final means will be sufficient. These differences can best be shown by the following brief table:

	Potsdam—B D.	Potsdam—P I.	Potsdam—P II.	Potsdam—Pr.	Means.
White.....	+0.25	+0.29	+0.29	+0.23	+0.26
Yellow white.....	+0.26	+0.25	+0.21	+0.20	+0.23
White yellow.....	+0.11	+0.09	+0.02	+0.06	+0.07
Yellow, etc.....	—0.05	—0.04	—0.09	—0.07	—0.06

The most striking feature shown in this table is the remarkable accordance in the mean results at Bonn, Harvard and Oxford. In each case there is a positive difference of about a quarter of a magnitude for white stars, and this quantity diminishes systematically to a small negative value for the yellow-red red stars. The systematic differences between the Bonn, Harvard and Oxford catalogues are inappreciable. In all cases Potsdam makes the white stars fainter and the red stars brighter than the other three observatories. Between these two extremes, however, somewhere between the whitish-yellow and yellow stars, the differences disappear. The differences seem difficult of explanation. On the one hand, we have Potsdam with two observers and with Zöllner photometers, and on the other hand, Bonn, Harvard and Oxford, with eight observers and photometers of several kinds. The differences concerned are small, however, and it may well be regarded as remarkable that the color scale of the different catalogues should agree so closely that for stars of one color the differences are positive, and for those of another color, negative.

Another relation is shown by arranging the observations with regard to magnitude. We may use for illustration Potsdam — P I. It is thus found that the scale of magnitude of the Harvard photometry lies, for stars of different color, on both sides of that of the Potsdam scale. For white stars a full Harvard magnitude equals about 1.05 of the Potsdam scale; for yellowish-white, 1.03; for whitish-yellow, 1.01; and for yellow and red stars, 0.94; and for all, about 1.00. Taking into consideration the systematic differences which are found in the results of a single observatory by different observers and instruments, as shown in the present discussion for Potsdam, and also the known influence of the Purkinje phenomenon, the differences of scale between Potsdam and Harvard are surprisingly small.

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BOTANICAL NOTES.

BOTANY IN THE ST. LOUIS CONGRESS OF 1904.

A LITTLE more than two years ago in the Congress of Arts and Science of the Universal Exposition at St. Louis a considerable number of botanical papers were read which are now given wider publicity by being printed in the fifth volume of the published proceedings of that notable meeting. The following papers on botanical subjects are printed in this volume: 'Development of Morphological Conceptions,' by Professor John M. Coulter; 'A Comparison between Natural and Artificial Selection,' by Professor Hugo de Vries; 'Plant Morphology,' by Professor Frederick O. Bower; 'The Fundamental Problems of Present-day Plant Morphology,' by Professor Karl F. Goebel; 'The Development of Plant Physiology under the Influence of the Other Sciences,' by Professor Julius Wiesner; 'Plant Physiology—Present Problems,' by Professor Benjamin M. Duggar; 'The History and Scope of Plant Pathology,' by Professor Joseph C. Arthur; 'Vegetable Pathology, an Economic Science,' by Merton B. Waite; 'The Position of Ecology in Modern Science,' by Professor Oscar Drude; 'The Problems of Ecology,' by Professor Benjamin L. Robinson; 'Relations of Bacteriology to Other Sciences,' by Professor Edwin O. Jordan; 'Some Problems in the Life-history of Pathogenic Microorganisms,' by Professor Theobald Smith. To these may be added the two more general papers—'The Recent Development of Biology,' by Professor Jacques Loeb, and 'The Problem of the Origin of Species,' by Professor Charles O. Whitman, and the brief introductory addresses by Professor Charles R. Barnes (plant physiology) and Professor Charles E. Bessey (plant pathology). Nor are these all that will

prove of much direct interest to the scientific botanist, who will find much that he can apply to his own science in Professor Charles B. Davenport's 'Animal Morphology in its Relation to Other Sciences,' Professor Alfred M. Giard's 'Present Tendencies of Morphology and its Relations to the Other Sciences,' Professor Oskar Hertwig's 'Advances and Problems in the Study of Generation and Inheritance,' Professor William K. Brooks's 'Individual Development and Ancestral Development,' Professor William E. Ritter's 'Place of Comparative Anatomy in General Biology' and Professor Yves Delage's 'Comparative Anatomy and the Foundations of Morphology.'

These stately volumes are issued by Houghton, Mifflin & Company, which is a sufficient guarantee of their excellence in type, paper and presswork.

TWO AND THREE PISTILS IN CASSIA CHAMAECRISTA.

In the autumn of 1905 I chanced to find a single flower of *Cassia chamaecrista* with two pistils (carpels), one of normal size and the other much smaller, so small in fact that its ovules had not developed. A few days later while out with a party of students I directed their attention to what I had found, and suggested that they hunt for similar cases of two pistils in a flower. It proved not to be a difficult task to find such cases, and in most of those found, both pistils were of normal size. A considerable number of these twinned pistils were secured, and preserved for further examination. They appeared to be normal in every particular. I was especially interested in the discovery of two cases in which there were *three* pistils in each flower. In one of these cases the three pistils were of approximately equal size.

If we are right in thinking that the *Caesalpiniaceae* have probably been derived from *Rosaceae* by a reduction in the number of carpels (along with other floral modifications) we have in these cases of two and three carpels a reversion to the polycarpellary type. It became interesting to know whether these cases were sporadic, or whether there was a tendency in these plants to produce more than one carpel. Accordingly, I visited this year the station where we found the two- and three-carpelled flowers last year, and again found a considerable number of flowers with two carpels. None was found with three carpels, though this may have been due to the fact that the search was not as prolonged as last year. It is evident, however, that in this particular colony of these plants there appears to be a tendency to produce bicarpellary flowers.

ENGLER'S PFLANZENREICH.

The twenty-third and twenty-fourth *Hefte* of Engler's 'Pflanzenreich' are devoted respectively to the *Halorrhagaceae* (by A. K. Schindler) and the *Aponogetonaceae* (by K. Krause). In the treatment of the first, the author excludes *Hippuris,* usually included in this family, regarding it as more nearly related to the *Santalaceae.* Seven genera are retained, viz., *Loudonia* (with 3 Australian species); *Halorrhagis* (59 species, mostly Australian); *Meziella* (1 Australian species); *Laurembergia* (18 species, from New Zealand and Australia to tropical Asia, Africa and America); *Proserpinaca* (2 North American species); *Myriophyllum* (a cosmopolitan genus of 36 species); *Gunnera* (33 species from Africa to New Zealand). The second family (*Aponogetonaceae*) is a small one containing but one genus (*Aponogeton*), which includes 22 species ranging from Southern Africa to tropical Asia and North Australia. In both *Hefte* the numerous illustrations are excellent.

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CHEMICAL ABSTRACTS.

A year ago an effort was made to secure the cooperation of the London Chemical Society, the Society of Chemical Industry and the American Chemical Society in the publication of an abstract journal which should cover the whole field of chemistry and which should go to the members of each society. A plan for such a cooperation was carefully worked out and submitted to the two English societies, but the Society of Chemical Industry finally decided that it was impossible for them to take part in such a cooperative enterprise.