Carnot; M. Tasilly, professor of physics, to succeed M. Daniel Berthelot, and M. Guérin, professor of botany, to succeed M. Guignard.

DR. EDWARD LUKAS, of the University of Graz, has been called to a professorship of folklore in the University of Tübingen.

DISCUSSION AND CORRESPONDENCE

PHILOSOPHY AND THE SCIENCES

NOTHING is more to be desired in the world of scholarship to-day than a sympathetic understanding between philosophers and scientists. Different as are their problems and their points of view, their tasks are vitally interrelated; and it is in the hope of promoting in some degree at least the necessary rapprochement that these lines are written.

The aim of every scientist, as I should conceive it, is to understand as intimately and in as great detail as possible some limited portion of our vast universe: the aim of the philosopher, on the other hand, is, not to fill out the gaps in scientific knowledge as it stands to-day, but to understand the facts that the particular sciences *have* revealed in their relation to all that is, to see things in the light of the whole. Being finite, no human thinker would dare pretend that this "synoptic view" can ever be more than the merest glimpse; but it is his hope that some such glimpse may be attained, nevertheless, however distorted in time and space that glimpse may be.

The astronomer, the physicist and the chemist, in their various ways, are interested in the composition of matter, the laws of energy and the structure of the material universe; the biologist seeks to understand the structure and activities of organisms, the conditions which make life possible and the laws of its evolution; the psychologist, when he remains within his proper field, examines in a precisely analogous fashion into the phenomena of the human (and animal) mind, with a view to analyzing and classifying these and formulating the laws of their succession and correlation. In cultivating their respective fields, the physical scientist definitely excludes vital phenomena and the whole realm of animal or human mentality from consideration; the biologist ignores the laws of non-living matter and, together with the physicist, disregards the influence of consciousness; and the psychologist concerns himself with those matters which both groups of his fellow-workers purposely and properly neglect. Moreover, in each of these domains the scientific investigator restricts himself to the question of how matter, life and mind, respectively, work—he does not inquire into their inherent nature, and still less into their relationships as parts of one great Reality. But what *is* matter? What *is* life? What *is* mind? What is the place of mind in physical nature? How are the truths of the various sciences to be unified into a great world-view? These are all questions over and above the specific programs of any one science: they are *meta*-physical, *meta*-biological, and *meta*-psychological questions. As for God, "I have no interest in that hypothesis," says science—and quite properly so; but if the follower of science is a man as well as a scientist he has an *ineradicable* interest in God which only philosophy can *intellectually* (I do not say emotionally or practically) satisfy. And the great and to many persons absorbing question of the correlation of religion and science is also a distinctively philosophical problem.

Again, philosophy and the sciences seem to differ fundamentally in their *attitudes* toward the world. The attitude of the scientist is a detached, disinterested, impersonal one: he wishes to know what are the facts about the world, quite regardless of their positive or negative value to himself or to other men; and he sets forth as his ideal the explanation, or at least correlation, of these facts in terms of the all-comprehending principle of causality, and in exclusion of any question of ends or purposes. But the philosopher is supremely interested in those very things which the scientist for his own purposes intentionally ignores: his paramount concern is that very "realm of ends" or of values which is quite properly taboo to the scientist. From this standpoint, the contention of many present-day scholars that ethics should be treated as an inductive science, "the natural history of goodness," is a complete perversion of the true place of moral philosophy in the general scheme of things. That there is a place for "ethology," the science of character as Mill proposed it, and for the "history of moral ideas" in Westermarck's phrase, there can be no doubt; but the former of these is a branch of psychology, and the latter a division of history, and both of them are scientific and so non-philosophical disciplines. The subject-matter of ethics as moral philosophy is the nature of the good as the supreme end of conduct, for as that of philosophical logic is truth, and of esthetics beauty—the value and validity of moral ideas, not merely their existence or even their evolutionary development.

When we consider religion, which is so closely interrelated with science, on the one hand, and philosophy, on the other, a quite different situation confronts us. Ethics is, indeed, a system of ideas, and so conceivably amenable to scientific treatment; and perhaps the same might even be said of theology, regarded as a theory of God and our relation to Him. But religion is not a system of ideas, religion is not

theology, religion is not a theory about life or about God or about our relation to Him: religion *is* life, it is our relation to God. Philosophy, as has been said, may intellectually satisfy man's yearnings for the infinite, and may attempt to set forth the relation between the truths of science and the truths underlying religion; but let us avoid confusing these purely intellectual endeavors with the living practical reality!

Finally, careful reflection over what has gone before should, it would seem, inevitably impel the reader to the conclusion which led in the first place to the writing of what has been here written, namely, that philosophy and the sciences, far from being enemies, rivals or even strangers, are inextricably interdependent. To science the philosopher must go for the facts he wishes to correlate, interpret and evaluate: no longer can one hope to obtain the data for philosophical investigation from the depths of his own inner consciousness, but at every step the philosopher is dependent on what science has accomplished through the use of its own empirical and analytical methods. Metaphysics *is* dependent on the work of the physicist, the biologist and the psychologist; esthetics, ethics and the philosophy of religion *are* dependent on the investigations of the psychologist and the historian; and so with the other philosophical disciplines. But there is another side to the picture also; for if the scientist contributes the materials for the philosopher to work upon, equally true is it that the philosopher has something to contribute to the scientist which may be to him in his wider-reaching human nature of equal value, namely, breadth of interest and the synoptic spirit. Each science in itself has a narrow range of interest; but under the influence of the great philosophical ideal of the unity of all knowledge and of all truth the work of the scientific investigator may be broadened, deepened and illumined to a degree which will carry him far beyond the confines of any one field, however penetrating his work in that field may be.

JARED SPARKS MOORE

THE JACOBS CAVERN MASTODON AGAIN

IN SCIENCE for October 14, 1921, Mr. J. L. B. Taylor, of Pineville, Mo., announced his discovery, in the well-known Jacobs Cavern located on his farm, of certain perforated and engraved bones. All but one of the eight or nine specimens recovered subsequently disintegrated and this surviving bone carried the incised figure of what appeared to be a mastodon. The discovery was of extreme interest and so, although Jacobs Cavern was excavated in 1903 by Professors Peabody and Moorehead, the American Museum ultimately undertook a reexamination. This was done in part by myself with results that did not warrant extended excavation. I also gave the engraved bone a prolonged examination, and on December 28, 1923, in open meeting of the American Association for the Advancement of Science, declared it as in my opinion a plain fraud.

Last year there was published as Part 6 of Volume 19 of the Anthrop. Papers of the American Museum of Natural History a brief paper entitled "The Antiquity of the Deposits in Jacobs Cavern." The author is Dr. V. C. Allison, Bureau of Mines, Pittsburgh, and his paper purports to be chronologic determinations based on the study of a stalagmite taken from Jacobs Cavern. Such studies are of interest to archeology, but until examined by one or more competent geologists the precise conclusions of this paper can hardly be accepted. Furthermore this paper gives the unfortunate impression of being, incidentally at least, an effort to rehabilitate the abovementioned mastodon engraving.

Space prohibits extended consideration of the subject here, but I must submit the substance of my own findings with respect to this engraved bone. They are as follows: (1) The said carved bones were admittedly found in a heap of loose dirt on the cave floor and their relation to the remaining deposits is therefore indeterminable. (2) It is difficult to understand why seven out of eight bones—unless tampered with—should have completely disintegrated, when the surviving specimen is in a fair state of preservation, as are also 3,000 or more bone fragments collected in the cave in 1923. (3) The cave fauna reveals no extinct species. (4) Archeologists are not familiar with bones and shells perforated after the manner of those under discussion (see illust. p. 593, Natural History, Vol. 21). (5) The perforation of the surviving bone is fresh-looking and shows no evidence of the piece having been suspended for any length of time by a cord. (6) The specimen as a whole shows little, if any, of that wear and polish commonly found on used artifacts. (7) Archeologists are not familiar with the indicated style of art on bone in America. (8) The engravings on the specimen give the appearance of having been fitted into the well-preserved surfaces of the bone. (9) In the case of the mastodon engraving the color of the artificial incision surfaces is quite different from that of the natural bone surface. (10) All incisions show such fresh surfaces and sharp angles as could hardly have been preserved on an ancient specimen. (11) The incised lines are of such depth, regularity and precision as to preclude their having been executed with flint tools.