

GENERAL SCIENCE

Scientists See New World Whenever the War Is Won

Cooperation of Scientists in Present War Viewed As Omen of Later Close Collaboration in Peace

WHEN the struggle against Nazism is won, science can build for humanity a new world in which there will be no want and war.

In essence, this is the assurance that representative American scientists sent to the International Conference on Science and the New World Order held in London under the auspices of the British Association for the Advancement of Science.

Conant Sees Cooperation

"SCIENTISTS of Great Britain and the United States are working almost as one group with the purpose of improving instruments of war," President James B. Conant of Harvard, chairman of the National Defense Research Committee, declared in a recorded message. "Is it fantastic to hope that in the not too distant future the scientists of all free countries may be joined in effective action to improve not instruments of war but those of peace? I like to see in the present scientific liaison that runs through the centers of London, Ottawa and Washington a hopeful omen of a long period marked by the friendliest relations between the British Commonwealth of Nations and the United States. If this be so, our work foreshadows a time when professional talent in many diverse societies of free men strive for effective cooperation to the end that we and our children may walk boldly along the paths of liberty and peace."

Einstein Feels Confusion

PROF. Albert Einstein, father of relativity, also sent his recorded voice to the conference.

"The super-national character of scientific concepts and scientific language is due to the fact that they have been set up by the best brains of all countries and all times," Prof. Einstein said. "In solitude and yet in cooperative effort as regards the final effect, they created the spiritual tools for the technical

revolutions which have transformed the life of mankind in the last centuries. Their system of concepts has served as a guide in the bewildering chaos of perceptions so that we learned to grasp general truths from particular observations.

"What hopes and fears does the scientific method imply for mankind? I do not think that this is the right way to put the question. Whatever this tool in the hand of man will produce depends entirely on the nature of the goals alive in this mankind. Once these goals exist, the scientific method furnishes means to realize them. Yet it cannot furnish the very goals. The scientific method itself would not have led anywhere, it would not even have been born without a passionate striving for clear understanding. "Perfection of means and confusion of

goals seem—in my opinion—to characterize our age. If we desire sincerely and passionately the safety, the welfare and the free development of the talents of all men, we shall not be in want of the means to approach such a state. Even if only a small part of mankind strives for such goals, their superiority will prove itself in the long run."

Peace and Justice Needed

DR. ERNEST O. Lawrence, Nobelist in chemistry of the University of California, wrote:

"At the moment, the greatest human need is peace and justice over the world, and this means that science's greatest immediate task is to implement with ever more powerful and effective weapons the forces for good to fight the forces of evil. To this end scientists almost to a man in this country are bending their efforts. I know that I speak for hundreds of American men of science when I send to our British colleagues heartiest greetings and good wishes along with assurances that we are doing our bit in behalf of the preservation of our common ideals of freedom and justice." (*Turn to next page.*)

DECLARATION OF SCIENTIFIC PRINCIPLES

Presented at International Conference on Science and the New World Order, London

Intellectual freedom is an essential condition of progressive human development. Throughout the ages, individual scientific workers have been forced to fight and to suffer in order that life and intellect may be preserved from the effects of unreasoning prejudice, stagnation and repression. Today they feel compelled to proclaim their special responsibility in the struggle against any subjection which would lead to the betrayal of intellectual liberty.

The war now devastating our world involves an age-old conflict of ideas. Liberal minds of the last generation were convinced that the battle for independence of thought and free expression of opinion was finally won; yet once again this conviction is being violently assailed. The fight to maintain it must perforce be resumed, for the danger of losing the heritage of freedom seems graver than ever before.

During the past third of a century, changes in the conditions of life have come about, more profound than any in human history. Distance has been virtually abolished; cognizance of events has become simultaneous throughout the world; all men have become neighbors. Fresh discoveries open up undreamed-of potentialities for good or for evil, but their proper use demands correspondingly high ethical standards.

While only a century ago the village was an almost self-sufficing unit, today the world is our unit. To such a disturbing change of outlook and obligations, we are not yet attuned, and we must re-adjust our way of living, for only by the fullest and freest adaptation of ideas to new conditions can this re-adjustment be achieved. Intense mental effort and clear vision are now needed.

In the past, freedom for the written and spoken word was desirable; today, complete freedom of thought and interchange of knowledge and opinion are supreme necessities. Full freedom of expression is the very essence of science

as well as democracy: where thought is enslaved science, like democracy, withers and decays. Men of Science must, therefore, declare clearly and emphatically the principles which underlie their beliefs and guide their conduct.

Accordingly, the principles of the Fellowship of science are here affirmed; and it is maintained that any policy or power which deprives men or nations of their free practice convicts its agents of an iniquity against the human race.

1. Liberty to learn, opportunity to teach and power to understand are necessary for the extension of knowledge, and we, as men of science, maintain that they cannot be sacrificed without degradation to human life.

2. Communities depend for their existence, their survival and advancement, on knowledge of themselves and of the properties of things in the world around them.

3. All nations and all classes of society have contributed to the knowledge and utilization of natural resources, and to the understanding of the influence they exercise on human development.

4. The basic principles of science rely on independence combined with co-operation, and are influenced by the progressive needs of humanity.

5. Men of science are among the trustees of each generation's inheritance of natural knowledge. They are bound, therefore, to foster and increase that heritage by faithful guardianship and service to high ideals.

6. All groups of scientific workers are united in the Fellowship of the Commonwealth of Science, which has the world for its province and the discovery of truth as its highest aim.

7. The pursuit of scientific inquiry demands complete intellectual freedom and unrestricted international exchange of knowledge; and it can only flourish through the unfettered development of civilized life.

Urey Sees Plenty

"IN A GENERATION or two men will learn to live successfully with the new abundance that this century has produced," Dr. Harold C. Urey, Nobelist of the Columbia University, said in his message.

"In fact, when men in all walks of life learn that plenty is available for all in this modern world, and learn this so thoroughly that it is part of the background of their thoughts, these wars and uncertainties of life will disappear and the dreams of scientists of good for all will become reality."

Predicts Social Laws

"STRIFE and calamity are the bitter fruit of ignorance, success and achievement the reward of knowledge," Dr. Frank B. Jewett, president of the National Academy of Sciences, declared. "Mankind in the aggregate is, I suggest, ruled by laws or principles of behavior as immutable as those which guide the performance of the molecules of air he breathes. To be sure, the laws of social behavior have not proved as easy to discern as have those of the material world. Newton, single-handed, was able to envisage and enunciate clearly the law which guides the planets in their courses. Faraday and Maxwell drew a correspondingly clear picture of the domain of electrical phenomena. But the world has still to rear its social Newtons and its political Faradays and Maxwells. Indeed, the task is so complex that one wonders whether these social and political discoverers, when found, may not prove to be groups of able investigators who have banded together to secure the increased power of carefully focussed endeavor—not individual human beings."

World State or Chaos

"AIMLESSNESS, concealed behind rusty slogans, characterizes so much of our current social policy that science and the activities of scientific men are largely turned from world problems to the immediate utilities," Dr. Harlow Shapley, Director of the Harvard College Observatory, declared. "The goals are nearby and not inspiring.

"The sooner it is commonly realized that either a world state or chaos and recession lies ahead, the sooner we can shape a program for scientists that appears constructive and is appropriately dignified. Until then we are merely

skilled mechanics with our eyes on the time clock.

"The blueprinting is, of course, not for scientists alone, and certainly it cannot be left to diplomats assisted by shortsighted economists. The draughtsmen must be advised by anthropologists, social psychologists, men who know the religions of people, as well as the more obvious geographers, agriculturists, and engineers. An aim must be the end of aimlessness.

"Although they must be tempered by expediency, the blueprints should recognize the present small size of the planet,

the futility of presumption of racial superiorities, the futility of striving for restoration of a previous social order, the fact that possibly some good points for the adjusted world order can be obtained from the social philosophies of the totalitarian states, and they should recognize especially that if we strive to model the future on the Anglo-American present we are just setting up another great world sorrow and are not going out to meet the coming world state in the frank and intelligent manner that should become the scientific man."

Science News Letter, October 11, 1941

ASTRONOMY

Comet Surprises Astronomers By Increase in Brightness

Jump From Eighteenth Magnitude to Thirteenth In Few Weeks Causes It To Be Mistaken for New One

By LELAND E. CUNNINGHAM

Harvard College Observatory

THE ASTONISHING comet found in 1927 by Drs. A. Schwassmann and A. A. Wachmann, of the Hamburg Observatory, Bergedorf, Germany, has again attracted the attention of astronomers by its unaccountable behavior. It is the first of three periodic comets found by the same pair of discoverers, and is, therefore, called the first Schwassmann-Wachmann comet.

The orbit is unusual because it is more nearly circular than that of any other comet, and because it lies completely between the orbits of Jupiter and Saturn. The comet never comes within half a billion miles of the sun; and it is apparently tailless. Observed every year since its discovery, its orbit is well determined and its position in the sky can be predicted closely for several years ahead. But its sudden changes in form and in brightness are quite unpredictable, as well as mysterious.

On August 29 of this year Dr. G. Neujmin, of the Simeis Observatory, in the Crimea, discovered a comet of the 13th magnitude. It was the second discovered by him in little more than a month, despite his location so near the battle lines. The telegram announcing his discovery was not received in this country until 12 days later.

Soon it was noticed that the positions and motion of the new comet were

those predicted for the first Schwassmann-Wachmann comet, which Prof. G. Van Biesbroeck, of the Yerkes Observatory, had observed, only a few weeks before, at the 18th magnitude! In this time the distance of the comet from the sun and earth had changed but little, so that this hundred-fold increase in brightness represented a real change in the comet itself.

By September 15 the comet had faded at least two magnitudes, but a photograph taken three days later at the Oak Ridge station of Harvard Observatory showed that it had brightened to the 11th magnitude! In this short interval its brightness had, therefore, increased at least thirty-fold, and its appearance had changed markedly. When faint it appeared as a nebulous patch, but after it had brightened it appeared almost star-like.

Such outbursts have occurred several times before. The original discovery in 1927 occurred during one of them. In 1931 while looking over old photographs Dr. K. Reinmuth found images of a comet on four plates taken in 1902 at the Königstuhl Observatory, Heidelberg, Germany. These were later shown to be images of the first Schwassmann-Wachmann comet. Since 1927 perhaps a dozen outbursts have been observed. It is probable that several more occurred during the times when the comet was not being watched. The cause of these outbursts is not known.

Science News Letter, October 11, 1941