of atomic bombs. If the nations agree not to use them and are sincere, then they should also agree not to make them. Incidentally, the Pope tried to outlaw the cross-bow in the twelfth century and from that time to this no outlawing of weapons between sovereign states has been effective.

The suggestion is made that we turn the bombs over to the United Nations organization to enforce peace. This suggestion is better, but it also has difficulties. Where would we store the bombs in the possession of the United Nations? Europe and Asia would object to North America, and we would object to Asia or Europe. How about Africa? You can imagine that the United Nations would have an effective small policing army powered with atomic bombs at some isolated point. Would we not all be afraid of the United Nations organization? Would we not fear that some Hitler might gain control of those weapons and subjugate the world in a very short time?

There is another difficulty. We presume that if the United Nations has a store of such bombs, it proposes to use them in emergencies. Let us assume that manufacturing the bombs in any country is a criminal offense, but that in spite of this the administration of the United States decides that it will make these bombs. The United Nations can then use the bombs to interfere with this operation. They will use them to destroy all the manufacturing facilities that might be set up. In so doing they will kill a very large number of quite innocent people, and the effect will be to unite the entire country against the United Nations.

If one wishes to police any state or nation, or the world, one wants to use weapons for the police purpose that will distinguish between those who violate a law and those who do not. If one can do this the law-abiding citizens will aid you against the law breaker, but the use of a large weapon of necessity unites all classes against the policing power. Atomic bombs are good for nothing but wars and for the destruction of large cities and their populations and large industrial plants.

But this proposal to turn the bombs over to the United Nations leads to a further suggestion. If we turn over the most powerful weapon to the United Nations why not also turn over all large caliber weapons of all other kinds for, of course, they are relatively ineffective against a superior weapon. And then we come to the next step. If we have turned all our large caliber weapons over to the United Nations, it is unnecessary for this organization to have them either, for there is no one to oppose them.

We are inevitably led to the conclusion that a superior world government of some kind possessing adequate power to maintain the peace and with the various divisions of the world relatively disarmed, is the only way out. What will be needed is a most efficient inspection service which will detect and report promptly any attempt to produce atomic bombs or other heavy arms and a sufficient police force to prevent such activities. In this way neither the countries of the world nor the United Nations organization will have atomic bombs and no one will need to fear them.

I am not so naive as to think that this is a solution easily arrived at. I am not even so sanguine as to think that there is a high probability that logical action of this kind can be accomplished without the dubious advantage of a third world war. But I pass the problem to you now. Do you see any way to avoid the threat of an atomic war?

I think I have said enough to give my audience an opportunity to think these things over. I trust the conclusions of an informed populace of the United States. I believe that the considered judgment of the whole people is a reliable guide, and, after all, it is the people of the United States who face destruction and death, and they should have the privilege of making their own decisions.

There are a number of statements which I would categorically defend, and I wish to present them to you:

(1) If atomic bombs are made in one country they will be made in all industrial countries of the world.

(2) If atomic bombs are made in all these countries we will spend all our days in deadly fear that they will be used, and in time they undoubtedly will be.

(3) By one means or another no atomic bombs must be made anywhere in the world and they must not be in the possession of any government of any kind.

(4) The peace-time applications of atomic energy, or, in fact, of anything else, are of no importance whatever unless the danger of atomic bombs is banished from the earth.

In conclusion, may I repeat the hope of Alfred Nobel, that this weapon is sufficiently terrible to make possible the bringing of peace to the earth.

OBITUARY

ACADEMICIAN V. I. VERNADSKY
1863–1945

THE news came from Moscow of the death on January 6, 1945, of Professor V. I. Vernadsky (see SCIENCE, 101: 110, 1945). With his passing Russia lost one of its oldest and most distinguished scientists of international renown.

Vladimir Ivanovich Vernadsky was born on March

13, 1863, a son of a professor of Moscow University, and educated first in that city and later at St. Petersburg University, from which he was graduated in 1886. He was appointed a docent of mineralogy of Moscow University in 1890 and received his master's degree in 1891. In 1897 he was awarded a Ph.D. degree for his thesis, "The Phenomena of Gliding Planes in Crystalline Substances." He soon won fame for his classical research on silicates. One of his most important works on that subject is: *"Sur le groupe de la sillimanite et le rôle de l'alumine dans les silicates"* (1892).

Being a brilliant lecturer and educator he reformed the teaching of mineralogy in Moscow University and was practically the founder of chemical mineralogy based on historical methods. Outstanding Russian mineralogists, such as the late V. Archangelsky and A. Fersman, were students of Vernadsky. His widely known voluminous "Essay on Descriptive Mineralogy" (1908) is a standard work on mineralogy in Russia.

In 1906 he was elected a member of the Academy of Sciences. Since that time, he turned his attention to geochemistry and study of the isomorphism of chemical elements. In 1915 he took a leading part in the organization of the Commission for the Study of Natural Resources of Russia, from which a number of scientific institutes later emerged. Vernadsky was made in 1922 the head of the Radium Institute and engaged energetically in study of the role of the radioactive elements in the history of the development of our planet. He was first to introduce the method of the determination of the age of rocks and minerals by the rate of their radioactivity and he made great contributions in that field of science.

He was also very interested in the problem of the role of micro-organisms in the biogeochemical processes in the earth's crust, and for the purpose of its solution, he founded in 1918 the Biogeochemical Laboratory of the Academy of Sciences and was its director since 1920 until his death.

The last period of Vernadsky's activity was devoted mostly to the study of geochemistry. His classical work "Ocherki geokhimii" ("Essays on Geochemistry") sustained four editions and was translated into French, German, Japanese, etc.

This in no way exhausts the list of the activities of Professor Vernadsky. We can mention only briefly his attainments in other fields of science: the study of physical and morphological properties of meteorites, the organization and development of balneologic centers and the founding of the Ukrainian Academy of Sciences, of which he was president in 1918, etc.

He visited Europe many times and was very well known in European scientific circles. His outstanding work was recognized by both the Imperial and Soviet governments and by the science world and he was the recipient of many honors and distinctions. In 1942 he was awarded the full prize of 200.000 roubles for his research in geochemistry and genetical mineralogy.

His colleagues in the Academy of Sciences and in Moscow University mourn him not only as a famous scientist but as a noble, simple and good-natured man and as a faithful friend.

VLADIMIR C. ASMOUS

ARNOLD ARBORETUM,
HARVARD UNIVERSITY

DEATHS AND MEMORIALS

THOMAS J. MANEY, research professor of pomology in the Iowa Agricultural Experiment Station, died on October 12 at the age of fifty-seven years.

DR. HENRY B. KUMMEL, from 1902 to 1937 state geologist of New Jersey, died on October 23 at the age of seventy-eight years.

DR. JAMES H. BEAL, senior past president of the American Pharmaceutical Association, Remington medalist, died on September 20 at the age of eighty-four years.

DR. E. J. WILLIAMS, F.R.S., professor of physics at University College, Aberystwyth, Wales, died on September 29 at the age of forty-two years.

DR. PAUL RUGGLI-BLUME, professor of chemistry at the University of Basel, died on September 4 at the age of sixty-one years.

ON the opening of the fall session of the Medical Branch of the University of Texas at Galveston, the auditorium of the out-patient clinic building was named Randall Hall in honor of Dr. Edward Randall (1860–1944), who served as professor of materia medica and therapeutics from 1890 to 1929, when he became professor emeritus and chairman of the Board of Regents of the university.

A MEMORIAL meeting in honor of the late Professor Pio del Rio Hortega was held on October 31 by the Montreal Neurological Institute. The speakers were Dr. Wilder Penfield, Dr. Pierre Masson, Dr. Miguel Prados and S/L William Gibson.

SCIENTIFIC EVENTS

THE ARMY MEDICAL RESEARCH AND DEVELOPMENT BOARD

A BOARD to be known as the Army Medical Research and Development Board has been constituted in the Office of the Surgeon General. It will be responsible for the planning and general supervision of all Medical Department research and development activities. The membership will include the chiefs of the various