is moistened, and a roller charged with a greasy ink is passed over it, the ink is taken up by the print more readily where the light has produced the most change and the water has been the least absorbed. The use of rollers for the application of the ink soon gave way in favour of brushes. This process commended itself to many photographers, especially those who desired to "control" their prints, that is, to produce what they desired rather than what they were able to secure by photographic methods, for it is possible to put on much or little ink, and to reduce or increase the quantity in the various parts of the print as the taste of the worker may dictate. Obviously a wide choice of colours is available, and the method has the advantage of giving the peculiar richness and depth of tone associated with oil colours.

About a year ago it was found possible to render bromide enlargements available for this process, the silver image in the enlargement effecting the reduction of the bichromate. Thus no large negative is needed, and no exposure to light after the bromide enlargement has been made. Mr. F. J. Mortimer calls this last method of work the "bromoil" process, and he has now on view at the house of the Royal Photographic Society, 66 Russell Square, more than fifty examples of his own work. The exhibition will remain open, free on presentation of visiting card, daily from 11 a.m. to 5 p.m., until June 8. Mr. Mortimer has been known for a considerable time as the producer of fine marine and coast-scenery photographs, but here he shows also landscapes and portraits of various kinds. Those who are interested in such methods of work will get a better idea of the possibilities of the "bromoil" process by a study of these examples than they have ever had an opportunity of getting before.

ARBORICULTURE IN GERMANY.[1]

THE German Arboricultural Society came into existence in the year 1892, and now has a membership of 1800, of whom 120 attended its annual meeting in August, 1908, in Alsace Lorraine; Strassburg and Colmar being its headquarters. The president is Count Schwerin, who is ably helped by the secretary, L. Beissner, the conifer expert. The report just issued gives a detailed account of the meeting. The first three days were devoted to the reading of papers now published. Then followed visits to private parks, where many fine exotic and native trees, some of which are illustrated in the report, were seen. Each member, who was himself listed and conspicuously numbered, received a numbered list of the trees worthy of note in each centre visited. The list gave the name, girth, height, and age of each tree, with further remarks in some cases.

The lists embodied in the report may serve as an indication of the perfection of arrangement which characterised the meeting. Everything was planned to the minute, and nothing was allowed to interfere with the programme. Thus at Ollweiler Prof. Engler was in danger of being left behind after a hurried inspection of a fine specimen of *Quercus sessiliflora*, 250 years old. La Schlucht and Hoheneck gave a peep into the forests on the slopes of the Vosges Mountains. This district, with Longuemer and Retournemer, was also visited by the botanists fresh from the Botanical Congress at Strassburg, and was full of interest.

A few only of the articles in the report can be noticed. In addition to many contributions by the president, including one on the hardiness of certain trees, and one by Beissner on conifers, C. S. Sargent, an honorary member, gives an illustrated account of the Arnold Arboretum, Koehne writes on Taxodium, Forster on exotic trees, Berg on *Pseudotsuga Douglasii* in Europe, while St. Olbrich and Hübner write on trees suitable for avenues and towns, and Sprenger and Rehder on new or rare arboreous plants.

Following on more than twenty important papers there are many smaller contributions. One of these may be noticed. Unger, just returned from a residence of twenty years in Japan, proposed the cultivation of *Broussonetia papyrifera* for the supply of Japanese paper. As twenty degrees of frost is fatal to the plant, Germany was declared by experience unsuitable for the industry. Several pages are devoted to descriptions, in Latin in many cases, of new species or forms. A useful feature is a correspondence section for the supply of information on such subjects as Platanus diseases, and pitch pine. A place is also found for reviews of books on trees. Obituary notices appear, including one on John Booth, a Teutonic Scot, who strove successfully to introduce exotic timber trees into Germany, and one on George Nicholson, of Kew. Altogether the publication is astonishingly rich in contents of wide and general interest, and is very cheap.

A curious feature of the report is the entire absence of any reference to the many beautiful illustrations, there being sixteen full-page ones and many others incorporated in the text. Members of the Society, by payment of an annual subscription of five marks, obtain the report, certain privileges at the meeting, and supplies of packets of seeds as well as of living plants. This result is mainly due to the enthusiastic devotion and organising skill of the president, who has personally made all the detailed arrangements for the meeting at Cottbus in 1909, and provided the necessary particulars for two alternative places of meeting in 1910. The society would be delighted, I learnt, to visit the British Isles in the company of British arboriculturists. Cannot this be arranged for by the three British arboricultural societies?

A re-issue of the reports for the year 1892–1901, in one volume of 500 pages, at not more than nine marks, is offered for subscription. T. J.

[1] Mitteilungen der deutschen dendrologischen Gesellschaft. No. 17, 1908. Pp. 285; with many illustrations. (Bonn—Poppelsdorf: L. Beissner, Geschäftsführer der Gesellschaft.) Price 5 marks.

GROWTH OF NERVE FIBRES.

THE view that each nerve fibre develops as an independent outgrowth from a nerve-cell, finally becoming united to other tissues (*e.g.* muscle fibres) in the periphery of the body is associated especially with the name of His, and has been accepted by the majority of embryologists. Those who have worked at the question of nerve repair or have studied the mechanism of the regeneration of nerve fibres which leads to restoration of functions are divided into two camps; the majority hold, as Waller originally taught, that the nerve fibres grow in a distal direction from the cut stump attached to the central nervous system, ultimately finding their way into the peripheral segment. A minority of researchers hold the contrary view, namely, that restoration occurs in the peripheral segment independently of connection with the central nervous system.

Within the last year, Mr. Ross Harrison, of Yale, has demonstrated the correctness of the views of His in a very remarkable way. He has actually seen the fibres growing outwards in embryonic structures. Pieces of the primitive nervous tube which forms the central nervous system were removed from frog embryos and kept alive in a drop of lymph for a very considerable time; the cilia of the neighbouring epidermic cells remained active for a week or more; embryonic mesoblastic cells in the vicinity were seen to become transformed into striated muscular fibres, and there was therefore no doubt that even under these artificial conditions—rendered necessary for microscopic purposes—life and growth were continuing. From the primitive nervous tissue, and from this alone, nerve fibres were observed growing and extending into the surrounding parts. Each fibre shows faint fibrillation, but its most remarkable feature is its enlarged end, which exhibits a continual change of form. This amœboid movement is very active, and it results in drawing out and lengthening the fibre to which it is attached, and the length of the fibre increases at the rate of about 1 micromillimetre per minute. Those interested in this subject should refer to Mr. Harrison's last paper, published in the *Anatomical Record* (Philadelphia, December, 1908), where they will find figures representing the growing fibres in various lengths drawn at intervals of half an hour or thereabouts.

Such observations show beyond question that the nerve fibre develops by the overflowing of protoplasm from the central cells and thus give us direct ocular evidence in

favour of the view which most embryologists previously held mainly as the result of circumstantial evidence. It is not surprising to find that as this and other facts all bearing in the same direction are brought to light, the prevalent idea regarding nerve regeneration after injury follows the same lines. Indeed, the number of those who hold the so-called "autogenetic theory" of nerve regeneration is being reduced nearly to vanishing point.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Adams prize for 1909 has been awarded to G. A. Schott, late scholar of Trinity College.

The Adam Smith prize has been awarded to J. M. Keynes, fellow of King's College, for an essay on the "Method of Index Numbers."

LIVERPOOL.—On May 8 the following honorary degrees were conferred, among others:—*LL.D.*, Mr. A. J. Balfour, Lord Charles Beresford, Mr. Birrell, M.P., Sir John Brunner, M.P., Dr. Richard Caton, Lord Crewe, Sir Donald Macalister, Mr. Marconi, Lord Roberts, and Prof. Paul Vinogradoff; *D.Sc.*, Mr. Francis Darwin and Prof. J. L. Todd; *D.Eng.*, the Hon. C. A. Parsons. At a luncheon after the ceremony Mr. Balfour spoke upon the growth of the university movement. In the course of his remarks he referred to this growth as one of the most important and fruitful facts which has emerged in the experience of this generation. We live in an age of scientific discovery and industrial invention—in an age in which, from the very nature of the case, there is, and must be, a tendency to put into a less prominent position relatively, though not absolutely a less important position, the ancient studies which for centuries have occupied the educational interest and intellect of Europe. The problem to be decided is how to combine all the cultivation of these ancient studies with their newer sisters which have so much closer relation to the cultivation of the material needs of great industrial communities. There is no way of coordinating except to bring all the highest intellects concerned with both into a single organisation. It is an honour to be associated with a movement which is going to have a world-wide influence in the direction of not merely increasing industrial dexterity, but also improving and adding to the knowledge of nature, which is the greater security that the industrial and scientific movement in future shall never be divorced from those humanistic influences which have been the greatest element of intellectual progress in the history of our race.

MR. T. H. LABY has been appointed professor of physics in Victoria University College, Wellington, New Zealand.

HARVARD UNIVERSITY will lose one of the most distinguished members of its faculty in September by the resignation of Prof. G. L. Goodale, who will by that time have completed his seventieth year. Dr. Goodale has been connected with Harvard since 1872, when he was appointed instructor in botany and lecturer in vegetable physiology. In 1873 he was promoted to the assistant professorship in the latter subject. Since 1878 he has been Fisher professor of natural history and director of the botanic garden.

THE *Physikalische Zeitschrift* for April 15 contains the list of lecture courses to be given in the German universities during the summer semester. We note that at the University of Berlin seven professors and lecturers will deal with mathematics, five with astronomy and geodesy, thirteen with various branches of physics, three with meteorology, two with wireless telegraphy, twenty with the various branches of physical, inorganic, and organic chemistry, and ten with technical, physiological, botanical, and photographical chemistry.

BY a recent Act of the United States Legislature, provision has been made, says *Science*, for a biological station to be located on the shores of Devil's Lake, North Dakota. An appropriation has been made for building laboratories and providing annual maintenance. This laboratory will be well situated for the study of many interesting ecological and physiological problems, inasmuch as Devil's Lake is a large body of brackish water with no outlet and represents the collected water supply of a large interior drainage basin. The direction of the laboratory will be under the charge of the biological department of the State University, of which Prof. Melvin A. Brannon is head.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 6.—Sir Archibald Geikie, K.C.B., president, followed by Mr. A. B. Kempe, vice-president and treasurer, in the chair.—Reciprocal innervation of antagonistic muscles. Note xiv. Double reciprocal innervation: Prof. C. S. **Sherrington**. This communication establishes that the algebraic summation of excitation and inhibition pointed out in a previous note in regard to extensor muscles holds good also for flexor muscles. In regard to the mutual action of antagonistic muscles, it shows that three types of result have to be distinguished, and that in each of these reciprocal innervation is the controlling factor. The importance of reflex inhibition for the grading of intensity of reflex actions is illustrated by various examples, in some of which the excitatory stimulus remains of constant intensity while the inhibitory is varied, and in others the inhibitory stimulus is kept constant in intensity while the excitatory is varied; in both cases a very delicate grading can be obtained even with artificial stimulation, electric and so on. The action of strychnine on the flexor inhibition is shown to be, as in the case of extensor inhibition, a conversion of the inhibition into excitation. These effects, namely, grading, algebraic summation, and conversion of inhibition into excitation, are all found readily both in the decapitated and spinal animal and in decerebrate rigidity.—Note on a curious property of neon: Prof. J. Norman **Collie**. During some work with specially pure neon, it was noticed that, as the gas escaped at ordinary pressure from a Töpler pump up through the mercury in an inverted test-tube, each bubble glowed with a fine red glow. This property is very apparent if the neon is sealed up in a glass tube with mercury, and the tube shaken violently. It was expected that the glow would always be produced when the tube containing the neon and mercury was shaken. This was found not to be the case, for it was noticed in many instances that, after shaking for some time, the glow became very feeble. These tubes could at once be brought back to their original condition by allowing a discharge to pass through them from an induction coil. Sometimes, however, when a powerful discharge was passed through them, exactly the opposite effect was produced, and further sparking did not improve them. Platinum wires sealed through the ends of the tubes did not interfere with the property of glowing when shaken. Another tube was strongly etched inside with hydrofluoric acid, also without effect on the glow. Heating the tubes strongly did not destroy the effect, but, on the contrary, restored those tubes that had been spoilt by passing heavy electric discharges through them. It was found possible to produce in this way tubes that possessed the property of glowing only at one end, or glowing at both ends and not in the middle. The slightest trace of moisture entirely stops the glow. The tubes were filled at different pressures, varying from 120 mm. to 200 mm. pressure, as it was found that the glow was as bright at these as at ordinary pressures, and a saving in neon was thus made.—The properties of colloidal systems. I. The osmotic pressure of Congo-red and of some other dyes: Dr. W. M. **Bayliss**. Congo-red, although a colloid in the sense of not being diffusible through parchment-paper and exhibiting other colloidal properties, such as those dependent on surface effects, has an osmotic pressure equal to that which would be given if it were present in true solution in single molecules. The solutions are not resolvable into particles under the ultra-microscope. The theoretical osmotic pressure is only to be obtained in the complete absence of extraneous electrolytes. Even the carbonic acid present in ordinary distilled water is sufficient to cause a marked fall in the pressure recorded. The