

existence from the gametophyte, it must possess assimilatory tissue of its own, and this is necessarily developed first in the ontogeny; but it does not necessarily follow, therefore, that the foliage leaf was the primary organ in the phylogeny of the sporophyte. The provision for the development of a large number of spores in the thallophytes, so that many may perish and still some remain to perpetuate the race, is laid hold on by the bryophytes, where the mass of spore-bearing cells increases and becomes more stable, for purposes of the greatest importance. Instead of perishing, some of the sporogenous tissue forms protecting envelopes, then supporting and conducting tissue, and finally in the pteridophytes and spermatophytes nutritive and assimilatory structures are developed. Nature is prodigal in the production of initial elementary structures and organs. But while making abundant provision for the life of the organism through the favoured few, she has learned to turn an increasing number of the unfavoured ones to good account. Acted upon by external agents and by internal forces, and a changing environment, advance is made, step by step, to higher, more stable, and prolonged periods.

While we have not yet solved any one of these problems, the results of experimental morphology are sufficient to indicate the great importance of the subject and the need of fuller data from a much larger number of plants. If thus far the results of experiments have not been in all cases sufficient to overthrow the previous notions entertained touching the subjects involved, they at least show that there are good grounds for new thoughts and new interpretations, or for the amendment of the existing theories. While there is not time for detailing even briefly another line of experiment, viz. that upon leaf arrangement, I might simply call attention to the importance of the experiments conducted by Schumann and Weisse from the standpoint of Schwendener's mechanical theory of leaf arrangement. Weisse shows that the validity of the so-called theory of the spiral arrangement of the leaves on the axis may be questioned, and that there are good grounds for the opening of the discussion again. It seems to me, therefore, that the final judgment upon either side of all these questions cannot now be given. It is for the purpose of bringing fresh to the minds of the working botanists the importance of the experimental method in dealing with these problems of nature, that this discussion is presented as a short contribution to the subject of experimental morphology of plants.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Sir Archibald Geikie has been appointed the Romanes Lecturer for 1898.

The Delegates of the Common University Fund have appointed Mr. William John Smith Jerome Lecturer in Medical Pharmacology and Materia Medica for the years 1898-99.

CAMBRIDGE.—Mr. J. H. Grace, bracketed second wrangler 1895, has been elected to a fellowship at Peterhouse.

Mr. S. F. Harmer, Superintendent of the Museum of Zoology, has been approved for the degree of Doctor of Science.

Mr. H. K. Anderson, Demonstrator of Physiology, has been elected to a Drosier Fellowship at Gonville and Caius College.

Dr. A. A. Kanthack, of St. John's College, has been elected to the Professorship of Pathology, in the place of the late Prof. C. S. Roy.

The University Lectureship in Midwifery is vacant by the resignation of Mr. E. H. Douty. Applications for appointment are to be sent to the Vice-Chancellor by November 15.

The General Board of Studies have issued a report in which they propose that the time-honoured examination in Paley's "Evidences" shall be discontinued, and that candidates for honours shall in the previous Examination be required to pass in English, French, or German, and also in Mechanics, Physics, or Logic. The report is likely to be keenly discussed.

The State Medicine Syndicate report that in the present year seventy candidates have offered themselves for examination in Sanitary Science, and that thirty-four were approved and received the University diploma in Public Health.

The degree of M.A. *honoris causa* is to be conferred on Mr. C. R. Marshall, Assistant in Pharmacology to the Downing Professor of Medicine.

Among the new Fellows elected at St. John's College on November 9, are Mr. W. McDougall, First Class Natural Sciences Tripos, 1892-94, and Mr. T. J. P.A. Bronwich, Senior Wrangler 1895, First Class Division I. Mathematical Tripos Part II., 1896.

It is announced that Mr. Jonathan Hutchinson, F.R.S., has signified his desire to found an educational museum at Selby, his native town.

In connection with North Dakota Agricultural College and Station a new chemical laboratory is in course of construction. Its estimated cost will be about 5000*l.*

DR. MOLLIER, of Göttingen, has been appointed professor of mechanical engineering in the Technological Institute at Dresden.

*Science* states that the U.S. Geological Survey has practically completed the distribution of the Educational Series of Rocks, 175 sets of 156 specimens each having been sent out during the past summer to universities, colleges and technical institutions in the United States. There remains a small number of incomplete sets, which will be placed in certain smaller colleges. The Educational Series were prepared by the Survey with much care, for the purpose of aiding students in acquiring a general and special knowledge of rocks, and promoting the study of geology.

THE Clerk to the Drapers' Company has informed the Registrar of the University College of North Wales, Bangor, that the Company will modify, in the sense suggested by the College, the conditions attached to their grant of 1000*l.* towards stocking and equipping the College farm. The grant is therefore now made conditionally upon a further sum of 3000*l.* being raised towards the same purpose before the end of the present session. It has been arranged that students pursuing the ordinary agricultural course at the College shall in future reside for a part of that course in the immediate neighbourhood of the farm, and thus get the benefit of practical training, side by side with the theoretical instruction. The College enters upon its tenancy of Lledwigan this week.

#### SCIENTIFIC SERIALS.

THE current number (July) of the *Monthly Weather Review* (Washington) contains a paper on the observation of halo phenomena. This is a translation of a reprint of an article by the Rev. K. Schips in the Year-book of the Natural History Association, a copy of which we have received. A committee has been formed in Germany for the study of halos, and a request is made for the regular observation of these phenomena, as it appears that the subject of meteorological optics receives no great attention, except in Japan. The paper will be found instructive to both observers and students.—The equations of hydrodynamics in a form suitable for application to problems connected with the movements of the earth's atmosphere, by J. Cottier. This contribution is of much importance to those who are studying the fundamental problem of meteorology. Mr. Cottier, who was a student of brilliant promise, unfortunately died on August 17.—Rain gushes in thunderstorms, by the editor (Prof. Cleveland Abbe). Several plausible explanations of this phenomenon have been put forward from time to time, but have been rejected as erroneous. It is at present an open question whether the gushes of rain bring about the formation of lightning, or *vice versa*. Several suggestions are made by the editor, which require to be tested by further experiment.—Among various other notes there is an interesting one, entitled "Kites at the Chicago Conference, August 1893." This method of obtaining information relating to the upper air is daily becoming more popular, and seems likely to lead to useful results.

*Bollettino della Società Sismologica Italiana*, vol. iii. N. 2, 1897.—On an old mercurial seismometer designed by A. Cavalli, by G. Agamennone.—Geological observations on the Florentine earthquake of May 18, 1895, by C. De Stefani. An abstract of a memoir published in the *Annali* of the Central Meteorological Office.—Notes of earthquakes recorded in Italy (February 4-18, 1897), by G. Agamennone, the most important being the earthquake of Sicily and Calabria of February 11-12, and five earthquakes of unknown but distant origin, one on February 7, two on February 13, and two on February 15.