# Science Advances in 1965

Mars photographs show life on that planet unlikely; Russian and U.S. astronauts walk in space, and most distant and most ancient astronomical object discovered.

# By WATSON DAVIS

➤ MAN'S PROGRESS in the conquest of space continued during 1965. Both Russian and American astronauts "walked in space" outside their capsules.

Mariner 4 photographed Mars relatively close up. The Martian pictures showed that the surface of the ruddy planet was more like the moon than the earth. This discouraged the idea that life exists on that planet because there is every indication that the moon is a lifeless satellite of the earth. The "canals" of Mars appear to be due to an optical illusion of elevation on Mars' surface.

In space also Comet Ikeya-Seki, the brightest visible so far in the 20th century, appeared for a short period. Farther in the depths of space, far outside the solar system or even our own galaxy, explosively brilliant objects called quasars were studied by astronomers. One quasar 3 C-9 was found and pronounced the most distant and most ancient object in the universe today. The study of quasars tended to support the idea of a "big bang" start of the universe.

# Life Existence More Ancient

On the earth itself, the time that life has existed was pushed into the more remote past with evidence from chemical molecules in Minnesota rocks that life existed 2.7 billion years ago and from African rocks, 3 billion years ago.

From the Olduvai Gorge in Tanzania, East Africa, where other evidences of prehistoric man had been unearthed in previous years, evidences of a different type of human being living about 600,000 years ago were discovered, indicating that three different types of prehistoric man existed near to each other in this ancient area.

For the benefit of the health of modern Americans, legislation was passed by Congress on Medicare which will have a great influence on health and medical practice. A new heart, cancer and stroke program was also implemented. Besides bringing medical benefits to many of the older people in our population, there will be an increase in medical research to continue the development of new methods of treating illnesses and increasing longevity.

One promising accomplishment was the detection of brain tumors by ultrasonic waves. In another advance, steps were taken to overcome the Rh negative factor by giving high-antibody gamma globulin to the mother shortly after the birth of her first child.

In a constant effort to develop through animal experimentation the new methods of treating diseases, an artificial heart was implanted partially in a calf. Dog brains were successfully transplanted, aiming at the better understanding of brain tumors, cancer growths and multiple sclerosis.

New studies of nucleic acid structure brought science closer to discovering the secret of life. For the first time in history, the structure of a nucleic acid, carrier of hereditary messages, was determined. The first complete nucleotide sequence was detected in one of the smallest biologically active nucleic acids known—an alanine transfer RNA, or ribonucleic acid, isolated from yeast. This discovery could lead to understanding many important processes of living cells and to synthesis of a biologically active nucleic acid.

# Chromophore, Key to Growth

Scientists are understanding what makes some plants grow tall and others short by the isolation of a small bile pigment called chromophore which, in essence, triggers a protein molecule that governs the growth of plants. The chromophore, highly sensitive to light, is the key to growth and flowering of certain plants at certain times of the year as the timing and intensity of sunlight change.

The five nucleotides or building blocks of life's basic material DNA (deoxyribonucleic acid) and RNA (ribonucleic acid) were synthesized from chemicals in a laboratory by an "astonishingly simple" method of adding simple phosphate to ammonia, methane and water, believed to have been earth's principal ingredients when life began billions of years ago.

The perceptual system of newborn babies was found to be more highly organized than previously thought, and this will undoubtedly have a bearing upon early training and education of children—a field of research and practice that has been continually important and interesting.

# **Poverty Program Educates**

The making of public education available to younger and younger children, particularly the underprivileged who do not have the advantage of home life and care, is an accomplishment of the enrichment of educational experience being provided by the poverty program of the Federal Government applied to local conditions.

A striking buildup of more interest in science for youth, increasing effectiveness of science courses in the elementary and secondary schools, and a growth of science youth activities in science clubs and fairs was noted, not only in the United States, but in other parts of the world.

A long-term sea mystery of what creature has been making spirally coiled tracks deep on the ocean floor was solved by special



Smithsonian Astrophysical Observatory

IKEYA-SEKI—This picture of the Comet Ikeya-Seki was taken on Oct. 29 at Maui, Hawaii, by one of the observers at the Smithsonian Astrophysical Observatory's observing station located there. It was taken with a 35 millimeter camera.

photographs showing for the first time the acorn worm, known as "giant" enteropneust, 15,534 feet below the surface of the South Pacific Ocean. These fragile, pinkish-tan marine worms, measuring two inches to two feet long, have a rounded snout that fits into a collar looking much like an acorn. They burrow into mud and sand, swallowing the mud to digest their food and leaving casings lined with mucus to form the odd spirals and coils on the ocean floor.

Science's continued investigation of the moon was advanced not alone by the human astronaut Gemini flights accomplished and planned, but by the readying of sophisticated robots that will precede man on the surface of the moon to send back to earth signals reporting their lunar discoveries.

While space explorations concentrated largely upon the moon and Mars, astronomical observations of various sorts have determined new facts about some of the other planets. The rotation of Mercury has been determined to be different than what was believed in the past. By radar observations and a reanalysis of optical ones, the

rotation rate was determined to be 58.6

The discovery of the antideuteron during the year gave new strength to the intriguing idea of an antimatter world, the particles of which are opposite in charge to those in our own part of the universe. The two kinds of matter would annihilate each other. The antideuteron is the largest known particle of antimatter and the first known entity of this sort that is made up of more than one antinucleon.

Scientists continued to be intrigued at the idea that some of the phenomena causing the gigantic disasters on the earth may have been caused by chunks of antimatter smashing into our atmosphere causing such explosions as the one in Siberia in 1908.

The location of the 200 billion electron volt particle accelerator, projected to cost \$350 million over a period of years, was not decided during the year. Competition between various parts of the country are complicating its location. The physicists believe that this gigantic instrument will give new information about the constitution of matter and possibly reveal new ways to tap the energy of the atom.

New artificial "metals," made by applying very high pressures to non-metals, were produced in laboratory experiments, leading the way to production of improved metalliclike substances and giving great promise of better understanding of how and why materials react as they do.

# **Drought Causes Apprehension**

The drought of the northeastern United States area continued to cause apprehension that water shortages for large cities like New York will become even more serious, requiring desalination plants and major changes in utilization of rivers. This may be a climatic cycle that will continue for a decade or two.

Scientists are exploring the sea in various ways more intensively than in the past. Dwelling places beneath the ocean have been developed. New depths of the sea have been reached in craft withstanding the pressures encountered. Even astronauts whose primary interest has been outer space are joining in the deep sea exploration. Many more oceanographic vessels are cruising the waters around the North American continent to obtain new information and possible sources of materials for food utilization by an expanding population.

Publication of a map that was drawn in 1440 by Viking explorers reinforced the idea that Columbus was not the first white man to reach America, but that Scandinavian explorers preceded the first settlements which are credited in our history books.

By assembling panels of experts, the National Academy of Sciences, the elite body advising the Government and the nation on science and research, issued reports on pollution of water and atmosphere, chemistry, botany, use of computers, the search for life on Mars and other planets, and 10 years' progress studying the solid earth.

Science News Letter, 88:387 December 18, 1965

GENERAL SCIENCE

# **10 Top Science Advances Chosen by Science Service**

- ➤ THE TEN TOP science, medicine and technology advances in 1965 as selected by Dr. Watson Davis, director of Science
- 1. Photographs of Mars obtained by Mariner 4, indicating the improbability of life there.
- 2. Space walks by Russian and United States astronauts.
- 3. Advances in transplantation, including transfer of brains of dogs from one animal to another and implantation of an artificial heart into a calf, techniques foreshadowing possible use in humans.
- 4. Passing of Federal legislation for Medicare, as well as a new heart, cancer and stroke program.
- 5. Discovery of the antideuteron, sustaining theories that an antimatter, or negative type, exists in the universe.
- 6. Comet Ikeya-Seki, most brilliant in the century.
- 7. Advances in learning the structure of nucleic acid that may bring science closer to knowledge of the secret of life.
- 8. Discovery of the most distant and most ancient object in the universe, the immense astronomical explosion of quasar 3C-9.
- 9. Discoveries during continued exploration for traces of early man in Africa indicating that human beings existed two million years ago.
- 10. Recovery of a map drawn in 1440 A.D. showing that America was visited by Norsemen before Columbus landed.
  - Science News Letter, 88:388 December 18, 1965

# THE REVIEW of the YEAR 1965 of **SCIENCE NEWS LETTER** to one of your friends

SCIENCE NEWS LETTER 1719 N Street, N.W. Washington, D. C. 20036
Please send the Review of the Year issue of Science News Letter, FREE, to:
Name
Address
City
StateZip Code

	1962; Section 4369, Talle 30, Unit	AND CIRCULATION P.	ablisher: File two copies of is form with your postmaster.
December 1, 1965	2. THE OF POSICENCE SCIENCE NEWS LETTE	R	
Weekly			
1719 N Street, N. W.	- Washington, D. C.	20036	
1719 N Street, N. W.	- Washington, D. C.	20036	
	6. NAMES AND ADDRESSES OF PUR		TOI
	., 1719 N Street, N.	W Washington, D. C	. 20036
Dr. Watson Pavis, 36	20 Garfield Street, N	. W Washington, D.	C. 20007
ANNUGHO (DROX (Name and address)			
7. OWNER (U owned by a co- drawn of stockholders assuing a addresses of the individual own well as that of each individual	eporation, its name and address of holding I percent or more of to eer must be given. If sumed by must be given.)	unt be stated and also immedia tel amount of stack. If not ourse a partnership or other unincorper	tely thereunder the names and ad- ed by a corporation, the names and ated firm, the names and address, as
HAME		ADDRESS.	
Science Service, Inc.	1719 N	St., N. W Washingt	on, D. C. 20036
OF BONDS, HIGHTGAGES OR OTHER	TGAGES, AND OTHER SECURITY HE SECURITES (If there are seen, to	OLDERS OWNERS ON HOLDING 1 F	ENCENT OR MORE OF TOTAL AMOUNT
None		ADCARES	
House			
9. Paragraphs 7 and 8 includ trustee or in any other fiducias meets in the two paragraps stockholders and security hold a rapacity other than that of which itself is a stockholder or in paragrapha 7 and 8 when	e, in cases where the stockhold y relation, the name of the pers how the stant's full knowledgers who do not appear upon the bons fide owner. Names and thoider of bonds, morrgages or the interests of such individuals	it or security holder appears up no or corporation for whom numer e and belief as to the circumse to books of the company as true addresses of individuals with other securities of the publishin are equivalent to 1 percent	ion the books of the company as the trustee is acting, also the same cheer and conditions under securities in steel, hold stock and securities in are trockholders of a corporation of corporation have been included more of the total amount of the
IO 1965 ITTH WINT BY COMPARING AC	A sea from a troop process many		
IO 1965 ITTH WINT BY COMPARING AC	- Contraction	H DO HOT CARRY ADVERTISING OTHER	THAN THE PUBLISHER'S OWN AND WHICH of Title 39, United Stells Code)
IO 1965 ITTH WINT BY COMPARING AC	A sea from a troop process many		
10. THE STEM MUST BE COMPLETED FOR ASS HANDO IN SECTIONS 132-231, 1	# ALL FURICATIONS EXCEPT THOSE WHIS 22 232, AND 132 133, FOSTAL MANUA	H DO HOT CARRY ADVERTISING OTHER	THAN THE PUBLISHER'S OWN AND WHICH of Title 39, United Stells Code)
10. THE STEW WILL BE COMPLETED FO ARE NAMED IN SECTIONS 137.221. T ALECTION PROTECTION Pro-	# ALL FURICATIONS EXCEPT THOSE WHIS 22 232, AND 132 133, FOSTAL MANUA	N DD NOT CART ADVERTISING DENSE ("Seniore 4355», 4358, 434 4355 AVERAGE NO. COMIS AVERAGE NO. COMIS FRECENSIO 12 MONTAGE  94,849	THAN THE PUBLISHER'S OWN AND WHICH of Title 39. United Steins Code! SHOOL ESCH HEADS? 10 PAING DATE
10. THE STEEN MUST BE COMPACTED FOR ASS MANNO IN SECTIONS 132.221. 1  TOTAL NO. COPES PRINTED (Not Print Inches CIRCULATION)  AND STREET STREET, STREET, SAND.	R ALL FUNCATIONS EXCEPT THOSE WHIC 29 232, AND 132 133, FORMI, MANUA Berl	N DO NOT CART ADVENTION DOING (Service 4356, 4358, 4nd 4556, AVERAGE NO. CONTS PERCENSIO 13 MONTHS 94,849	THAN THE PUBLISHER'S OWN AND WINCO If This 39, United State Code; SMOOL ISSUE HEAREST TO PAIN GOATE
TO THIS ITEM WINT BE COMPLETED FO ARE HAMPO IN SECTIONS 337.271. 1 TOTAL HO. COPES PRETED (Not Prim 1. PAID CRICUATION 1. MAID TRICUION GEALES AND 1. MAID TRICUION GEALES AND 2. MAIL SUBSCRIPTIONS	R ALL FUNCATIONS EXCEPT THOSE WHIC 29 232, AND 132 133, FORMI, MANUA Berl	N DD MOT CARY ADVERTISING DOISE (Section 41556, 43554), and 4556 of ARREST MOS CORPS (SECTION 12 MOTHERS (94, 849)  87	PAIN THE PUBLISHES IS OWN AND WHICH If THE 39, United States Code; Smooth recent recents Smooth recent recents 98,700
10. THIS ITEM WILET BY CONTRETED FO ARE MANNO IN SECTIONS 132.221. 1 1. TOTAL HO, COPES PRINTED (Not Print 1. PAID CHOCKATION 1. MAIST THROUGH GEALERS AND 14415	R ALE PUBLICATIONS EXCEPT THOSE WHICE 20 237, AND 132 133, POSTAL MANUAL Res.  Res.  CAMBES, STREET VENCOUS AND COUNTS	N DD NOT CAMP ADVERTISHED DONE (Finders 43354, 4354), and 4334  APRICA BOD, CONTES  PRECEDENT 13 MODERS  94,849  87  90,461	98,700 87 96,445
IO. 195 IIBN WAIT M COUNTERS FO ARE HAMOD IN SECTIONS 152.221, 1 100M NO. COPES PRINTS (Fir Print I AND SECULATION MAINT SPROMOM SEALES AND SAUSS 2. MAIL DUSCOPPIONS 1. TOTAL FAIR CHECKATION	A ALL PUBLICATIONS SECTION THOSE WHITE AND A SECTION ASSOCIATION AND A SECTION ASSOCIATION AND A SECTION ASSOCIATION AND A SECTION ASSOCIATION AND A SECTION ASSOCIA	** DO NOT CART ADVENTISHED DESIGN (Francisco Const. Cart. ASSA. 4316. 44	Train for Publisher's Own AND WHICH  **Told 37, Owned Train Cash  **Most Brown Brown  **Told Train Control  **
10 195 IIBM WALL BE COMPLETED FO ARE HAMAD IN SECTIONS 132 221. T 1. TOTAL NO. COPES PRINTS (Not Print 1. AND COROLATION 1. AND STROUGH GEALES AND 1. AND STROUGH GEALES AND 1. AND STROUGH GEALES AND 1. AND STROUGH GEALES AND 1. TOTAL PAD CRICIATION 1. MET BETSHAUTON (sectioning complete	AND	90,461 90,548 90,548	1940 176 (1985) 1961 1 (1994) 499 WHICH I (1994) 1 (1994)
THE STREET (STATE (STATE ) AND THE STATE ) AND THE STATE (STATE ) AN	A THE CONTROL OF THE	90 and still desiration of organic and a state of the sta	1960 37, 1960 37, 1960 48, 196

## SCIENCE NEWS LETTER

DECEMBER 18, 1965 NO. 25

#### Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington, D. C. 20036. NOrth 7-2255. Cable Address: SCIENSERVC.

7-2255. Cable Address: SCIENDERVC.

Subscription rates: 1 yr. \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage. Change of address: Three weeks notice is required. Please state exactly how magazine is addressed. Include zip code.

how magazine is addressed. Include zip code.
Copyright © 1965 by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newpapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also produces and distributes THINGS of science (monthly), produces and publishes books, and conducts the National Science Youth Program. Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U.S. and Canadian Patent offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member of Audit Bureau of Circulation.



### SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Wallace R. Brode, \*\*\* Washington, D.C.; Bowen C. Dees, National Science Foundation; Athelstan F. Spilhaus, University of Minnesota. Nominated by the National Academy of Sciences: Harlow Shapley, Harvard College Observatory; Detley W. Bronk, Rockefeller Institute; Henry Allen Moe, The Clark Foundation. Nominated by the National Research Council: Leonard Carmichael,\* National Geographic Society; Eric A. Walker, Pennsylvania State University; Glenn T. Seaborg, U.S. Atomic Energy Commission. Nominated by the Journalistic Profession: Gordon B. Fister, Allentown (Pa.) Call-Chronicle; Ralph B. Curry, Flint Journal; O. W. Riegel, Washington and Lee University. Nominated by the Scripps Estate: Ludwell Denny, Scripps Howard W. Scripps Trust; Edward W. Scripps II,\*\* Edward W. Scripps Trust; Edward J. Meeman, Memphis Press-Scimitar. \*President, \*\*Vice President, \*\*\*Treasurer.

\*\*\*Treasurer.

Staff—Director: Watson Davis. Assistant Director:
Dorothy Schriver. Writers: Elinor Betters, Jonathan
Eberhart, Ann Ewing, Faye Marley, Patricia McBroom, Barbara Tufty, Judith Viorst, Ruby Yoshiok.
Science Youth Division: Joseph H. Kraus, Lloyd
Ulmer. Photography: Fremont Davis. Production:
Marcia Nelson. Syndicate Sales: Forrest L. Snakenberg. Librarian: Margit Friedrich. Interlingua Division in New York: Alexander Gode, 80 E. 11th
St., GRamercy 3-5410. Advertising Manager: Fred
A. Moulton, MEtropolitan 8-2562, Washington, D.C.