PROFESSOR ROBERT A. MILLIKAN, of the University of Chicago, delivered the "Thomas Lectures" at Richmond College in April. The general topic was "The New Physics." In his first lecture Dr. Millikan recounted some of the important recent discoveries in the field of radioactivity and X-rays and discussed the significance of these facts to modern science and life. The second lecture was given to a description of some of the properties of the electron, and the methods by which these properties had been discovered.

DIRECTOR JOHN F. HAYFORD, of the College of Engineering of Northwestern University, addressed the engineering sub-division of the Chicago Association of Commerce on Friday evening, May 14, on the subject "Chicago as an Engineering Center."

PROFESSOR LOUIS KAHLENBERG, of the University of Wisconsin, delivered the annual address before Phi Lambda Upsilon, the honorary chemical society of the University of Michigan, at Ann Arbor, on May 13. The subject was "A Neglected Principle of Chemistry and some of its Applications."

UNIVERSITY AND EDUCATIONAL NEWS

THE trust estate of $3,250,000 left by Miss Elizabeth Thompson, will on the death of her brother and sister be equally divided among the following institutions: The Children's Aid Society, the New York Association for the Improvement of the Condition of the Poor, the New York Historical Society, the Society of the New York Hospital, the Presbyterian Hospital and Columbia University.

THE Michigan legislature has appropriated $350,000 for the erection of a new university library building for the University of Michigan.

THE James Buchanan Brady Urological Institute of the Johns Hopkins Hospital, made possible through Mr. Brady's gift of $600,000, was formally opened on May 4. Among those who made speeches were Dr. Hugh H. Young, head of the institute, and Dr. William H. Welch.

DR. THOMAS ORDWAY, of the Harvard Medical School, has accepted the deanship of the Albany Medical College. Dr. Ordway was formerly professor of pathology in the medical school of which he now becomes dean.

G. V. COPSON, now specializing in dairy bacteriology in the University of Berne, Switzerland, has been appointed instructor in pathological and dairy bacteriology at the Oregon Agricultural College.

DR. E. F. MALONE, of the department of anatomy, University of Cincinnati, has been promoted to be associate professor of anatomy.

DR. ERNEST LINWOOD WALKER, formerly chief of the biological laboratory of the Federal Bureau of Science, and chief of the department of medical zoology at the University of the Philippines, Manila, has been appointed associate professor of tropical medicine at the George Williams Hooper Foundation for Medical Research, University of California.

PROFESSOR R. C. LODGE, who has been this year at the University of Minnesota, has been appointed professor of philosophy and psychology at the University of Alberta.

DISCUSSION AND CORRESPONDENCE

BALANCED SOLUTIONS AND NUTRITIVE SOLUTIONS

MR. TRUE'S article on "Antagonism and Balanced Solutions"[1] closes with the following remarks.

> In both sea water and the more or less dilute nutrient solutions present in the soil, normal life is sustained, as a rule, only in mixtures of proper proportions and necessary concentration. Since salts are required in both cases to overcome the harmful action of pure water, as well as that of the salts themselves, there seems to be no reason to seek to limit the use of the term "balanced solutions" in the manner suggested by Loeb and Osterhout. Unless we admit that malnutrition due to a deficiency in nutrient salts is a form of toxicity excited by the substances present, we can hardly escape the alternative proposition that the missing salts are injurious *in absentia*.

Since the writer is responsible for the introduction of the term physiologically balanced salt solutions,[2] he may be pardoned for pointing out that in his opinion neither of the

[1] SCIENCE, N. S., XLI., No. 1061, p. 653, 1915.
[2] Loeb, *Am. Jour. Physiol.*, III., p. 445, 1900.

two alternatives in the last sentence of Dr. True is correct. The writer defined physiologically balanced salt solutions as solutions in which the toxic effects are annihilated, which each or certain constituents would have if they were alone in solution. Thus the fertilized egg of *Fundulus* develops naturally in sea water, is killed in a pure NaCl solution of the concentration in which this salt occurs in sea water, and is kept alive if some $CaCl_2$ or $KCl + CaCl_2$ is added. Since the egg lives and develops perfectly normally in distilled water the $CaCl_2$ or $KCl + CaCl_2$ are only needed to counteract the directly injurious effects which the NaCl solution produces as soon as its concentration exceeds a certain limit (about $m/8$) (but not to counteract the injurious effects of distilled water which do not exist in this case). The nature of this injurious action of the NaCl solution of a sufficiently high concentration is perfectly well known, since it consists in the injury or destruction of the specific impermeability or semipermeability of the membrane.[3]

The term *physiologically balanced* or *protective* salt solution was intended to be used in contradistinction to the term *nutritive* solution. If from a *nutritive* solution one or the other constituent is omitted (*e. g.*, K or NO_3 in the case of plants or K or the ion NH_4 in the case of bacteria) so that a malnutrition or a deficiency disease follows, it can not be stated that the organism suffers from the toxic effects of the salts left in the solution (as in the case of a pure NaCl solution of a sufficiently high concentration) but it suffers because the missing elements are indispensable building stones in the construction of the complicated compounds of the organism. The writer is not aware that anybody has proved that NO_3 or K or PO_4 in the nutritive solution of a plant are merely needed to overcome the toxic effects of the rest of the constituents of the nutritive solution; while in the case of *Fundulus* the experiments with distilled water show directly that the egg does not depend for the building up of an embryo upon any of the salts contained in the sea water or any other physiologically balanced solution.

In the writer's opinion the last sentence in Dr. True's note should read as follows: A deficiency of nutritive salts deprives the organism of some of the necessary building stones for the construction of its specific complicated compounds, and this deprivation may result in the formation of inadequate or directly injurious compounds, causing the phenomena of malnutrition or of the "deficiency diseases."

Jacques Loeb
The Rockefeller Institute
for Medical Research,
New York

[3] *Pflüger's Archiv*, CVII., p. 252, 1905; *Biochem. Ztschr.*, XLVII., p. 127, 1912; *Jour. Biol. Chem.*, XIX., p. 431, 1914.

The Typical Case Exemplified[1]

I received three offers when I came up for my degree; two from institutions in the east and one from a typical state university in the northwest. The opportunities for scholarly work were pictured to be as great by the western university as by the two eastern, and the former offered me considerably more in salary than either of the latter. Everything else being equal, the difference in salary decided the case. I came west, was disillusioned, and now wish that I had chosen differently; but, by the light that I had to follow, I could not have made a different choice. Therefore, it is with the purpose of casting some new light upon the offers that come from the west that I now write.

In general, the positions out here seem more attractive than those in the east, because usually the beginning salaries are higher—the fact that the maximum salary is much lower is overlooked or disregarded; and because usually the opportunities for scholarly and research work are represented to be as large. Or, rather, I should say, misrepresented, for all the time that I have had for original work I have taken from my sleep and recreation.

In the correspondence that I had with the head of my department and with the president of the university in reference to the position,

[1] See the letter by Professor Edward C. Pickering, Science, February 19, 1915, p. 288.