small outlying engine house with storage tanks. The laboratory owns a small sail-boat to assist in the work of collecting."

Passing to Holland, we read—"Holland, in the summer of 1890, opened its zoological station in the Helder, a locality which, for this purpose, had long been looked upon with the greatest favour. There is here an old town at the mouth of the Zuyder Zee, the naval stronghold of Holland, a station favourable for biological work on account of the rapid running current which renews the waters of the Zee. The station was founded by the support of the Zoological Society of the Netherlands, whose valuable work by the contributions of Hubrecht, Hoek, and Horst has long been known in connection with the development of the oyster industry of Holland. The work of the society had formerly been carried on by means of a portable zoological station which the investigators caused to be transplanted to different points along the East Schelde, favourable on account of their nearness to the supplies of spawning oysters. The present station at the Helder is situated directly adjoining the great Dyke, a small stone building of two storeys, surrounded by a small park. In itself the laboratory is a model one—the rooms are carefully finished and every arrangement has been made to secure working conveniences. A large vestibule leads directly into two laboratory rooms, and by a hallway communicates with the large, well-lighted library, and the rooms of the director. The aquarium-room has, for convenience, been placed in a small adjacent building. The director of this station is Prof. Hoek, and the president of the society is Prof. Hubrecht."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Stanford University of California (the *Times* says) is rapidly becoming the wealthiest institution of the kind in the world. Yet there are several American Universities and colleges which enjoy enormous wealth. For example, Columbia University has an invested capital of £2,600,000; Harvard, £2,200,000; Yale, £2,000,000; the California, £1,400,000; and the Johns Hopkins, £600,000. The endowment fund of the Stanford University cannot at present be stated, partly because the benefaction exists in the shape of property which is rapidly increasing in value. But estimates which appear to be well founded have been made at San Francisco showing that at no distant date the University will be worth £40,000,000, yielding an annual income of £2,200,000.

SCIENTIFIC SERIALS.

Wiedemann's Annalen der Physik und Chemie, No. 8 (1893).—Polarisation of undiffracted infra-red radiation by metal wire gratings, by H. E. J. G. du Bois and H. Rubens. Polarised light passing without diffraction through silver wire gratings experiences in general a rotation of its plane of polarisation. The transmitting power of the gratings for light polarised in a plane perpendicular to the length of the wires was found to be greater than that for light polarised in a plane parallel to them. The present, experiments were conducted with finer gratings than before the smallest interval attained being 0·001 cm. and the measurements were taken in the infra-red region. The intensity of radiation transmitted was measured by the bolometer. It was found that as long as the wave length does not exceed a certain value, the grating transmits a larger fraction of the radiation when the electric vector is parallel to the wires; this value appears to be independent of the width of interval, but characteristic of the metal; for greater wave-lengths the transmittance is greater when the magnetic vector lies in the direction of the wires.—The superior limit of wave-lengths which may occur in the thermal radiation of solids; a conclusion from the second law of thermodynamics, by Willy Wien. Assuming the second law, and the existence of none but Maxwell's ponderomotor forces in the pressure exerted by a gas, the author shows that thermal radiation does not imply waves of all lengths, but that the curve of energy, when traced along the spectrum, falls continuously to infinitesimal values on the less refrangible side, and practically disappears in the region of Hertz's finite waves.—Electric oscillations of molecular structures, by H. Ebert. It is shown that the mechanism of luminescence may be fully explained by Maxwell's theory, regarding the luminous molecules as analogous to Hertz oscillators of very small dimensions.—A photometer, by E. W. Lehmann. This is constructed on the principle of Joly's photometer; it consists of two totally reflecting prisms placed side by side in a box. In each prism one of the adjoining faces is ground, and the two ground faces are turned in opposite directions so as to be illuminated by the two sources to be compared. The plain faces are turned towards the observer, with their edges touching. The observer looks at them through a tube containing a telescope; the box to which the tube is attached can be swung round through 180°, so as to exchange the ground faces. The sensitiveness is such that forty successive readings with amyl acetate burners at 120 cm. gave results not differing by more than 0·4 per cent.

Bulletin de l'Académie de Belgique, No. 6 (1893).—We notice the following among the scientific papers: Megamicros, or the sensible effects of a proportional reduction of the dimensions of the universe, by J. Delbœuf. According to Laplace, if the dimensions of all the bodies in the universe, their mutual distances and velocities were to increase or diminish in a constant proportion, these bodies would describe the same curves as they do now. The appearances presented to observers would be the same, and independent of the dimensions assumed. Hence the only facts we are able to appreciate are ratios. In opposition to this theorem, M. Delbœuf shows that if a system consisting of the sun and the earth were to be diminished in linear dimensions to one-half, all densities remaining the same at homologous points, and the orbital velocity of the earth were reduced to one-half its value, there would be certain changes in the relations of an observer to his surroundings which could not escape notice. The velocity of sound propagation will be the same as before, but the distance traversed during a certain number of vibrations will appear larger. If a metric system were to be determined on the reduced planet in a manner analogous to ours, the hectare will be a quarter, the litre one-eighth, and the kilogramme—owing to the reduction of gravitation—one-sixteenth of the corresponding actual measures. Hence the work done in lifting a kilogramme through one metre will be $\frac{1}{16}$ of an actual kilogramme-metre. Muscular power, on the other hand, being proportional to the volume or mass of muscle, will be only reduced to one-eighth, and the observer will be able to lift four times the previous maximum weight. All work necessary for life will proceed at four times the usual rate, and hence life itself will be more rapid. These considerations pursued by the author into the regions of building, thermometry, animal heat, respiration and circulation, go to show that real space is different from geometric space, and that the dimensions of the universe are absolute.—Note on the variations of temperatures of transformation below and above the critical temperature, by P. de Heen. The superior limit of pressure of superheated steam before the passage into the liquid state is the simple prolongation of the curve expressing the variation of the tension of saturated vapour.—On the production of ammonia in the soil by microbes, by Émile Marchal. Nitrification takes place in three principal stages, which may be described as ammonisation, nitrosation, and nitratation, resulting in the production of ammonia, nitrites, and nitrates respectively from the organic nitrogen. Ammonisation takes place essentially under the influence of microbes living in the upper layers of the soil. In arable land, the action of bacteria is predominant. The *Bacillus mycoides*, the most energetic of these, exerts a double activity in the production of ammonia, being ammonising in the presence of nitrogenous organic matter, denitrifying when embedded in easily reducible substances such as nitrates.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 1.—"On the Flow in Electric Circuits of Measurable Inductance and Capacity; and on the Dissipation of Energy in such Circuits." By Alfred W. Porter, B.Sc., Demonstrator of Physics in University College, London. Communicated by Prof. G. Carey Foster, F.R.S.

The arrangement of the apparatus in the experiments described was as follows:—

L is a coil possessing self-inductance; S, a condenser; R, an

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