

clusions as to evolution and heredity. The fundamental idea of this weighty work is the conception of the Idioplasm, namely, of a definite portion of the general protoplasm, to which alone is committed the transmission of hereditary characters. This idea, as Weismann points out, is a fruitful one, and will live, and is indeed incorporated in all recent theories of heredity. Nägeli's speculations, however, as to the details of the distribution and molecular structure of this idioplasm are of much more doubtful value, and rest on no firm basis of actual observation.

Nägeli rightly argues that the character of the fertilized egg must be determined by a minute amount of idioplasm and not by the cytoplasm generally, because the characters of the male and female parent are on the average equally represented in the offspring in spite of the enormous difference in the bulk of the cytoplasm of spermatozoid and ovum.

It was only, however, after the idioplasm had been identified by Weismann and Strasburger with a definite constituent of the nucleus that the theory acquired a positive basis.

Nägeli in the "Abstammungslehre" points out that fertilization can only consist in the direct union of solid idioplasmic bodies, and thus on theoretical grounds arrives at a conclusion which has been fully confirmed by the observations of Van Beneden, Strasburger, and Guignard. He also shows that while in the higher organisms idioplasm alone is necessarily transmitted from parents to offspring, in the increase of the lower plants and animals by division, the descendants acquire a share of the nutritive protoplasm also. Hence in the latter the conditions of culture may directly affect the descendants, as Nageli found in his observations on bacteria. These views are in essential agreement with those of Prof. Weismann on the continuity of the germ-plasm, as brought forward a year later, though on other points there is a wide divergence of opinion.

Nägeli insists in his preface to this book, that the subject of heredity can only be authoritatively treated by a physiologist, and he no doubt regarded his micellar theories as an important contribution to the question. In this his view is somewhat one-sided, and as a matter of fact all recent advance in our knowledge of the essential points in reproduction has come from the morphological side.

Nägeli's attitude towards the question of spontaneous generation is interesting. In his early days he had no doubts as to the spontaneous origin of many Fungi, and thought that this could be experimentally demonstrated. In 1865 he gave up the experimental evidence, but believed in the origin *de novo* at all epochs of simple vegetable cells. In the "Abstammungslehre" he still maintains that spontaneous generation is constantly in progress, but no longer holds that even the lowest known organisms can arise in this way. His supposed primitive living things (*Probiën*) are as much more simple than bacteria, as these are more simple than the highest animals or plants.

As regards the causes of evolution, Nägeli in his great work appears to limit the field of natural selection even more narrowly than in his earlier essays. Its function, according to his later views, consists in the separation and definition of races by the elimination of ill-adapted forms, rather than in determining the origin of the races themselves. In a brilliant illustration he pictures natural selection as pruning the phylogenetic tree, though powerless to cause the putting forth of new branches. He still regards evolution as a necessary progress towards perfection determined by the constitution of the organism itself, and more especially of its idioplasm.

This view is only needed if we assume with Nägeli the existence of purely morphological characters—of characters, that is, which are not, and never have been, of the nature of adaptations. It appears to us to have been sufficiently shown by Prof. Weismann and others that the existence of such characters is an unnecessary assumption. As biology advances, we learn every day the function of characters which had before appeared to us to be useless, and the whole tendency of investigation is to prove that all characters whatsoever are either of direct use to their present possessors or have been inherited from ancestors, to whom, at the time when they were acquired, they were equally advantageous. It would be difficult to cite a stronger instance of a "morphological character" than the alternation of generations which so clearly characterizes the higher cryptogams. Yet it has been lately shown by Prof. Bower that this may well have been an adaptive character at its first origin, the sporophyte being adapted for taking possession of the dry land, while the oophyte, owing to the mode of fertilization, was compelled to retain a lowly and semi-aquatic habit.

We have given a very incomplete and imperfect sketch of the life-work of one of the most illustrious of that illustrious band of botanists to whom the chief advances of our science are due. Much of his work has of necessity been left quite unnoticed. But on even a cursory glance through the writings of Nägeli the conviction is forced upon us that he was a man not only of exceptionally wide scientific and philosophical training and of great literary power, but also one of real genius, and as far removed as possible from that narrow specialism which is the besetting sin of so much modern scientific effort. The judgment of Nägeli's colleague, Prof. Cramer, that he was "a truly great man," cannot be dismissed as the exaggerated language of personal affection, but expresses a truth. Though some of his theories may be abandoned, a vast sum of permanent achievement will always remain, and the influence of Nägeli on the future of our science will be powerful and lasting.

D. H. SCOTT.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Full term commences on Saturday, October 17. The following lectures in science generally have been advertised:—

The Savilian Professor of Geometry (J. J. Sylvester) will lecture on surfaces of the second order, illustrated by the models with which that department has been supplied at the request of the Professor.

The Professor of Astronomy (Rev. C. Pritchard) proposes to lecture on the methods of determining astronomical constants, and offers practical instruction with the transit circle and solar spectroscope.

Rev. Bartholomew Price (Sedleian Professor of Natural Philosophy) lectures on hydromechanics.

The Professor of Experimental Philosophy (R. B. Clifton) will lecture on electricity; and instruction in practical physics is offered by Mr. Walker and Mr. Hatton at the Clarendon Laboratory. Lectures on mechanics and experimental physics are offered by Rev. F. J. Smith, at the Millard Laboratory.

The Waynflete Professor of Physiology (J. S. Burdon-Sanderson) will lecture on the subjects required for the final examination in the School of Physiology, and Mr. Dixey will lecture on histology. Practical instruction on this latter subject will be given by Mr. Kent.

In the subject of Chemistry, the Waynflete Professor (W. Odling) will lecture on animal products, while the Aldrichian Demonstrator (W. W. Fisher) will give a series of lectures on the non-metallic elements. Mr. J. Watts lectures on organic chemistry, and the instruction in practical work is under the supervision of Mr. Watts, Mr. Veley, and Mr. J. E. Marsh.

The Deputy Linacre Professor of Human and Comparative Anatomy (E. Ray Lankester) offers a course of lectures on comparative anatomy and embryology. This course is intended for seniors. There will also be a junior course for beginners and candidates for the preliminary examination in animal morphology conducted by the Deputy Linacre Professor and Dr. W. B. Benham. This last-named gentleman will also lecture on the *Chaetopoda*.

The Professor of Geology (A. H. Green) offers two courses of lectures, one on physical, the other on stratigraphical geology.

The Reader in Anthropology (E. B. Tylor) will lecture on the origin and development of language and writing.

The Sherardian Professor of Botany (S. H. Vines) lectures, this term, on elementary botany.

The Hope Professor of Zoology (J. O. Westwood) lectures and gives informal information upon some of the orders of *Arthropoda*.

In the department of medicine, Sir H. W. Acland, Bart., gives informal instruction on modes of medical study. This instruction is given at the Museum, where arrangements will be made for one or more demonstrations in illustration of subjects bearing on public health. Dr. Collier and Mr. Morgan give demonstrations for the Professor on Medical and Surgical Pathology. The Lichfield Lecturer in Clinical Medicine (W. Tyrrell Brooks) will lecture on the physical signs of disease, and the Lecturer in Clinical Surgery (A. Winkfield) offers instruction on the treatment of fractures, &c.

The Lecturer in Human Anatomy (A. Thomson) offers a

course of lectures on human osteology, and a series of demonstrations will be arranged to meet the requirements of those working in the department. The dissecting-room will be open daily for practical work and instruction.

The Rev. H. Boyd, Principal of Hertford College, has been nominated Vice-Chancellor for the ensuing year.

A mathematical fellowship has been awarded at Merton College to Mr. Arthur Lee Dixon, B.A., formerly scholar at Worcester College. Mr. Dixon was placed in the first class both at Moderations and in the final Mathematical Schools. He obtained the Junior Mathematical Scholarship in 1887 and the Senior Mathematical Scholarship in 1891. Also at Corpus Christi College a mathematical fellowship has been awarded to Mr. Arthur Ernest Jolliffe, scholar of Balliol College. Mr. Jolliffe was placed in the first class by the Mathematical Moderators in 1889, and in the first class by the Examiners in *Scientiis mathematicis et physicis* in 1891. He also obtained the Junior Mathematical Scholarship in 1889.

CAMBRIDGE.—The erection of the Newall telescope is nearly completed. Prof. Adams was able to use it for the first time last week, and took an observation of Neptune.

Prof. Ewing announces that the new Engineering Laboratory is ready for use, and will be occupied this term.

Mr. F. Blackman, of St. John's College, has been appointed Demonstrator of Botany.

By the return of Prof. Jebb, the University enjoys the distinction of being represented in Parliament by a Senior Classic (Dr. Jebb) and a Senior Wrangler (Sir G. G. Stokes).

Sixty-four candidates entered for the examination in sanitary science held last week. Of these forty-three have passed both parts of the examination, and receive the diploma in Public Health.

The Lecturer in Geography (Mr. Buchanan, F.R.S.) will this term lecture on physical and chemical geography, with especial reference to land surfaces and their development under climatic and other agencies.

The vote in the Senate on the question whether a syndicate shall be appointed to consider alternatives for Greek and Latin in the Previous Examination will be taken on Thursday, October 29, at 2 p.m.

University Extension.—It is announced that Mr. T. D. Galpin, of the firm of Cassell and Co., Limited, has offered to the Dorset County Council the sum of £1000 to be invested for the purpose of providing scholarships to send natives of Dorset to the Summer Meetings of Oxford and Cambridge. The scholarships will be awarded to the writers of the best essays, and it is proposed that the examination should be conducted by the University Extension Committee of the Oxford Delegates of Local Examinations. The scholarships are to be awarded without distinction of sex, or any political, sectarian, or social distinction whatever.

SCIENTIFIC SERIALS.

The American Journal of Science, October 1891. Some of the possibilities of economic botany, by George Lincoln Goodale. This is the Presidential address delivered before the American Association for the Advancement of Science, at Washington in August last.—On the vitality of some annual plants, by T. Holm. The author enumerates several species of plants which show a tendency to vary from annual to biennial or perennial.—A method for the separation of antimony from arsenic by the simultaneous action of hydrochloric and hydriodic acids, by F. A. Gooch and E. W. Danner.—Notes on allotropic silver, by M. Carey Lea. The blue form of allotropic silver is mainly considered. The action of light on this form is remarkable, for its effect is first to increase the sensitiveness to reagents and then to completely destroy it. This reversing action is analogous to that which light exerts upon silver bromide. Mr. Lea has also examined the point as to whether in the reduction of silver, the allotropic or the normal form is produced, and he finds that when the silver passes from the condition of the normal salt or oxide to that of the metal, the reduced silver always appears in the ordinary form. But when the change is first to sub-oxide or to a corresponding sub-salt, the silver presents itself in one of its allotropic states.—Structural geology of Steep Rock Lake, Ontario, by Henry Lloyd Smyth.—On the so-called amber of Cedar Lake, North Saskatchewan, Canada, by B. J. Harrington. The resin or "retinite" examined by the author had a hardness

of about 2.5, and a specific gravity 1.055 at 20° C. An analysis gave for its composition, carbon 80.03, hydrogen 10.47, and oxygen 9.50.—Geological horizons as determined by vertebrate fossils, by O. C. Marsh. The method of defining geological horizons by vertebrate fossils was first used by the author in 1877, and appears to afford the most reliable evidence of climatic and other geological changes. It is now extended and revised. A section accompanies the paper representing, in their geological order, the successive strata at present known with certainty from characteristic vertebrate fossils.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, October 3.—M. Duchartre in the chair.—On the variations of composition of Jerusalem artichokes from the point of view of mineral matters, by M. C. Lechartier. The author gives the results of some investigations made at the Rennes Agricultural Station, on the culture of artichokes in soils differently treated. He has also studied atmospheric influences as indicated by cultures on similar plots for three consecutive years.—Observations of Wolf's comet made with the great telescope of Toulouse Observatory, by M. E. Cosserat. Observations for position were made and are recorded, extending from August 13 to September 28.—On the value of electrostatic tension in a dielectric, by M. L. de la Rive.—On the simultaneous existence, in cultures of *Staphylococcus pyogenes*, of a vaccine substance capable of being precipitated by alcohol, and of a substance soluble in alcohol, by MM. A. Rodet and J. Courmont.—On some parasite Copepods, by M. Eugène Canu.—Observations of the fall of a solar prominence into a spot, by M. E. L. Trouvelot. The observations relate to some remarkable luminous filaments occurring in a group of spots from August 6 to August 10.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

The Physical Geology and Geography of Ireland: E. Hull, 2nd edition (Stanford).—*On Surrey Hills, a Son of the Marshes* (Blackwood).—*By Seashore, Wood, and Moorland*: E. Step (Partridge).—*An Introduction to Human Physiology*: Dr. A. D. Waller (Longmans).—*Guide to the Examinations in Physiography, and Answers to Questions*: W. J. Harrison (Blackie).—*Journal of the Chemical Society*, October (Gurney and Jackson).—*London and Middlesex Note-Book*, vol. 1, No. 3 (E. Stock).—*Botanischer Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*, Vierzehnter Band, 3 Heft (Leipzig, Engelmann).—*Quarterly Journal of the Royal Meteorological Society*, July (Stanford).—*Meteorological Record*, vol. x. No. 40 (Stanford).—*Himmel und Erde*, October (Berlin).

CONTENTS.

	PAGE
Physical Chemistry. By J. W. R.	561
United States Fish Commission Reports	562
The Catalogue of the Washington Medical Library. By Dr. A. T. Myers	563
Our Book Shelf:—	
“Dictionary of Political Economy”	564
“South Africa, from Arab Domination to British Rule”	564
Letters to the Editor:—	
A Pink Marine Micro-organism.—Prof. W. A. Herdman	565
Advertisements for Instructors.—M.	565
“Rain-making.”—W. R. Pidgeon	565
Alum Solution.—Shelford Bidwell, F.R.S.	565
B.Sc. Exam. Lond. Univ. 1892.—Edward J. Burrell	565
Some Notes.—J. J. Walker, F.R.S.	565
The Molecular Process in Magnetic Induction. (Illustrated.) By Prof. J. A. Ewing, F.R.S.	566
The Sun's Motion in Space. By A. M. Clerke	572
Notes	574
Our Astronomical Column:—	
Measurements of Lunar Radiation	577
Two New Variable Stars	578
A New Asteroid	578
A New Comet	578
The Iron and Steel Institute	578
Carl Wilhelm von Nägeli. By Dr. D. H. Scott	580
University and Educational Intelligence	583
Scientific Serials	584
Societies and Academies	584
Books, Pamphlets, and Serials Received	584