enrollments will pass beyond the 3,000,000 mark by 1960. Veteran enrollment in the fall of 1947 will be greater than in the fall of 1946 and will not reach its peak until the fall of 1948. Not until 1950–51 will the number of veterans in college begin to decline significantly. It is confidently believed that after that period nonveteran enrollment will have increased and will continue to increase. This period is sufficiently long so that if a recourse is had to the employment of temporary, poorly qualified staffs, these staff members will have acquired a degree of permanence such that it will be difficult to replace them without doing some violence to the concept of tenure in college faculty employment. Inertia alone will tend to perpetuate them in their posts. It should not be necessary to add that this generation of veterans deserves well-qualified teachers.

In summary, it seemed to the members of this round table that higher education is at a crossroad. In one direction, that of temporary expediency, lies the road of poor instruction, poor public relations, and a long-time weakness in American life resulting from a poorly trained generation. In the other direction, that of a courageous insistence on qualified instruction regardless of cost, lies the road to success in the experiment of higher education for all, good public relations, and an adequately trained generation of veterans. It seemed to the members of the round table that education should have complete awareness of the implication of this situation.

Obituary

Velyien Ewart Henderson
1877-1945

The death of Prof. Henderson on 6 August 1945, at the age of 68, removed from the field of pharmacology and related medical sciences an outstanding teacher and critical investigator. An influential member of American scientific societies, this distinguished Canadian was long an officer of the American Society for Pharmacology and Experimental Therapeutics, of which he was president in 1936 and 1937. In 1936 he also served as president of the Federation of American Societies for Experimental Biology. A fellow of the Royal Society of Canada, he was president of the Biological Section in 1937, and in 1944 he was awarded its Flavelle medal for meritorious contributions to medical science. From 1941 to 1943 he was president of the Canadian Physiological Society, of which he was a charter member. He was also the founder of the Toronto Biochemical and Biophysical Society and its chairman in its second and twenty-first years.

Born and educated in Ontario, Dr. Henderson studied at Upper Canada College and in 1902 was graduated in medicine from the University of Toronto, the institution with which, except for a few post-doctorate years, he remained associated throughout his entire career. After a brief interest in a career in pathology and a period at the University of Pennsylvania, Dr. Henderson became a pupil of Hans Horst Meyer, then at Marburg. The impressions gained while under the tutelage of this great leader remained vivid throughout Dr. Henderson's life, and it was largely as a tribute to Meyer that he translated into English the seventh edition of *Experimental pharmacology,* the important textbook of Meyer and Gottlieb. After a few months with Starling in London, Dr. Henderson returned to the University of Toronto, where he was for a time in the Department of Physiology. He undertook the development of the Department of Pharmacology in 1906, at the age of 29, and became professor of pharmacology six years later. In 1914 he entered the Canadian Expeditionary Force as a combatant officer and was reluctantly transferred to the Medical Corps toward the end of the war, from which he returned as a major in 1919.

Prof. Henderson was extremely well versed in his subject and was gifted with a remarkable memory and unusual clarity of thought. An indefatigable teacher, he shouldered the lion's share of the responsibility for the instruction of the large medical classes by the staff of his Department. Lacking the facilities for student participation in other than very simple exercises in experimental pharmacology, he gave generously of his time by the presentation twice weekly throughout each school year of elaborate mammalian demonstrations chosen carefully to illustrate important pharmacological principles. Subsequently, photostatic copies of the kymographic tracings were presented to the students for detailed analysis, a practice much less enjoyed by the students than was the drama of the demonstrations.

In research, his interests were widely diversified, but he was particularly well known for his contributions

in the field of the chemical transmission of nerve impulses, for studies of the respiratory center, and for important and original discoveries in the field of anesthesiology. In 1922, with W. E. Brown, Prof. Henderson showed that ethylene is a more powerful anesthetic than nitrous oxide, and it was their work, together with that of Luckhardt and his associates in Chicago, which led to the development of ethylene as a general anesthetic agent. Investigations of many potentially valuable narcotic substances led to a study, with G. H. W. Lucas, of the pharmacology of propylene and to the discovery, while searching for possible toxic impurities in this gas, of the striking anesthetic properties of cyclopropane. The fundamental studies of this remarkable compound received prompt recognition, and cyclopropane was shortly introduced into, and widely applied in, clinical anesthesia.

He was one of Banting's closest friends and staunchest supporters during the days of the search for the antidiabetic hormone and provided Banting with a university post and laboratory facilities, in the year following the discovery of insulin by Banting and Best. He also had much to do with the effort to raise funds with which to endow the Banting Research Foundation. For 16 years he served as the secretary-treasurer of the Foundation, exercising unstintingly his keen judgment with regard to the significance of proposed research projects and the progress obtained under the support of the Foundation.

Prof. Henderson excelled in the training of graduate students, who found themselves exposed constantly to sincere interest, wide knowledge, and kindly but pungent guidance. He was particularly careful to direct the investigations of the advanced student into several relatively unrelated fields, in order to prevent a restriction of scientific experience and a narrowness of outlook that are all too often encountered in graduate training. By precept and example the student was trained honestly to persevere, to observe, and to evaluate.

Prof. Henderson was perhaps at his best in his home, where it was a real pleasure to join his charming family group. It was here particularly that one appreciated his wide cultural interests and his truly lovable nature. He was especially interested in architecture and painting. During recent summers at Georgian Bay he made many water-color sketches of wild flowers that were charming in design and color and gave him much pleasure.

His colleagues the world over mourn the passing of a distinguished investigator, a splendid teacher, and a noble man.

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Technical Papers

Formation of Hyalite and Opal

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As in the case of mother-of-pearl, the optical properties of opal reflect the mode of its formation. In this respect the existing theories of opalescence constitute, however, a mere record of contrasting possibilities. Thus, L'Abbé Haüy (*6*) considered opalescence to be due to reflection from internal fissures; Brewster (*2*) attributed the display of color to the presence of microscopic cavities or minute air bubbles; and Behrens (*1*) assigned opalescence to the reflection from the thin, curved lamellae of opal, the refractive index of which may differ by 0.1 from that of the mass. These were conceived to have been formed originally in parallel position, but have been changed, bent, and finally cracked and broken in the solidification of the ground-mass.

There is considerable evidence to support the view that acidic silicic acid gels (pH value below 7.0) constitute an intermediate stage between the basic silicic acid gel and minerals of the hydrated silica type. This evidence includes the probable restriction of the monomolecular state to soluble silicates, molecular weight determinations, conditions of transition, the reduction of pH values with progressive gelation, and the general identification of coagulation with polymerization. In this light the soft, reactive basic silicic acid gel (pH value above 8.0) may be termed the *primary* or simple polymer of silicic acid; the elastic, inert acidic gel, the *secondary* or closely-linked complex polymer; and the hard, hydrated silica in the form of non-ionized minerals, *tertiary* polymers.

Recent work (*4*) on the rhythmic structures of silica and its hydrates led to the synthesis of the clear, opalescent and opaque forms of the acidic polysilicic acid gel under conditions specific to the Liesegang phenomenon. This, together with the consequent differentiation of these varieties by the presence and state of dispersion of silica particles within the colloidal