(*b*) the renunciation of official secrecy and security controls over microbiological, toxicological, pharmaceutical and chemical–biological research.

In considering how to implement the second of the foregoing proposals, we note the already excellent effects of the Report of the U.N. Scientific Committee on the Biological Effects of Radiation. A comparable scientific committee, or a permanent U.N. Scientific Commission on biological and chemical modes of warfare, could help to dispel apprehension. A subsidiary function of either group might be to investigate impartially the claims by plaintiff nations that others had openly or surreptitiously used methods of biological or chemical warfare against them.

The very existence of such a Commission might in time arouse the conscience of the individual scientists of all nations, the only ultimate effective safeguard against violations.

In agreement with the Third Pugwash Conference in Vienna, we repeat that, in the end, only the absolute prevention of war will preserve human life and civilization in the face of chemical and biological as well as nuclear weapons. No ban of a single type of weapon, no agreement that leaves the general threat of war in existence, can protect mankind sufficiently. We therefore must look forward to a day when the preservation of peace will transcend the ambitions of individual nations.

Trust between nations cannot be established by proclamation, but only by experience, particularly by experience in co-operative work toward common aims. There is already an extensive interchange of scientific information and people in the sciences basic to the problems discussed in this statement. We must build on this. The Commission proposed to collect and evaluate information bearing on chemical and microbiological warfare should serve not only to allay the fears of mankind that new and ever more horrible weapons of such types will be invented but also to dispel the miasma of secrecy that fosters international suspicion and tension, and in its place to extend the benevolent application of microbiological and chemical knowledge for the benefit of all men.

Dr. Brock Chisholm (Canada)
Prof. Claude E. Dolman (Canada)
Prof. Donald Kerr (Canada)
Sir Robert Watson-Watt (Canada)
Dr. Preben von Magnus (Denmark)
Dr. Andre Lwoff (France)
Dr. Pierre Thibault (France)
Dr. M. L. Ahuja (India)
Academician Mikhail M. Dubinin (Soviet Union)
Prof. Alexandre A. Imshenetsky (Soviet Union)
Mr. Vladimir P. Pavlichenko (Soviet Union)
Prof. A. A. Smorodintsev (Soviet Union)
Prof. Sven Gard (Sweden)
Mr. F. C. Bawden (United Kingdom)
Dr. Patricia J. Lindop (United Kingdom)
Prof. Gordon Manley (United Kingdom)
Prof. Joseph Rotblat (United Kingdom)
Prof. M. G. P. Stoker (United Kingdom)
Prof. H. Bentley Glass (United States)
Dr. Charles C. Higgins (United States)
Dr. Martin M. Kaplan (United States)
Prof. Chauncey D. Leake (United States)
Prof. Hugo Muench (United States)
Prof. Eugene Rabinowitch (United States)
Prof. Alexander Rich (United States)
Prof. Theodor Rosebury (United States)

OBITUARY

Dr. B. van der Pol

After a brief illness, Dr. Balthasar van der Pol, a director of research in radio science, university professor and international Civil servant, died at his home in The Netherlands on October 6, at the age of seventy.

Dr. van der Pol was born on January 27, 1889, at Utrecht, The Netherlands, where he was educated and obtained his degree in physics at the University of Utrecht in 1916. In that year he went to study under Prof. J. A. Fleming at University College, London. He proceeded to Cambridge in the following year, where he worked in the Cavendish Laboratory as a foreign research student under Sir J. J. Thomson. He was very interested in the Heaviside layer theory of the reflexion of radio waves, and carried out experiments designed to show that ionized air in an electric discharge could act as a radio wave reflector. He was successful in this work, and on returning to Holland in 1919 he was awarded his doctor of science degree for a thesis on "High Frequency Measurements of Glow Discharges", and became assistant to Prof. H. A. Lorentz at Teyler's Institute, Haarlem.

In 1922, Dr. van der Pol was appointed physicist in the research laboratory of the N.V. Philips works at Eindhoven, where he later became director of research in radio science. He was appointed knight of the Order of Oranje Nassau in 1927, for establishing the first radio-telephone communication between the Netherlands and the Dutch East Indies. Concurrently with his service in the Philips organization, he was professor of theoretical electricity in the Technical University, Delft (1938–49); and he was president of the temporary University founded at Eindhoven to replace other Netherlands universities in occupied territories, for which service he was appointed knight of the Order of the Netherlands Lion in 1946.

Van der Pol was interested in a wide range of mathematical and physical subjects, and was the author of a number of papers published in scientific journals; these included two lectures delivered before the Wireless, and later Radio, Section of the Institution of Electrical Engineers in London on "Discontinuous Phenomena in Radio Communication" (*J. Inst. Elect. Eng.*, **81**, 381; 1937), and "The Fundamental Principles of Frequency Modulation" (*J. Inst. Elect. Eng.*, Part III, **93**, 153; 1946). He also published a book jointly with Dr. H. Bremmer on "Operational Calculus based on the Two-sided Laplace Integral" (Camb. Univ. Press, 1950). He was a member of both the American and London Mathematical Societies, of the Netherlands Royal Society, a founder member of the Netherlands Radio Society, fellow, and vice-president for 1934, of the Institute of Radio Engineers (N.Y.), and an honorary life-member of the Institute of Radio Engineers

(Australia). He was awarded the Medal of Honour of the Institute of Radio Engineers (N.Y.) in 1935 for contributions to circuit theory; and in 1953 the Danish Academy of Technical Sciences presented him with the Valdemar Poulsen Gold Medal for outstanding contributions in the field of radio research and for international scientific co-operation in matters related to radio communication.

Dr. van der Pol became greatly interested in the scientific and technical aspects of international radio affairs and, from 1927, he was a well-known participant in a large number of conferences in all parts of the world. He was vice-president of the International Scientific Radio Union during 1934–50, and was elected an honorary president in 1952.

He was appointed the first director of the International Radio Consultative Committee in 1949, and held this position until his retirement in 1956. As the permanent executive officer of the Committee, he was the technical adviser to the International Telecommunications Union on the planning and development of radio communications during the post-war years. Until a few weeks ago, he was attending the present conference of this Union in Geneva, representing other international scientific bodies on the allocation of frequencies for radio astronomy and space research. In later years his interest in mathematics developed towards the Heaviside calculus, to the extension of which he made notable additions; he was also interested in the theory of numbers. Since his retirement in 1956, he had been an active lecturer in these subjects, particularly in the United States.

Dr. van der Pol was very well liked and respected by the vast number of friends with whom he came in contact throughout the world. His qualities as a scientist and his administrative abilities as an international Civil servant always received the highest recognition. He never spared himself in his devotion to the pursuit of knowledge and human understanding on a wide international basis. He was happily married and leaves a widow, a son and two daughters.

R. L. SMITH-ROSE

NEWS and VIEWS

Nobel Prize for Medicine for 1959: Prof. S. Ochoa

THE Nobel Prize for Medicine for 1959 has been divided between Prof. S. Ochoa and Prof. A. Kornberg. Dr. S. Ochoa has long been regarded as one of the principal exponents of the highly successful enzymological approach to the study of intermediary metabolism. His recent contributions to the mechanism of the biosynthesis of nucleic acids have been preceded by a succession of outstanding biochemical discoveries principally concerned with the metabolism of carboxylic acids and with associated phosphorylation reactions. One of the most notable of these discoveries was made in 1939 while he was a research worker at Oxford. He found that large quantities of inorganic phosphate are esterified when pyruvic acid is oxidized by dispersions of brain tissue. This 'oxidative' phosphorylation is recognized as part of the fundamental mechanism whereby energy is made available from biological oxidations. With his students and colleagues at New York University, he has since discovered a number of important enzymes which are involved in the tricarboxylic acid cycle and the oxidation of fatty acids.

Dr. Ochoa's work on nucleic acids originated from experiments on phosphorylation reactions in enzyme preparations from *Azotobacter*. In 1955, together with Dr. M. Grunberg-Manago, he reported the discovery of an enzyme which is able to catalyse the removal of the terminal phosphate group from ribonucleoside diphosphates accompanied by the polymerization of the resulting nucleoside monophosphate residues. In this way, a mixture of the four appropriate nucleoside diphosphates can be converted into a polynucleotide which closely resembles naturally occurring ribonucleic acid, although it is not yet understood how the arrangement of the nucleotides in the polymer is controlled. The discovery is notable because of the structural complexity of ribonucleic acid and because of the essential functions of this material in the synthesis of proteins.

Prof. A. Kornberg

BEFORE making their discoveries in the biosynthesis of nucleic acids, Dr. Kornberg and his colleagues were responsible for many important advances in several areas of intermediary metabolism, including the biosynthesis of nucleotides and nucleotide coenzymes. In 1956, Drs. Kornberg, Lehman, Bessman and Simms described experiments indicating that deoxyribonucleic acid could be synthesized by an enzyme system prepared from *Escherichia coli*. Further study with a purified preparation of the enzyme has shown that the nucleic acid is made from the triphosphates of the four kinds of deoxyribonucleosides and requires the presence of some pre-formed deoxyribonucleic acid. The detailed results substantiate the elegant hypothesis proposed by Drs. Watson and Crick in 1953. Thus, it seems that the double strand of the primer deoxyribonucleic acid becomes separated into its complementary single chains which then act as templates for the assembly of new polynucleotides and finally become two molecules having the detailed structure of the original double-stranded one. Within the past year, Dr. Kornberg and his very active group of research workers have reported an outstanding series of experiments on the synthesis of deoxyribonucleic acid in *E. coli* infected with certain bacterial viruses. Their experiments show that the viruses induce the infected bacteria to develop a number of enzymes which, between them, cause rapid multiplication of the deoxyribonucleic acid of the virus while preventing the formation of bacterial deoxyribonucleic acid. The great interest of these exciting developments is that deoxyribonucleic acid is a characteristic component of chromosomes and is considered to act as the principal carrier of genetic information; the sequences of the four kinds of nucleotides in the long polynucleotide chains are thought to determine the structure of the proteins and hence to control the hereditary properties of living cells.