

shall do well to avoid inferences as to relationship based on a single character. Phylogenies of the angiosperms based on the structure of the root-tip, or of the conifers on the supposed occurrence of a ligule in the Araucarineæ, or of the Pteridophyta derived from the presence or absence of a suspensor in the embryo or a basal cell in the archegonium, have in the past been far too common. We morphologists have sinned the sins of youth in this respect and have often provoked the just censure of the taxonomists. We must avoid, too, the using, for phylogenetic purposes, of characters which can be easily modified by environment, in other words characters which are formal or physiological. In making our phylogenetic trees, as Professor Coulter has recently happily expressed it, we have begun with the topmost branches and then have followed downward into the trunk. May we successfully continue this downward progress, so that in the fullness of time our perfect tree may stand firmly rooted in the earth, drawing strength and nourishment from every stratum which contains a vestige of the former vegetation of the world.

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*THE AFFILIATION OF PSYCHOLOGY WITH
PHILOSOPHY AND WITH THE NAT-
URAL SCIENCES.¹*

I AM embarrassed that this discussion of

¹This was the topic on the program of the joint meeting of the Philosophical and Psychological Associations at Harvard, December 27, 1905. The introductory exercises of this session consisted in dedicating the new Emerson Hall with addresses by President Eliot, Dr. Emerson and Professor Münsterberg. The last named opened the discussion of the above question by arguing that philosophy and psychology, now under one roof, should be one and inseparable. The address here printed follows exactly as it was given except that part of the first paragraph was spoken in the discussion at the end.

the relations between philosophy and psychology immediately follows the exercises which have so emphatically and reiteratedly pronounced them one. I had written my brief paper purposely in a slightly more partisan than judicial spirit because asked to represent one side, and informed that others would represent the other. I had no idea, however, that I must read just at a moment which makes me seem to be trying to put asunder what Harvard has just now joined together. Objections to marriages are usually called for before the ceremony itself, and I almost feel that the proprieties of the hour should make me hold my peace here, though not forever afterwards. I feel like a divorce lawyer, thrusting his professional card into the hands of a wedded pair before they have left the church. However, the hospitality of our hosts will be, I am sure, more than adequate, and of course there was no thought of projecting the momentum of this occasion into the discussion to place my side of it at a disadvantage. At least, I will assume that the program takes precedence over any such proprieties and proceed with what I have written, which is as follows:

To me it seems only a truism to say that we do not and, perhaps, never can know any more of the ultimate nature, origin and destiny of the soul than we can and do of the nature, origin or destiny of matter or of life. In this sense psychology may do very well for the present without a soul as physics may do without an ultimate definition of force, or biology without a theory of life. This, moreover, is a positive and gnostic and not an agnostic standpoint except to those who place metaphysics, meta-biology or meta-psychology above these sciences themselves. *Definitions* of our science and even of each sense of will, cognition, feeling and the rest, may, perhaps, be divided into the following

kinds: (a) generalizations from facts which have at best only a classificatory and at worst a repetitive, attenuated, verbal sense, from which the red blood of meaning has begun to evaporate; (b) attempts at logical interpretation or statements of genus and difference, with the corpses of which the pathway of our science is so thickly strewn and which are usually haunted with all kinds of personal and philosophic biases in which no two agree; (c) those prompted by man's inveterate longing for finality, which have a certain sacrosanct character because they are *so* satisfying to the author and which, therefore, constitute precious psychological data to be collected and used empirically for future generalizations concerning human nature. Of the soul and each of its powers it can be said, as Schleicher said of language, all discussion of the origin and definition of which was long forbidden by the Société de Linguistique, 'Es ist was es wird.' Thus every new fact in psychology changes the definition of it and, perhaps, makes some older ones obsolete, because the definition of the science is nothing more nor less than the science itself in its present state. Only the tyro in any subject seeks to begin with definitions, while the connoisseur only ends with them if he reaches them at all. But (d) there may be definitions made only for the purposes of speculation or of controversy. These should be expressly provisional and ought to be transcended at the end of every discussion. My definition of psychology is expressly of the latter kind and is as follows: It is a description as accurate as can be of all those facts of psychic life, conscious and unconscious, animal and human, normal and morbid, embryonic and mature, which are demonstrable and certain to be accepted by every intelligent unbiased mind who fully knows them. They must also be so ordered, like to like, and organized that they can all be

known with the least effort, and so that each is nearest to that it is most akin. To this I would add that the best principle or organization of these facts, wherever it is justifiable, is evolutionary because the best explanation and definition of *anything* is a complete description of its developmental stages. From this definition you can foresee about all I have to say upon this topic.

Psychology deals with the facts, measurable and immeasurable, of sense and the inner life under conditions controlled in the laboratory, with statistics based on large numbers, with the myth, custom, belief and language of races, and is excluded from no field of experience, inner or outer, or of life, conscious or unconscious, religious, social, genetic, individual, that can be studied on the basis of valid empirical data. The individual speculator or system-builder who goes beyond these facts contributes nothing save one more personal set of data for the future generalizer. Consciousness, too, is an island in the midst of the shoreless, unconscious sea, or, better, in Huxley's simile it is a tallow dip illuminating only one room of the great museum of man-soul. Consciousness can only give us a glimpse of the experience of the individual and hardly that of the race. From this it follows that psychology must more and more rest upon induction and that its closest allies in the future are to be biology, physiology and anthropology.

What should it exclude? My answer is that it is just as proper, and no more so, for it to concern itself with the relations between mind and body as for physics to speculate about the relations between force and matter. It is no more pertinent for it to discuss parallelism or interaction than it is for abnormal, genetic or comparative psychology to do so. It makes no possible difference for any scientific fact of psychology whether the soul is a spirit, a mesh of neurons or a monad in Howison's sense.

These are meta-psychological considerations which we can neither prove nor disprove; they are matters of taste in philosophy, of individual bias, popular oracles to which those of literary proclivities or those who love the ancient developmental history of psychology can appeal. They are matters of creed, and often with some, and it may be great, practical value. The same is true of the old issue between dualism and monism, of freedom *versus* determinism, the nature of time, and still more so of space. These old problems in all their restatements, including that of the priority of psychic or somatic changes in feeling, the question of the educability of the pure absolute quality of retentiveness, have high pedagogic value and have impelled many ingenuous minds to the study of psychology, and their motivation is hard to exorcise in the present state of psychology, even from the stage of scientific maturity. As old sailing ships were trimmed by rolling heavy ballast chests full of old chains to starboard or larboard, according as the ship listed this way or that, so the ship of life sometimes needs to be ethically trimmed by changing the stress of these old and broken fetters of the soul; but not till the far-off day when pragmatism has quite absorbed and digested the concept of pure science should these be confused with the precious cargo of facts.

So of all attempts to define knowledge and its relations to reality, to delimitate subject and object and to decant the universe from one into the other, or to determine how many parts of each are found in the mixture of experience, whether the ego is constituted of flitting, disconnected present states or is the stream bed in which they flow, or whether, on the other hand, every change of attention is an expression of the basal and eternal will to live. If *homo studiosus* were less isolated from the daily struggle for existence, suffered less

from psychic anemia, if, instead of being pampered with a second-hand, attenuated book knowledge, he had had in his own person more of the experience he attempts to analyze, and if his selfish interest in a future life were entirely eliminated, all those questions would fade into dreams and shadows. Neither the abnormal nor the selfish impulses which animate these impulses are scientific, and therefore these questions should be segregated from psychology, for which they have no more pertinence than they have for chemistry or astrophysics.

Again, psychology inherits from philosophy a passion to classify the soul into activities, parts, faculties; to attempt to organize the different sciences; to legislate what should be done in each field and under each name; to demarcate boundaries between esthetics, ethics, logics, psychology and the rest. The age when this work can do much good or harm ended with Hegel and Comte, unless it have some value for the pedagogy of curricula or be of use to the maker of the scheme in putting his own mind in order. Logic never led to the discovery of anything, not even of a new method of investigation. At best it follows the discoverer, often at a distance, and may at best afterwards tell how his work was done. Psychology seeks its own in any and every field where psychic action is intense and manifold. But all schematizations of the relation of different fields are only tenuous formulations of the personal equation, and if they could be valid for a day are sure to be shattered by the next fruitful research. More than this, too long acquaintance with the breezy altitudes of philosophy at the same time predisposes and disqualifies for this task because it tends to a nimbleness impossible for a mind which carries a heavy cargo of facts. Intellectual temperance is not its forte. In the day of Borelli, and again with Fechner

and Herbart, and now with Karl Pearson, men of our craft have lost poise and become mathematical methodists, forgetting Aristotle's injunction to the effect that it is the mark of an amateur to insist on a greater degree of accuracy than the subject permits. So years ago when a man of science said that memory was a continuity of vibrations and that heredity and even the properties of matter were a form of memory, this speculation found place in many a text-book almost as if it were a new category, and here it stood as if substantial with the basal facts which all admit. When hypnotism showed the importance of suggestion, it was interpreted by some of the very ablest philosophic minds as including about every form of mental action, and originality and spontaneity themselves were eclipsed by it, while others argued that even heredity was a form of suggestion. In a similar holophrastic way, irritability, reflex action, electrical stimulation, tremors and vibrations, the atom concept in the form of reals and monads, the ego, the feeling of absolute dependence, the emotions, the intellect, the will, memory, and many more, have been overworked or made the key for an entire system. This constitutes at once the charm and the confusion of the history of philosophy. It infects the mind with the idea that a new principle can be found to explain, or an old one stretched to include, or be made the key to unlock, the entire universe; that the secrets of mind are to be taken by storm and perhaps by brilliant individual soldiery instead of step by step by a long siege. This is the very opposite of the Aristotelian temperance with its motto—'Nothing too much.' It is this that has caused psychology, especially in America to-day, to be shot through with surds, with metaphysical problems injected up from ancient fires like dikes, here an established conclusion from the labora-

tory or a fact from field work, in the next paragraph a discussion of its bearings upon some venerable philosophical problem.

In all this I mean no disrespect to philosophy, the history of which I have always taught and tried to understand and held worthy of highest honor as the culmination of culture history. Are we not all a little in the unhappy state of an importunate lover of two mistresses who either finds it hard to choose between them, and therefore may die without issue, or seeks to wed the preferred one without relinquishing his hold upon the other?

Again, psychiatry is just now coming our way. Its extreme subserviency to neurology is abating. Wernicke and the somatologists whose chief paradigm was general paresis, the outcome of which was sure death and which showed brain lesions, is giving way to Ziehen, Janet and Hughlings Jackson, whose type diseases are epilepsy, hysteria, etc., and who proceed from function to structure and not conversely. This opens up an unprecedented opportunity for normal psychology to influence psychiatry. But, alas, owing to the infections of our field by metaphysics, we are not unified enough to profit by this opportunity. This is a large and vital chapter I can only allude to here.

Finally, should not psychology now practically accept the more modest ideal of Bateson in biology and for a time be content to find and describe facts so as to broaden the base of the pyramid, refuse to accept its problems from speculative or even ethical philosophy, suspend judgment and even refrain from indulging the literary passion, if we have it, by writing attractively concerning insoluble questions? Thus, while keeping open the perspective by teaching the history of philosophy to every experimenter, must we not admit that we are all materialists and idealists, realists and phenomenologists, necessitarians

and freedomists, pantheists and atheists, scholastics and empiricists at the same time, and that to affirm the one exclusively is to expel a minority of faculties of the infinitely complex thing we call soul, and that one who truly knows himself can be any one of these only by a working majority of his powers? Accepting our cue from Aristotle, who called metaphysics those studies that come chronologically or developmentally after physics, and applying them also to all logic and epistemology, should we not recognize that the present glowing twilight of psychology is that of the dawn and not of the evening; that ultimates are chiefly for senescence and should be only prelusive for youth; that they better befit old than new sciences; and realize that if psychology is ever to become the queen of humanistic studies she must avoid all surds and extravasations and deal effectively with the great problems of human life, health, reproduction, disease and vital experience, and find the center of her field where psychic life is most intense, and thus, widening her boundaries from physiological psychology to biological philosophy, strive to become what, as we have just heard in the able address of his son, Emerson, for whom this admirable building was named, thought it should be, viz., a true natural history of the soul. Some of us deprecate this identification or organic unity of speculative philosophy with scientific psychology, and hope that, despite their proximity, neither will interfere with the purity of the other, and that progress may be made in evicting the many metaphysical, logical and epistemological and other utterly insoluble, though fascinating, questions from the domain of scientific psychology.

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SCIENTIFIC BOOKS.

Organography of Plants, especially of the Archegoniatae and Spermatophyta. By Dr.

K. GOEBEL, Professor in the University of Munich. Authorized English translation by ISAAC BAYLEY BALFOUR, M.A., M.D., F.R.S., King's Botanist in Scotland, Professor of Botany in the University and Regius Keeper of the Royal Botanic Garden of Edinburgh. Part II., *Special Organography*, with 417 wood cuts. Oxford, the Clarendon Press. 1905. Pp. xxiv + 707. Large 8vo.

It is five years since the English edition of Part I. appeared. That volume was devoted to 'General Organography,' including the general differentiation of the plant-body, relationships of symmetry, differences in the formation of organs at different developmental stages, juvenile forms, malformations and their significance in organography, and the influence of correlation and external formative stimuli upon the configuration of plants. It has proved its value by its wide use in advanced botanical teaching in this country and England. Part II. has now appeared as a bulky volume and, although the German edition from which this was translated was completed in 1901, the preface informs us that 'Professor Goebel has read all the proof-sheets, and has modified the text in several places, and added additional notes.' The volume is thus brought down to the present, and consequently is the most recent work on plant morphology, as it is the most important. The subject is taken up systematically, about one hundred and fifty pages being given to the liverworts and mosses, fifty pages to the gametophyte of the Pteridophyta, and over four hundred to the sporophyte of the Pteridophyta and Spermatophyta. It is under the latter that we find the fullest discussion of the morphology of the higher plants, the matter being treated under such topics as—the organs of vegetation, including root and shoot (leaf, branching of the shoot, division of labor, the shoot in the service of reproduction), and the organs of propagation, including the sporogonium of Pteridophyta apogamy, and the sporangium of Spermatophyta.

It is interesting to note here the greatly broadened use of terms, which an older morphology concerned itself with narrowing. What would the botanists of the last genera-