evolved from lower forms of animals"; another 24 percent checked "Don't know"; 35 percent checked "Yes."

7. In this statement, we draw not only on the attitudes in this study but on a wide variety of other materials on the attitudes of contemporary young Americans.
8. The other side of this picture is sometimes seen in comments made by foreigners who have entered the sciences because Americans think they require less of a knowledge of the culture, and who because of their science training can get teaching positions in the schools. After a year or two of teaching in small-town schools, the foreign-born teacher flees back to the cities where he has friends or at least can live anonymously. (Based on life-history data from Chinese informants in the Chinese section of the Study Program in Human Health and the Ecology of Man, New York Hospital–Cornell Medical College, New York.)
9. Studies of the College Entrance Examination Board Commission on Mathematics and the University of Illinois Committee on School Mathematics give promise of bringing about improvement in mathematics instruction. A study of junior-high-school mathematics will be undertaken at the University of Maryland this fall. There is more to be done, especially in the elementary grades, and state departments of education should be encouraged to establish state committees which can determine how work now in progress at the national level can be made effective in local schools. The Poloidi-blocs, developed by Margaret Lowenfeld of the Institute of Child Psychology, 6 Pembridge Villas, London, W.11, are an important addition to the equipment for teaching young children mathematics.

A. S. King, Spectroscopist

Arthur Scott King was born 18 January 1876 in Jerseyville, Illinois. In 1883 the family moved to Santa Rosa, California and, about 1890, to Fresno, where Arthur received his secondary education. In 1895 he entered the University of California at Berkeley; here, in 1899, he received the B.S. degree and, in 1901, the M.S. In 1903 he received the first Ph.D. degree in physics ever awarded by the university. He was assistant instructor in physics at the university from 1901 to 1903. He spent the years 1903 and 1905 in Bonn, Germany, where he was a pupil of H. Kayser, who was then publishing the early volumes of his monumental *Handbuch der Spectroscopie.*

King's professional career really began in 1905, when he was appointed instructor in physics at the University of California. In January 1908 he was appointed superintendent of the physics laboratory at the Mount Wilson Solar Observatory, as it was called at that time. Here he remained until his retirement in 1943, and here, under George E. Hale's dynamic leadership, King chose detailed studies of atomic spectra for his life's work. The atmosphere of the observatory was vibrant with new ideas and the promise of rapid developments. Hale had shown that strong magnetic fields occur in sunspots. The spectroheliograph was daily revealing new information concerning phenomena on the sun. The 60-foot tower telescope was completed, the 60-inch reflector was to go into service at the end of the year, and the new physics laboratory in Pasadena was to be occupied in May.

King was a pioneer in the study of thermal excitation of atomic spectra and in the classification of lines in the complicated spectra of metallic atoms. When Hale suggested to him the study of the effects of temperature on atomic spectra, the immediate objective was the interpretation of solar data. King's work did indeed supply invaluable information on the relative temperatures of sunspots and the normal solar disk. But it did more. It created a powerful means of analyzing atomic spectra and of assisting in the development of the quantum theory of the atom.

The electric furnace which he designed was set up in the new laboratory in 1908. A horizontal graphite tube containing the substance to be studied was heated to the desired temperature by a powerful electric current. Light from the vaporized material left one end of the tube to enter a spectrograph. Light from the other end of the tube went to an optical pyrometer, which determined the temperature. The visible and near-ultraviolet parts of the spectra of numerous elements were recorded, at temperatures of from 1600° to nearly 3000°K. On each spectrogram were also recorded arc spectra of the same substance that was used in the furnace. With painstaking attention to detail, King estimated the intensities of many thousands of lines on photographs of furnace and arc spectra. These data led to a classification of the lines of each element according to the temperature required for their appearance. Five main temperature classes made up the system, which was the forerunner of the present quantum classification.

In those early days it was well known that heated substances would produce continuous spectra, but some physicists doubted that heat alone would produce discrete emission lines. They thought that the emission of lines from King's furnace somehow depended on the fact that the carbon tube was electrically heated. Because the voltage was low (from 6 to 10 volts), King did not think that this was true, but, to make perfectly sure, he made other photographs of the emission lines, exposing the film only during intervals when the electric current was shut off. His observations steered thinking about spectra in the right direction and were later of tremendous importance in the sorting out of spectrum lines according to the quantum theory of atomic structure.

King engaged in other scientific activities that were of considerable importance. In his early years he investigated the Zeeman effect in lines of titanium, iron, and other metals. Later he studied spectra of meteorites. He was codiscoverer, with Raymond T. Birge of the University of California, of the isotope carbon-13, and he collaborated with R. F. Sanford of the Mount Wilson Observatory staff in studying carbon isotopes in N-type stars. During World War I he investigated phenomena of sound in water. After his retirement, in 1943, he worked for several years at the Pasadena office of the Naval Ordnance Test Station.

King had a delightfully gentle personality and was beloved by all who knew him. After months of illness he passed away at his home in Pasadena, on 25 April 1957.

HAROLD D. BABCOCK
Mount Wilson and *Palomar Observatories, Pasadena, California*