CONCLUSION

World War II may not be a total loss for humanity. A tempo never before attained in the United States has been reached with a collaboration and exchange of knowledge between heretofore highly competitive groups. New materials now in war production will have great peacetime values. We will also have access to a vast amount of knowledge and experience which has been accumulated as the result of hectic years of war. Man's life will be prolonged, his health, mentality, imagination, and productivity increased, and the pain and irritations of life will be reduced to a minimum.

OBITUARY

OSKAR BOLZA

NEWS has recently reached mathematicians in America through the American Red Cross that Oskar Bolza passed away peacefully in Germany on July 5, 1942, at the age of eighty-five years. He emigrated to this country in 1888, was one of the founders of the Chicago Section of the American Mathematical Society and a member of the National Academy of Sciences, and had great influence on the development of mathematics in America during his residence here from 1888 to 1910.

He was born on May 12, 1857, in Bergzabern in the Palatinate of the Rhine. The fortunes of his family were considerable, due to the exploitation in 1817 of an invention of a rapid printing press by his maternal great-great-grandfather, Friedrich Koenig. So far as is known he was free throughout his life from financial worries. In 1873 his father, who had retired from his position in judicial service, moved his family to Freiburg-im-Breisgau, and from that time this city was Professor Bolza's German home city to which he returned for a part of almost every year.

As a young student Bolza was interested primarily in languages and comparative philology. But in an academy at Neuchatel under a Frenchman named Terrier, and in the Gymnasium at Freiburg under a professor named Koch, he studied what we would call college mathematics. Both of these men were inspiring teachers, and Bolza's experience with them became decisive for his whole life. His enthusiasm for mathematics grew to be a dominant one, while his interest in languages took a secondary position.

At the University of Berlin, which Bolza entered in 1875 at the age of eighteen, it soon became evident that he would be much more interested in a scientific career than in the family printing press factory which had long been managed by two of his uncles. After some hesitation over theoretical physics he decided in 1878 to devote himself to pure mathematics. Due to his own conscientiousness, and probably partly to his financial independence, his university student career was a long one. He studied at the University of Berlin under Kummer, Kronecker and Fuchs, and notably under Weierstrass in the famous course on the calculus of variations which Weierstrass gave in 1879. This course proved to be perhaps the most potent influence in forming Bolza's mathematical interests, though his doctor's dissertation was written in a different field. In other years he studied at Göttingen under Schwarz and Klein, and his dissertation on the reduction of hyperelliptic to elliptic integrals was finally approved by Klein in 1888. His examination for the Ph.D. was successfully passed in the same year when Bolza was twenty-nine years old.

The problem of a profession was a serious one for Bolza. Two of his intimate student friends, the mathematician Heinrich Maschke and the physicist Franz Schulze-Berge, had both reluctantly taken positions as gymnasium instructors. There did not seem to be opportunities in Germany for the three friends as lecturers in a university. Bolza had been rejected for military service because of his rather delicate physique and he dreaded the twenty hours a week of teaching required in a gymnasium. Fortunately at this stage, in 1887, Schulze-Berge came to the United States and promptly secured a position as an assistant in Thomas Edison's experimental laboratory. His enthusiastic recommendations and the persuasiveness of two American professors, M. W. Haskell and F. N. Cole, who were then students in Göttingen, decided Bolza to take a chance in the New World. In April, 1888, he joined his friend Schulze-Berge in New Jersey, and shortly thereafter he was appointed reader in mathematics at the then youthful Johns Hopkins University. A year later he was appointed "associate" at Clark University, which opened its doors for the first time on October 1, 1889.

Clark University had been founded as a graduate school. In a few years it had financial difficulties which led to unhappiness and dissension in the faculty, as a result of which a number of them were quite ready to accept positions at the still newer University of Chicago which opened on October 1, 1892. Bolza was invited to join this group and he persuaded President Harper of the new university and Professor E. H. Moore, the head of the department of mathematics, to appoint both himself and Maschke as associate professors, Maschke having meanwhile also come to the United States. Bolza took up his new duties on January 1, 1893, and after one year was made a

full professor, in accordance with an earlier agreement.

The combination of Moore and Bolza in analysis, and Maschke in geometry, was a strong one at the University of Chicago. The university became at once one of the leading graduate schools of mathematics in America and its students are widely scattered in the departments of mathematics of American universities. Many of us owe our interest and training in mathematics to Bolza in particular, though every one who studied at Chicago at that time must also have been greatly influenced by Moore and Maschke. They were all three most able scholars and skilful lecturers.

In 1908 Maschke died, and the Chicago environment became a very sad one for Bolza. Their friendship from student days had been an ideal and very intimate one. This sadness, together with the fact that his mother in Freiburg was very old and seemed to have at most a few years more to live, were undoubtedly most influential in deciding Bolza to return to Freiburg permanently. But he himself has said that he was also much influenced by the feeling that by that time there were many younger men well trained in mathematics in America, and that he should make way for some of them. He was also interested to find that he would be appointed at the University of Freiburg to an honorary professorship which would permit him to lecture on mathematics as much or as little as he desired. So in June, 1910, after eighteen years at the University of Chicago, Bolza was appointed non-resident professor of mathematics there and returned to Germany with, as he himself wrote, "warm feelings of thanks and admiration for this country, which at a critical time in my life had given me the opportunity to develop my possibilities and follow my inclinations."

As honorary professor at the University of Freiburg Bolza continued at a moderated pace his lectures on a variety of mathematical subjects and his mathematical research. In the summer quarter of 1913 he lectured again at the University of Chicago and renewed with great pleasure his friendships in America. The first world war of course disturbed him greatly and in the end cut short his research activity in mathematics. In 1922 at the age of sixty-five he gave up his mathematical research, and in 1926 he interrupted his lectures at the University of Freiburg.

At this time he became interested seriously again in languages, especially Sanskrit, and in religious psychology. In the latter field he published a book entitled "Glaubenslose Religion" under the pseudonym F. H. Marneck. It was an absorbing interest during the latter part of his life.

He had one last return to his lectures on mathematics at the University of Freiburg during the years 1929–1933 and then gave them up finally at the age of seventy-six. Just about that time one of his earlier and most intelligent Ph.D. students, J. H. McDonald, of the University of California, visited him for several weeks in Freiburg. A result of this visit was a renewed interest in the theory of the transformation of hyperelliptic to elliptic integrals. Bolza wrote and published in 1933 on this subject his last mathematical paper.

Bolza's principal mathematical interests were in the reduction of hyperelliptic integrals to elliptic integrals (eight papers), elliptic and hyperelliptic functions (seven papers), and the calculus of variations (twenty-eight papers). In these fields, and others of lesser interest to him, he made important contributions. In the calculus of variations especially he has been a most notable contributor, and his principal book on the subject, entitled "Vorlesungen über Variationsrechnung," published in 1909, is an example of the finest scholarship, indispensable to every one interested in the field.

Thus has passed a potent figure in American and European scholarship, a brilliant lecturer and a man beloved by his students and colleagues. At the suggestion of one of his former students he wrote and published privately in 1936 an autobiography of about forty-five pages entitled "Aus meinem Leben." It is a most interesting document, now in the hands of many of his mathematical students. From it was taken much of the material in the preceding paragraphs.

G. A. BLISS

RECENT DEATHS

DR. CARL C. BRIGHAM, professor of psychology at Princeton University, died on January 24, at the age of fifty-two years.

DR. GEORGE BORIS KARELITZ, professor of mechanical engineering at Columbia University, known for his work on lubrication, died on January 19 at the age of forty-eight years.

DR. JOHN RATHBONE OLIVER, formerly professor of the history of medicine at the Johns Hopkins University, died on January 21, at the age of seventy-one years.

DR. WINFORD LEE LEWIS, inventor of lewisite gas, until 1924 professor of chemistry and head of the department at Northwestern University, later director of the Scientific Research Institute of the American Meat Packers Association, died on January 20. He was sixty-four years old.