

ON THIS DAY IN WEST VIRGINIA HISTORY  
NOVEMBER 28STATE ACADEMY OF SCIENCE  
WILL BE ORGANIZED TODAY

The West Virginia Academy of Science was organized in Morgantown on November 28, 1924.

**CSO:** SS.8.25, S.6-8.L.6, S.6-8.L.2, ELA.8.1, ELA.8.2

**Investigate the Document:** (Ms2008-090)

1. What three philosophers were products of the “Golden Age?”
2. Why was the Renaissance considered a period in which the human spirit was reborn?
3. Which two scientists listed in the Bethany College presidential address were responsible for the following:
  - Three Laws of Motion \_\_\_\_\_
  - Theory of Evolution \_\_\_\_\_
4. On Page 24, the second paragraph starts by reading “the present war...” What war was ongoing at the time of this address? Did the war have an impact on West Virginia’s industry or economy? If so, explain.
5. According to Bethany College President Andrew Leitch, what is a scientist’s primary objective?

**Think Critically:** What is the theme of President Leitch’s address? How does he describe the future of scientific research? What form of government does he denounce as the adversary of “scientific spirit?” What is this denouncement an allusion to?

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## OFFICERS OF THE ACADEMY

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## OFFICERS OF THE WEST VIRGINIA ACADEMY OF SCIENCE

### THE OFFICERS FOR 1942-1944

President .....	Andrew Leitch, Bethany
Vice-president .....	E. Meade McNeill, Athens
Secretary .....	J. E. Judson, Buckhannon
Treasurer .....	Nelle P. Ammons, Morgantown
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Biology .....	Leslie E. Greenlee, Charleston
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Social Sciences, Group I .....	C. H. Quenzel, Charleston
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Biology .....	H. D. Bond, Salem
Chemistry .....	John McGraw, Athens
Mathematics and Physics .....	S. G. Williamson, Athens
Social Sciences, Group I .....	M. S. Cushman, Athens
Social Sciences, Group II .....	Elizabeth Stalnaker, Morgantown

## Papers Read at the Fairmont Meeting

### Science in a New World\*

ANDREW LEITCH

*Bethany College*

THERE HAVE BEEN several extraordinary periods in the history of the world. There was the golden age of Greece which produced Socrates, Plato, and Aristotle. There was the rise of Christianity, when a new notion of the value of the individual and his relation to his fellows was born. There was the fall of the Roman Empire, when chaos seemed to envelop civilization. There were the crusades, with the growth of commerce and nationalism which followed in their wake. There was the liberation of the human spirit during the Renaissance, expressing itself in a rebirth of art, literature, religion, discovery, invention, science, and philosophy. There were the industrial and political revolutions of the eighteenth and nineteenth centuries, with widespread economic, sociological, and political repercussions. Finally there is our own incomparable age.

Ours is an age of mass production, popular education, social unrest and evolution, economic change, and political upheaval. It is also an age of science. It is an era of science come of age in a world of change, in a world tottering precariously on the brink of chaos or at the foot of an upward climb unparalleled in human history.

Our age of science is not a new creation of our own. It is the culmination of a long series of contributions and advances from the time of Aristotle through Copernicus, Galileo, Kepler, Descartes, and Newton, through the long line of brilliant scientists of the nineteenth century, including such illustrious names as Darwin and Pasteur, up to such wizards as Burbank, Carver, and Edison and a veritable galaxy of scientific stars of our own day.

The spectacular resurgence of science which we are now witnessing in the twentieth century has been stimulated profoundly by the two wars which have engulfed the world in our generation. Discoveries, inventions, advances of all sorts of a scientific nature which in the normal course of events would require fifty or a hundred years for their development have been compressed into the short span of four or five years. It was so in 1914-1918. It is true again and will become increasingly so, the longer the present war continues.

Almost without our realizing it, we lived in a new world during the two and a half decades following 1918. Gone forever from the highways were the horse and buggy and the old-fashioned dray, all replaced by the passenger car and the motor truck. Trolleys and interurbans gradually gave way to buses, local and transcontinental. Even the railroads in both freight and passenger traffic were almost threatened with extinction until the present war overtaxed all transportation facilities and saved

\*The address of the Society's president.

the railroads for a time at least. With the automobile come of age, other important developments followed. Improved highways spanned the continent, American families traveled as never before. The consolidated school was made possible. A mass migration of city dwellers began from the congested city centers to the suburbs and rural areas, with a consequent boom in the building trades.

The use of the telephone was greatly expanded in both home and office. In the meantime whole new industries had sprung up almost overnight, notably the radio and the motion picture, first the silent and then the one with sound effects. In the kitchen were installed the electric range and refrigerator. This with the automobile, the telephone, the radio, the motion picture, and silk hosiery became almost the symbol of American life in the two decades preceding Pearl Harbor. Needless to say, they produced profound changes in the entire structure of our social life.

The present war will have repercussions far more significant than those of the last. The forces which emanated from that conflict and which gave us a radically different world in the twenties and thirties have been magnified a hundredfold. Inevitably we shall live in a new world in the postwar era of reconstruction, one which defies the capacity of the human imagination to conceive in its totality. It is possible, however, on the basis of the present status of scientific achievement, to foresee some of the more important developments which are bound to come.

In the realm of transportation the airplane will occupy a place comparable to that of the automobile in the past generation. The principles of mass production applied to the airplane for war purposes, along with the developments of new designs of planes and engines utilizing high-power fuels, plastics, and light metals which are now just in their infancy, together with the perfecting of helicopter devices and parachutes capable of landing an entire plane in safety, will place an airplane flier in almost every back yard or on every roof top. Our children will take to the air as eagerly as our generation did to the road. Only this time, national boundaries will be obliterated. A businessman will have supper in London and breakfast in New York. American families will weekend in Switzerland; honeymooners will visit Alaska rather than Niagara Falls. Likewise, the flight of the Constellation recently from San Francisco to Washington in 6:57:51, a ship weighing 40 tons and capable of carrying 100 fully equipped paratroopers—these give us a glimpse of what is just around the corner in air transport for both freight and passengers. "Airplanes now designed are capable of flying to Europe and back non-stop, carrying pay loads of 20 tons. . . . Designers are thinking in terms of hemisphere-spanning freighters and of passenger air-carriers in fleets numbering hundreds of planes. Transcontinental non-stop air trains of gliders—these are no longer figments of an imaginative air man's dreams."<sup>2</sup>

When, as a consequence of the knitting together of the world socially and commercially, the peoples of Europe and the Orient alike become our

<sup>2</sup>Charles M. A. Stine, Molders of a Better Destiny, *Science*, October 2, 1942, p. 310.

next-door neighbors, gone forever will be American or any other kind of isolationism, as surely as we witnessed a generation ago the passing of the horse and buggy. For this new world, political science must devise new and more adequate forms of national and international government, economics must eliminate tariff walls, and sociology will be challenged to create a new social order in which brotherhood will prevail. The whole world will be closely knit into one big family, and as in all well-ordered families, peace must be established on the basis of mutual understanding and good will. The recurrence of a devastating war once in every generation must become as obsolete as smallpox. Either that, or our civilization will perish.

The changes brought about by the development of the airplane and consequent new modes of transportation and communication are symbolic of other changes equally as revolutionary in other areas. By radio and colored television combined, the opera star will be brought realistically into our own sitting room. We will see every play of the ball game as clearly as if we were in the stands. Vast new industries are being born out of wartime necessity—the synthetic rubber industry, the aluminum and magnesium industries on a colossal scale, pliable and unbreakable glass, radar and electronics, high-octane gasoline 50 percent more powerful than 100-octane aviation gasoline, fuel and oil made from farm products to run the world's automobiles after the present reserves in the ground have been exhausted.

The houses in which we shall live will bear little semblance to those of today . . . prefabricated with sectional units and movable partitions, fireproofed, insulated, air-conditioned, electrified, heated by the sun, and with one-way-vision glass enabling us to look out but preventing neighbors and passers-by from looking in. Medicine also holds out the bright hope of the eventual conquest of disease, including dreaded cancer and venereal diseases, through the application of the miracle sulphur drugs and penicillin. The new cure for syphilis in 24 hours, the 6-hour cure of gonorrhea, the immediate stopping of meningitis epidemics by sulphadiazine, the very recent prevention of seasickness in the armed forces, these are but portents of more miraculous things yet to come in the prevention and cure of disease, while continuous caudal anaesthesia bids fair at last to eliminate the age-old pangs of childbirth. These are but a few of the revolutionary changes that are our heritage for the world of tomorrow.

What function should science perform in this new world created to some considerable extent by science itself but created also in part by other forces . . . political, economic, sociological, educational, moral, and religious? In the first place, the scientist must continue as of old to search for the truth . . . open-minded, broad-minded, tolerant, impartial, faithful to the facts. His motto must always be, "Ye shall know the truth." His primary objective is first to discover and then to reveal knowledge to man. In order to accomplish this purpose, however, he must be free . . . free from fear, free from want, free to pursue his investigation, free to proclaim his findings to the world. To the four freedoms of the Atlantic Charter must be added, as far as the scientist is concerned,

a fifth freedom . . . freedom of critical inquiry and research. For this reason science must help win this war in order to protect itself. It must fight to make the world safe for freedom of thought. Without this freedom the scientist cannot pursue his objectives. He must be free to explore any field, every field, to follow the facts and deduce conclusions based on the facts. His only coercion is that of the truth itself.

Totalitarianism is diametrically opposed to the scientific spirit. In this kind of political order, scientists must support the dogmas of the state. Instead of conclusions deduced from observed data, whether they support political doctrines or not, the scientist must subscribe to tenets that are politically expedient. Hence the preposterous doctrine of Nordic superiority and Jewish inferiority, and also the unseemly spectacle in Germany of some scientists conveniently accommodating the Nazi party by espousing its doctrines. To the glory of German science, however, let us not be unmindful of the exodus of scientists from Germany away from the intolerable Nazi regime . . . Einstein, Stern, Koffka, Köhler, and scores of others. Our immediate task as scientists, therefore, is to help win this war.

In our world of tomorrow, science will have a second function. In the past it tended to feel that it had fulfilled its obligations to itself and society when it had discovered knowledge and had shown its applications. In the new world of the postwar era, however, science must help create a new social order. Scientists on the whole may no longer bury themselves in their laboratories and ignore social and political winds and currents. The Nazis have surely driven home this lesson. The scientist must be a citizen of the world. After he has discovered the truth he must not remain aloof and indifferent to the use of his own findings. He will be vitally interested in knowing whether they will be used for the weal or woe of mankind. He will realize that the ultimate objective of science is to solve human problems, to promote human welfare, that Science at its best is cultural, designed and destined to enable man to climb the long and sometimes steep ascent to the richness and fullness of life.

The new physical world that Science was in the process of creating before the Nazi holocaust, Science must defend and preserve. The new social world that will emerge when the smoke of battle has cleared away, Science must help to create. Science did not cause this war. The scientist is a man of peace, interested always in making this old world a better place in which to live, in promoting the highest well-being of man, in creating a social order in which justice prevails, with prosperity, happiness, and brotherhood for all. These are the fruits of peace, not war.

In the molding of this new social order which must arise out of the wreckage of our old world, Science must join hands with philosophy and religion. Along with the philosopher, the scientist must co-operate in determining meanings, values, and ultimate objectives. Along with the man of religion the scientist must seek to promote the kingdom of God and of man in which is recognized the infinite value of personality, the brotherhood of all mankind, and the reign of love versus force. Then will we have the kind of new world in which we want to live.