and he was the contrary, that we should not be sufficiently in sympathy to discuss these matters with good feeling. I do not know how this may have been; but, speaking as one who, though subscribing to no formal religious creed, has a religious faith which is precious and a religious experience that is vital, I can not easily believe that our friend had nothing of these possessions. For the best evidence of something divine within ourselves and of something divine greater than our individual selves comes to us through affliction and sorrow borne with love; and this experience he had in full.

EDWIN H. HALL

HARVARD UNIVERSITY

SCIENTIFIC EVENTS

THE MEDALLISTS OF THE ROYAL SOCIETY

AT the anniversary meeting of the Royal Society on November 30, the president, Sir J. J. Thomson, conferred the medals of the society. The work of the recipients was thus characterized:

Copley Medal.—M. Emile Roux, Pasteur's chief collaborator, succeeded him as the director of the Institut Pasteur, which he has successfully developed and maintained as the foremost school of bacteriology, both for teaching and for research. From the early eighties, when he was associated with Pasteur and Chamberland in the study of anthrax and the production of vaccines against this disease, he has played a leading part in the development of our knowledge of the processes of immunity. His work with the distinguished veterinarian Nocard upon the contagious pleuro-pneumonia of cattle was the first demonstration of the existence of "ultra-microscopic," or, as they are now termed, filterable viruses as disease-producing agencies; his work with Yersin, the first full study of the bacillus of diphtheria and of its toxins. He shares with the late Professor Behring, of Marburg, in the introduction of diphtheria antitoxin as a practical means of prophylaxis and cure, and with him as cofounder of serum therapeutics was awarded the Nobel prize. All the leading French bacteriologists of our generation have been his pupils.

Royal Medals.—Dr. Aiken is distinguished for his lifelong researches on the nuclei of cloudy condensation, embodied in a series of memoirs communicated to the Royal Society of Edinburgh. The latest of these appeared in the present year. Dr. Aitken's discoveries opened up a new field of investigation in physics, and constitute a chapter of knowledge of great importance intrinsically and in their relation to the physics of meteorology. Dr. Aitken, who has pursued his work as an amateur, has displayed great experimental ingenuity, and his remarkable construction of the "dust-counter" has provided a permanent scientific appurtenance of precision to the physicist and climatologist. Among other contributions to science, Dr. Aitken has made important advances in our knowledge of the formation of dew.

Dr. Smith Woodward has been for many years keeper of the department of geology in the British Museum, and has published a very large number of valuable memoirs on fossil vertebrates, especially fishes. He has also published an important "Catalogue of Fossil Fishes in the British Museum," and his "Outlines of Vertebrate Paleontology," published in 1898, is a standard text-book on the subject. Dr. Smith Woodward's original memoirs are too numerous to mention, but they have secured for him a world-wide reputation, and he is universally regarded as one of the highest authorities on vertebrate paleontology.

Davy Medal.—M. Albin Haller, professor of organic chemistry at the Sorbonne, Paris, founder and first president of the International Association of Chemical Societies, and at the present time the most representative chemist of France, is distinguished for his many and important contributions to chemical science during the past forty years. His investigations have covered a very wide field in the domain of organic chemistry, the most important being those dealing with compounds belonging to the camphor group. He has maintained over a long period of years the reputation of the Sorbonne School of Chemical Research, created by Dumas and Wurtz, his predecessors in the chair.

Buchanan Medal.—Sir Almroth Edward Wright was the first (1896) to apply laboratory knowledge on typhoid immunity to the protection of human beings against enteric fever. Against formidable opposition he carried out a long series of observations with the highest scientific acumen and unsurpassed technique, and laid the foundations for the effective elimination of enteric fever from the armies of the world. Nothing of importance has been added to his work down to the present time.

Hughes Medal.—Professor C. G. Barkla's investigations have mainly dealt with X-rays, and

their absorption and secondary emission by solid substances. He showed that secondary emission of X-rays was of two varieties. In one of these the X-rays are scattered, without change of quality. The scattered rays were shown by examining tertiary emission to be polarized, and this was a fundamental result for the classification of X-rays with ordinary radiation, at that time doubtful. Professor Barkla's other kind of secondary emission is characteristic of the secondary radiator, and is accompanied by selective absorption of the primary rays. He showed that each chemical element emitted more than one definite kind of secondary fluorescent radiation. Concentrating attention on, say, the less penetrating kind, it was found to vary in quality by definite steps with the atomic weight of the secondary radiator.

REPORT OF THE YEAR'S WORK AT THE U. S. NAVAL OBSERVATORY

In his annual report to the Bureau of Navigation, Rear Admiral Howard, United States Navy, retired, superintendent of the Naval Observatory, says in part:

The time signals were sent out twice daily during the year, at noon and 10 P.M., seventy-fifth meridian time, both by land lines and by radio, through the operating relay at Radio, Va. The improvements mentioned in the last annual report have been completed and put in operation. The accuracy of the radio time signals, which can be picked up anywhere in the north Atlantic, has made it possible to reduce to one the allowance of chronometers for vessels of the Navy operating along the Atlantic coast.

The Naval Observatory has continued the policy of encouraging suggestions and developments of methods and instruments for navigation, particularly for submarines and aircraft.

The nautical-instrument repair shop has continued to prove economical in time and expense as compared with the previous system of having this work done by contract.

Owing to the great increase in ships of the Navy and the lack of receipt of materials and nautical instruments from abroad and the shortage of skilled labor in this country, especially in the manufacture of instruments and chronometers, the question of supply of instruments for navigation, especially chronometers, is becoming a matter of very serious proportions. The increased demand for the gyro-compass and the instruments attached to it is taxing the capacity of the only factory in this country which is able to manufacture this instrument.

Congress did not provide any addition to the clerical force, and it is earnestly recommended that the additional clerks which will be requested in the estimates to be submitted by the superintendent for the next fiscal year be approved and Congress urged to allow the same.

The scientific personnel has met twice each month, except during the summer, for the discussion of current astronomical topics and reading of papers by its members and scientists.

The astronomical work of this institution is now even more important than usual, owing to the European observatories losing many skilled observers due to the war.

Under the head of Aviation instruments and equipment, the report says:

As noted in the last annual report, the year started without any instruments or equipment for aviation, under the cognizance of the Bureau of Navigation, having been standardized.

Sets of clothing as used in the British and French aviation services were inspected at the observatory and at the aeronautic station at Pensacola, as well as sets manufactured by American firms. A board was appointed at Pensacola to specify a standard equipment and their report has been approved. The Bureau of Supplies and Accounts now has specifications for standard articles of clothing and personal equipment.

THE ENLISTMENT IN ENGINEER RESERVE CORPS OF TECHNICAL STUDENTS PENDING COMPLETION OF STUDIES

With the approval of the Secretary of War, Major General W. M. Black, chief of engineers, has promulgated regulations governing the creation of an Engineer Enlisted Reserve Corps, in which may be enrolled, pending completion of their studies, students of recognized technical schools. The announcement reads:

Under such regulations as the Chief of Engineers may prescribe a proportion of the students, as named by the school faculty, pursuing an engineering course in one of the approved technical engineering schools listed in the War Department, may enlist in the Enlisted Reserve Corps of the Engineer Department, and thereafter, upon presentation by the registrant to his local board of a certificate of enlistment, such certificate shall be filed with the questionnaire and the registrant shall be