same—presenting the "scientific significance and substance" of science news in understandable form, even as science and engineering have become increasingly specialized and technical.748

The relationship between scientists, the press, and the public also continued to evolve. Historians Jane Gregory and Steve Miller have suggested that after World War II, scientists fell into one of two camps, those whose work had bound them to secrecy, and those whose role had been very public. According to Gregory and Miller, both groups of scientists felt uncomfortable with the post-war media climate, some because they were unaccustomed to sharing information, and others because their sharing had been agenda-driven, either as sanctioned public information or as propaganda. For this reason, Gregory and Miller suggest, journalists became the ones to lead in communicating science information to a postwar American audience, while scientists receded into the shadows.749 Gregory and Miller noted


that scientists, with their devotion to accuracy, and journalists, who rely on scientists for the facts they use in their articles, formed a mutually beneficial alliance, but one still laden with potential difficulties.\textsuperscript{750}

Indeed, historian Dorothy Nelkin argues that modern relationships between scientists and journalists have remained awkward. Looking at the late twentieth-century’s interaction between the two communities, Nelkin sees that scientists continue to complain about the quality of journalists' reporting and "anti-science" attitudes. Journalists, in turn, continue to complain about scientists and their institutions for providing misleading information.\textsuperscript{751} Nelkin credits Science Service with a key role in setting the stage for modern coverage of research. In particular, she describes Edwin E. Slosson, Science Service's first editor, as "the most influential interpreter of science to the public" during the 1920s, who really created "a market for science news, and a pattern for the emerging profession of science journalism." While much of Nelkin’s work focuses on more recent decades, she notes that the 1930s saw the emergence of a vital group of about twelve science writers who adopted the ideas and style established by Science Service,\textsuperscript{752} and undoubtedly their style and substance influenced other and future science writers.

\textsuperscript{750} Ibid., 107.
\textsuperscript{752} Ibid., 83. Also see, Deborah Blum and Mary Knudson, \textit{A Field Guide for Science Writers: The Official Guide of the National Association of Science Writers} (New York: Oxford University Press, 1997).
Nevertheless, Nelkin also emphasizes that the twentieth century brought a real transformation in science journalism over time. Pre-World-War II Science Service editors and reporters were always hesitant to speak in terms of "breakthroughs" and "latest discoveries," reluctant to feed unrealistic expectations of authors and wanting to acknowledge the complex nature of the scientific process that necessarily involved the work of many researchers. By contrast, Nelkin notes, postwar science journalists, working in many outlets, were less cautious; stories from the 1960s were particularly heavy on references to "breakthroughs" and "revolutions" in science. By the 1970s, when environmental concerns moved onto the stage, journalists took a more reflective stance and gave more attention to consequences related to scientific and technological change. The 1980s saw a resurgence of the 1960s emphasis on the new and remarkable, with technology in the spotlight. With the 1990s, the same "celebration of technology" focused on biological innovations such as genome mapping.\footnote{Dorothy Nelkin, \textit{Selling Science: How the Press Covers Science and Technology} (New York: W.H. Freeman, 1995): 10.}

So, after almost a century of attempts to bring science news to the public, just how informed about science are Americans? Over recent decades, there has been substantial discussion about what has become known as the issue of “science literacy.” The recent work of Chris Mooney and Sheril Kirshenbaum argues that the often-used science quiz, designed to test people's knowledge of science "facts," risks missing the more important question of whether people really achieve a depth of intelligent understanding of the science issues they deem important to their own lives, such as climate change.\footnote{Chris Mooney and Sheril Kirshenbaum, \textit{Unscientific America: How Scientific Illiteracy Threatens Our Future} (New York: Basic Books, 2009): 14.} Many well-intentioned people
end up misinformed about the details of science, and critics rush to blame the educational system for the public's lack of "science literacy." One of the problems with this, according to Mooney and Kirshenbaum, is that it distances scientists from their share of the responsibility for the problem, and absolves them from having a primary role in making sure correct information is used wisely.⁷⁵⁵ Americans want to understand science—they are just too uninvolved with it to do so, argue the authors.

Only fifteen percent of the American public follows science news closely, according to a National Science Foundation study.⁷⁵⁶ The consequences of this lack of interest and attention could be dire—fewer engineers and scientists, American students lagging behind their peers in other nations, and possibly less support for scientific funding and freedom. Funding for science research programs is far from secure in many cases. Recent austerity measures by the federal government threaten research and development, echoing Depression-era scientists’ fears of disastrous cutbacks.⁷⁵⁷

For that reason, many scientists, educators, and policy experts today argue that scientists can and should attempt to learn to communicate better with the public. Those who do may find more resources available to help than when Science Service first began trying to facilitate that exchange. In 2006, Richard Hayes and Daniel Grossman, in cooperation with the Union of Concerned Scientists, constructed *A Scientist's Guide to Talking With the Media: Practical Advice from the Union of Concerned Scientists.* Their goal was to walk

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scientists through the interview process so as to understand how reporters work, and help make for more productive outcomes. Today’s major scientific organizations, such as the American Chemical Society, maintain full-time press offices and coordinate intensive public-relations efforts to disseminate new research findings in accessible and appealing form, using new outlets such as the Internet.

If it is true that scientists and the press still struggle to appreciate how essential each is to the other in the transmission and translation of science news, and if it is true that the majority of the indiscriminate public willingly laps up whatever science information it is served, what does that say about the success and value of Science Service? Did it achieve its goal of instilling "a scientific habit of mind" in the public? It was Science Service that took the necessary initial step, creating the first organized, ambitious, sustained, and multi-faceted effort at gathering, translating, and disseminating science news to the public. Further, the organization served as the training ground not only for its own writers, but also as a model for other writers drawn to the emerging field of science journalism. By providing vehicles through which the American public could experience science—whether by reading science news in their local newspaper, or subscribing to the Science News Letter, listening to science programming on the radio, or as young people participating in a science club or the Science Talent Search, Science Service illustrated and facilitated the important role of science in every day life. The Science News Letter continues to be published as Science News, and Science Service, renamed the Society for Science & the Public in 2008, continues to coordinate and co-sponsor what is now the Intel Science Talent Search. Today, National

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Public Radio devotes several hours each week to science coverage, while the *New York Times* devotes a full section each week to science. Newspapers in any community, on virtually any day, will include multiple stories about science, medicine and technology, from meteor strikes, to new ideas about curing cancer, to the latest Nobel Prize winners.

There also exist other, less quantifiable but no less apparent, examples of a society which, though not necessarily "science literate," is science *curious*, and science *comfortable*. People more readily accept that science, and the resulting technologies, are part of their lives, even if they rail against it. One of the most popular channels on the crowded cable menu is The Weather Channel, which first aired in 1982, and was conceived as a venue for transmitting news about weather and weather-related phenomena twenty-four hours a day, putting it on par with around the clock sports channels. Meteorologists remind viewers that computer access allows them to view, and even put in motion, weather radar maps to help them plan their travel and guard their safety. This allows the public to put science to use with the click of a computer mouse, or tap of an application on their mobile phones.

Comic strips in daily newspapers routinely run panels that have science angles—a child who brings home an elephant cloned by his classmate and asks his mother, "Can we keep him?"759 or a laboratory where researchers are decoding a child's gene for "willingness-to-hold-someone-else's-chewed-gum."760 Television crime programs meant as entertainment deal with forensic evidence, and assume the public has a certain familiarity with, if not deep knowledge of, DNA as the unique biological expression of a human being. A cereal company using television commercials to sell its product assumes the same familiarity on the part of its

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target audience when a small "crunchy" piece of cereal tells a "shredded frosted mini-wheat" that he thought they might be related, so he had "fiber analysis" done to confirm it. Three recent mainstream animated movies had a scientific context: Disney Pixar's *Ratatouille* features a rat pursuing DNA evidence to help a friend; Columbia Pictures' *The Pirates! Band of Misfits*, features a pirate attempting to win the title of Pirate of the Year by vying with no less than Charles Darwin for possession of a dodo bird; and Disney's *Frankenweenie*, the story of a boy so saddened by the loss of his beloved dog, that he "harnesses the power of science to bring his best friend back to life."

If these few examples speak to larger trends, as we must assume they do given the amount of money spent on advertising and movie making, then the twenty-first century American public as a whole has become engaged with science, even if individuals do not always understand every detail. But then Science Service knew long ago that scientists, not the public, are the ones who "do" science, and they do it for the larger world. As with most professions, those who need to know how, learn how and others benefit from their knowledge. Though many of the American people may not be deeply knowledgeable about science, so wide an array of purveyors using science to reach their audiences tells us that they believe, and the public confirms, its awareness of science as integral to their lives.

People have long sought to explain natural and scientific phenomena, even if they could not, or did not, conceive of their observations and superstitions as a foundation for systematic, objective investigation. No science news service or publication can claim

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762 *Ratatouille*, DVD, (Disney Pixar, 2007).
764 *Frankenweenie*, DVD (Disney, 2013).
responsibility for the human quest to organize and explain the natural world and its processes. However, it was Science Service that recognized that interest, valued it as essential to the fullest expression of being an intelligent and responsible human being in a free society, and took the unprecedented step of constructing models by which that curiosity could be tapped and directed. With a belief in the power of informing people and inviting them to understand science information, to become more responsible citizens willing to support and protect science research, and motivated by that mission and not profit, Science Service founders, leaders, and staff provided the foundation upon which future efforts could be established.

Perhaps the constellation of scientists, journalists, government agencies, and other public and academic leaders that participated in Science Service represented a unique "perfect storm" of interested and inspired participants. In creating their new model for science communication, they defied previous tensions in the relationship between these different groups. Science Service editors and writers managed to convince a skeptical press community and a skeptical scientific community that it was worth revisiting previous scattered and unfocused attempts to provide popular coverage of science. At every turn, Science Service leaders asked themselves not whether they had a role, but rather what that role in support of science could be. Convinced as they were that no area of life was beyond the influence of science, they concentrated on establishing both the philosophy and practical arrangements, through which science could be revealed and reported to a deserving public.
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For explanation and examples of Science Service's **Cartoonographs**, see Marcel

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For an overview of **W.E. Ritter**, his life and educational endeavors, see:


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For an overview of various elements relating to the **Scopes Trial**, including views by Ronald Numbers, see: http://www.counterbalance.org/history/scopes-frame.html.

For an overview of **E.W. Scripps**, his life and business ventures, see:


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