they serve a similar purpose. When the causal relations are prominent the analogy with biology may be close; in other instances the resemblance is only formal; the categories or grand divisions become mere abstractions, and the resulting association of facts follows no natural sequence. Philosophers who have sought to frame ultimate classifications have largely neglected to take advantage of the concrete basis of arrangement afforded by the coherence of the biological series.

To integrate everything to the unity of a single 'substance' or 'principle' (monism) is an idealization of mathematical concepts for which no objective reasons have been adduced. Matter, life and person* appear, as yet, to be final categories of phenomena, comprising different series of properties and meriting separate vocabularies. The second and third categories are not, it is true, independent of the first or of each other, but no causal nexus has been established. Matter gives us elsewhere no hint of the power of vital coordination, and consciousness is no necessary part or consequence of biological evolution. The materialist defines matter so as to include the other categories, while the idealist would annex the universe to the realm of thought. From the middle ground of biology it is apparent that such assumptions are devoid of practical meaning, in that they correspond to no perception based on objective experience. It is easy to say 'protoplasm is a chemical compound' or 'matter thinks,' but these integrations are born of the confusion of words rather than of the conception of ascertained facts. The chemist will find that protoplasm is not a single compound, but an ever-varying infinity of compounds, each capable of work of which 'unorganized' matter has given no suggestion. Neither is it necessary to confuse deliberate purpose with chemical affinity or physical reaction, in the vain attempt at the construction of a specious universal equation.

Students of nature have labored mightily, and they must also wait patiently. Science is advanced neither by disconnected particulars nor by meaningless generalities; all possible associations of facts are to be considered, but essential distinctions must not be neglected and the unlike confused. To recognize biological phenomena as distinct from those of physics does not require belief in an intermittent creation or a polytheistic theology, as suggested by Professor Lankester; the diversity is not lessened by ascribing it to gradual changes which both the physical conditions and the organisms have experienced 'since life began,' whatever that may mean. And until we know vastly more than we do about life and matter, nothing is to be gained by confusing either the phenomena or the vocabularies of biology and physics. Science observes, classifies and interprets facts, with the assistance of language, but neither facts nor words are science by themselves.

O. F. COOK.

WASHINGTON, D. C.
October 16, 1903.

* As a designation for the third category of phenomena this term, though open to many objections, seems preferable to consciousness, as being at once more general and more particular. Consciousness is a property of person as inertia is a property of matter and evolution a property of life; in this sense consciousness does not become synonymous with intelligence, memory, instinct or mere protoplasmic irritability, as sometimes implied by Minot and other biological writers. Instincts, and even mental arts, such as language, are attainable without subjective intelligence or deliberate thought.

AGRICULTURAL EXHIBITS AT ST. LOUIS.

A PAMPHLET has been issued containing a description of the collective exhibit of the colleges of agriculture and mechanic arts and the agricultural experiment stations of the United States in the Palace of Education at the Louisiana Purchase Exposition. The exhibit, as the pamphlet explains, is intended to illustrate the progress of education and research in agriculture and the mechanic arts in the United States, showing those distinctive features of the work of the land-grant colleges and experiment stations which differentiate them from other educational and scientific institutions. It is probably the most complete and comprehensive display of its kind that has ever been attempted and is believed

to furnish an instructive exposition of a phase of educational and scientific effort which is rapidly extending and is already exerting a potential influence in developing the industries and resources of the country. It is safe to say that in no special field of education and research has there been greater progress during the past decade than along the agricultural, industrial and technological lines represented by the land-grant colleges and experiment stations. The exhibit is under the control of the Government Board, and has been prepared under the general management of a committee of the Association of American Agricultural Colleges and Experiment Stations, of which Dr. W. H. Jordan, director of the New York Experiment Station, is chairman. Mr. James L. Farmer, special agent of the Government Board, is in immediate charge. The exhibit occupies about 16,000 square feet of space very favorably located in the Palace of Education. In addition to the displays of the U. S. Bureau of Education and of the Office of Experiment Stations of the U. S. Department of Agriculture, which represent the national government in its relations with these colleges and stations, the space devoted to agricultural exhibits is divided into fifteen sections, that occupied by the mechanic arts exhibits into nine sections. The displays in these sections have been prepared with the collaboration of experts selected from the faculties of the land-grant institutions, agricultural experiment stations and the U. S. Department of Agriculture, and cover all of the principal subdivisions of agriculture and mechanic arts.

The agricultural exhibits include soils, fertilizers, plant laboratory, field crops, horticulture and forestry, plant pathology, economic entomology, classed under the general head of agronomy or plant production; animal husbandry (investigation), animal husbandry (instruction), and veterinary medicine, classed under the head of zootechny or animal industry; dairy laboratory and sugar laboratory, classed under the head of agrotechny or agricultural technology; rural engineering, or farm mechanics; rural economics or farm management; and inspection. The mechanic arts exhibits include civil engineering, mechanical engineering, electrical engineering, mining engineering, technical chemistry, architecture, drawing and shop practise (including textiles and trades), domestic science and ceramics.

HONORARY DEGREES CONFERRED BY THE UNIVERSITY OF WISCONSIN.

On the occasion of the recent jubilee celebration of the University of Wisconsin, the doctorate of laws was conferred on some forty delegates. The words addressed by President Van Hise to several of the candidates were as follows:

Henry Prentice Armsby—Formerly professor at this university, with the aid of ingeniously devised apparatus you have for years been successfully working upon the very important problems of metabolism of food nutrients. Upon you, for these valuable researches on the nourishment of the body, and for vigorous administration of the Pennsylvania state agricultural experiment station, we confer the degree of doctor of laws.

Thomas Chrowder Chamberlin—It is with the greatest pleasure that I confer upon you the degree of doctor of laws. The University of Wisconsin owes you much. As her president for five years, you contributed to her development and upbuilding more than can be estimated. She honors you to-day for this, and also for your contributions to the science of geology. In your work in connection with the state and federal surveys, and in your comprehensive scientific investigations regarding the principles of ore deposition, the Pleistocene formations and the evolution of the solar system, you have combined in a rare manner patient collections of facts, discriminating reasoning power and constructive scientific imagination. You have richly deserved the highest academic honor in the gift of this university.

John Dewey—Profound philosopher and psychologist, you have successfully applied your learning to the study of childhood and youth. You have been an inspiration and a guide to students of education in every progressive country. For distinguished service