## **2018 Annual Report**





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Photo Courtesy OregonAS

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### About STEM Next Opportunity Fund

Starting in 2006, the Noyce Foundation made significant investments in high quality STEM learning opportunities after school, during summers, and in STEM learning ecosystems for millions of children and youth. Before the Noyce Foundation closed its doors at the end of 2015, it had invested \$75 million in a broad portfolio of grants, working in partnership with large youth-serving organizations such as Boys and Girls Clubs of American, Girls Inc., National 4-H Council, and YMCA of the USA. Other grantees that have supported this mission include the Charles Stewart Mott Foundation's National State Afterschool Networks, the Every Hour Counts urban intermediary network, Afterschool Alliance national policy organization, National Afterschool Association and National Summer Learning Association, Partnerships in Education And Resilience (PEAR) Institute at Harvard on assessment, the University of Nebraska-Lincoln's Click2SciencePD blended professional development platform, and the STEM Learning Ecosystem Initiative, among others.

The last major contribution by the Noyce Foundation was to provide a significant seed investment in the STEM Next Opportunity Fund to carry on this important work. Under the leadership of Ron Ottinger, and with strong support from founding Board members Penny Noyce and Bob Schwartz, the vision for STEM Next Opportunity Fund was to continue the Noyce Foundation's legacy in expanding and deepening efforts to provide high quality STEM education outside of school time and in STEM learning ecosystems. The goal was to reach as many children and youth as possible within existing organizations and networks across the country, especially those from communities of poverty, from underrepresented groups, and girls.

Building on the strong foundation laid by the Noyce Foundation to infuse high quality STEM programming into afterschool and summer programs for millions of children and youth, the STEM Next Opportunity Fund is poised to play a critical role as a national cheerleader, strategic guide, policy advocate, and investor to bring about a transformative expansion of high-quality and inclusive STEM learning opportunities.

In this context, the goal of the STEM Next Opportunity Fund is to establish the systems and infrastructure that will bring high-quality STEM learning experiences to an additional 20 million young people by 2026, the nation's 250th anniversary.

We firmly believe that accomplishing this goal will result in the following outcomes:

Our nation's children and youth (especially girls, youth of color, and children from low-income households and rural America) will be inspired to become lifelong learners in science, technology, engineering, and mathematics—the STEM fields. The development of knowledge and skills in STEM fields will enable today's youth to fully participate and thrive in the modern world as scientifically and technologically literate consumers, workers, and citizens. Our nation will have a strong STEM technical workforce that is essential to drive our economy forward while preserving the environment for the enjoyment of our children and grandchildren. We can achieve this goal if and only if opportunities to become STEM literate are available to all of our children. That is not the case at present. The underrepresentation of girls and minorities continues to be systemic and will require evidence-based solutions if it is to change. To address these concerns, we have built on the Noyce Foundation's three-point strategy. The first is to invest in infrastructure. That includes improved curricula, methods of professional development, support for national policy and professional organizations like the Afterschool Alliance and National Afterschool Association, improved methods of research and evaluation, and an expanding cadre of professional educators for the out-of-school space. Second is to leverage support from fellow private foundations, corporations, and government agencies. Third, and most important, is to change the mindset of our nation's educational leaders, from thinking of afterschool and summer programs as just a means to keep children and youth off the streets, to seeing these venues as opportunities to energize tomorrow scientists, engineers, and STEM literate citizens.

We now have evidence the strategy is working.<sup>1</sup> But the need is great, and it will require continued investment over a longer period of time to expand the effort.

"The underrepresentation of girls and minorities continues to be systemic and will require evidence-based solutions if it is to change."

Photo Courtesy 50 State Afterschool Network



### **Staff and Advisors**

Executive Director	Ron Ottinger
Founding Board Chair	Penny Noyce
Founding Board Member	Bob Schwartz
Board Member	Dennis Bartels
Board Member	Gywnn Hughes
Associate Director	Teresa Drew
Finance and Operations Manager	Amanda Hanno
Executive Assistant	Sandi Maida-Callahan
Senior Strategic Advisor	Kumar Garg
Family Engagement Advisors	Linda Kekelis and Kara Sammet
Senior STEM Advisor	Cary Sneider

### Investors

A sincere thank you to the following investors whose generous giving to STEM Next Opportunity Fund has made an impact on STEM Education.

Arthur and Toni Rembe Rock\*

Charles Stewart Mott Foundation\*

Noyce Foundation\*

Larry and Helen Hoag Foundation\*

Charles & Lynn Schusterman Foundation

The Ellen Lettvin Family

Qualcomm Inc.

\*Foundiing Investors

### 2018 Year in Review

During the three years that STEM Next Opportunity Fund has been in existence, we have maintained and expanded initiatives begun under the Noyce Foundation, such as our work with large youth-serving organizations, including Boys and Girls Clubs of America, Girls, Inc., National 4-H Council, YMCA of the USA, and Girl Scouts of the USA. We continue to work with our foundation partners to expand the STEM ecosystem movement; and our partnership with the Charles Stewart Mott Foundation has continued to grow as we deepen and sustain the STEM work in 33 states with plans to expand to all 50 states. We have also initiated new projects, including the feature of this year's annual report: a research and communications project to support and inspire families to engage in STEM learning.

The STEM Next Opportunity Fund strategy has been to seed programs, maintain support with close collaboration over extended periods so our grantee can demonstrate effectiveness, and then encourage grants from other private, corporate, or government sources of support. One of our long-time grantees is the National Afterschool Association (NAA), which we funded several years ago to infuse their national conferences with STEM programs, a practice that they have continued even without funds earmarked for that purpose. Last year we launched a new effort led by the NAA, in partnership with three other STEM Next grantees, to design a digital badge program to provide opportunities for front-line STEM facilitators to receive professional certification. The NAA reports major progress this year with several badges developed, and successful completion of a pilot program to measure applicants' facilitation skills. The program is expected to come to fruition in 2019 and be rolled out at scale in 2020.

For this annual report we have selected **The Family Engagement Project**, a series of blogs and case studies featuring the extremely important role that parents and caregivers play in their children's attitudes and eventual participation in STEM courses in high school, college, and beyond. Since STEM Next Opportunity Fund initiated the project last year, it has received a tremendous amount of attention in social media, and promises to be one of the most influential projects that we have ever launched, especially for girls and youth of color.

**Ron Ottinger** Executive Director, STEM Next Opportunity Fund



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### Highlighted Work: The Family Engagement Project

### By Cary Sneider

The Family Engagement Project is a series of remarkable research studies, interviews, and case reports on family engagement conducted by two of our consultants, Linda Kekelis, Founder and former CEO of Techbridge, a highly successful afterschool engineering and science program for girls, and Kara Sammet, Founder and Principal of Gender Lenz, LLC, an inclusion and leadership consulting firm. The reports from this project, which are available on the STEM Next **website**, describe a wide variety of approaches to involve families in supporting their children's interest and engagement in science, technology, engineering, and mathematics—the STEM fields.

At the STEM Next Opportunity Fund, we have long been aware of the power that families have to influence their children's interests and career choices. However, we did not fully appreciate the depth of that influence until recently. Although we realized a substantial return on those investments in the form of increased learning and heightened interest in STEM fields, we now recognize that the value of those investments was greatly amplified whenever they were coupled with a strategy to inform and engage parents and other caregivers.

### The Purpose of the Family Engagement Project

The purpose of The Family Engagement Project is to raise awareness and inspire leaders of youth programs, foundations, corporate partners and policymakers to take action, and make their work with families an essential part of all that they do. While our primary focus is on out-of-school settings, we believe it is essential to bridge family engagement strategies to pre-K through 12 schools. Many of the strategies we have written about are as applicable to in-school as they are to informal and out-of-school programs. The project's primary objectives are to:

- Identify the current state of the field, including gaps and opportunities, of family engagement for practitioners, foundations and corporations.
- Accelerate and consolidate the field's understanding of key concepts, common language, research and evaluation related to family engagement.
- Amplify the promising practices for funding and implementing culturally-responsive family engagement.
- Convene foundations, corporations, national youth-serving organizations, community-based organizations, and policymakers to develop strategies for shared learning and field building to reform, elevate, and scale family engagement.
- Catalyze investments in family engagement.

The first step in this project was to track down and summarize the vast body of research in this area. As shown by the following summary—which features just a few of the many studies—parents have tremendous power to encourage (or discourage) their children's interest and future educational opportunities in STEM.

![](_page_7_Picture_0.jpeg)

"Parents have a profound impact on children's learning, development, interests and aspirations."

### Research on Parent Engagement

There is extensive research going back more than 50 years on the effects of parent influence and outcomes on educational, career, and general life trajectories. Cumulatively, the research shows that parents have had a profound impact on children's learning, development, interests, and aspirations, and educational and career outcomes. Longitudinal studies confirm the return on investment sustained family engagement from early childhood through high school is correlated with higher graduation rates and college attainment.

Photo Courtesy PowerMyLearning

Collectively, the research studies highlighted —along with many other programs and studies—show the return on investment that family engagement can have. Family engagement can be a game changer for expanding and diversifying the world of STEM and expanding the options for all youth. Each of these studies focus on different areas of STEM and within different communities, showing innovative ways of supporting youth along the STEM pathway from pre-K through high school.

#### Parents' awareness of their key role is essential

While parents want to be supportive, when it comes to STEM many parents feel anxious and unqualified to do so. In a survey by Bayer, nearly one-third of parents reported that they didn't feel confident enough in their scientific knowledge to help their child engage in hands-on activities. Parents with less formal education are less confident.<sup>2</sup> In a national survey about young children and science by EDC and SRI, 99% of parents wanted to be involved in their child's education; however, few understood the role they can play in their child's learning. The researchers attribute this confidence gap to how parents view their role in STEM learning—needing to have the right answer and communicate information appropriately rather than supporting their child's exploration.<sup>3</sup>

#### **Encouragement matters for computer science**

While parents may think that it's their expertise, experience, or knowledge that makes for their child's success in computer science, research shows otherwise. Google conducted research to determine factors that influenced young women's decision to pursue computer science. They queried 1,000 women and 600 men with a survey built on research factors from existing studies. What matters? Encouragement by parents and exposure to out-of-school computer science activities arose as key factors in females' persistence in computer science. The gender gap in tech can be tackled with deliberate and directed action focused on encouragement and exposure. Google has developed resources to support family engagement in computer science across home, school, and library settings.<sup>4</sup>

#### Math competence starts early and starts at home

Bedtime Math offers playful math problems for families with kids ages 3-9. These problems can be completed in just 5 minutes and fit into nighttime (or anytime) routines. Parents can sign up for the daily email, download the free app, or read one from their children's books. Evaluation with a control group documents program benefits for kids and parents. Using Bedtime Math as little as once a week over a year improves kids' math skills by 3 months. For kids whose parents have math anxiety the results are even more positive—gains of half a school year. Research shows kids were still ahead two years later, even after they stopped using the app. The program boosts parents' confidence and helps overcome their own fear of math, thereby empowering them to engage in math activities with their child.<sup>5</sup>

![](_page_8_Picture_6.jpeg)

### The importance of talking science for STEM identity

A national survey of college students looked at the relationship between STEM identity, interest in STEM careers, and informal STEM experiences during the K-4 school years. Talking with friends or family about science, as well as reading or watching science programs, had significant influences on STEM identity. The authors note the importance of these results—that everyday experiences, like talking science and engaging in science through books and television, make it possible for youth in families with fewer economic resources to develop STEM identities. Supporting those activities do not require great financial investment. Given that STEM identity is associated with STEM career interest, supporting parents in talking about science, and promoting science reading and media holds promise for family engagement supporting a pathway in STEM.<sup>6</sup>

#### Remake Learning for a more inclusive and equitable society

Remake Learning, which began as an experiment in collaboration in Pittsburgh, has grown into a cross sector regional network, igniting engaging, equitable learning and impacting thousands of practitioners in southwestern Pennsylvania and West Virginia. One aspect of this effort is Remake Learning Days, a multi-day celebration that offers thousands of families hundreds of free hands-on events at schools, museums, parks, libraries, makerspaces, centers of faith, community centers, and businesses. The program increases parent familiarity with science, technology, engineering, art and math (STEAM), with a special focus on reaching out to low-income families. The overarching goal is to increase parent and caregiver awareness and understanding of what the future of learning looks and feels like in practice. Other regions across the country are now producing Remake Learning programs in ways that are contextually relevant for the organizations and families in their communities.<sup>7</sup>

![](_page_9_Picture_4.jpeg)

To summarize, there is a disconnect between what parents think they need to do and what really matters in their child's STEM journey. Within STEM, parental influence is related to improving or increasing children's interest, academic persistence and success, and career choice. Family support plays a particularly important role in participation and retention in a STEM pathway, including but not limited to seeking opportunities for their children to participate in afterschool and summer STEM programs. Parents are vital players in raising youth's awareness of the value of STEM and brokering their participation in activities that build STEM competencies. But to harness the power of family engagement, we need to work hard as a community, to provide parents with the information and resources that they need to help their children succeed.

### **Promising Practices**

Distillation of the research, and interviews with dozens of innovative STEM program leaders have enabled the Family Engagement Project authors to identify five promising practices.

#### **Practice 1: Listen and Learn**

Family engagement is most effective when it starts with listening to families. Program leaders who listen before designing and piloting solutions can better understand what parents need. They will also likely learn about potential barriers to parents' engagement before scaling new offerings. A human-centered design process is a powerful approach for family engagement because it raises up families' voices and builds relationships between families and program providers.

![](_page_10_Picture_4.jpeg)

![](_page_10_Picture_5.jpeg)

### Practice 2: Empower parents with research and resources

Parents don't need to be the experts or have the answers to STEM problems; it's their encouragement that matters. Research-backed messages like these, reinforced with resources, empower parents.

### Practice 3: Prioritize Access and Inclusion

By engaging in research and practice with families, we can develop culturally responsive programs that acknowledge our limitations and build from families' knowledge, experiences, and priorities for change. Mindfulness is needed to ensure that research and resources are shared in ways that are equitable and inclusive.

![](_page_10_Picture_10.jpeg)

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### Practice 4: Provide Professional Development

Out-of-school-time staff with strong STEM knowledge may need professional development about how to effectively listen to and learn from parents before designing content. Youth workers in community organizations may need more professional development to get comfortable with STEM content. To optimize the investment in professional development, administrators should ask staff about their needs first, and then involve them in developing targeted solutions.

#### **Practice 5: Evaluate Impact**

Evaluation means more than counting the number of people impacted. It is about collecting feedback from families and youth to find out if, and to what extent, family engagement activities amplify program goals and youth outcomes. Parent feedback provides rich information that supports rapid prototyping so that program leaders can learn, revise, and retry quickly. Evaluation of early-stage family engagement does not have to be expensive or complicated. Instead, it can be as simple as asking families, "What was the most valuable thing you learned today? And, how can we improve our program to serve you better?"

![](_page_11_Picture_5.jpeg)

### Resources

The lessons we've learned about the most effective practices are of no value if we don't get the word out to educators on the front lines, to program administrators, influential community and business leaders, and to our sister foundations. Consequently, Family Engagement advisors, Linda Kekelis and Kara Sammet, have authored a large number of resources, all of which are accessible via the STEM Next Opportunity Fund website. These include Case Studies that describe the most innovative and effective programs for families that we've found so far, Blogs that provide short and impactful ideas about the importance of family engagement and how to make it happen, and a comprehensive monograph—Changing the Game in STEM with Family Engagement: A White paper for Practitioners and Field Leaders to Empower Families in STEM. The STEM Next Family Engagement team has been very successful in widely disseminating these resources through social media, including popular websites and twitter.

### White Paper

Changing the Game in STEM with Family Engagement: A White Paper for Practitioners and Field Leaders to Empower Families in STEM

#### **Case Studies**

Early Wins and Lessons Learned: How the Bay Area STEM Ecosystem Engages Families

STEM Careers + Families: Learning from Centers and Museums

Expanding Access and Inclusion in STEM through Culturally Responsive Family Engagement

Family Engagement: Taking it to the Next Level

Set a Place at the STEM Table for Youth with Disabilities and their Families

#### Blogs

After Hour of Code™: Family Engagement Maintains the Momentum

How Do We Achieve Computer Science for All? Not without Family Engagement

How a Library's Making Program Empowers Mothers and Daughters

Flipping the Engagement Model on Its Head: Bringing STEM Home to Families

Science Chapter Books: Launchpads for Middle Schoolers

Introduce a Girl (and her family) to Engineering

Public Libraries in the STEM Ecosystem

Where do Families Go for STEM?

2019 The Summer of STEM

Got STEM? Families are the Key as Kids Head Back to School

#### Connect with us!

Sign up for our newsletter

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Follow us on Twitter

# Collaboration, dissemination, and partnership work

In addition to the resources described above, the Family Engagement advisors maintain a busy schedule of presentations, coaching, and collaboration activities. A recent update includes the following partial list of partnership events in 2018, drawn from interim reports. References are to the Family Engagement advisors, Linda Kekelis and Kara Sammet.

- Kara facilitated a panel on family engagement at the CSforAll summit.
- Linda participated in the Bay Area STEM Ecosystem Steering Committee and is presenting on a panel at the National Community of Practice Convening for STEM Ecosystems.
- Linda is also collaborating with TIES as a member of its Design Team to help plan Spring 2019 Community of Practice Convening for STEM Ecosystems.
- Linda is presenting on family engagement with Tara Chklovski at Iridescent for the National Academy of Engineering's LinkEngineering video conversation series.
- Linda is coaching organizations including Imagine Science and Scientific Adventures for Girls on their family engagement work in schools and libraries, with a special focus on equity. Linda intends to apply lessons from this work for the next case study.
- Linda has been invited by the Superintendent of the California School for the Blind to present on STEM accessibility to staff as a result of the new case study.
- Linda is written into a proposal with the National Girls Collaborative Project for a panel on family engagement and STEM for the National Afterschool Association Convention in 2019.
- Linda participated in conferences in the spring, sharing the work from this project and identifying new opportunities and partners for future endeavors.
- Linda provided direct support services with Imagine Science Orange County over the past three months. In addition to helping this group plan family engagement strategies for its summer program Linda also visited the program and offered feedback to staff.
- We have stepped into a coaching and support role this year with several groups including the Mott Statewide Networks, STEM Learning Ecosystems, and Imagine Science.

This brief overview of STEM Next Opportunity Fund's new initiative would not be complete without recognizing the rigor, passion, and creativity that has given life to this project. Linda Kekelis and Kara Sammet are remarkable individuals who deserve immense credit for what they have accomplished and continue to do to help parents and caregivers offer their children the very best that the modern age has to offer. We conclude, therefore, with a statement by Linda Kekelis that she added at the end of one of her blogs, to illustrate the essential role that simple encouragement can play in a child's life.

I am an advisor on The Family Engagement Project with STEM Next and chairperson of the steering committee for EngineerGirl. As a little girl, I loved to play with my Barbie dolls and my brother's erector set. I spent hours building doll furniture but when I stopped playing with dolls, I put away the erector set too. Maybe if I had been encouraged or met role models, I would have followed a path to becoming an engineer like my brother. Instead, I found my passion encouraging girls in engineering, science, and technology and supporting families in this effort.

### STEM Next Opportunity Fund Grants in 2018

STEM Next Opportunity Fund grants awarded in 2018 fall into three categories: grants to large youth serving organizations, funds aimed at strengthening the infrastructure that supports afterschool and summer programs, and grants to groups of "ecosystems" that represent partnerships among schools, businesses, and organizations that offer STEM activities in out of school time.

### A. Large Youth-Serving Organizations

**Imagine Science Orange County** (\$163,800) January 1, 2018 to December 31, 2018. Sustain a collaborative project among youth-serving organizations in Orange County, California. Expand the Imagine Science Orange County Impact for student participants and their families.

**Girl Scouts of the USA** (\$266,982) February 1, 2018 to March 31, 2019. Goal: Strengthen Girl Scouts' National STEM Strategy by providing the infrastructure and outcome measurements necessary to support long term sustainability of the computer science program for girls in grades 6 to 12.

**Girl Scouts of Northern California** (\$50,000) December 1, 2018 to June 30, 2020. Increase access and capacity building. Adapt the new Space Science Badge curriculum for use in staff-and volunteer-led programs.

#### **B. Strengthening Infrastructure**

**Afterschool Alliance** (\$260,000) January 1, 2017 to December 31, 2018. Grant in support of the STEM Hub, which is a collaboration of afterschool leaders and stakeholders with the common mission of ensuring that afterschool programs become a key component in the STEM learning ecosystem, and a website that serves as a curated repository for messaging and advocacy tools.

**Afterschool Alliance** (\$100,000) August 1, 2018 to July 31, 2019. Assist and coordinate STEM Learning Ecosystems to host VISTAs who will help increase access to STEM education in afterschool and summer learning programs.

**Techbridge Girls** (\$68,023) September 1, 2018 to August 31, 2019. Provide comprehensive afterschool STEM curriculum for afterschool educators, training on effectively delivering gender inclusive curriculum and supportive coaching for afterschool program leaders to build their program leadership skills in STEM education.

**The Tech Museum of Innovation** (\$50,000) November 1, 2018 to May 31, 2019. Support educators in developing the next generation of problem solvers through online resources, professional development and a multi-year intensive program.

**Afterschool Alliance** (\$11,020) August 1, 2017 to July 31, 2018. This grant supports AmeriCorps VISTA service members in STEM Learning Ecosystems across the country.

#### **C. Ecosystems**

**Envision Excellence in Education** (\$200,000) July 1, 2018 to June 30, 2019. Establish a sustainable path forward for the STEM Learning Ecosystems Community of Practice.

**Mott Afterschool State Networks.** The Noyce Foundation began to formally collaborate with the Charles Stewart Mott Foundation in 2012 to leverage their investments and build off the existing network infrastructure in order to expand the availability of quality STEM in afterschool and summer. Through this joint venture, we are working to build STEM state systems. State applications to the STEM Next Opportunity Fund are reviewed individually by a panel. Total support from the STEM Next Opportunity Fund for this effort in 2018 is \$350,500. Grant amounts and performance periods vary from state to state, as shown below:

**Arizona Center for Afterschool Excellence** (\$60,000) November 1, 2017 to October 31, 2019. Afterschool and STEM System Challenge Grant (Year 2 of a 2-year \$120,000 grant).

**Arkansas Out of School Network** (\$7,000) September 1, 2018 to December 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**Illinois Act Now! Afterschool Coalition for Children and Teens** (\$5,000) August 1, 2018 to July 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways. Kentucky Out of School Alliance (\$60,000) May 1, 2018 to April 30, 2019. Expand, deepen and sustain statewide STEM system building efforts (Year 2 of a 2-year \$120,000 grant).

**Kentucky Out of School Alliance** (\$7,000) May 1, 2018 to April 30, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**Maryland Out of School Time Network** (\$7,000). August 1, 2018 to October 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**Massachusetts Afterschool Partnership, Inc.** (\$7,000). August 1, 2018 to July 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**North Carolina Center for Afterschool Programs** (\$60,000) February 1, 2017 to January 31, 2019. Afterschool and STEM System Building Grant (Year 2 of a 2-year \$120,000 grant).

**New Mexico Out of School Time Network** (\$3,500) August 1, 2018 to July 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**New Mexico Out of School Time Network** (\$60,000) December 1, 2017 to November 30, 2019. Afterschool and STEM Sustainability Challenge Grant (Year 2 of a 2-year \$120,000 grant).

**South Carolina Afterschool Alliance** (\$7,000) July 1, 2018 to December 31, 2018. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**Vermont Afterschool Inc**. (\$7,000) August 1, 2018 to July 31, 2019. Address barriers in equity and access to quality STEM learning in new and innovative ways.

**West Virginia Statewide Afterschool Network** (\$60,000) May 1, 2018 to April 30, 2019. Expand, deepen and sustain statewide STEM system building efforts (Year 2 of a 2-year \$120,000 grant).

### Endnotes

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