morial night. The following were announced as speakers: Drs. George W. Crile, Cleveland; C. A. L. Reed, Cincinnati; Frank Billings, L. L. McArthur, E. Wyllys Andrews, D. A. K. Steele, A. D. Bevan, W. E. Quine, A. J. Ochsner, Jacob Frank and W. A. Evans.

A BRONZE bust of Dr. Nicholas Senn has been presented to the Wisconsin Historical Museum, Madison, by Dr. Emanuel J. Senn, of Chicago. Dr. Senn began his practise as a country practitioner near Fond du Lac in 1869.

DR. LEVI LEONARD CONANT, head of the department of mathematics at the Worcester Polytechnic Institute, was killed by an automobile truck on October 11. Professor Conant was born in 1857. He was known for his work on primitive number concepts, the history of mathematical notation and the theory of functions and of graphs.

DON JOSÉ ECHEGARAY, professor of mathematical physics in the University of Madrid, and distinguished also as a poet and dramatic author, died on September 15, aged eighty-three years.

DR. V. VON CZERNY, professor of surgery at the University of Heidelberg since 1877 and chief of the cancer research hospital there, has died, aged seventy-four years.

THE death is also announced of A. Magnan, one of the leading alienists of France.

MR. R. J. L. GUPPY, known for his work on the geology of Trinidad and other West Indian Islands, his died at the age of eighty years.

THE death in Munich, on June 22, of Mr. Gustav Mann, is announced in *Nature*. Mr. Mann, who was in his eighty-first year, was known for his botanical work in Africa and India.

MR. E. G. KENSIT, a member of the Botanical Department of the South African College, has been killed in the war.

THE *Auk* for October contains obituary notices of several ornithologists, John Alexander Harvie-Brown, D.D., died at his residence, Dunipace House, Stirlingshire, Scotland, July 26, 1916. He was born at Dunipace, August 27, 1844, and spent his life there, being a landed proprietor who devoted himself to natural history. He was best known for his work in connection with the "Vertebrate Fauna of Scotland," of which he was chief editor and author of many of the volumes. He was also the founder, owner and joint editor of the "Annals of Scottish Natural History," as well as a supporter of its successor, "The Scottish Naturalist." Col. Herbert Hastings Harrington, the British ornithologist, noted for his work on the "Birds of Burma" (1909) and for numerous papers on Indian birds, was killed in the campaign in Mesopotamia on March 8, 1916. He was born on January 16, 1868, at Lucknow. Lieutenant-Colonel Boyd Robert Horsbrugh, well known as the author of "The Game Birds and Water-Fowl of South Africa" and of numerous articles in *The Avicultural Magazine* died at his home in Surrey, England, on July 11, having been invalided home from France in 1915. Colonel Horsbrugh was born at Poona on July 27, 1871. John Claire Wood, known in Michigan as an oologist and ornithologist, died June 16, 1916, at his home in Detroit, aged forty-five years.

UNIVERSITY AND EDUCATIONAL NEWS

PLEDGES have been received for the full amount of the Vassar College million dollar endowment fund. $200,000 had been pledged by the General Education Board of the Rockefeller Foundation on condition that the balance be raised. The fund will be used for the endowment and equipment of the college.

THE merger of the medical department of the University of Pennsylvania and the Jefferson Medical College has been postponed for a year, and it is thought that the union may be abandoned.

THE new chemistry building of the Throop College of Technology which with its equipment will cost nearly $100,000 is approaching

completion and will be ready for occupancy about December 1, when Dr. Arthur A. Noyes will go to Pasadena, where from now on he will spend half of each year. James H. Ellis, Ph.D. (Mass. Inst.) has been appointed research associate in physical chemistry in the college.

THE appointments of Drs. Edward H. Nichols and Charles A. Porter as clinical professors in the Harvard Medical School have been confirmed by the university's board of overseers. Both men formerly held positions as associate professors.

HAROLD VEATCH BOZELL has been appointed assistant professor of electrical engineering in the Sheffield Scientific School of Yale University for the college year 1916–17, for which period he has secured leave of absence from the University of Oklahoma, where he is dean of the school of electrical engineering and professor of electrical engineering.

PROFESSOR C. N. HASKINS, of Dartmouth College, has been promoted to a full professorship of mathematics. Drs. R. D. Beetle and F. M. Morgan have been promoted to assistant professorships of mathematics.

ROY G. HOSKINS, associate professor of physiology in the Northwestern University Medical School, has been promoted to be full professor and head of the department. Virgil Ernest Dudman, M.D., interne in Cook County Hospital, Chicago, has been elected assistant professor of hygiene and director of student health.

H. H. BUNZELL, Bureau of Plant Industry, has been appointed assistant professor of biochemistry at the University of Cincinnati Medical School.

DR. A. A. BENNETT, of Princeton University, has been appointed adjunct professor of mathematics at the University of Texas.

O. F. BURGER has been appointed instructor in plant pathology in the Graduate School of Tropical Agriculture of the University of California at Riverside, and Alfred Free Swain, formerly of Montana State College and of Stanford University, assistant in entomology there.

DISCUSSION AND CORRESPONDENCE

COLLOIDS AND NEGATIVE SURFACE TENSION

IN a review of Professor Fischer's translation of Wo. Ostwald's "Handbook of Colloidal Chemistry" which recently appeared in this journal,[1] Professor W. A. Patrick states that the existence of negative surface tension which is assumed by Ostwald is contrary both to experimental evidence and to the fundamental ideas of surface tension. Although the present writer does not agree with all of Ostwald's energetic considerations, he wishes to point out that the existence of negative surface tension under certain circumstances is not only supported by a vast body of experimental evidence but is necessitated by the thermodynamic theory of the stability of colloidal solutions.

Surface tension may be defined in the usual way as the work which has to be done in order to increase the surface in question by one square centimeter, this increase in surface being carried out of course reversibly and isothermally. This work, however, and hence also the surface tension, may be either positive or negative.

If for a given two-phase system the surface tension at the boundary between phases is positive, then a positive quantity of work will have to be done in order to increase this surface, and such an increase in surface will be accompanied by an increase in the free energy of the system. Since all spontaneous changes in a system must be in the direction of decrease of free energy, these systems with positive surface tension if left to themselves will automatically decrease the surface between phases. Thus, for example, in the case of finely divided crystals of copper sulfate in contact with a saturated solution, we have a system in which there is positive surface tension at the boundary between the phases, and if this system is left to itself there will be a spontaneous decrease in surface, the smaller crystals going into solution and precipitating on the larger until finally we have all the solid copper sulfate in one large crystal, this being the condition of smallest possible surface.

If, on the other hand, we have a two-phase

[1] SCIENCE, 43, 747, 1916.