Dr. Samuel T. Orton, of the University of Pennsylvania Hospital, has been appointed head of the Psychopathic Hospital of the University of Iowa, Iowa City.

The field party of the New York State College of Forestry, at Syracuse, has begun its second season of field work on the cooperative ecological survey of the Palisades Interstate Park. The field party, under the direction of Dr. Charles C. Adams, representing the College, and Mr. Edward F. Brown, representing the park, consists of Professor P. M. Silloway, who is continuing his study of bird tramping trails, in cooperation with Professor H. R. Francis, who is studying the general problem of park trails. The park fishes are being studied by Professor T. L. Hankinson, Dr. Adams and Dr. W. C. Kendall, in cooperation with the U. S. Bureau of Fisheries. Dr. J. Percy Moore, also working in cooperation with the Bureau of Fisheries, is studying the control of mosquitoes by fish. He is also making a study of the control of leeches. Mr. Walter H. Rich is making fish portraits and Mr. Edmund J. Sawyer those of birds. The field assistants of the party are Mr. Robert K. Fletcher and Mr. Winn Merrill. This cooperative survey is conducted by the College of Forestry, the Commissioners of the Palisades Interstate Park, and in part by the United States Bureau of Fisheries.

"Mathematics and Statistics" is the subject of the retiring address of the president of the Mathematical Association of America, Professor E. V. Huntington, Harvard University, to be given at Ann Arbor on September 4.

A campaign committee has made plans for raising funds for the erection of an Abraham Jacobi Memorial Hospital for Washington Heights, New York City. This locality has been chosen because of its lack of hospital facilities. The active campaign will not be begun until November. Dr. S. Robert Schultz is executive director of the campaign and has issued a call for volunteer workers. A resolution will be introduced in the board of aldermen at the first fall meeting, proclaiming Heights Hospital Week from November 15 to 22.

Appropriate exercises at the unveiling of the memorial tablet to the late Dr. Charles O. Zahner, professor of physiology in the University of Louisville, took place in the college building, June 26.

UNIVERSITY AND EDUCATIONAL NEWS

Dr. Bradley M. Davis, of the University of Pennsylvania, has been appointed professor of botany at the University of Michigan. He will take up his new work in October.

Arthur H. Blanchard has been appointed professor of highway engineering at the University of Michigan to occupy the chair recently established by the board of regents. He will retain his consulting office at Broadway and 117th Street, New York City, until September 15, after which he will be at Ann Arbor, Michigan.

Dr. Arthur C. Neisch, of Columbia University, has accepted a position as head of the department of chemistry at Queen's University, Kingston, Ontario.

Messrs. Frederick S. Dellenbaugh, Arthur L. Nelson and F. B. Philbrick, have been appointed instructors in electrical engineering at the Massachusetts Institute of Technology. Mr. Dellenbaugh was a captain of the Signal Corps in overseas service during the war. During the war Mr. Nelson was a lieutenant in the Engineer Corps of the Navy with important work relating to construction of power plants and supply of power at the submarine base.

Mr. E. A. Wildman has resigned his position as director of chemical research for Eli Lilly and Company, and has accepted the position of professor of chemistry and director of the chemical department of Earlham College.

Professor A. Findlay, of University College of Wales, Aberystwyth, has been appointed to the chair of chemistry in the University of Aberdeen in succession to Professor Soddy who has accepted a call to the University of Oxford.

THE University of Bristol has made the following appointments to the professorial chairs mentioned: *Botany:* Dr. Otto Vernon Darbishire, lecturer in botany in the university. *Education:* Dr. Helen Marion Wodehouse, principal of the Bingley Training College, Yorkshire. *Henry Overton Wills Chair of Mathematics:* Dr. H. Ronald Hassé, late fellow of St. John's College, Cambridge; senior lecturer in mathematics in the University of Manchester. *Mechanical Engineering:* Major Andrew Robertson. *Henry Overton Wills Chair of Physics:* Dr. Arthur Mannering Tyndall, acting head of the department of physics in the university during the war. *Henry Overton Wills Chair of Physiology:* Dr. George A. Buckmaster, assistant professor of physiology in the University of London.

DISCUSSION AND CORRESPONDENCE

TANDLER AND KELLER ON THE FREE-MARTIN[1]

IN April, 1916, the writer published a short article on "The Theory of the Free-Martin"[2] in which he sought to demonstrate that contrary to the then prevailing opinion the free-martin is a female, and that its intersexual condition is due to early embryonic anastomosis of the blood vessels of its chorion with those of the male twin, with consequent inversion, more or less complete, of the internal organs of reproduction by action of the testicular homones of the male. A detailed account of the data and theory was published in the *Journal of Experimental Zoology* in 1917.[3] At the time of publication the writer supposed that both the data and theory were new, but he has learned this summer by a reference in a work of Magnusson[4] that some of the data at least were anticipated by Tandler and Keller in a publication dating from 1911.[5]

These writers studied seventeen pairs of two-sexed cattle twins in fœtal stages and determined the following fundamental facts:

1. That such twins have a common chorion.

2. That branches of the umbilical vessels, especially the arteries, anastomose by relatively large branches, so that an injection from an umbilical artery of one fœtus would pass over into the umbilical arteries of the other. The females of such pairs possessed the typical "hypoplastic genitals" of the free-martin.

3. In one case, in which there was no macroscopic vascular anastomosis in the chorion and the injection would not pass over, both male and female possessed normal reproductive organs. The authors consider this more than a mere matter of chance.

4. That the maternal ovaries possess two corpora lutea, usually one in each ovary; hence they correctly interpret the twins as dizygotic.

5. The youngest pair of twins examined had a neck-rump measurement of 21 cm.; the female was typically malformed. Hence the origin of the condition is earlier.

From these facts the authors conclude that "vascular relationships and genital development stand in some kind of etiological relationship."

The writer independently stated all of these facts in his 1916 paper, and in addition the following facts and considerations:

1. A comparison of sex ratios of the four kinds of twins ♂♂, ♀♀, ♂♀, ♂♀, demonstrating from the statistics that the sterile free-martin must be zygotically female.

2. A study of much earlier stages than the youngest of Tandler and Keller showing that the union of chorions is secondary and that it probably occurs at or about the time of beginning sex-differentiation (20–25 mm.).

3. A statement of conditions of the fœtal membranes in twins of sheep, showing that, though the membranes fuse, no macroscopic

[1] To the kindness of Professor A. Lipschütz, of Berne, the writer owes a reference to a later and presumably more complete account of the investigations of the same authors (*Wiener Tierärzlitche Wochenschrift,* III., Jahrgang, Heft 12, 1916), which however he has not yet seen.

[2] SCIENCE, N. S., XLIII., pp. 611–613.

[3] Vol. 23, pp. 371–452.

[4] *Arch. f. Anat. u. Physiol., Anat. Abt.,* 1918, pp. 29–62.

[5] *Deutsche tierärztliche Wochenschrift,* 19 Jahrgang, 1911, pp. 148–149.