question of the real difference between those sensations on which different persons can agree and those on which they differ comes up and the problem is open again. So positivism seems to face the dangers of all subjective philosophies.

Positivism has also been attacked as a philosophy of resignation and defeat, as a refusal to admit the existence of problems for which no solution can immediately be seen. Fifty years ago the positivists denied the reality of atoms. Atoms, they said, are convenient means by which to describe the results of observation, but they are by their very nature such that it will be impossible ever to isolate and observe one. It has no sense to speak of their existence. Experience since then has not justified this position. Those who have made advances in physics have been those who took the atoms seriously, who went out and found methods by which individual atoms could really be observed, and if to-day a positivist still maintains that atoms and electrons are only useful fictions, he must admit that they are at least as useful and necessary as anything else whose reality he would affirm.

Thus while positivism is a philosophy which a physicist can easily defend, I am inclined to believe that it is not the philosophy which really motivates him. I am inclined to believe that those most effectively active in physics to-day have the very naive view which I mentioned at the beginning. They tend to believe that there is a real world which can be discovered, and they propose to discover it.

THE URSI PROGRAMS OF SHORT-WAVE STATION W1XAL

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THE Union Radio-Scientifique Internationale (abbreviation URSI), as its name indicates, is an International Union, founded in 1919 under the auspices of the International Research Council, for world study of radio science. It has sections in some twelve countries of the world and its Secretariat is at 54, Avenue des Arts, Brussels, Belgium. The Secretariat of the American Section is at the National Bureau of Standards, Washington, D. C. It has two official languages, French and English, for its reports, papers and discussions.

The URSI seeks to build up and to spread international knowledge of the scientific principles of radio communication and has held plenary meetings at two- or three-year intervals, the first in 1922, at Brussels, and later in Washington, D. C., London, Brussels and Copenhagen.

It was soon recognized that radio communication is affected by certain changes in cosmic phenomena such as (1) spots on the surface of the sun, (2) electric and magnetic disturbances on the earth, as well as in the upper regions of our atmosphere. In order to bring such cosmic changes promptly to the notice of radio observers in various parts of the world, the French Government in 1928, at the suggestion of the late General Ferrié, the founder and first president of the URSI, inaugurated a daily service of radio-cosmic bulletins, broadcast from the Eiffel Tower Station in Paris, which bulletins came to be known as Ursigrams. These Ursigrams, emitted in international dot-dash signals, were expressed in cipher code groups containing data of solar and terrestrial surface changes affecting radio. These messages, picked up in various countries by radio observers, and recorded by them in cipher code, were decoded into the languages of the various countries. Since 1929 these Eiffel Tower Ursigrams have been repeated daily in broadcasts from the long-wave radio station at Lafayette near Bordeaux and the shortwave station at Pontoise near Paris.

In 1929 the American Section of the URSI, recognizing the value of the Ursigram service in radio communication, enlisted the cooperation of a number of scientific institutions in America for the establishing of an American daily Ursigram service. These institutions have been the U. S. Coast and Geodetic Survey, the National Bureau of Standards at Washington, Smithsonian Institution, Carnegie Institution, Mount Wilson Observatory, assisted by the United States Government departments of Army, Navy and Weather Bureau.

Through the aid of Science Service at Washington, D. C., these institutions were enabled to collaborate for the emission of a daily Ursigram in international dot-dash signals from the U. S. Navy Station NAA at Arlington, Va., near Washington, D. C. Changes in the solar surface were reported from Mount Wilson Observatory; changes in the solar radiation intensity at the earth's surface were reported by the Smithsonian Institution; terrestrial magnetic observations by the Coast and Geodetic Survey; observations of aurora borealis in Alaska were supplied by the Car-

negie Institution; measurements of reflecting-layer heights and critical frequencies in the ionosphere by the National Bureau of Standards.

Since August 1, 1930, these observations have been forwarded daily to Science Service, Washington, by the aid of U. S. Army radio network. Science Service makes up a daily Ursigram in cipher code from the data received and forwards this to the U. S. Navy Department for the evening broadcast by U. S. Navy Station NAA. Additional cosmic data for the Ursigrams has been supplied by the Japanese Section of the URSI as well as from observers in the Philippine Islands.

The American Ursigram from NAA, broadcast every day of the year, has been of distinct service to radio operators in various countries by furnishing them advance information as to cosmic disturbances likely to interfere with radio communication. Until this year, however, all these Ursigrams have been carried by dot-dash signals of international Morse code. They can, therefore, only be received by persons trained as radio operators. The number of such radio-trained operators in the various countries of the world is naturally limited.

On February 1, 1937, short-wave station W1XAL at Boston, Mass., in liaison with Science Service at Washington, opened a daily URSI program by radio telephone in plain English, thereby supplementing to a much larger available audience of world listeners the coded Ursigrams.

W1XAL is a broadcasting station employing short-waves only. Its charter does not permit of broadcasting advertising or commercial information; its purpose being to disseminate cultural and educational information. It is supported by voluntary contributions, at present aided by a Rockefeller Foundation grant. The station operates with a power not exceeding 20 kilowatts on any one of four frequencies (6.04–11.79–15.25– and 21.46 Mc p.s., corresponding severally to wave-lengths 49.6 m 25.4 m–19.6 m and 13.9 m). The radio telephone broadcasts from this station have been reported as successfully received in practically all parts of the civilized world. The purpose of W1XAL is not only to disseminate cultural and educational information, but also to build and spread international understanding, cooperation, sympathy and good-will.

W1XAL seeks to interest a much larger number of scientific students around the world in telephonic Ursigram information than can be reached in the regular channels of dot-dash broadcasts through NAA. This change of vehicle from dot-dash signals to the spoken word introduces a new venture in scientific broadcasting. To English-speaking listeners everywhere the new W1XAL Ursigram broadcast should be as readily understood as any telephonic news broadcast, but to listeners in the various non-English-speaking countries it is desirable that the English language used be modified so as to be more readily understood; long and complicated words should, of course, be eliminated and the vocabulary employed should be as short and simple as may be practicable.

The Orthological Institute at 10, King's Parade, Cambridge, England, has promulgated for a number of years a simplified form of the English language, called "Basic English," suitable for verbal and written communications among elementary students of English in non-English-speaking countries. Basic English contains less than 1,000 selected English key-words, so that a non-English-speaking listener by learning the meanings of these words is able to understand communications in English which would otherwise be beyond his reach.

Basic English is now being officially taught in various European and Oriental countries as a secondary or international language, and more than fifty books have already been printed in Basic English for carrying this work into effect. It is generally admitted that Basic English not only furnishes a direct avenue for subsequent study of standard literary English, if desired, but also enables scientific information to be conveyed to a listener or reader with the minimum amount of linguistic effort on the part of both speakers and listeners. It frequently happens that an English-speaking reader opening for the first time a book printed in Basic English does not notice anything unusual about the text except what might be attributed to the literary style of the author. It would seem, therefore, that a good opportunity exists for increasing the number of world students interested in cosmic science and radio by the use of simplified English broadcasting at W1XAL.

The daily Ursigram Service of W1XAL has already been found suitable for swiftly conveying cosmic information, such as earthquakes and astronomical events of international significance, to all parts of the world. A few hours after W1XAL started its daily Ursigram service (21: 55–22: 00 world time, or GCT) an unexpected comet was recorded at Harvard College Observatory, Cambridge, U. S. A., on certain photographic plates of the northern sky. Dr. F. L. Whipple, of the Harvard Observatory, repeating and comparing similar plates on February 7, verified thereby the presence of a new small comet of the twelfth magnitude, in the Hunting Dogs constellation (Canes Venatici). Within a couple of hours of its official discovery at Cambridge Observatory the comet was reported in the daily Ursigram of W1XAL for world-wide distribution. This new comet on February 15 was at 35° 26′ North Declination and 13h 19m 30s

Right Ascension. This comet then had a tail of about one degree in length and it was traveling east and north about one third of a degree daily. It is estimated that this new comet (the first to be announced by URSI radio) will be closest to the sun and earth on June 22, 1937, at which date it is believed it will have attained the eighth or seventh magnitude, still too faint for the unaided eye but visible through a small telescope. Through the URSI announcement this new comet will probably have been under observation in many parts of the world and its discovery just after W1XAL opened the Ursigram broadcasts is a good augury.

The W1XAL URSI-broadcasts are emitted every day on a frequency of 11.79 Mc/sec. (wave-length 25.4 m) at 21:55–22:00 GCT, or 16:55–17:00 Eastern Standard Time (EST). The weekly URSI summary of cosmic events is being added every Monday, immediately after the daily URSI broadcast—*i.e.*, at 22:00 GCT so that, although the regular daily broadcast lasts only five minutes, the weekly broadcast on Monday may last twenty minutes or more.

SCIENTIFIC EVENTS

PRINCIPAL ADDRESSES AT THE DENVER MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

ON Wednesday evening, June 23, the Maiben lecture of the American Association for the Advancement of Science will be delivered in Denver, Colorado, by Professor Nevil V. Sidgwick, F.R.S., of Lincoln College, Oxford, England. The association is particularly fortunate in securing this distinguished British scientist for one of its principal addresses. Dr. Sidgwick is not only eminent as a chemist but has rare personal qualities and an extensive acquaintance with America and American science. An American chemist, referring to Dr. Sidgwick, recently wrote:

> He has frequently been in the United States, in fact, has been fond of spending his holidays in the Rocky Mountains. He attended the Pittsburgh meeting of the American Chemical Society last September and I believe the Tercentenary at Harvard University as well.
>
> He is a kindly, lively and lovable gentleman who has made many friends among the chemists of the United States. . . . He has reached the apex of his achievements during the past ten years. . . .
>
> Dr. Sidgwick was the non-resident lecturer in chemistry at Cornell University in 1931 and in May of that year delivered the Edgar Fahs Smith birthday address in the Harrison Laboratory of the University of Pennsylvania, his subject at that time being "Atomic Cohesion," . . . .

It is interesting that Dr. Sidgwick "has been fond of spending his holidays in the Rocky Mountains," for the plans for the Denver meeting provide for a very attractive series of excursions into the magnificent Colorado mountains, the lower slopes of which in June are covered with flowers and the tops of which are white with snow.

On Tuesday evening, June 22, Dr. Herbert M. Evans, professor of biology and director of the Institute of Experimental Biology of the University of California, will deliver his address as retiring president of the Pacific Division of the association. The title of his address is, "The Development of Our Knowledge of Anterior Pituitary Function."

Dr. Evans was educated at the University of California, the Johns Hopkins University and Freiburg University, and he has been a member of the faculty of the Johns Hopkins University, as well as of the University of California. He has published many scientific papers and has been honored by membership in many scientific societies, including the National Academy of Sciences.

On Thursday evening, June 24, Dr. A. E. Douglass, professor of astronomy and director of the Steward Observatory of the University of Arizona, will deliver the John Wesley Powell lecture of the Southwestern Division of the association. The subject of his address is "Tree-rings and Chronology."

Dr. Douglass was educated at Trinity College, Connecticut, and at Harvard University. In addition to his contributions to astronomy, he has been a leader in extending chronology, particularly as it pertains to climatic variations, backward over long periods of time by studies of tree-rings. By this method, he has thrown much light on the climatic conditions surrounding prehistoric Indians of the Southwest.

It will be clear from these brief statements respecting the principal evening lectures at the Denver meeting that the association will present an unusually varied and interesting program, ranging from the fundamentals of chemistry to the remarkable functions of the anterior part of the pituitary gland, and to chronology as revealed by tree-rings. Together the lectures touch on an extraordinarily wide range of rapidly developing science.

F. R. MOULTON,
Permanent Secretary

THE AMERICAN CHEMICAL SOCIETY

AT the North Carolina meeting of the American Chemical Society, President Edward R. Weidlein presented the following statement prepared by Dr. Charles