

GENERAL SCIENCE

# Science, Mankind's Servant

Not a mysterious and magical super-creed, declares Dr. Warren Weaver in retiring presidential address of AAAS, which gave 11 characteristics of science.

► SCIENCE is not a mysterious and magical super-creed, but is instead the servant of mankind and the friendly companion of art and moral philosophy, Dr. Warren Weaver, Rockefeller Foundation vice-president for natural and medical sciences, reassured the American Association for the Advancement of Science at Atlanta in his address as retiring president.

Dr. Weaver presented 11 general characteristics of science, which may be briefly summarized as follows:

1. Science has impressively proved itself to be a powerful way of dealing with certain aspects of our experience. These are, in general, the logical and quantitative aspects, the method working superbly for linear and stable physical problems in two or three variables. The physical universe seems to be put together in such a way that this scientific approach is exceedingly successful in producing a good, workable, initial description.

2. We simply do not know yet how far these methods, which have worked so well with physical nature, will be successful in the world of living things. The successes to date are most impressive. One feature after another which previously seemed to fall in a special "vital" category has usefully yielded to biochemical or biophysical attack. But it is also the case that we have as yet made only a beginning. How far the logical-quantitative method will succeed here, one would be rash to forecast, although the prospects do indeed seem most promising.

3. We have made small beginnings at extending the scientific method into the social sciences. Insofar as these fields can be dealt with in terms of measurable quantities, they seem to present closely intercoupled situations, which can very seldom usefully be handled with two or three variables, and which often requires a whole hatful. Science has, as yet, no really good way of coping with these multivariable, but nonstatistical, problems, although it is possible that ultra-high-speed computers will inspire new sorts of mathematical procedures which will be successful in these cases where the effects are too numerous to handle easily, and not numerous enough or of suitable character to permit statistical treatment.

4. It is, incidentally, not at all necessary that the particular analytical techniques of the physical sciences be forced upon biological or social problems with the arrogant assumption that they can and should make unnecessary other types of insight and experience. During the recent war a most useful collaboration was developed, known often as operations analysis, in which reason-

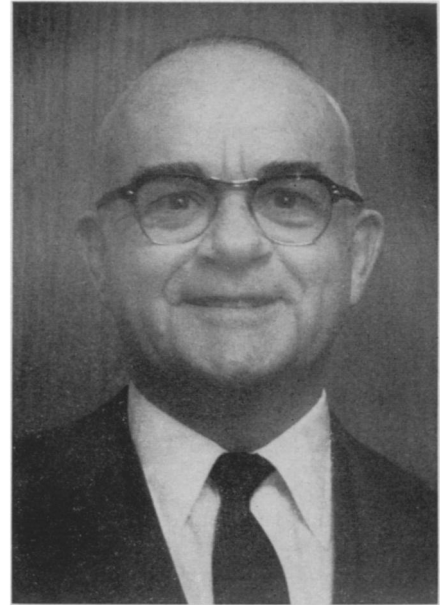
ing of a mathematical type was applied to certain aspects of very complicated situations, but with no expectation that judgment, experience, intuition, or a vague sort of general wisdom would be displaced or superseded—rather only that these be aided by whatever partial light could be furnished by quantitative analysis.

5. An important characteristic of science is its incapacity to be impractical. The most far-reaching discoveries and the most widespread useful applications regularly flow out of ideas which initially seem abstract and even esoteric. These ideas arise out of the unguided and free activity of men who are motivated by curiosity or who, even more generally, are thinking about scientific problems simply because they like to. This way in which apparently aimless curiosity stubbornly refuses to be foolish and leads to important goals, doubtless seems strange or even incredible to some persons. This eventual usefulness of the initially impractical is widely held to be a very special feature of science, but I am not so sure of this. I think that impracticality is more generally important than we are inclined to suppose.

6. Science presents the kind of challenge that attracts to it young men and women who tend to have a rather high degree of a certain kind of intelligence. Since this particular kind of intelligence is relatively easy to recognize and measure, and since many other types are subtle and illusive, even though perhaps more important, we tend to adopt this one type as the norm. Also, this particular type of intelligence leads rather promptly to tangible results. These circumstances lead to the conclusion, which is then something of a tautology, that scientists are more intelligent than other people. This may or may not be so. More important: it may be neither true nor untrue, in the sense that the attempted comparison is meaningless.

7. In spite, however, of their appearing to be so bright, scientists are not special creatures: they are people. Like lots of other people they are good at their own tasks. Off their jobs they seem, as Shylock remarked in another connection, "to be fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same winter and summer" as other men are. When you prick them, they do indeed bleed.

8. One rather accidental fact has led many to think that scientists are strange and special. This is the fact that scientists often use a strange and special language. Science does find it desirable to use very many



**NEW A.A.A.S. PRESIDENT** — Dr. Lawrence H. Snyder, dean of the University of Oklahoma graduate college, Norman, Okla., was elected president of the American Association for the Advancement of Science at its Atlanta meeting. A geneticist and specialist in heredity, Dean Snyder will preside over the A.A.A.S. in 1957 and deliver the principal address at the 1958 meeting.

technical words, and it has indeed developed, as a matter of saving time, a sort of language of its own. This gives to science an external appearance of incomprehensibility which is very unfortunate. The public need not think itself stupid for failing intuitively to grasp all this technicality. Indeed what has developed is not so much a language as a series of very specialized dialects, each really understood only by its inventors.

9. Science does not deserve the reputation it has so widely gained of being based on absolute fact (whatever that is supposed to mean), of being wholly objective, of being infinitely precise, of being unchangeably permanent, of being philosophically inescapable and unchallengeable. There seem still to be persons who think that science deals with certainty, whereas it is of course the case that it deals with probabilities.

10. The development of Western science, rather than constituting a uniquely inevitable pattern, has been influenced by the general nature of Graeco-Judaic culture, including specially the standards, arising within that tradition, of what is interesting and important.

11. Science is a very human enterprise, colored by our general ideas, changeable as any human activity must be, various in its possible forms, and a common part of the lives of all men. The impressive methods which science has developed, methods

which sometimes seem so formidable, are in no sense superhuman. They involve only improvement, great, to be sure, of pro-

cedures of observation and analysis, which the human race has always used.

Science News Letter, January 14, 1956

#### MEDICINE

## Cold Vaccine Tests

**Navy recruits are receiving shots against one kind of infectious cold. Already found successful in tests on prisoner volunteers. Many colds now plaguing us may be this type.**

► TESTS of a new vaccine against one kind of infectious cold, maybe the kind that is plaguing many of us now, have started in a small group of Navy recruits at Great Lakes, Ill., Naval Training Station. They will be started in a second small group next month.

The tests are being made by the Naval Medical Research Unit No. 4 at Great Lakes, a Navy spokesman said.

The vaccine being tested is for the APC viruses. These viruses were isolated by Drs. R. J. Huebner, J. A. Bell and Victor Haas of the National Institutes of Health, Public Health Service. The NIH scientists made a vaccine against them and with Dr. T. G. Ward of Johns Hopkins School of Hygiene, Baltimore, tested the vaccine on prisoner volunteers. These tests on a small group showed the vaccine to be safe and effective.

The tests now under way among Navy recruits are still considered preliminary. Only a couple of hundred recruits are getting the vaccine. These small scale trials were set up to see how the vaccine works in a military establishment and to determine proper dosage. If the vaccine suc-

ceeds in safely protecting the couple of hundred recruits from APC infection, it is expected to get large scale trial among thousands of recruits.

APC viruses cause a special kind of cold, or upper respiratory disease to use the technically correct term. This is not the sneezing, runny nose type of cold. It is one in which its victims have sore throat and some fever. In summer outbreaks, the disease is less severe than in winter. Red eyes are a symptom of the summer APC attack.

APC viruses are very common and come at all seasons. In schools, military training establishments, orphanages, and the like, the APC viruses cause outbreaks or epidemics. Last summer an outbreak in Canada was traced to swimming pools.

Many of the colds now plaguing the population are believed due to APC viruses, although they have been so recently identified that facilities are not yet in existence for testing and reporting all cases. The letters APC stand for Adenoid, Pharynx in the throat and Conjunctiva of the eyes where the viruses were found.

Science News Letter, January 14, 1956

#### DENTISTRY

## Saliva vs. Tooth Decay

► REPULSIVE to many, the mucus in saliva nevertheless may have an important role in preventing tooth decay. This is shown in studies by Dr. C. E. Klapper and associates at the University of Alabama Medical Center, Birmingham, reported to the AAAS.

Most of the saliva in the mouth is produced by three pairs of glands. These are the submaxillary located below the angle of the lower jaw, the sublingual under the tongue, and the parotid glands in front of the ears, which are the ones that swell in mumps, Dr. Leon H. Schneyer of the university's dental school found.

Dr. Klapper put Syrian hamsters on a diet that is known to produce tooth decay in these animals. Then he tied off or removed all the saliva-producing glands in one group. Another had only the parotid glands tied off. A third had only the under-tongue glands removed. The fourth group had only the under-jaw glands removed.

The tooth decay scores after 70 days of the decay-producing diet were highest for the group with all saliva-producing glands removed, lowest for those with only the parotid glands removed. This showed the saliva produced by the parotid glands played little or no part in protecting against tooth decay. The other glands still in the mouth were keeping the decay down.

The under-tongue glands which produce the smallest amount of saliva, only five percent of the total, were more effective in protecting against tooth decay than the parotid glands which produce 25% of the total saliva.

The reason, Dr. Klapper reports, is in the difference in composition of the saliva produced by the different glands. The parotids produce exclusively a clear fluid type of saliva. The under-tongue glands produce only the mucus of saliva. The under-jaw glands produce some of each.

Science News Letter, January 14, 1956

## ● RADIO

Saturday, Jan. 21, 1956, 2:05-2:15 p.m. EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. T. Campbell Thompson, surgeon-in-chief, Hospital for Special Surgery, New York City, will discuss "They Walk Again."

Spraying while trees are dormant is the only cure for *peach leaf curl*.

*Rheumatoid arthritis* is a seasonal disease that is likely to begin or grow worse in the colder months.

## SCIENCE NEWS LETTER

VOL. 69 JANUARY 14, 1956 NO. 2

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., North 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1956, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeographed form March 19, 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 Audit Bureau of Circulation, Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, Eldorado 5-5666, and 435 N. Michigan Ave., Chicago 11, Superior 7-6048.

#### SCIENCE SERVICE

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

Board of Trustees — Nominated by the American Association for the Advancement of Science: Kirtley F. Mather, Harvard University; Paul B. Sears, Yale University; Karl Lark-Horovitz, Purdue University. Nominated by the National Academy of Sciences: Edward U. Condon, Berkeley, Calif.; Harlow Shapley, Harvard College Observatory; George W. Corner, Carnegie Institution of Washington. Nominated by the National Research Council: Ross G. Harrison, Yale University; Leonard Carmichael, Smithsonian Institution; Jerome Hunsaker, Massachusetts Institute of Technology. Nominated by the Journalistic Profession: Neil H. Swanson, Ruxton, Md.; O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal. Nominated by the Scripps Estate; Edward J. Meeman, Memphis Press-Scimitar; John T. O'Rourke, Washington Daily News; Charles E. Scripps, Cincinnati, Ohio.

Officers — President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff — Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Horace Loffin, Howard Simons, Dorothy Schriver, Helen M. Davis. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410.