a document of 208 pages listing over 3,400 definitions, ranging from the fundamental definitions on which the science of electricity is based, to definitions for practical applications, such as those for control equipment, generation, transmission and distribution, welding, illumination, wire and radio communication, electrobiology and electro-therapeutics.

THE University of Kentucky, in cooperation with the State Board of Health, during the 1932 summer session offered a group of special courses for the public health workers of the state. Dr. Allen W. Freeman, professor of public health administration, the Johns Hopkins University School of Hygiene and Public Health; Dr. Edward J. Murray, superintendent of the Julius Marks Sanitarium, Lexington; Miss Margaret East, director of the Bureau of Public Health Nursing, State Board of Health, and Dr. J. S. Chambers, department of hygiene and public health, University of Kentucky, formed the resident staff, while various members of the staffs of the University of Kentucky and the State Board of Health gave special lectures. The courses offered were epidemiology, public health administration, health supervision of schools, tuberculosis, public health nursing and maternal and child health. Twenty-five health officers were enrolled for the courses offered for health officers only, while thirty nurses and eighteen teachers were enrolled for the courses offered these workers.

AT the recent Denver meeting of the American Chemical Society the following resolution was adopted:

RESOLVED, That the Secretary of the American Chemical Society be instructed to advise the Century of Progress of the facts relative to the meeting of the American Chemical Society in Chicago in September, 1933, and urge in effect that the Century of Progress advise the distinguished foreign chemists whom they have invited, of these facts, and try to arrange for at least some of these chemists to remain until September, when the meeting of the American Chemical Society would provide a large audience of their American colleagues. In this, the secretary will invite the cooperation of the American Association for the Advancement of Science.

It was voted to instruct the secretary at the proper time to advise the chemists of the world of the meeting to be held by the American Chemical Society in Chicago at the time of the Century of Progress, extending to them the privilege of attending this meeting on the same basis as members of the American Chemical Society, as was done at the society's jubilee in 1926. The society will meet in St. Petersburg, Florida, in March, 1934, and in Cleveland in September. With reference to the question of future meetings the following motion was passed:

Voted that the council policy committee present to the council at its next meeting a plan whereby the selection of the meeting places for the society be made in a more logical manner; that their report include a tentative schedule some years in advance, together with any proposed amendments to the constitution and by-laws they may deem necessary to carry it into effect.

DISCUSSION

VITALISM, MECHANISM AND ORGANICISM

To such of the brethren as have wondered at times just where the organicism of Claude Bernard stands in the logical scheme, it may be of service to attempt a dichotomy to show its real position.

We may start our scheme of dichotomy with the vitalistic position, namely, that the reactions in living organisms are not completely explicable in terms of physics and chemistry; that there is some supernatural or ultranatural element in these processes which puts them beyond the range of jurisdiction of so-called natural laws. Descartes (1596–1650), while admitting that some of the processes of the organism were physical or chemical in nature, was the first to insist upon a sharp dualistic separation between any such physical and chemical processes and the rational soul. Present-day vitalism dates from Stahl's (1660–1743) *anima sensitiva* rather than from Descartes' *âme raisonable.* In contrast to this we may put the other division of biological thinkers who maintain that there is no supernatural element in the processes in living organisms. This position has been stated most graphically by Goodrich; "The metabolic process in living matter draws in inorganic substance and force at one end, and parts with it at the other; it is inconceivable that these should, as it were, pass outside the boundaries of the physico-chemical world, out of range of the so-called physico-chemical laws, at one point to reenter them at another."

The second group of thinkers have sometimes been called mechanists, and to some it might appear that the dichotomy, as it has been presented, includes all possibilities. But the organicists hold a different opinion. They say that neither mechanism nor vitalism contains the answer to the biological riddle. There may be others beside myself who have been sorely puzzled to find their place in the scheme.

Suppose that we let vitalism stand as it is, for if the organicists deny that they are vitalists, no one has a right to put them there against their will. Certainly, Claude Bernard was not a vitalist. And a third category of organicism, coordinate with the other two, does not seem easy to establish. It seems worth while, then, to look a little more closely at our second category, which is commonly designated by the term "mechanism." Most biologists will recall

having come across, somewhere or another, the statement that a particular biological process is not a physical-chemical process. Such a statement, while frequent enough, in one guise or another in the literature, leaves certain things to be desired. One of these unfulfilled—but not suppressed—desires is the failure to designate just what shall be done with this reaction which is not a physico-chemical reaction, particularly when the author has somewhere or another stated that his position is not that of vitalism. Suppose that we say, as the second division of our dichotomy, that the processes in living organisms are natural processes, nowhere crossing the border into the supernatural, but frequently lying over the border of the unknown. It seems possible to state two possible alternatives of this second category. The first possibility would appear to be that the reactions in living organisms, being physico-chemical in nature, are the same in quality and direction that they would be in an inorganic system if such a system could be placed under the same conditions. We might designate this as the strictly mechanistic position. Our second alternative might be stated as follows: the reactions in living organisms are physico-chemical in nature and not supernatural; but they do not always occur in the same direction as they would in an inorganic system under the same conditions, or are not qualitatively the same. This appears to be the clearest statement which I can make of the organicist position, and I believe that it is logically sound. The main point of debate, then, between mechanist and organicist would not be whether the processes in living organisms spill over into the realm of the mysterious at times, but whether they are, or are not, exactly the same in nature and direction in living organisms as they would be in inorganic systems under the same conditions. And if we can now and then show that a reaction in a living organism is not the same in direction as it would be in an inorganic system, under the same conditions, I, personally, see no need whatever for invoking vitalism.

When we reflect that, since the appearance of living organisms upon the earth, every stratum of the earth's crust which has been exposed to the same environmental conditions as the living organism has been changed, sometimes almost beyond recognition, while living organisms have persisted, we seem driven to the conclusion that the processes in living organisms have not always been the same in direction as in the inorganic systems of the rocks. There seems to be a facility of adaptation in living organisms which is not present, to the same extent at least, in inorganic systems. Treviranus regarded this facility of adaptation as one of the most characteristic properties of living organisms. I[1] have presented elsewhere the argument that at least some phases of adaptation can be considered as a special case under the theorem of Le Chatelier. Such a view seems consistent with the position of the organicist, and needs no entelechy.

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A NEW DISEASE OF MOOSE. III

A NEW BACTERIUM

IN a recent paper, the first of this series, Thomas and Cahn[1] have described a new disease among the moose (*Alces americana americana*) in northeastern Minnesota and the adjacent region of Ontario, Canada. The disease is described as appearing in the early spring, coincident with the final metamorphosis of the tick *Dermacentor albipictus* into the adult stage, which tick heavily infests the moose of this area. The symptoms are described as marked activity shown by blind, aimless wandering, followed by a paralysis of the limbs and death in a great many cases. Ticks taken from animals dying of the disease transmitted the disease to guinea pigs and rabbits in the laboratory, these dying with symptoms similar to those exhibited by the moose. The blood picture accompanying the disease is described and the presence of bacteria noted. An organism was isolated which, when inoculated into experimental animals, produced the symptoms of the moose disease and caused death. In a second paper, Wallace, Thomas and Cahn[2] discuss further experiments with this isolated organism and emphasize its extreme virulence. Guinea pigs and rabbits were killed in an hour by inoculating the organism or a filtrate of the organism. This virulent organism was pronounced a bacterium, and was placed tentatively in the Klebsiella group. It is a capsulated rod form with a tendency to assume a coccoid shape; it grows as an excessively mucoid colony on agar, and produces Beta hemolysis on blood agar. Its growth is extremely rapid, covering an agar slant in five hours, and it apparently produces an extra-cellular toxic substance. Since this paper was published a great deal of work has been done upon the organism, involving its life history, pleomorphic behavior and physiological reactions. With much of this completed, the writers are convinced that it is a new organism not hitherto described, and because of the seriousness of the disease which it

[1] F. H. Pike, *Ecology*, iv, 129, 1923.

[1] Thomas, L. J., and Cahn, A. R. A New Disease of Moose. I. Preliminary Report. *Journ. Parasit.*, XVIII: 219–231, 1932.

[2] Wallace, G. I., Thomas, L. J., and Cahn, A. R. A New Disease of Moose. II. *Proc.* Soc. Exp. Biol. and Med., XXIX: 1098–1100, 1932.