

2-4-1994

NEWS AND NOTES 1994, VOL.4, NO.17

The Rockefeller University

Follow this and additional works at: http://digitalcommons.rockefeller.edu/news_and_notes_1994

Recommended Citation

The Rockefeller University, "NEWS AND NOTES 1994, VOL.4, NO.17" (1994). *News and Notes 1994*. Book 3.
http://digitalcommons.rockefeller.edu/news_and_notes_1994/3

This Book is brought to you for free and open access by the The Rockefeller University News and Notes at Digital Commons @ RU. It has been accepted for inclusion in News and Notes 1994 by an authorized administrator of Digital Commons @ RU. For more information, please contact mcsweej@mail.rockefeller.edu.



Toasts celebrate McCarty and 50-year-old DNA discovery



Professor Emeritus Maclyn McCarty (center) was honored by Deputy Mayor John Dyson, Chairman of the Board's Executive Committee David Rockefeller, President Torsten Wiesel and Physician-in-Chief Jules Hirsch (left to right) at a ceremony Tuesday in The Rockefeller University Hospital.

Fifty years to the day of the publication of the ground-breaking paper by Oswald Avery, Colin MacLeod and Maclyn McCarty showing that genes are made of DNA, The Rockefeller University hosted an anniversary toast at the site of the original discovery, The Rockefeller University Hospital.

With a vial of dry, white DNA in one hand and a glass of champagne in the other, Jules Hirsch, professor and physician-in-chief of the Hospital, welcomed the audience, which included labs associated with the Hospital, to the gathering. He was the first among the speakers—who included President Torsten Wiesel, Chairman of the Executive Committee of the Board of Trustees David Rockefeller, and Deputy Mayor of New York City John Dyson—to raise a glass in salute of McCarty, now professor emeritus at the university.

President Torsten Wiesel spoke

next at the festive occasion: "The implications of this discovery have been enormous, and we are still only at the beginning of the revolution that began 50 years ago with the paper by Avery, MacLeod and McCarty in *The Journal of Experimental Medicine*. We are particularly pleased that the leaders of New York City recognize the importance of this home-grown discovery and that Deputy Mayor John Dyson could come here to join our

See **Toasts**, page 2

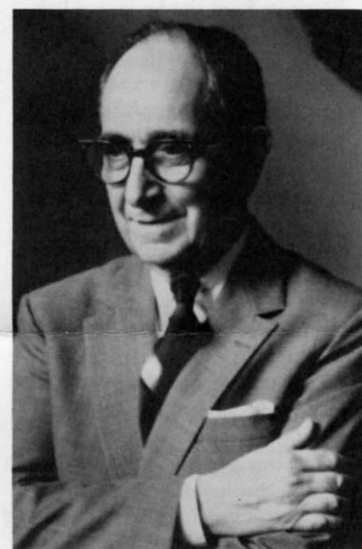
Symposium to honor Avery legacy

The Rockefeller University will hold a scientific symposium entitled "The Legacy of Avery" today (Feb. 4) in honor of the 50th anniversary of the 1944 paper by Oswald Avery, Colin MacLeod, and Maclyn McCarty, which showed for the first time that genes are made of DNA. Robert Austrian, John Herr Musser Professor Emeritus at the University of Pennsylvania School of Medicine, and John Robbins, chief of the Laboratory of Developmental and Molecular Immunity at the National Institute of Child Health and Human Development, will review Avery's scientific accomplishments and discuss subsequent developments in the fields of immunology and infectious disease—areas once pursued by the Avery laboratory.

"The 1944 paper came at the end of Avery's career," said Professor Emil Gotschlich, who will introduce the speakers. "In fact, Avery was recognized as an eminent scientist for his many contributions to the understanding of pneumococcal infection and treatment well before this historic paper. The symposium will give us the opportunity to more fully appreciate Avery's work as seen by two outstanding investigators who picked up where he left off and made great strides in these areas."

Robert Austrian

An expert on infectious diseases, particularly pneumococcal infec-



Robert Austrian (above) will speak with John Robbins at the scientific symposium "The Legacy of Avery" today (Feb. 4).

tion, Austrian was responsible for gathering clinical and bacteriologic data in the 1950s showing that, despite treatment with penicillin, mortality from pneumococcal disease was unacceptably high. He recognized that the disease could be prevented with polysaccharide vaccines originally developed by MacLeod and his associates during World War II. Austrian led the effort to re-introduce and improve the vaccines, which had fallen into disuse. Since their licensing in 1977, the vaccines have been used worldwide.

After graduating from Johns Hopkins University (A.B., 1937; M.D., 1941), Austrian served with the U.S. Medical Corps and Typhus Commission in the China-Burma-India Theater until 1945, then completed his residency at Johns Hopkins Hospital and later became physician and assistant director of the Medical Outpatient Department. In 1952, Austrian was appointed associate professor at the State University of New York College of Medicine. He became full professor in 1957. In 1962, he was named John Herr Musser Professor and Chairman of the Department of Research Medicine at The University of Pennsylvania School of Medicine. He became

See **Symposium**, page 4

Trustee meeting attracts new faces



The trustees sponsored a breakfast meeting yesterday (Feb. 3) to reach out to new audiences, particularly in the financial and business communities. Here, Associate Professor Stephen Burley (left), a speaker at the event with Assistant Professor Titia de Lange, talks with R.U. Council Member Robert Forbes (center) of Forbes, Inc. and his guest, James Torrey of Torrey Funds.

2 Thoughts on DNA discovery

3 Zinder on genetics since 1944

Avery colleague tells DNA story McCarty gives an inside view

The late René J. Dubos, renowned biologist and a colleague of Oswald Avery at The Rockefeller Institute (now The Rockefeller University), describes Avery's role in the pivotal work that uncovered the genetic role of DNA in *The Professor, The Institute, and DNA*. Excerpts from the book, published in 1976 by The Rockefeller University Press, follow.

Avery was a late starter in science.... In 1916, when he was 39 years old, there was nothing in his professional achievements to indicate that, from the age of 40 to the age of 65, he would continuously make major contributions to the biomedical sciences.... He rapidly developed into a creative scientist.... because the Institute Hospital provided an intellectual and human atmosphere that suited his temperament. (p. 69-70)

Avery was a persistent man. Once he became involved in a scientific problem he pursued it doggedly, waiting, if need be, for many years until he saw the way to a solution. He even pretended at times that he enjoyed the failures that are inevitable in scientific life. "Disappointment is my daily bread," he was wont to say. "I thrive on it." (p. 91)

Avery was haunted by the memory of the turmoil that had attended the announcement by him and Heidelberger, exactly 20 years earlier, that polysaccharides, and not proteins, were responsible for the immunological specificity of pneumococcal types. And he anticipated that even greater skepticism would now greet the claim of genetic specificity for deoxyribonucleic acid. For this reason, the manuscript of the paper reporting the claim was sent for publication only after it had been submitted for many months to the critical review and adverse criticism of associates and friends. Furthermore, the conclusions were

The Rockefeller University Archives, c. 1941



Rockefeller investigator René Dubos wrote a book with two heroes: Oswald Avery and The Rockefeller Institute.

presented with several cautionary statements. (p. 144)

...The price of such thoroughness is some loss in the spectacular value of "discovery," and this was precisely the price Avery had to pay. His intellectual puritanism won him the admiration of those who were in direct contact with him, but it prevented him from gaining full recognition of his achievements by the outside world. (p. 153)

Press offers discount

The Professor, The Institute, and DNA is available from The Rockefeller University Press, x8572 or Box 183, at a 20 percent discount for members of the university community. The list price is \$17; members of the university community pay \$13.60.

Professor Emeritus Maclyn McCarty, a co-author with Oswald Avery and Colin MacLeod of the landmark 1944 paper on DNA, published his memoirs, *The Transforming Principle: Discovering that Genes are Made of DNA* (W.W. Norton & Company) in 1985. Excerpts follow.

It is often pointed out that research in the basic sciences provides the base of new knowledge essential for the development of the applied sciences, including medicine. We are less frequently reminded that the reverse can also occur. Research directed against a specific medical problem has resulted in contributions to fundamental biological knowledge. The most dramatic example of this is the discovery that deoxyribonucleic acid (DNA) is the substance that transmits genetic information. (p. 51)

The first indication that the pneumococcus contained DNA came as something of a surprise. Knowledge of the occurrence and distribution of the nucleic acids in nature had not yet reached the point where one could assume that all living cells contained both RNA and DNA. (p. 109)

The process leading to our serious consideration of DNA as the bearer of transforming activity was surely gradual. Nothing in my memory or in the laboratory notes suggests that there was a moment of sudden revelation, a single experiment that resulted in a flash of insight and reorientation of our thinking. On the contrary, the results of several different experiments and the injection of some new information from outside the laboratory were all involved in the crystallization of the concept. (p. 134)

An amusing episode occurred during this period when Fess [Avery] discussed with me his concerns about the order in which our names should



Professor emeritus Maclyn McCarty, shown here around 1940, published his memoirs in 1985.

appear on the paper, a matter that causes more trouble among scientists than the layman might imagine. He said that he wasn't sure whether the names should appear in the order of the length of association with the problem, on the basis of age and seniority, or simply alphabetically. It was not until after he had left me on that occasion that it suddenly hit me that all of the alternatives came to the same result. No matter how you sliced it, it was "Avery, MacLeod, and McCarty." It was fine with me. (p. 167)

News&Notes is published each Friday throughout the academic year by The Rockefeller University, 1230 York Avenue, New York, NY 10021. Phone: 212-327-8967.

Torsten Wiesel, President
Ingrid Reed,

Vice President for Public Affairs and Corporate Secretary
Doron Weber, Director of Communications

Mika Ono Benedyk, Editor
Jennifer Horne King, Assistant Editor
Heather Leahy, Design
Robert Reichert, Photography
Media Resource Service Center, Processing

Ideas and submissions can be sent interoffice (Box 68), by electronic mail (newsno), or by fax (212-327-7876).

The Rockefeller University is an equal opportunity/affirmative action employer.

Toasts celebrate McCarty and 1944 DNA paper

(continued from page 1)

50th anniversary celebration."

Rockefeller, who was a member of the Board at the time of the 1944 finding, also toasted McCarty: "Even if nothing else had been done at this great university, this extraordinary discovery has, in my judgment, more than justified—all by itself—the great hope and aspiration of my grandfather and father when they established this institution. It has given to the world what they hoped for: the beginning of

the understanding of the inner mysteries of life and disease."

Dyson, who is a former member of The Rockefeller University Council, said: "The future of this city is always going to be connected to intelligence. And you at The Rockefeller University are one of the shining examples of this in New York."

At the end of the ceremony, McCarty made a few remarks, reminiscing briefly about his sense of relief, rather than celebration, when the paper came out 50 years

ago. He also offered a toast to The Rockefeller University Hospital, which he called "the cradle of this research."

Other events during the week included a public lecture on the Human Genome Project by David Botstein, professor and chairman of the Department of Genetics at Stanford University School of Medicine, on Wednesday and a historic roundtable discussion with key scientists active in the period between 1944 and 1953 on Thursday.



Zinder chats about past, present and future of genetics

Doron Weber of *News&Notes* spoke recently with Professor Norton Zinder, a leading expert in molecular genetics and chair of the faculty committee that helped plan the celebration "50 Years of DNA." They discussed developments in the field since the Avery lab's ground-breaking paper in 1944.

News&Notes (N&N): How do you see the significance of the Avery lab's discovery?

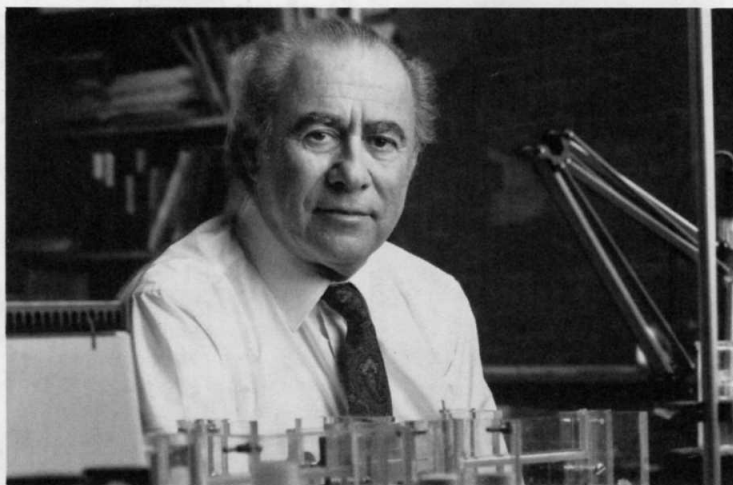
Zinder: It was an important discovery. The whole history of science would be different if no one had made it.

Avery picked up on Fred Griffith's 1928 finding of transformation. Avery was probably annoyed by the Griffith experiment, because it interfered with his belief in the specificity of serological types. But he kept somebody in the lab working on this mysterious process for over 10 years until he had shown that Griffith was correct. It is not always fully appreciated how important it was that an obscure experiment published in an English journal was reproduced in a highly credible laboratory.

The Avery lab made everyone interested in DNA. This is the bottom line in science: not what people were thinking at the time, but whether anyone *did* anything about a finding. Thursday [Feb. 3] we had five eminent people here besides Mac [McCarty] who followed up on the discovery. Their experiments, all emanating from the Avery lab's work, ultimately led to the Watson-Crick model of the double helix.

N&N: At what point did you become involved with this work?

Zinder: I arrived in Josh [Lederberg's] lab in Wisconsin in 1948. I had not been aware of the Avery experiment until a professor asked me to lecture on the pneumococcal transformation phenomenon. So, the information about the experiment had, in four years, reached the University of Wisconsin's very classical medical microbiology department. In my lecture, I emphasized that this phenomenon caused a genetic change—a change in the organism which was heritable and could be extracted and passed on to other organisms. I'm not sure if I discussed whether it was DNA or not. We were still fighting to convince people that bacteria had genes and that this was a genetic phenomenon. We were still agnostic on whether it was DNA or not, but to us it seemed, at the moment, the lesser of the two questions.



Professor Norton Zinder, first chairman of the National Institutes of Health's Program Advisory Committee on the Human Genome, spoke with *News&Notes* about the changing field of genetics since the discovery that genes are made of DNA.

N&N: So, the paper has made a lasting impact?

Zinder: All of biology today is based on it. Most things in biology are not necessary, so the finding of what things *are* is more important than in other areas like physics where you can work from first principles. The fundamental question of biology at the time was "what is the genetic material" and it remains at the root of biological research today. Did DNA have to be the genetic material? I doubt it. It would not disobey any laws I know of if something else contained this information.

N&N: Are there still important discoveries to be made in biology?

Zinder: Biology is full of potential discoveries because it has few general principles and many particulars. Some principles were found during the 1950s and 60s governing DNA, nucleic acid, RNA and protein synthesis. However, now that biologists have begun examining gene regulation, we have found that gene action is controlled by a bewildering array of different mechanisms. This has led to a kind of particularism in biology today.

If you are interested in a particular gene, you have to study that gene specifically and thoroughly. You cannot say, "I know about it because I know about a homologous system." Each system has its own answers. Evolution is filled with niches; it uses what it has and tinkers. There are rarely optimum solutions; there are solutions. One of the reasons why there is a Human Genome Project is because we need to know about all of the 100,000 genes. In addition, there is all the non-gene space. People call it

"junk," but very rarely do things turn out to be total junk.

Since we are interested in certain kinds of diseases, we will have to learn even more. For example, if you learn about atherosclerosis, it may have very little to do with diabetes, even if they overlap partially.

There is a lot of work to be done in genetics although we may not uncover any more new principles. What does remain to be understood in terms of fundamental principles is the functioning of the brain.

N&N: Once we have these 100,000 genes, what will we be able to do with this information? Will we be able to cure disease?

Zinder: We will be able to do something, but precisely what I do not know. The question is what we will want to do. Some diseases will certainly be cured, life probably will be extended, and the quality of life will most likely be improved. But we are speaking from the perspective of the culture and mores of the 1990s with the information of the 1990s. When we reach year 2020 or 2030, we will have a different society, a different civilization and a different set of facts. All we can be sure of is that more information will be available; we will have the infrastructure of the genetics of most organisms. Once the genome is understood, it will never be forgotten. And each generation will add to what can be done or what might be done. In a sense, this effort is amortized over all of human history.

N&N: Will this work enable us to cure cystic fibrosis?

Zinder: Maybe yes, maybe no. It looks promising but we've only

known the gene for two years, and it generally takes 10 to 15 in the best of circumstances before a basic discovery is converted into a therapy. This process may speed up now that there are more scientists working on more areas. But even with a product in hand, it takes years to treat people and to treat enough people to make it worthwhile.

N&N: Once we crack the human genome and possess the ability to correct flaws in our genetic make-up, aren't we inevitably moving towards a kind of eugenics?

Zinder: I think so. However, first we have to get to a state where people who have defective genes are not discriminated against—an ideal situation I call "genes without fault."

N&N: What do you think of new genetic tests, for example those which allow a mother to find out if her fetus has some defect?

Zinder: One of the problems is that we will have a diagnosis long before we have therapy or anything approaching therapy. So it is not always useful to have all the information. Even in my daily existence I like to exert my right not to know things. And that is certainly true in the use of genetic information which may in some instances be burdensome for individuals. Judgments will have to be made during this long transition state about what to make available because of the danger of discrimination.

N&N: How do you avoid it?

Zinder: You avoid it by education. Soon there will be another generation that will realize that each of us has several mutations which, if they were in a homozygous condition, could kill us. My own feeling has been that the more genes you can screen for the better, because once you can screen for 100 and 200 genes, these tests will show something wrong with everyone.

N&N: Would you still go into genetics today?

Zinder: I cannot think of an area of science that is more interesting. I might go into the genetics of the brain or something of that kind to make the basic science questions more difficult. But genetics is a passion I have always had. It is the study of origins, of the beginning of us. Without that you can never really know very much. I believe human genetics will be at the forefront of biology through the early part of the next century.

Potpourri

Tri-Institutional Noon Recital

The Windham String Quartet will perform works by Franz Joseph Haydn and Johannes Brahms at the Tri-Institutional Noon Recital today (Feb. 4). Founded in 1992 at the renowned Marlboro Music Festival, the quartet debuted with rave reviews at Lincoln Center and Merkin Hall, and has since performed at concert halls across the East Coast. The musicians include violinists Ivan Chan and Naomi Katz, violist Hsin-Yun Huang and cellist Wilhelmina Smith. The concert, to be held in Caspary Auditorium at noon, is free and open to the public.

Sunday film

The Atomic Café (U.S.A., 1982), directed by Kevin Rafferty, Jayne Loader and Pierce Rafferty, will be shown in Caspary Auditorium at 7:30 P.M., Sun., Feb. 6. The film combines comedy and horror to describe government misinformation and pop-culture artifacts from the atomic 1950s. Admission is free. All are welcome.

Computer workshops

Upcoming computer workshops which still have openings include:

- **Introduction to Windows:** Mon., Feb. 14, 2:00 to 4:00 P.M.;
- **Introduction to the Macintosh:** Tues., Feb. 15, 2:00 to 4:00 P.M.;
- **Word for the Macintosh, Part I:**

DNA anniversary in the news

This week, Rockefeller University's celebration of the 50th anniversary of the discovery that genes are made of DNA received more attention in the national print and broadcast media. Some highlights were:

- coverage in *The New York Times* "Chronicle" section;
- a segment on the NBC "Today" show;
- continuing pickup of an Associated Press feature story on the Avery lab and the DNA revolution.

In addition, the landmark 1944 paper by Oswald Avery, Colin MacLeod and Maclyn McCarty will be reprinted in the March issue of *The Journal of NIH Research*, accompanied by an interview with McCarty.

Courtesy of Marilyn Gilbert, Artists Management



The Windham String Quartet will perform at the Tri-Institutional Noon Recital today (Feb. 4).

Tues., Feb. 22, 2:00 to 4:00 P.M.

To register, leave voice mail at x7768 stating your name, extension, lab or department name, and the classes for which you wish to register. More workshops will be announced in the following weeks.

Tax forms

Tax forms are available on the second floor of Founder's Hall, on a table across from Room 215. For information concerning tax materials that are not on the table, contact Deborah Sousa, x8345. Sousa emphasizes that she is not qualified to give tax advice.

Moscow interviews

The Deans' Office would like to know if any faculty members traveling to Moscow before early April would be willing to interview applicants with a background in cell or molecular biology. Call Susanna Ander, x8088.

Mika Ono-Benehyk



The Super Bowl drew a crowd to the Faculty and Students Club on Sunday. Viewers witnessed the defeat of the Bills to the Cowboys, the fourth straight Super Bowl loss for Buffalo.

Academic Council

Assistant Professor Ulrike Gaul was elected to the Academic Council to finish the term of Associate Professor Steve DiNardo. She joins Associate Professor Alan Aderem and Assistant Professor Michel Nussenzweig as junior-head-of-lab representatives on the Council.

Dining special

Food Service is offering a special in the Abby Aldrich Rockefeller Hall Dining Room: after nine meals within a 30-day period, the 10th meal is free. This offer is for personal use only; meals charged to account numbers are not eligible.

New network service

Computing Services is pleased to announce the availability of a new network service—a centralized 'Apple Remote Access (ARA) server. Subscribers to this service will be able to connect to the university AppleTalk network from home or when they travel using their own ARA software and modem. Once an ARA connection is established, a subscriber has access to AppleTalk and TCP/IP network services such as printing, AppleShare file services, file transfers, telnet and electronic mail (via Eudora). To use the server, users must have a Macintosh computer with System 7, the ARA client software (available from Apple for \$38.00), a modem (9,600 bps. is the minimum modem speed recommended; typically a 14,400 bps. modem costs about \$250) and a central ARA server account (subscribers will be issued their own user name and password). The cost of this service is \$15 per month for Rockefeller faculty and staff and \$10 per month for students. For further information, contact the consultant, x8940.

Symposium to pay tribute to Avery's legacy

(Continued from page 1)

emeritus in 1986 and continues to hold the position of professor of research medicine.

An active member of numerous advisory committees and editorial boards, Robbins has received many honors, including the Albert Lasker Award and election to the National Academy of Sciences and its Institute of Medicine.

John B. Robbins

A pediatrician and leading investigator in immunology, Robbins will speak on the development and use of polysaccharide-protein conjugate vaccines. Avery had explored the concept of using conjugates to prevent bacterial infection. Since then, Robbins and his colleagues have expanded Avery's chemical principles into a vaccine that has been successfully used to prevent *Haemophilus influenzae* type B infections and has been incorporated into the routine immunization of infants throughout the world.

A graduate of New York University (B.A., 1956; M.D., 1959), Robbins completed his training at the Massachusetts General Hospital in 1960 then held a postdoctoral fellowship at the University of Florida, where he was later appointed assistant professor of pediatrics and microbiology. In 1967, Robbins joined the faculty of pediatrics at Albert Einstein College of Medicine as assistant, then associate professor and remained there until 1970, when he became clinical director of the National Institute of Child Health and Human Development at the National Institutes of Health (NIH). Subsequent appointments at the NIH include: chief of the Developmental Immunology Branch (1971-74); director of the Division of Bacterial Products with the Food and Drug Administration (1974-83); and chief of the Laboratory of Developmental and Molecular Immunity (since 1983).

Robbins has received numerous awards, including a Public Health Service Distinguished Service Medal from the U.S. Public Health Service at the NIH and election to the National Academy of Sciences' Institute of Medicine.

The scientific symposium, to be held in Caspary Auditorium at 3:45 P.M., will be preceded by tea at 3:15 P.M. in Abby Aldrich Rockefeller Hall.